



Archaeological Resources
Airport Vicinity Development Checklist
Parking Study
Trip Generation Comparison
Parking Master Plan



Southbridge Expansion

Traffic Impact Study

North of 5th Avenue and
West of Scottsdale Road
in Scottsdale, Arizona

May 2019
Project No. 18-1110

Prepared For:
Spring Creek Development
7134 East Stetson Drive, Fourth Floor
Scottsdale, AZ 85251

For Submittal to:
City of Scottsdale

Prepared By:



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SOUTHBRIDGE EXPANSION TRAFFIC IMPACT AND MITIGATION ANALYSIS

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West of Scottsdale Road in Scottsdale, Arizona**

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EXECUTIVE SUMMARY

The Southbridge Expansion development is located generally north of 5th Avenue and west of Scottsdale Road in Scottsdale, Arizona. The development consists of four “Zones”, totaling 9.94 gross acres. Zone A consists of a 200-key hotel, 184 multi-family residential units, 119,040 square feet (SF) of office space and 35,520 SF of retail space/art gallery. Zone B consists of 21 multi-family residential units and 15,590 SF of retail space. Zone C is a high-rise, 12-story, condominium with 194 residential units and 27,700 SF of retail on the ground floor. Zone D consists of 171 multi-family residential units and 10,427 SF of retail space. Zones A and C provide on-site underground parking for their guests/residents with on-street parking available to the public on all local roads connecting the developments. Zone D provides on-site parking for guests above grade. Zone A has some underground parking reserved specifically for people visiting Zone B. Zone B patrons will also be using the public parking garage located directly south of the Zone, northwest of the intersection of Scottsdale Road and 3rd Avenue. The vicinity of the site is provided in **Figure 1**.

CivTech, Inc. has been retained by Spring Creek Development to perform the traffic impact and mitigation analysis for the proposed development. The purpose of this assessment is to address the traffic and transportation impacts of the proposed development on the surrounding streets and intersections. The following conclusions have been documented in this study:

General

- The Southbridge expansion is a proposed redevelopment of an existing site located in Old Town Scottsdale. The site currently consists of approximately 80,000 square feet of retail, one quality restaurant, two high turnover restaurants, 3,000 square feet of office space and approximately 6 multi-family apartments.
- The existing development generates approximately 3,360 external weekday daily trips with 124 trips occurring during the AM peak hour (74 in/50 out), and 310 trips occurring during the PM peak hour (169 in/141 out).
- This redevelopment consists of four “Zones” with a variety of land uses on each.
 - Zone A consists of a 200-key hotel, 184 multi-family residential units, 29,100 square feet (SF) of retail, a 6,420 SF art gallery and 119,040 SF of office space.
 - Zone B consists of 21 multi-family residential units and 15,590 SF of retail space on the ground floor.
 - Zone C consists of 194 residential units in a 12-story high-rise with 27,700 SF of retail on the ground level. The residential units located in Zone C are comprised of the following:
 - 1 Bedroom Condominiums – 25 DU’s
 - 2 Bedroom Condominiums – 125 DU’s

- 3 Bedroom Condominiums – 44 DU's
- The six-story mid-rise at Zone D consists of 171 residential units and 10,427 SF of commercial area. The residential units located on Zone D are comprised of the following:
 - Studio Condominiums – 21 DU's
 - 1 Bedroom Condominiums – 109 DU's
 - 2 Bedroom Condominiums – 29 DU's
 - Townhomes – 12 DU's
- The proposed redevelopment is anticipated to generate 8,414 external weekday daily trips with 484 trips occurring during the AM peak hour (257 in/227 out), and 696 trips occurring during the PM peak hour (327 in/369 out).
- The proposed redevelopment is anticipated to generate an additional 5,054 external daily trips with 360 additional trips in the AM peak hour and an additional 386 trips in the PM peak hour when compared to the trips already generated by existing development in Zones A, B and C. Zone D is a paved parking lot presently and provides public parking for those visiting surrounding businesses and is considered to generate no trips in the existing condition.
- The contractor should ensure that adequate sight distance is provided at all site access points to allow safe left and right-turning movements from the development. It is recommended that sight triangles be designed at all site access driveways to provide the required sight distance shown in *Appendix 5-3B* within the *City of Scottsdale Design Standards and Policies Manual*.

Existing

- The results of the existing conditions analysis summarized in **Table 2** indicates that all study intersections operate with acceptable levels of service (LOS D or better), with the exception of the intersection of Scottsdale Road and Chaparral Road.
 - The signalized intersection of **Scottsdale Road and Chaparral Road** operates overall at LOS E during the PM peak hour. The delay is caused by the relatively high traffic volume entering the intersection and the split phase operation of the signal. The intersection's average delay per vehicle during the PM peak hour is evaluated to be approximately 61 seconds.

Opening Year 2022

- All 2022 study intersections are projected to operate at level of service LOS D or better during the AM and PM peak hours under the existing lane configurations and traffic controls with the exception of the following intersections:

- Without mitigation, the signalized intersection of **Scottsdale Road and Chaparral Road** is anticipated to operate at LOS E during the PM peak hour with or without the site. In order to mitigate this delay, it is recommended that the minimum initial green time for the southbound left phase be increased from 5 seconds to 7 seconds, the northbound/southbound through phase be extended from 10 seconds to 12 seconds, the southbound left turn phase be extended from 17 seconds to 24 seconds and the southbound through phase be extended from 57 seconds to 62 seconds. With these mitigation measures applied the southbound delay is expected to decrease from 118.5 seconds per vehicle to 75.1 seconds per vehicle. Although the intersection is still anticipated to operate at an overall LOS E during the PM peak hour, the delays at each approach are more even and one approach does not experience significantly more delay than another.
- Without mitigation, the westbound approach of **Scottsdale Road and Highland Avenue** is anticipated to operate at LOS E during both the AM and PM peak hours with or without the site. During the AM peak hour, the delay is very close to the threshold for an acceptable level of service and no mitigation is recommended at this time. During the PM peak hour, it is recommended that the eastbound/westbound minimum initial green time be increased from 7 seconds to 10 seconds. This is expected to decrease the westbound delay from 56.3 seconds per vehicle to 54.6 seconds per vehicle during the PM peak hour.
- Without mitigation, the eastbound and westbound approaches of **Goldwater Boulevard and Fashion Square Drive** are anticipated to operate at LOS E during both the AM and PM peak hours with or without the site. During the AM peak hour, it is recommended that the vehicle recall mode be changed from “none” to “min” and during the PM peak hour it is recommended that the vehicle recall mode be changed from “none” to “max.”
 - With the vehicle recall mode set to “none”, if no vehicles approach the eastbound or westbound approaches as the northbound and southbound phases come to an end, their phase will be skipped and the cycle will return to the northbound and southbound phases. However, if a vehicle does not approach the intersection from the east or west during this detection phase, the eastbound and westbound phase will still be skipped and the vehicle will have to wait for the next cycle. By changing the recall mode to “min”, it means that the minimum green time will always occur on the minor approach whether a vehicle approaches or not. The vehicle recall mode “max” means that the maximum green time will always occur on the minor approach with or without a vehicle approaching. Changing the recall mode will add more delay to the northbound and southbound approaches, however, since the northbound and southbound approaches experience very little delay, it is reasonable to change the recall mode to significantly decrease the delay on the eastbound and westbound approaches.

- During the AM peak hour, the eastbound delay is anticipated to decrease from 57.3 seconds per vehicle to 53.2 seconds per vehicle and the westbound delay is anticipated to decrease from 57.8 seconds per vehicle to 53.2 seconds per vehicle. During the PM peak hour, the eastbound delay is anticipated to decrease from 56.8 seconds per vehicle to 36.9 seconds per vehicle and the westbound delay is anticipated to decrease from 64.5 seconds per vehicle to 36.2 seconds per vehicle.
- Without mitigation, the signalized intersection of **68th Street and Camelback Road** is anticipated to operate at LOS E during the PM peak hour with or without the site. It is recommended that the northbound/southbound through phase be extended from 15 seconds to 24 seconds and the northbound/southbound left turn phase be extended from 10 seconds to 19 seconds. With these mitigation measures applied, the northbound delay is expected to decrease from 229.3 seconds per vehicle to 48.4 seconds per vehicle and the southbound delay is expected to decrease from 85.7 seconds per vehicle to 33.9 seconds per vehicle during the PM peak hour.
- Without mitigation, the southbound approach of **Goldwater Boulevard and Camelback Road** is anticipated to operate at LOS E during the AM peak hour with or without the site. It is recommended that the vehicle recall mode for the southbound left and southbound through phases be changed from “none” to “min” and the southbound right turn overlap phase be extended from 24 seconds to 25 seconds. With these mitigation measures applied, the southbound delay is anticipated to decrease from 60.9 seconds per vehicle to 54.8 seconds per vehicle.
- Without mitigation, the westbound approach of **Scottsdale Road and Camelback Road** is anticipated to operate at LOS E during the PM peak hour with or without the site. It is recommended that the eastbound/westbound through phase be extended from 40 seconds to 41 seconds in order to decrease the anticipated delay from 56.2 seconds per vehicle to 53.9 seconds per vehicle.
- Without mitigation, the westbound approach of **Scottsdale Road and Stetson Drive/Drinkwater Boulevard** is expected to operate at LOS E during the AM and PM peak hours with or without the site. During the AM peak hour, it is recommended that the westbound right turn overlap phase be extended from 25 seconds to 28 seconds. With this mitigation it is anticipated that the westbound approach delay will decrease from 76.2 seconds per vehicle to 67.4 seconds per vehicle, which is lower than what is anticipated without the addition of site traffic.

- During the PM peak hour, it is recommended that the vehicle recall mode on the eastbound and westbound approaches be changed from “none” to “max” to allow for more vehicles to utilize the intersection on the minor approach during the peak hour. With this mitigation applied, the westbound approach delay is expected to decrease from 134.3 seconds per vehicle to 16.3 seconds per vehicle. By opening year 2022, this intersection will also be improved by the developer to include a dedicated eastbound left turn lane.
- Without mitigation, the southbound approach of **68th Street and Indian School Road** is anticipated to operate at LOS E during the PM peak hour with or without the site. It is recommended that the southbound through phase be extended from 39 seconds to 41 seconds, the southbound left turn phase be extended from 17 seconds to 25 seconds and the westbound left turn phase be extended from 15 seconds to 16 seconds. With these mitigation measures applied, the southbound delay is anticipated to decrease from 65.1 seconds per vehicle to 58.3 seconds per vehicle during the PM peak hour, which is lower than what is anticipated without the addition of site traffic.

Horizon Year 2032

- All 2032 study intersections are projected to operate overall at LOS D or better during the AM and PM peak hours under the existing lane configurations and stop controls with the exception of the following intersections:
 - Without mitigation, the signalized intersection of **Scottsdale Road and Chaparral Road** is anticipated to operate at LOS E during both the AM and PM peak hours with or without the site. In order to mitigate this delay, it is recommended that the dedicated southbound right turn lane be restriped to a shared through/right turn lane. Although this would force vehicles heading southbound through the intersection from this to use the Goldwater Boulevard off-shoot, many existing vehicles prefer this route as opposed to driving straight down Scottsdale Road. With this change in lane, the eastbound delay during the AM peak hour is anticipated to decrease from 119.8 seconds per vehicle to 56.7 seconds per vehicle.
 - During the PM peak hour, it is recommended that the southbound phase be extended from 62 seconds to 66 seconds, the northbound left turn phase be extended from 12 seconds to 26 seconds and the northbound phase be extended from 50 seconds to 71 seconds. With these mitigation measures applied, the northbound delay is expected to decrease from 216.8 seconds per vehicle to 116.4 seconds per vehicle and the southbound delay is expected to decrease from 192.7 seconds per vehicle to 101.2 seconds per vehicle, both of which are lower than the delays anticipated without the addition of site traffic.

- Without mitigation, the eastbound and westbound approaches of **Scottsdale Road and Highland Avenue** are anticipated to operate at LOS E during the PM peak hour with or without the site. In order to mitigate this delay, it is recommended that the eastbound through phase be extended from 38 seconds to 42 seconds and the westbound through phase be extended from 15 seconds to 18 seconds. With these mitigation measures applied, it is anticipated that the eastbound delay will decrease from 63.3 seconds per vehicle to 52.3 seconds per vehicle and the westbound delay will decrease from 61.1 seconds per vehicle to 56.3 seconds per vehicle. Although the AM peak hour also experiences delay on the westbound approach, it does not increase with the addition of site traffic.
- Without mitigation, the northbound approach of **68th Street and Camelback Road** is anticipated to operate at LOS E or worse during the AM and PM peak hours with or without the site. The westbound approach is also anticipated to operate at LOS E or worse during both the AM and PM peak hours only with the addition of site traffic. During the AM peak hour, by extending the cycle length from 109 seconds to 110 seconds, the westbound approach delay is expected to decrease from 57.2 seconds per vehicle to 50.9 seconds per vehicle. The northbound approach delay is similar with and without site traffic and since only minimal site traffic is added to this approach, no mitigation was applied.
 - During the PM peak hour, it is recommended that the eastbound/westbound phases be extended from 38 seconds to 49 seconds and the northbound/southbound through phases be extended from 24 seconds to 33 seconds. With these mitigation measures applied, the northbound delay is anticipated to decrease from 89.7 seconds per vehicle to 66.2 seconds per vehicle and the westbound approach delay is anticipated to decrease from 112.2 seconds per vehicle to 65 seconds per vehicle.
- Without mitigation, the southbound approach of **Goldwater Boulevard and Camelback Road** is anticipated to operate at LOS E or worse during the AM and PM peak hours with or without the site. During the AM peak hour, it is recommended that the southbound right turn overlap phase be extended from 25 seconds to 35 seconds in order to decrease the anticipated delay from 91.4 seconds per vehicle to 59.5 seconds per vehicle.
 - During the PM peak hour, only 4 site trips are added to the southbound through movement and since the delay is present without the addition of site traffic, any mitigation measures would be the responsibility of the City of Scottsdale.

- Without mitigation, the signalized intersection of **Scottsdale Road and Camelback Road** is anticipated to operate at an overall LOS E during the PM peak hour with or without the addition of site traffic. It is recommended that the northbound left turn phase be extended from 22 seconds to 28 seconds and the southbound left turn phase be extended from 25 seconds to 28 seconds. Although this does not eliminate the delay, all of the approach delays are more even and no one approach is anticipated to experience a significantly higher delay than another.
- Without mitigation, the signalized intersection of **Drinkwater Boulevard and Indian School Road** is anticipated to operate at an overall LOS E during the PM peak hour with or without the addition of site traffic. In order to mitigate this delay, it is recommended that the northbound right turn include an overlap phase, the eastbound/westbound left turn phase be extended from 19 seconds to 21 seconds, the eastbound/westbound through phase be extended from 48 seconds to 50 seconds and the southbound left turn phase be extended from 22 seconds to 24 seconds. With these mitigation measures applied, the overall delay during the PM peak hour is anticipated to decrease from 94.2 seconds per vehicle to 77.3 seconds per vehicle, which is lower than what is anticipated without the addition of site traffic.
- The unsignalized intersection of **70th Street and Goldwater Boulevard** experiences delay during the PM peak hour on the northbound left-turn movement. In the no-build scenario, this movement experiences a delay of approximately 55 seconds. A delay of 58 seconds is anticipated in the full-build scenario. The addition of site generated traffic does not add any northbound left turns and adds no more than 15 through vehicles in either peak hour in either the eastbound or westbound directions. For horizon year 2032, a signal warrant analysis was performed and this intersection does not meet any of the criteria for a signal with the major road speed limit of 35 mph. If a design speed of 40 mph is considered for this study, both the no-build and full-build scenarios would warrant a signal at this intersection using the eight-hour vehicular volume, four-hour vehicular volumes and the peak hour warrants. The developer would not be responsible for the installation of a signal since the signal is warranted without the addition of site generated traffic.

Queue Storage

- The proposed storage lengths for the existing turn lanes impacted by site generated traffic are summarized in **Table 12**. It is recommended by the City of Scottsdale that all storage lanes be a minimum of 100 feet. All storage lengths that fall below this minimum, which have additional and available space have been recommended at this length. Additional storage length calculations should be completed prior to traffic signal installation, a change in intersection stop control or installation of raised medians.

INTRODUCTION

The Southbridge Expansion development is located generally north of 5th Avenue and west of Scottsdale Road in Scottsdale, Arizona. The development consists of four Zones, totaling 9.94 gross acres. Zone A consists of a 200-key hotel, 184 multi-family residential units, 119,040 square feet (SF) of office space and 35,520 SF of retail space/art gallery. Zone B consists of 21 multi-family residential units and 15,590 SF of retail space. Zone C is a high-rise, 12-story, condominium with 194 residential units and 27,700 SF of retail on the ground floor. Zone D consists of 171 multi-family residential units and 10,427 SF of retail space. Zones A and C provide on-site underground parking for their guests/residents with on-street parking available to the public on all local roads connecting the developments. Zone D provides on-site parking for guests above grade. Zone A has some underground parking reserved specifically for people visiting Zone B. Zone B patrons will also be using the public parking garage located directly south of the Zone, northwest of the intersection of Scottsdale Road and 3rd Avenue. The vicinity of the site is provided in **Figure 1**.

Study Requirements

This study analyzes the traffic impact due to the proposed development on the surrounding street network. The study will be prepared in conformance with the City of Scottsdale *Design Standards and Policies Manual*, Chapter 5, Transportation Impact Studies, 2018. The specific objectives of the study are:

- To determine the existing site generated trips through trip generation rate calculations.
- To determine whether the planned street system in the vicinity of the site is adequate to accommodate the increased traffic that results from the proposed development.
- To recommend additional street improvements or traffic control devices, where necessary, to mitigate the additional site-generated traffic; and,
- Evaluate the internal site circulation, site access points, and provide recommendations if necessary.

Study Area

The study area has been defined as including the following intersections:

- | | |
|--|--|
| ➤ Scottsdale Rd & Chaparral Rd | ➤ Scottsdale Rd & Rancho Vista Dr |
| ➤ Scottsdale Rd & Highland Ave/Granada Ave | ➤ Goldwater Blvd & Fashion Square Dr |
| ➤ 68 th St & Camelback Rd | ➤ Goldwater Blvd & Camelback Rd |
| ➤ Scottsdale Rd & Camelback Rd | ➤ Scottsdale Rd & Stetson Dr/Drinkwater Blvd |
| ➤ Scottsdale Rd & 5 th Ave | ➤ Stetson Dr & 5 th Ave |
| ➤ Drinkwater Blvd & 5 th Ave | ➤ Drinkwater & Indian School Rd |
| ➤ Craftsman Ct & 5 th Ave | ➤ Marshall Way & 5 th Ave |

- Goldwater Blvd & 5th Ave
- Craftsman Ct & 3rd Ave
- Scottsdale Rd & 3rd Ave
- 68th St & Indian School Rd
- Marshall Way & Indian School Rd
- Brown Ave & Indian School Rd
- 70th St & Goldwater Blvd
- Scottsdale Rd & Osborn Rd
- Marshall Way & 3rd Ave
- Goldwater Blvd & 3rd Ave
- Drinkwater Blvd & 3rd Ave
- Goldwater Blvd & Indian School Rd
- Scottsdale Rd & Indian School Rd
- Buckboard Trail & Indian School Rd
- Goldwater Blvd & Scottsdale Rd

Horizon Years

This study has been conducted to conform to the *Design Standards and Policies Manual, Chapter 5, Transportation Impact Studies*, prepared by the City of Scottsdale in 2018. The proposed development is anticipated to generate just under 500 trips during the highest peak hour. The opening year of the entire site will be 2022. The developer will be building all four zones within a short time frame, the opening year 2022 has been considered the opening year for all four zones. Since all zones are likely to be constructed simultaneously, interim horizon year analysis is not needed for the phasing of off-site infrastructure improvement. For a category 3 TIMA, 5 years after opening is usually included in the analysis. Based on discussion with the City of Scottsdale about the timing of the development, analysis will be conducted for the opening year 2022 and 10 years after opening, 2032.

The study intersections and the site accesses will be analyzed for AM and PM peak hours to determine the recommended intersection lane configuration, intersection stop control, turn lane storage requirements, and roadway typical sections for the development.

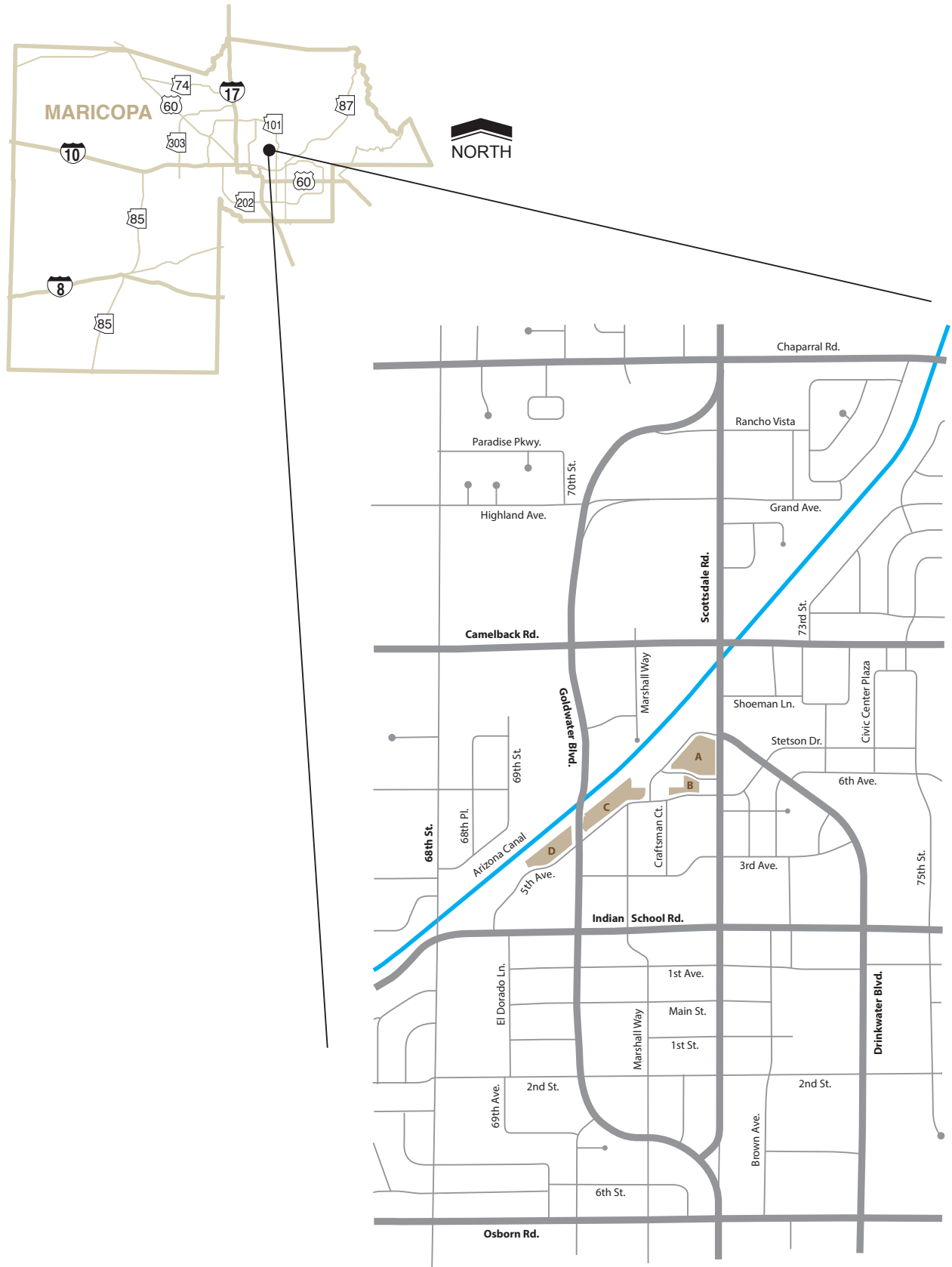


Figure 1: Vicinity Map

EXISTING CONDITIONS

EXISTING LAND USE

The existing land is part of the Old Town Scottsdale district and consists of a few different land uses. There are several restaurants, shops and services utilizing the proposed site under existing conditions.

SURROUNDING LAND USE

The proposed site is located in Old Town Scottsdale, which is also known as the Arts District of Scottsdale. North of the site is the Arizona Canal as well as Scottsdale Fashion Square shopping center. East of the site is commercial centers as well as multi-family residential. South of the site is the majority of art galleries in Old Town as well as the Scottsdale Artist's School and the Valley Ho Hotel. West of the site is mostly residential developments, located west of the Arizona Canal. There are also some businesses on the eastern side of the canal, but still west of the proposed development.

EXISTING ROADWAY NETWORK

West of the site is Loop 101. There are also many major arterial roads within the vicinity of the proposed development to allow for ease of travel for visitors and residents. The existing roadway network within the study area includes the following:

68th Street is a north-south, four-lane major collector within the vicinity of the proposed site. There are two travelling lanes in each direction and a raised median along portions of the road. 68th Street begins at the intersection with Jackrabbit Road and continues south to Continental Drive where it becomes College Avenue. The posted speed limit is 35 mph.

Camelback Road is an east-west six-lane minor arterial north of the proposed site. There are three lanes and a bicycle lane in each travelling direction with raised medians along portions of the roadway. Camelback Road begins in Goodyear just east of the Beardsley Canal and continues west until terminating at the intersection with Pima Road just west of the Loop 101. The posted speed limit is 40 mph.

Chaparral Road is an east-west five-lane road classified as a minor collector east of Scottsdale Road and a major collector to the west of Scottsdale Road. There are two lanes in each travelling direction and a continuous two-way-left-turn lane within the vicinity of the site. Chaparral Road begins at the intersection with Invergordon Road and continues west until ending just east of the Arizona Canal. Chaparral Road provides direct access to the Loop 101. The posted speed limit is 40 mph.

Scottsdale Road is a north-south, six-lane major arterial north of Camelback Road with three lanes in each direction and raised medians. South of Camelback Road and north of Stetson Drive/Drinkwater Boulevard, there are two southbound through lanes and three northbound through lanes with raised medians. South of Stetson Drive/Goldwater Boulevard and north of Goldwater Boulevard, Scottsdale Road has two lanes in each direction with

raised medians. Where Goldwater Boulevard and Scottsdale Road merge north of Osborn Road, Scottsdale Road has three southbound through lanes and two northbound through lanes with a raised median, this stays consistent south of Osborn Road. Scottsdale Road begins to the north at Carefree Highway (SR 74) and Tom Darlington Drive continuing south to the Red Mountain Freeway (Loop 202). South of the Loop 202 Scottsdale Road becomes Rural Road. Within the vicinity of the study area Scottsdale Road provides access to all major east-west arterials. The posted speed limit on Scottsdale Road south of the site is 40 mph. The posted speed limit within the vicinity of the site is 25 mph. The proposed site is located in Old Town Scottsdale, which is a very popular tourism destination, meaning that the speed limit is slower than on a typical section of road.

Indian School Road is an east-west four-lane road classified as a minor arterial by the City of Scottsdale. There are two lanes in each travelling direction as well as a bicycle lane. Along portions of the road, within the vicinity of the site, there is either a two-way-left-turn lane or a raised median. Indian School Road begins in the Town of Goodyear and continues west until terminating just west of Mesa Drive, before intersecting with SR 87. Indian School Road provides direct access to the Loop 101. The posted speed limit is 35 mph within the vicinity of the site.

Goldwater Boulevard is a north-south five-lane major arterial road within the vicinity of the site. There are three lanes in the southbound direction, two lanes in the northbound and raised medians along portions of the road. This road begins just south of Chaparral, breaking off from Scottsdale Road to the west, and rejoins Scottsdale Road at the intersection with Osborn Road. This road allows traffic to bypass Old Town Scottsdale and provides access to major and minor arterials to the west of the site. The posted speed limit is 35 mph.

Drinkwater Boulevard is a north-south five-lane major arterial road within the vicinity of the site. There are three lanes in the northbound direction, two lanes in the southbound direction and raised medians along portions of the road. The road begins just south of Camelback Road diverging east off of Scottsdale Road. Drinkwater Boulevard rejoins Scottsdale Road at the intersection with Earll Drive. The road provides access to major and minor arterial roads west of the site and also provides direct access to major landmarks in Scottsdale such as the Scottsdale Stadium and the Civic Center. The posted speed limit is 35 mph.

Stetson Drive is a north-south two-lane minor roadway within the vicinity of the site. There is one lane in each travelling direction. Stetson drive begins at the intersection with 5th Avenue and continues north for approximately 0.2 miles before terminating at the interstation with Scottsdale Road. Stetson Drive provides access to many shops and restaurants in the area. Stetson Drive shares an alignment with Drinkwater Boulevard. There is no posted speed limit.

70th Street is a north-south three-lane minor roadway just south of the site. There is one lane in each travelling direction and a continuous two-way-left-turn lane. 70th Street begins at the intersection with Goldwater Boulevard, just south of Scottsdale Artist's School and

continues south until terminating at the intersection with Thomas Road. The posted speed limit is 30 mph.

Marshall Way is a north-south two-lane minor roadway within the vicinity of the site. There is one travelling lane in each direction and on-street parking along the majority of the road. Marshall Way begins at the intersection with 6th Street and continues north until terminating at the intersection with 5th Avenue. There is no posted speed limit.

3rd Avenue is an east-west two-lane minor roadway within the vicinity of the site. There is one travelling lane in each direction. 3rd Avenue begins at the intersection with Goldwater Boulevard and continues east until terminating at Drinkwater Boulevard. The posted speed limit is 25 mph.

5th Avenue is an east-west two-lane minor roadway within the vicinity of the site. There is one travelling lane in each direction. 5th Avenue begins at the intersection with Indian School Road and continues east until Scottsdale Road, where it transitions into Stetson Drive east of the intersection. There is no posted speed limit.

Craftsman Court is a north-south two-lane minor roadway within the vicinity of the site. There is one travelling lane in each direction. Craftsman Court begins at the intersection with 5th Avenue and continues south until terminating at 3rd Avenue. There is on-street slanted parking spots along the entire length of the road. There is no posted speed limit.

Brown Avenue is a north-south two-lane minor roadway within the vicinity of the site. There is one travelling lane in each direction. Brown Avenue begins at the intersection with Indian School Road and continues south until terminating at Osborn Road. There is on-street slanted parking spots along the entire length of the road north of 2nd Street. There is no posted speed limit north of 2nd Street. South of 2nd Street, the posted speed limit is 25 mph.

Buckboard Trail is a north-south two-lane minor roadway within the vicinity of the site. There is one travelling lane in each direction. Buckboard Trail begins at the intersection with 3rd Avenue and continues south until terminating at 1st Avenue. There is on-street parking along the entire length of the road north of Indian School Road. There is no posted speed limit.

Highland Avenue is an east-west four lane road within the vicinity of the site. There are two lanes in each travelling direction and a raised median along most of the roadway. Highland Ave provides direct access from Goldwater Boulevard to Scottsdale Road. The posted speed limit is 30 mph.

Rancho Vista Drive is an east-west two-lane minor roadway within the vicinity of the site. There is one travelling lane in each direction. Rancho Vista Drive begins at Goldwater Boulevard and continues east until 73rd Street. The posted speed limit is 25 mph.

Fashion Square Drive is an east-west two-lane minor roadway within the vicinity of the site. There is one travelling lane in each direction. Fashion Square Drive begins at the parking garage adjacent to Dillard's at Scottsdale Fashion Square mall and continues east until terminating at Scottsdale Road. There is no posted speed limit.

Osborn Road is an east-west five-lane road classified as a major collector by the City of Scottsdale within the vicinity of the site. There are two lanes in each travelling direction and a continuous two-way-left-turn lane along the stretch of road within the vicinity of the site. This segment of Osborn Road begins at the intersection with 64th Street and continues east until transitioning into 87th Place just east of 87th Street. The posted speed limit is 35 mph.

EXISTING INTERSECTION CONFIGURATION

The intersection of **Scottsdale Road and Chaparral Road** is a four-legged signalized intersection with permissive-protected left-turns at the northbound and southbound approaches and protected left-turns at the eastbound and westbound approaches. The northbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and one (1) shared through/right-turn lane. The westbound approach consists of dual left-turn lanes, one (1) through lane and one (1) dedicated right-turn lane. The southbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and one (1) shared through/right-turn lane. The eastbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) dedicated right-turn lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Scottsdale Road and Rancho Vista Drive** is a four-legged signalized intersection with permissive phasing at all approaches of the intersection. The northbound and southbound approaches consist of one (1) exclusive left-turn lane, two (2) through lanes and one (1) shared through/right-turn lane. The westbound approach consists of one (1) shared left-turn/through lane and one (1) exclusive right-turn lane. The eastbound approach consists of one (1) exclusive left-turn lane, one (1) through lane, and one (1) exclusive right-turn lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Scottsdale Road and Highland Avenue/Granada Avenue** is a four-legged signalized intersection with permissive-protected phasing on the east and west approaches and permissive phasing on the north and south approaches. The northbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and one (1) shared through/right-turn lane. The westbound approach consists of one (1) left-turn lane and one (1) shared through/right-turn lane. The southbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and one (1) shared through/right-turn lane. The eastbound approach consists of dual left-turn lanes and one (1) shared through/right-turn lane. There are pedestrian crosswalks across all legs of the intersection with the exception of the north leg.

The intersection of **Goldwater Boulevard and Fashion Square Drive** operates as a signalized four-legged intersection with permissive phasing on all approaches of the intersection. The northbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and one (1) dedicated right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane and one (1) shared through/right-turn lane. The southbound approach consists of one (1) dedicated left-turn lane, three (3) through lanes and one (1) dedicated right-turn lane. The eastbound approach consists of one (1) shared left-turn/through/right-turn lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Goldwater Boulevard and Camelback Road** operates as a signalized four-legged intersection with protected phasing on the north and south approaches and permissive-protected phasing on the east and west approaches. The northbound approach consists of dual left-turn lanes, two (2) through lanes and one (1) dedicated right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes, one (1) shared through/right-turn lane and a bicycle lane. The southbound approach consists of dual left-turn lanes, three (3) through lanes and one (1) dedicated right-turn lane. The eastbound approach consists of one (1) dedicated left-turn lane, three (3) through lanes, a bicycle lane and a dedicated right-turn lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **68th Street and Camelback Road** operates as a signalized four-legged intersection with permissive-protected phasing on all approaches of the intersection. The northbound and southbound approaches consist of one (1) dedicated left-turn lane, one (1) through lane and one (1) dedicated right-turn lane. The eastbound and westbound approaches consist of one (1) dedicated left-turn lane, two (2) through lane, one (1) shared through/right-turn lane, and one (1) bicycle lane. There are pedestrian crosswalks across all four legs of the intersection.

The intersection of **Scottsdale Road and Camelback Road** is a four-legged signalized intersection with protected phasing on all approaches of the intersection. The northbound approach consists of dual left-turn lanes, two (2) through lanes and one (1) shared through/right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) shared through/right-turn lane. The southbound approach consists of dual left-turn lanes, two (2) through lanes and one (1) dedicated right-turn lane. The eastbound approach consists of dual left-turn lanes, two (2) through lanes and one (1) dedicated right-turn lane. There are pedestrian crosswalks across all four legs of the intersection.

The intersection of **Scottsdale Road and Drinkwater Boulevard/Stetson Drive** is a signalized four-legged intersection with permissive phasing on the north, east and west approaches and protected-permissive phasing on the southbound approach. The northbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) shared through/right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) dedicated right-turn lane. The southbound approach consists of dual left-turn lanes, one (1) through lane and one (1) shared through/right-turn lane. The eastbound approach consists of one (1) shared left-turn/through/right-turn lane. There are pedestrian crosswalks across all four legs of the intersection.

The intersection of **Drinkwater Boulevard and 5th Avenue** is a signalized four-legged intersection with permissive-protected phasing on the north and southbound approaches and permissive phasing on the east and westbound approaches. Drinkwater Boulevard is considered the north/south street. The northbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and one (1) dedicated right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane and one (1) shared through/right-turn lane. The southbound approach consists of one (1) dedicated left-turn lane, one (1) through

lane and one (1) shared through/right-turn lane. The eastbound approach consists of one (1) dedicated left-turn lane and one (1) shared through/right-turn lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Scottsdale Road and 5th Avenue** is a signalized four-legged intersection with permissive-protected phasing on the north and southbound approaches and permissive phasing on the east and westbound approaches. The northbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) shared through/right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane and one (1) shared through/right-turn lane. The southbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) shared through/right-turn lane. The eastbound approach consists of one (1) shared left-turn/through/right-turn lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Craftsman Court and 5th Avenue** is a three-legged stop-controlled intersection with free movements in the east and westbound directions and a stop sign on the northbound approach. The northbound approach consists of one (1) shared left-turn/right-turn lane. The westbound approach consists of one (1) shared left-turn/through lane. The eastbound approach consists of one (1) shared through/right-turn lane.

The intersection of **Stetson Drive and 5th Avenue** is a three-legged stop-controlled intersection with free movements in the east and westbound directions and a stop sign on the southbound approach. The southbound approach consists of one (1) shared left-turn/right-turn lane. The eastbound approach consists of one (1) shared left-turn/through lane. The westbound approach consists of one (1) shared through/right-turn lane.

The intersection of **Marshall Way and 5th Avenue** is a stop-controlled three-legged roundabout intersection within the vicinity of the site. All approaches consist of one (1) lane that allows for vehicles to turn into the roundabout and access all legs of the intersection.

The intersection of **Goldwater Boulevard and 5th Avenue** is a signalized four-legged intersection with permissive phasing on all approaches of the intersection. The northbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) shared through/right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) dedicated, right-turn slip-lane which yields to oncoming traffic. The southbound approach consists of one (1) dedicated left turn lane, two (2) through lanes, and one (1) shared through/right-turn lane. The eastbound approach consists of one (1) dedicated left-turn lane and one (1) shared through/right-turn lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Goldwater Boulevard and 3rd Avenue** is a three-legged stop-controlled intersection with free movements in the north and south directions and a stop sign on the westbound approach. The northbound approach consists of one (1) through lane and one (1) shared through/right-turn lane. The westbound approach consists of one (1) shared left-turn/right-turn lane. The southbound approach consists of a two-way-left-turn lane and three (3) through lanes.

The intersection of **Marshall Way and 3rd Avenue** is a four-legged all-way stop-controlled intersection within the vicinity of the site. All approaches consist of one (1) shared left turn/through/right-turn lane.

The intersection of **Craftsman Court and 3rd Avenue** is a three-legged stop-controlled intersection with free movements in the east and west directions and a stop sign on the southbound approach. The southbound approach consists of one (1) shared left-turn/right-turn lane. The eastbound approach consists of one (1) shared left-turn/through lane. The westbound approach consists of one (1) shared through/right-turn lane.

The intersection of **Scottsdale Road and 3rd Avenue** is a four-legged signalized intersection with permissive phasing on all approaches of the intersection. The northbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) shared through/right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane and one (1) shared through/right-turn lane. The southbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and one (1) dedicated right-turn lane. The eastbound approach consists of one (1) dedicated left-turn lane and one (1) shared through/right-turn lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Drinkwater Boulevard and 3rd Avenue** is a four-legged signalized intersection with permissive phasing on all approaches of the intersection. The eastbound approach restricts right-turns on red. The northbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and one (1) shared through/right-turn lane. The westbound approach is a driveway for the Hyatt Hotel and the San Marin Apartments, which consists of one (1) shared left-turn/through/right-turn lane. The southbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and one (1) dedicated right-turn lane. The eastbound approach consists of one (1) dedicated left-turn lane and one (1) shared through/right-turn lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Drinkwater Boulevard and Indian School Road** is a four-legged signalized with protected phasing on the north and southbound approaches and permissive-protected phasing on the east and westbound approaches. The northbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and one (1) dedicated right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes, a bicycle lane and a dedicated right-turn lane. The southbound approach consists of dual left-turn lanes, one (1) through lane and one (1) shared through/right-turn lane. The eastbound approach consists of one (1) dedicated left-turn lane, one (1) through lane, one (1) shared through/right-turn lane and one (1) bicycle lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Scottsdale Road and Indian School Road** is a four-legged signalized intersection with permissive-protected phasing on all approaches of the intersection. The northbound approach consists of one (1) dedicated left-turn lane, one (1) through lanes and one (1) shared through/right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane, one (1) through lane, one (1) shared through/right-turn lane and a bicycle lane. The southbound approach consists of one (1) dedicated left-turn lane, two (2)

through lanes and one (1) dedicated right-turn lane. The eastbound approach consists of one (1) dedicated left-turn lane, one (1) through lane, one (1) shared through/right-turn lane and a bicycle lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Marshall Way and Indian School Road** is a signalized four-legged intersection with permissive phasing on all approaches of the intersection. The northbound and southbound approaches consist of one (1) shared left-turn/through/right-turn lane. The eastbound and westbound approaches consist of one (1) dedicated left-turn lane, one (1) through lane, one (1) shared through/right-turn lane and a bicycle lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Goldwater Boulevard and Indian School Road** is a signalized four-legged intersection with protected phasing on all approaches of the intersection. The northbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) shared through/right-turn lane. The westbound approach consists of dual left-turn lanes, one (1) through lane, one (1) shared through/right-turn lane and one (1) bicycle lane. The southbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and one (1) shared through/right-turn lane. The eastbound approach consists of dual left-turn lanes, two (2) through lanes, a bicycle lane and a dedicated right-turn lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **68th Street and Indian School Road** is a four-legged signalized intersection with protected phasing on all approaches of the intersection. The northbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and one (1) dedicated right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane, three (3) through lanes, a bicycle lane and a dedicated right-turn lane. The southbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) shared through/right-turn lane. The eastbound approach consists of one (1) dedicated left-turn lane, three (3) through lanes, one (1) bicycle lane and one (1) dedicated right-turn lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Brown Avenue and Indian School Road** is a three-legged signalized intersection with permissive phasing on all approaches. The northbound approach consists of one (1) shared left-turn/right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and a bicycle lane. The eastbound approach consists of one (1) through lane, one (1) shared through/right-turn lane and a bicycle lane. There are pedestrian crosswalks across the south and east legs of the intersection.

The intersection of **Buckboard Trail and Indian School Road** is a four-legged signalized intersection with permissive phasing on all approaches. The northbound approach consists of one (1) shared left-turn/through/right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane, one (1) through lane, one (1) shared through/right-turn lane and a bicycle lane. The southbound approach consists of one (1) shared left-turn/through lane and one (1) dedicated right-turn lane. The eastbound approach consists of one (1) dedicated left-turn lane, one (1) through lane, one (1) shared through/right-turn lane and a bicycle lane. There are pedestrian crosswalks across the north, east and south legs of the intersection.

The intersection of **Scottsdale Road and Osborn Road** is a four-legged signalized intersection with permissive-protected phasing on all approaches of the intersection. The northbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and one (1) dedicated right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) shared through/right-turn lane. The southbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and one (1) shared through/right-turn lane. The eastbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) shared through/right-turn lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Goldwater Boulevard and Scottsdale Road** is a four-legged signalized intersection with permissive phasing on the northbound and southbound approaches and protected left-turns on the eastbound and westbound approaches. Goldwater Boulevard is considered the north/south street. The northbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) shared through/right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane and one (1) shared left-turn/through/right-turn lane. The southbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and one (1) shared through/right-turn lane. The eastbound approach is a driveway from the CVS Pharmacy and consists of one (1) shared left-turn/through/right-turn lane. There are pedestrian crosswalks across all legs of the intersection.

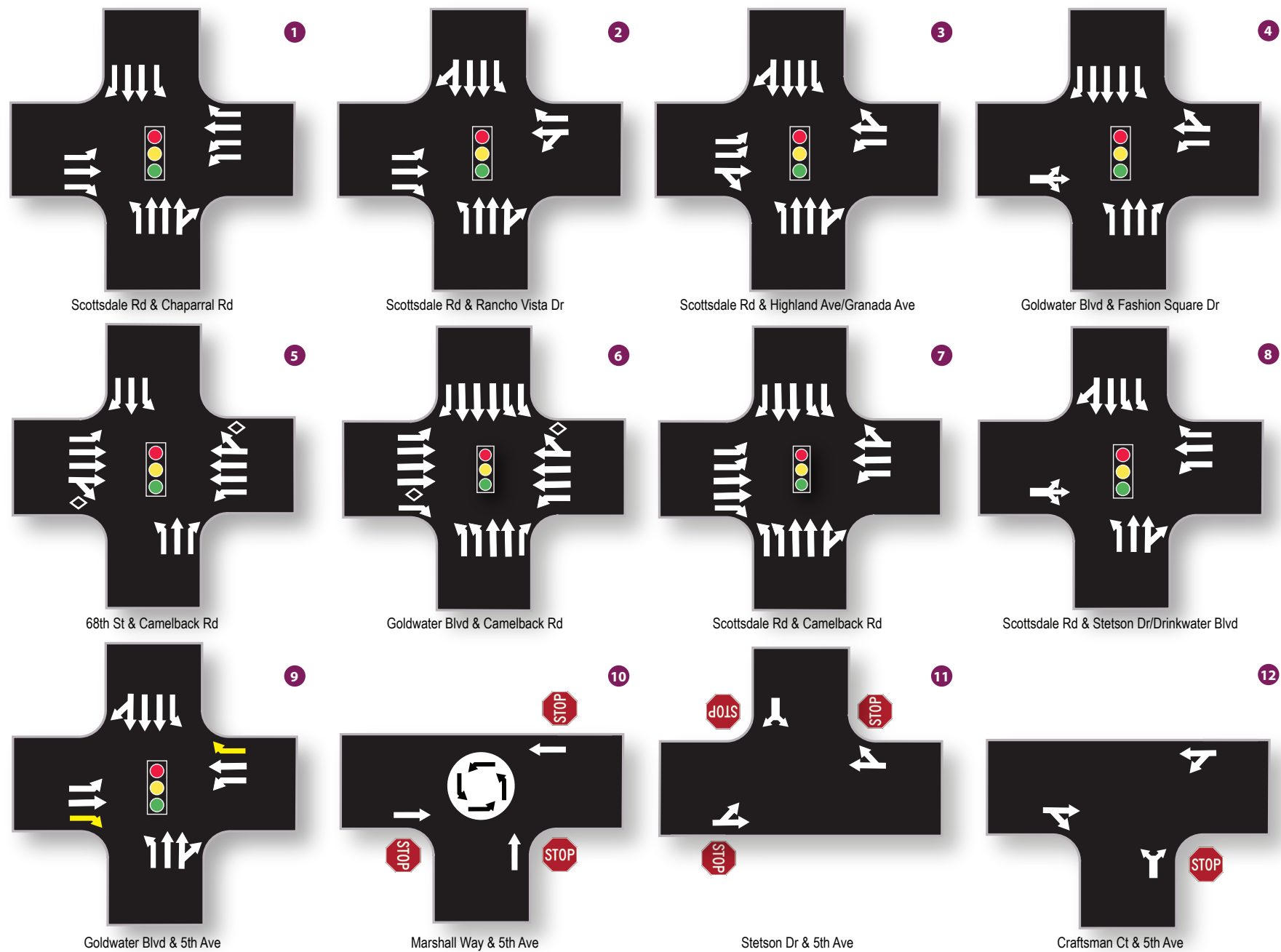
The intersection of **70th Street and Goldwater Boulevard** is a three-legged stop-controlled intersection with free movements in the east and west directions and a stop sign on the northbound approach. The northbound approach consists of one (1) dedicated left-turn lane and one (1) dedicated right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane and two (2) through lanes. The eastbound approach consists of two (2) through lanes and one (1) shared through/right-turn lane.

The existing intersection configurations and traffic control is illustrated in **Figures 2A** and **2B**.

EXISTING TRAFFIC VOLUMES

CivTech engaged Field Data Services of Arizona, Inc. to record traffic volumes at the proposed study intersections within the project vicinity. Peak hour volume turning movement counts were performed from 7:00-9:00 AM and 4:00-6:00 PM on Wednesday, August 1, 2018 at the following intersections:

- Scottsdale Rd & Chaparral Rd
- Scottsdale Rd & Highland Ave/Granada Ave
- 68th St & Camelback Rd
- Scottsdale Rd & Camelback Rd
- Scottsdale Rd & 5th Ave
- Drinkwater Blvd & 5th Ave
- Craftsman Ct & 5th Ave
- Goldwater Blvd & 5th Ave
- Craftsman Ct & 3rd Ave
- Scottsdale Rd & 3rd Ave
- 68th St & Indian School Rd
- Marshall Way & Indian School Rd
- Brown Ave & Indian School Rd
- 70th St & Goldwater Blvd
- Scottsdale Rd & Osborn Rd
- Scottsdale Rd & Rancho Vista Dr
- Goldwater Blvd & Fashion Square Dr
- Goldwater Blvd & Camelback Rd
- Scottsdale Rd & Stetson Dr/Drinkwater Blvd
- Stetson Dr & 5th Ave
- Drinkwater & Indian School Rd
- Marshall Way & 5th Ave
- Marshall Way & 3rd Ave
- Goldwater Blvd & 3rd Ave
- Drinkwater Blvd & 3rd Ave
- Goldwater Blvd & Indian School Rd
- Scottsdale Rd & Indian School Rd
- Buckboard Trail & Indian School Rd
- Goldwater Blvd & Scottsdale Rd



LEGEND

- Thru or Turning Movement
- Two-Way Left Turn-Lane
- Raised Median
- Bike Lane
- Traffic Signal
- Stop Sign
- Free Flow Right-Turn Lane



Figure 2A: Existing Lane Configurations and Traffic Controls

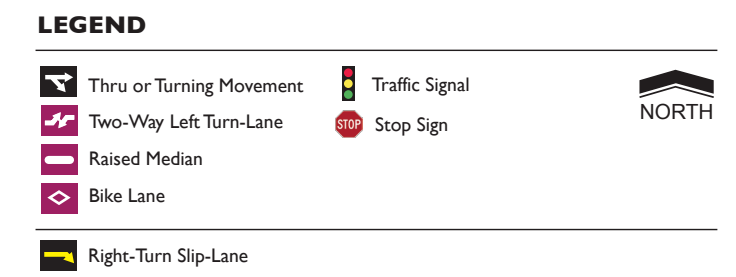
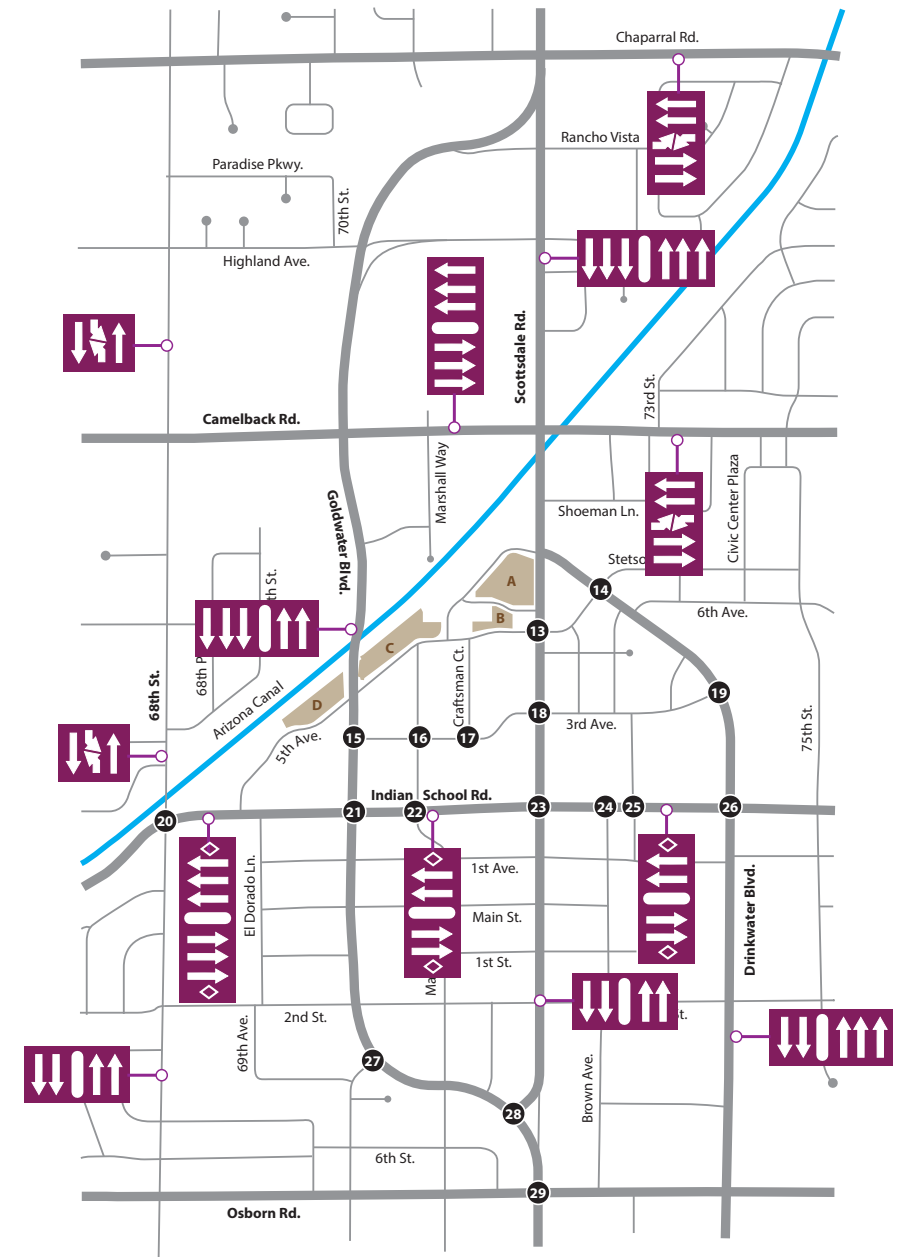
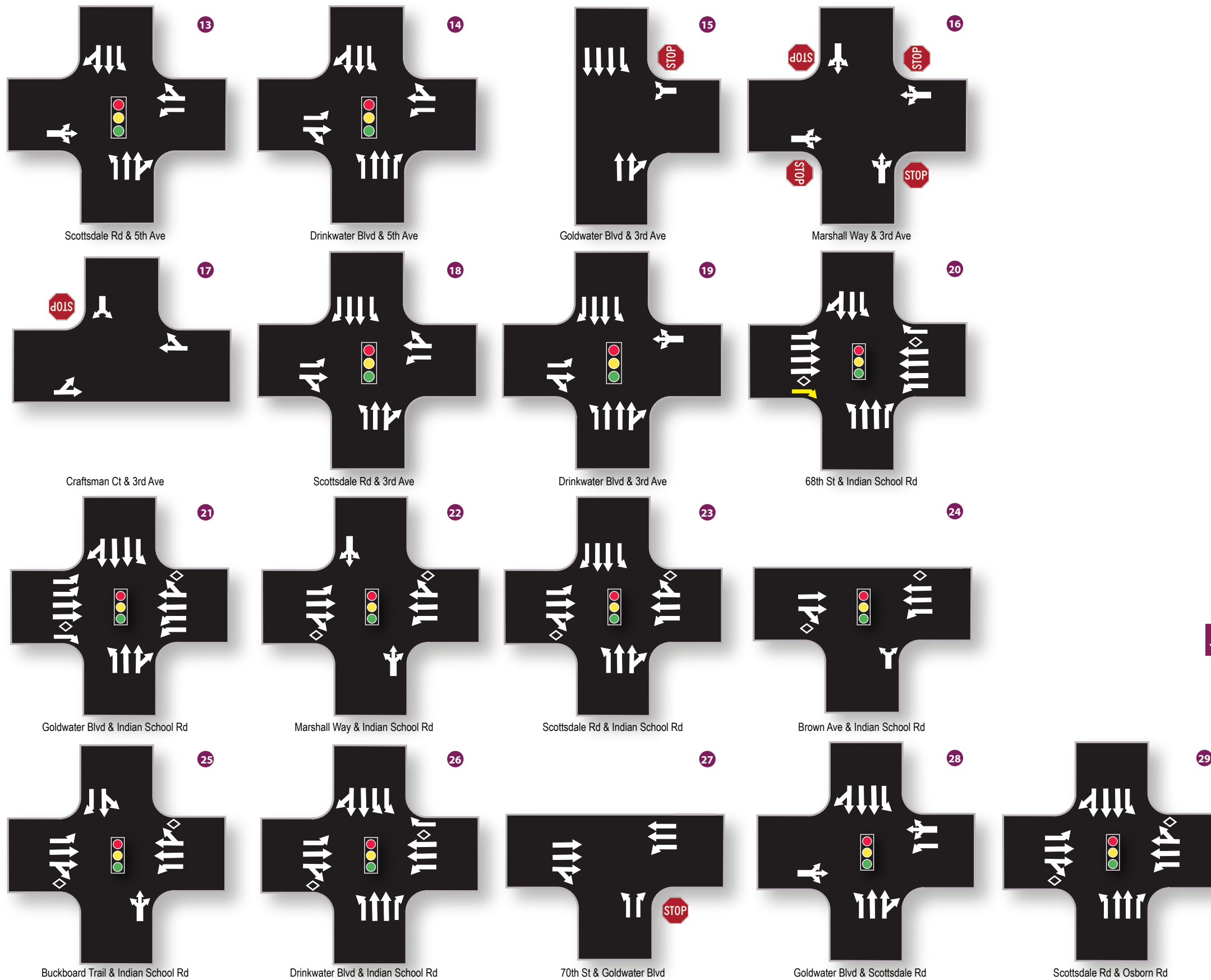


Figure 2B: Existing Lane Configurations and Traffic Controls

24-hour bi-directional counts were also obtained from Field Data Services of Arizona, Inc. at the following locations:

- Camelback Rd between 68th St & Goldwater Blvd
- Camelback Rd between Goldwater Blvd & Marshall Way
- Goldwater Blvd between Camelback Rd & Highland Ave
- Goldwater Blvd between Exeter Blvd & 5th Ave
- Goldwater Blvd between 1st St & 2nd St
- Indian School Rd between 69th St & Goldwater Blvd
- Drinkwater Blvd between 6th Ave & 3rd Ave
- Scottsdale Rd between Shoeman Ln & Drinkwater Blvd
- Stetson Dr between Scottsdale Rd & 6th Ave
- 5th Ave between Goldwater Blvd & Marshall Way
- Scottsdale Rd between Drinkwater Blvd & 5th Ave
- 5th Ave between Scottsdale Rd & Drinkwater Blvd
- 5th Ave between Scottsdale Rd & Craftsman Ct
- Craftsman Ct between 3rd Ave & 5th Ave
- 3rd Ave between Craftsman Ct & Scottsdale Rd
- Marshall Way between 5th Ave & 3rd Ave
- 3rd Ave between Goldwater Blvd & Marshall Way
- Marshall Way between Indian School Rd & 3rd Ave
- Indian School Rd between Marshall Way & Scottsdale Rd

The City of Scottsdale recommends a seasonal adjustment factor based on the month the counts were taken in order to get a more accurate representation of traffic in the area. Scottsdale is a popular area for tourism and traffic volumes are considerably lower during summer months. In order to get a better look at typical traffic, a seasonal adjustment factor is applied. For example, if counts were conducted in June, a 3% increase in traffic is added. Counts for this study were conducted on August 1, 2018. For the month of August, a 5% increase in traffic, or a factor of 1.05 is applied to the existing traffic counts.

Old Town Scottsdale generally attracts a large number of tourists in the month of October through April and counts were taken outside of these months. To account for the change in traffic experienced during the busier months within the Old Town area, it was assumed that the intersections directly bordering the site will experience a greater increase in traffic than the 5% increase that the City recommends. For this study, it was assumed that the following intersections would increase by a total of 15% on all approaches:

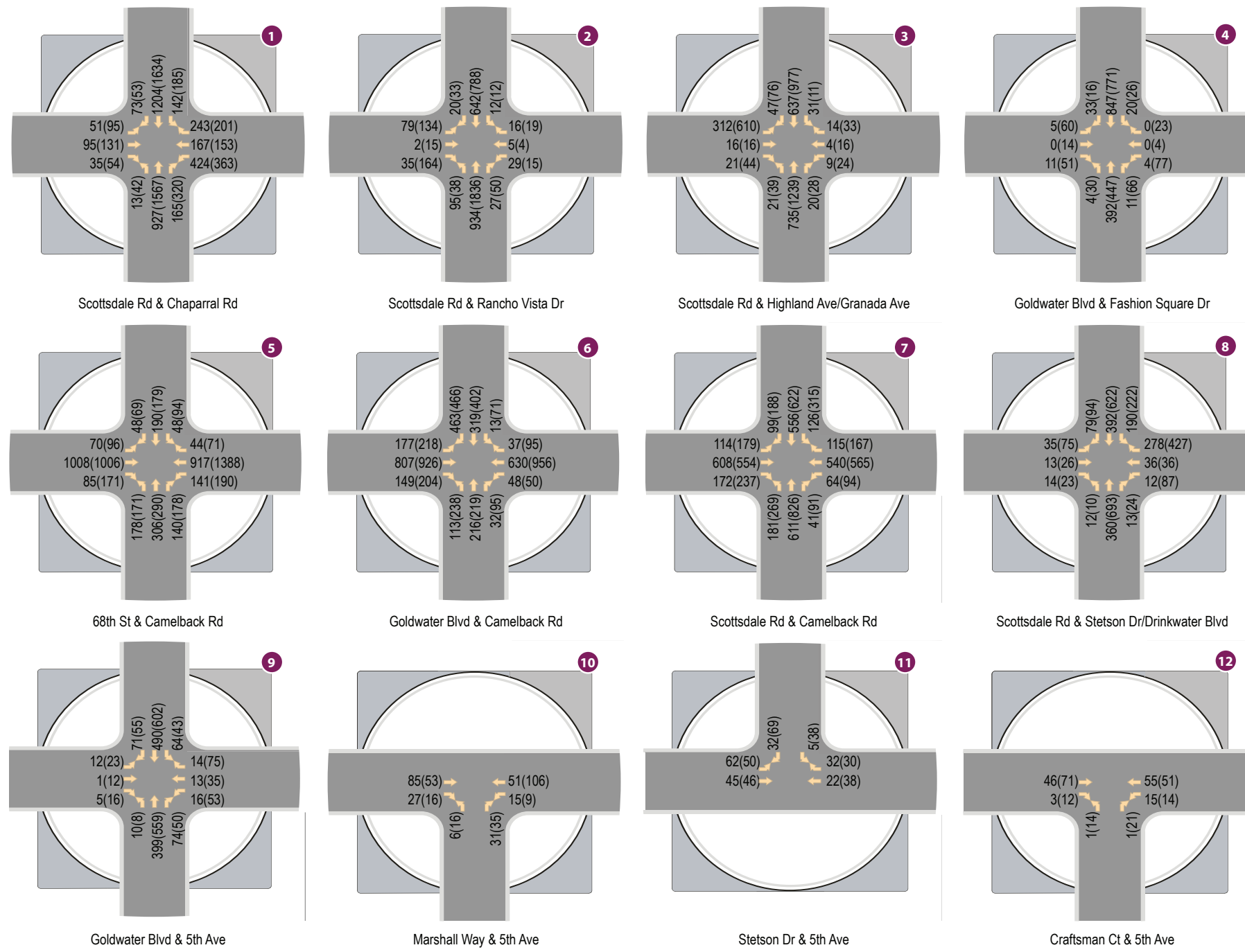
- Marshall Way & 5th Avenue
- Stetson Drive & 5th Avenue
- Craftsman Court & 5th Avenue
- Marshall Way & 3rd Avenue
- Craftsman Court & 3rd Avenue

The following intersections were grown by 15% on all eastbound/westbound movements and all northbound/southbound left-turn and right-turn movements. The northbound and

southbound through movements were grown by the seasonal adjustment factor of 5% because the northbound and southbound roads at the following intersections are major arterial roads and are less impacted by the effect of tourism in the area.

- Goldwater Boulevard & 5th Avenue
- Scottsdale Road & 5th Avenue
- Drinkwater Boulevard & 5th Avenue
- Goldwater Boulevard & 3rd Avenue
- Scottsdale Road & 3rd Avenue
- Drinkwater Boulevard & 3rd Avenue

The observed existing traffic volumes for this study are presented in **Figures 3A** and **3B** for the weekday AM and PM peak hours and the existing volumes grown by the previously mentioned percentages are presented in **Figures 4A** and **4B**. Traffic volume data obtained for this study have been included in the **Appendix B**.



Legend

XX(XX) - AM(PM) Peak Hour Traffic Volumes

X,XXX - Average Daily Traffic Volumes



Figure 3A: Observed Existing Traffic Volumes

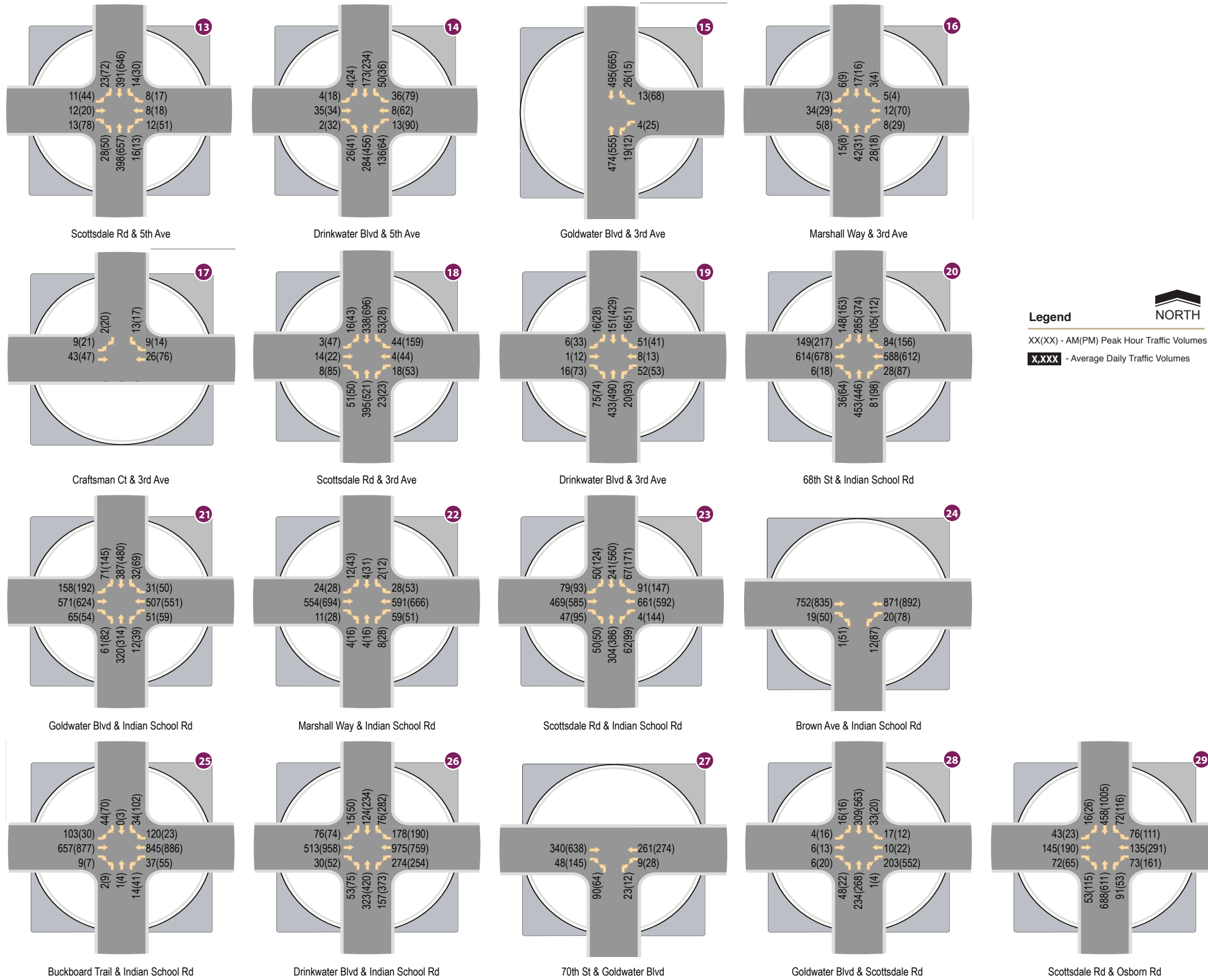
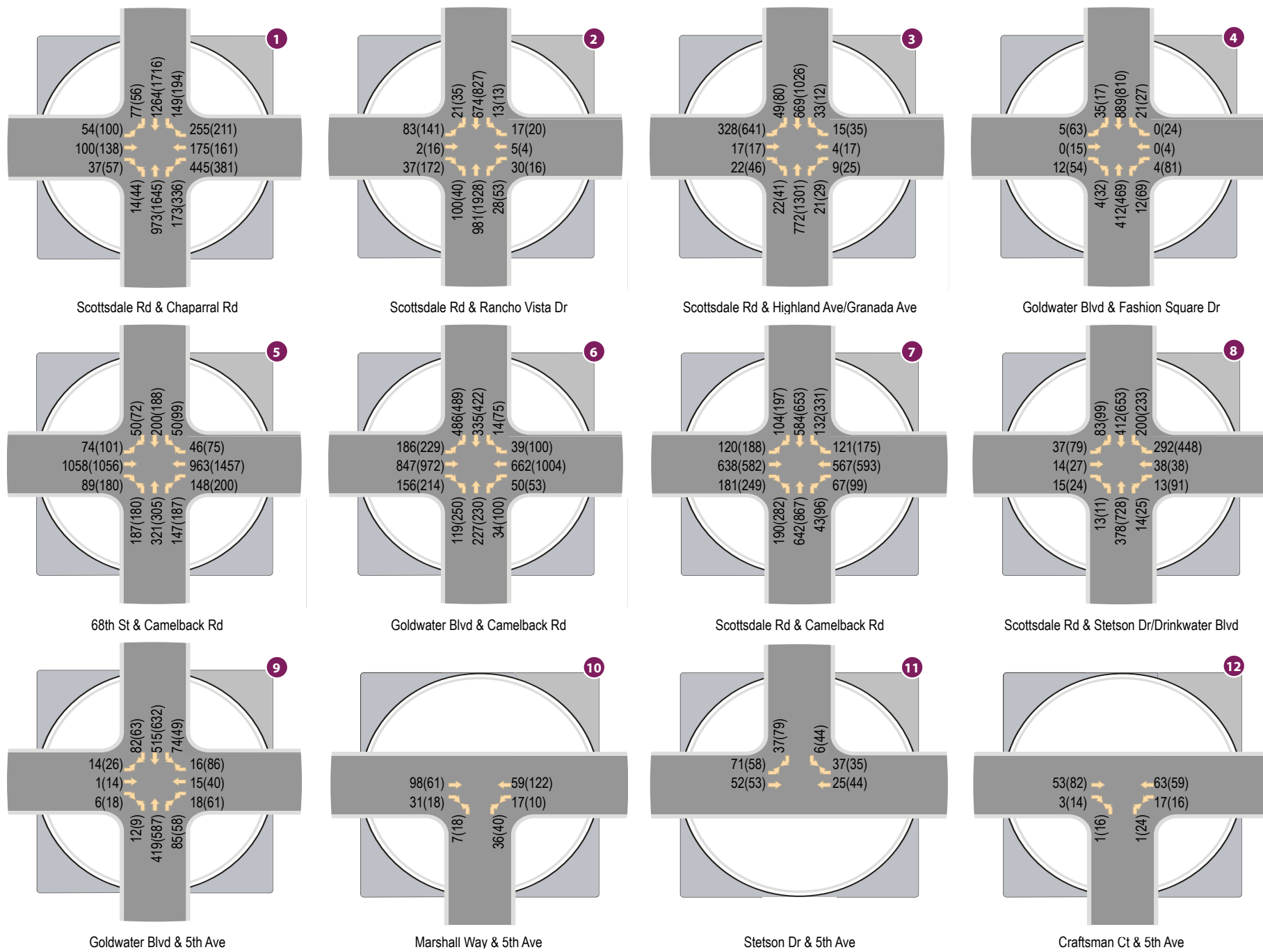


Figure 3B: Observed Existing Traffic Volumes



Legend

XX(XX) - AM(PM) Peak Hour Traffic Volumes

X,XXX - Average Daily Traffic Volumes



Figure 4A: Grown Existing Traffic Volumes

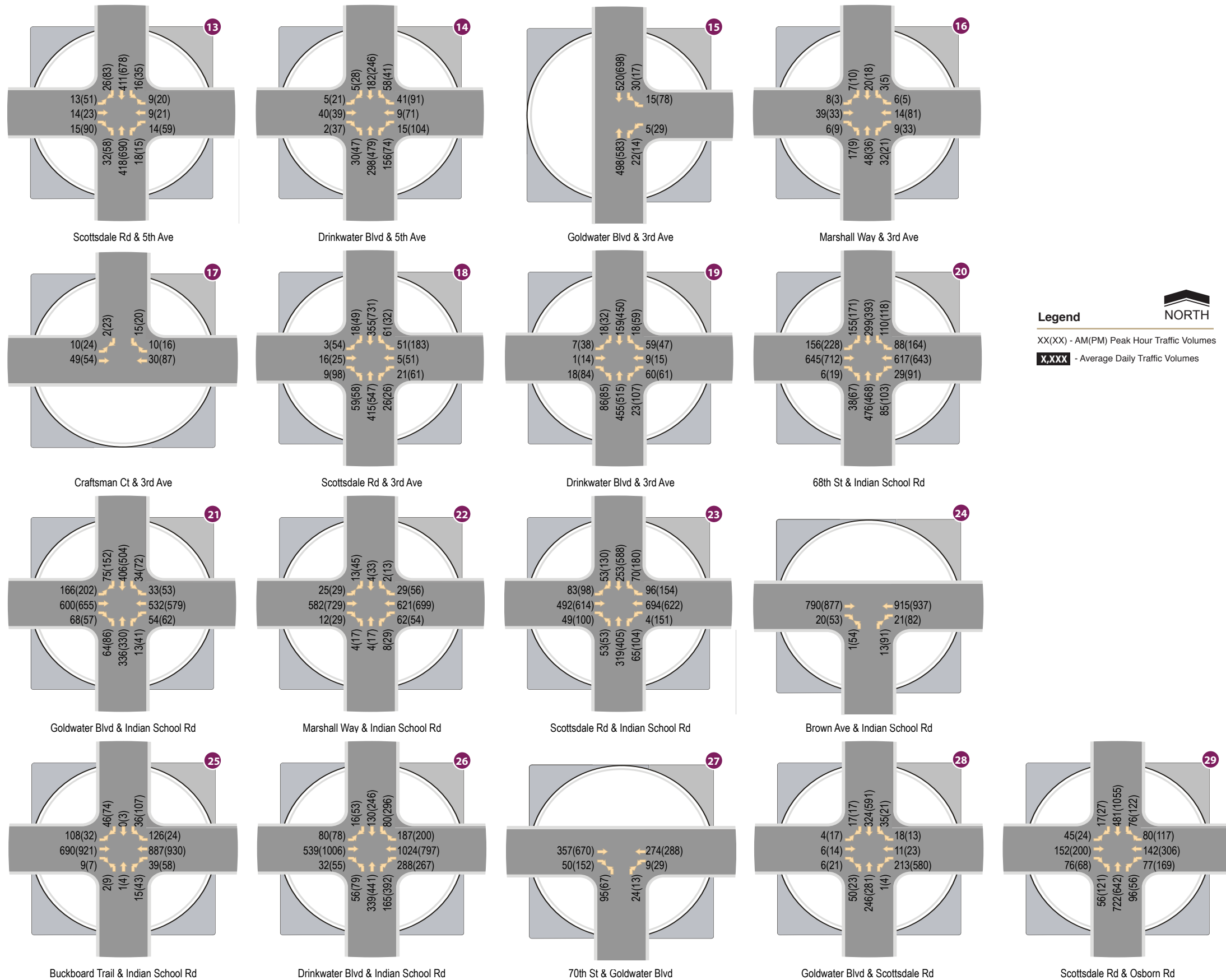


Figure 4B: Grown Existing Traffic Volumes

EXISTING CAPACITY ANALYSIS

Peak hour capacity analyses have been conducted for the study intersections based on existing conditions and traffic volumes. All intersections have been analyzed using, where possible, the methodologies presented in the *Highway Capacity Manual (HCM), 6th Edition* and using Synchro traffic analysis software. Signal timing during the AM and PM peak hours were provided to CivTech by means of Synchro models prepared by the City of Scottsdale. The signal timing at many of the signalized study intersections are incompatible for Synchro to analyze with the latest HCM methodologies due to multiple barriers, non-NEMA phase numbering or clustered intersections. As such, all signalized intersections were analyzed under HCM 2000 methodology while all unsignalized intersections were analyzed with the latest HCM 6 methodology.

The concept of level-of-service (LOS) uses qualitative measures that characterize operational conditions within the traffic stream. The individual levels-of-service are described by factors that include speed, travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Six levels of service are defined for each type of facility for which analysis procedures are available. They are given letter designations A through F, with LOS A representing the best operating conditions and LOS F the worst. Each level of service represents a range of operating conditions. **Table 1** lists the level of service criteria for signalized and unsignalized intersections, respectively.

Table 1 – Level-of-Service Criteria for Controlled Intersections

Level-of-Service	Unsignalized Control Delay (sec/veh)	Signalized Control Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10-15	> 10-20
C	> 15-25	> 20-35
D	> 25-35	> 35-55
E	> 35-50	> 55-80
F	> 50 or volume/capacity > 1	> 80 or volume/capacity > 1

Source: Exhibits 19-8, 20-2, 21-8, and 22-8, Highway Capacity Manual 2017

Results of the existing level-of-service analyses are shown in **Table 2** for both peak hours. The analysis worksheets for the existing conditions have been included in the **Appendix C**.

Table 2 – Existing Peak Hour Levels of Service

ID	Intersection	Control	Approach	AM	PM
1	Scottsdale Rd & Chaparral Rd	Signal	NB	C	D
			SB	C	E
			EB	E	E
			WB	E	E
			Overall	D	E
2	Scottsdale Rd & Rancho Vista Dr	Signal	NB	A	A
			SB	A	A
			EB	D	D
			WB	D	D
			Overall	A	B
3	Scottsdale Rd & Highland Ave/Granada Ave	Signal	NB	A	B
			SB	A	B
			EB	D	D
			WB	E	E
			Overall	B	C
4	Goldwater Blvd & Fashion Square Dr	Signal	NB	A	A
			SB	A	A
			EB	E	E
			WB	E	E
			Overall	A	B
5	68 th St & Camelback Rd	Signal	NB	D	F
			SB	D	E
			EB	B	B
			WB	B	C
			Overall	C	D
6	Goldwater Blvd & Camelback Rd	Signal	NB	D	D
			SB	D	D
			EB	C	D
			WB	C	D
			Overall	D	D
7	Scottsdale Rd & Camelback Rd	Signal	NB	D	D
			SB	C	D
			EB	D	D
			WB	D	D
			Overall	D	D
8	Scottsdale Rd & Stetson Dr/Drinkwater Blvd	Signal	NB	B	B
			SB	A	A
			EB	D	D
			WB	F	F
			Overall	C	D
9	Goldwater Blvd & 5 th Ave	Signal	NB	A	A
			SB	A	A
			EB	D	D
			WB	D	D
			Overall	A	B

Table 2 (Continued) – Existing Peak Hour Levels of Service

ID	Intersection	Control	Approach	AM	PM
10	Marshall Way & 5 th Ave	All-way stop controlled roundabout	NB	A	A
			EB	A	A
			WB	A	A
			Overall	A	A
11	Stetson Dr & 5 th Ave	1-way stop (SB)	SB Shared	A	A
			EB Left	A	A
			WB Right	A	A
12	Craftsman Ct & 5 th Ave	1-way stop (NB)	NB Shared	A	A
			WB Left	A	A
13	Scottsdale Rd & 5 th Ave	Signal	NB	A	B
			SB	A	B
			EB	C	B
			WB	C	B
			Overall	A	B
14	Drinkwater Blvd & 5 th Ave/Stetson Dr	Signal	NB	A	B
			SB	A	A
			EB	D	D
			WB	D	D
			Overall	B	C
15	Goldwater Blvd & 3 rd Ave	1-way stop (WB)	SB Left	A	A
			WB Shared	B	B
16	Marshall Way & 3 rd Ave	All-way stop	NB Shared	A	A
			SB Shared	A	A
			EB Shared	A	A
			WB Shared	A	A
17	Craftsman Ct & 3 rd Ave	1-way stop (SB)	SB Shared	A	A
			EB Left	A	A
18	Scottsdale Rd & 3 rd Ave	Signal	NB	A	A
			SB	A	A
			EB	C	B
			WB	C	B
			Overall	A	A
19	Drinkwater Blvd & 3 rd Ave	Signal	NB	A	A
			SB	A	A
			EB	D	D
			WB	D	E
			Overall	B	B
20	68 th St & Indian School Rd	Signal	NB	D	D
			SB	D	D
			EB	C	C
			WB	C	D
			Overall	D	D
21	Goldwater Blvd & Indian School Rd	Signal	NB	E	D
			SB	D	D
			EB	C	C
			WB	C	C
			Overall	D	D

Table 2 (Continued) – Existing Peak Hour Levels of Service

ID	Intersection	Control	Approach	AM	PM
22	Marshall Way & Indian School Rd	Signal	NB	D	D
			SB	D	D
			WB	A	A
			EB	A	A
			Overall	A	A
23	Scottsdale Rd & Indian School Rd	Signal	NB	D	D
			SB	D	D
			WB	B	C
			EB	B	D
			Overall	C	D
24	Brown Ave & Indian School Rd	Signal	NB	D	D
			WB	A	B
			EB	A	A
			Overall	A	B
25	Buckboard Trail & Indian School Rd	Signal	NB	D	D
			SB	D	D
			WB	A	A
			EB	A	B
			Overall	A	B
26	Drinkwater Blvd & Indian School Rd	Signal	NB	D	E
			SB	D	D
			WB	B	D
			EB	C	E
			Overall	C	D
27	70 th St & Goldwater Blvd	1-way stop (NB)	NB Left NB Right WB Left	C B B	D B B
28	Goldwater Blvd & Scottsdale Rd	Signal	NB	A	B
			SB	A	B
			WB	E	E
			EB	E	D
			Overall	C	C
29	Scottsdale Rd & Osborn Rd	Signal	NB	B	C
			SB	B	C
			WB	D	D
			EB	D	D
			Overall	C	C

The results of the existing conditions analysis summarized in **Table 2** indicates that all study intersections operate with acceptable levels of service (LOS D or better), with the exception of the intersection of Scottsdale Road and Chaparral Road.

The signalized intersection of **Scottsdale Road and Chaparral Road** operates overall at LOS E during the PM peak hour. The delay is caused by the relatively high traffic volume entering the intersection and the split phase operation of the signal. The intersection’s average delay per vehicle during the PM peak hour is evaluated to be approximately 61 seconds.

CRASH ANALYSIS

Crash data for the study area was obtained from the City of Scottsdale for the past three (3) years and the portion of the current year that has happened already. Crash data for both segments of roadway in the vicinity and all study intersections were provided. In total, there have been 839 incidents within the study area since the beginning of 2015. A majority of these crashes occurred at intersections along the length of Scottsdale Road within the vicinity of the site. The fewest crashes occurred at the intersections directly bordering the site. Segment crashes are crashes that do not happen at an intersection, but along a segment of road in between two intersections. In total, there have been 204 segment crashes within the study area. The highest number of segment crashes occurred along Scottsdale Road. The summary of intersection crash data is presented in **Table 3** and the summary of segment crash data is presented in **Table 4**.

Table 3 – Intersection Crash Data Summary

Intersection	Total	2018	2017	2016	2015	Injury	Fatality	Angle	Left Turn	Rear End	Head On	Sideswipe	Other	DUI	Pedestrian	Bicycle
Scottsdale Rd & Chaparral Rd	98	16	30	29	23	10	1	20	19	44	3	11	1	7	1	1
Scottsdale Rd & Rancho Vista Rd	20	1	9	5	5	2	0	3	5	9	1	2	0	1	0	0
Scottsdale Rd & Granada Ave/Highland Ave	5	0	2	1	2	1	0	0	0	3	2	0	0	1	0	0
Goldwater Blvd & Fashion Square Dr	22	3	8	7	4	3	0	8	7	3	0	4	0	0	0	1
68 th St & Camelback Rd	60	16	10	16	18	8	0	18	12	22	0	5	3	2	1	1
Goldwater Blvd & Camelback Rd	76	14	16	26	20	16	0	25	8	29	1	10	3	1	1	1
Scottsdale Rd & Camelback Rd	88	14	33	19	22	10	0	21	2	41	5	16	3	8	1	1
Scottsdale Rd & Drinkwater Blvd	51	13	9	15	14	9	0	10	7	19	0	11	4	4	0	1
Goldwater Blvd & 5 th Ave	5	0	0	3	2	1	0	0	0	1	1	3	0	0	0	0
Marshall Way & 5 th Ave	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0
Stelson Dr & 5 th Ave	2	0	1	1	0	1	0	1	0	0	0	0	1	1	1	0
Craftsman Ct & 5 th Ave	2	0	1	0	1	0	0	0	0	0	0	0	2	0	0	0
Scottsdale Rd & 5 th Ave	25	4	4	5	12	3	0	8	1	6	0	5	5	4	1	1
Drinkwater Blvd & 5 th Ave	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0
Goldwater Blvd & 5 th Ave	5	0	0	3	2	0	0	2	0	1	0	1	1	0	0	0
Marshall Way & 3 rd Ave	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
Craftsman Ct & 3 rd Ave	2	0	1	1	0	0	0	1	0	0	0	0	1	0	0	0
Scottsdale Rd & 3 rd Ave	27	6	5	11	5	7	0	9	3	8	1	2	4	2	2	4
Drinkwater Blvd & 3 rd Ave	6	0	2	3	1	0	0	0	0	1	1	3	1	3	0	0
68 th St & Indian School Rd	42	14	10	11	7	1	0	10	1	14	0	15	2	1	0	0
Goldwater Blvd & Indian School Rd	43	11	8	12	12	4	0	8	5	21	1	8	0	3	0	0
Marshall Way & Indian School Rd	13	2	4	4	3	3	0	6	1	3	0	1	2	0	1	0
Scottsdale Rd & Indian School Rd	80	17	14	27	22	7	0	12	8	40	5	10	5	8	1	3
Brown Ave & Indian School Rd	18	4	3	5	6	3	0	1	1	12	1	0	3	2	1	1
Buckboard Trail & Indian School Rd	12	1	3	5	3	0	0	1	0	7	0	2	2	0	0	0
Drinkwater Blvd & Indian School Rd	47	6	12	15	14	6	0	14	6	20	2	2	3	5	1	1
70 th St & Goldwater Blvd	3	0	2	0	1	0	0	0	0	0	0	3	0	1	0	1
Goldwater Blvd & Scottsdale Rd	30	4	10	11	5	1	0	4	3	13	1	7	2	9	0	0
Scottsdale Rd & Osborn Rd	54	9	13	16	16	7	0	15	10	14	2	9	4	1	1	0
Totals	839	155	211	253	220	104	1	198	99	332	27	130	53	64	13	17

Table 4 – Segment Crash Data Summary

Roadway	Total	2018	2017	2016	2015	Injury	Fatality	Angle	Left Turn	Rear End	Head On	Sideswipe	Other	DUI	Pedestrian	Bicycle
68th St	22	3	5	6	8	7	0	1	2	10	0	5	4	3	0	0
Brown Av	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
Buckboard Tr	3	1	1	0	1	0	0	0	0	1	0	2	0	0	0	0
Craftsman Ct	2	1	0	0	1	1	0	0	0	1	0	0	1	0	0	0
Drinkwater Blvd	13	2	5	2	4	1	0	2	0	8	0	2	1	1	0	0
Goldwater Blvd	22	1	6	8	7	4	0	4	0	9	1	3	5	0	1	0
Marshall Way	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Scottsdale Rd	140	17	42	44	37	13	0	17	6	77	3	23	13	11	4	0
Stetson Dr	8	0	3	2	3	1	0	1	0	3	1	2	1	1	0	0
5th Ave	8	0	3	4	1	2	0	1	0	2	0	1	4	0	1	0
Totals	220	26	66	66	62	29	0	27	8	111	6	38	29	16	6	0

In order to predict future crashes and to determine how additional site traffic will impact the rate of crashes at the study intersections, first the existing rate of crashes was found. This value was found by dividing the number of crashes in a year by the estimated incoming traffic at the intersection. The estimated crash rate takes the existing crash rate and adds the estimated additional crashes due to site generated traffic to determine the total number of crashes that are estimated at that intersection. **Table 5** shows the intersections with the highest number of estimated crashes per million entering vehicle

Table 5 – Crash Predictions

Intersection	Estimated Crashes per Million Entering Vehicles	Predictive Crashes with Addition of Site	Predictive Crashes of Site Traffic
SCOTTSDALE RD & CHAPARRAL RD	1.276	1.277	0.001
GOLDWATER BL & CAMELBACK RD	1.069	1.070	0.001
SCOTTSDALE RD & CAMELBACK RD	1.102	1.104	0.002
SCOTTSDALE RD & DRINKWATER BL	1.296	1.300	0.003
SCOTTSDALE RD & INDIAN SCHOOL RD	1.387	1.390	0.002
BROWN AV & INDIAN SCHOOL RD	0.471	0.471	0.001
BUCKBOARD TR & INDIAN SCHOOL RD	0.290	0.290	0.000

Of all of the crashes listed in the tables above, only one (1) involved a fatality, a pedestrian at the intersection of Scottsdale Road and Chaparral Road. The highest percentage of accidents at most intersections is rear-end collisions and the lowest percentage of accidents

being head on collisions. With the addition of site generated traffic, the percentage of estimated collisions per million entering vehicles is not expected to increase significantly. Crash analysis worksheets are included in **Appendix D**.

PROPOSED DEVELOPMENT

SITE LOCATION

The proposed Southbridge Expansion will be located north of 5th Avenue and west of Scottsdale Road in Scottsdale, Arizona. The proposed project will be located on two (2) sites which will encompass approximately 10 gross acres. The site is a planned redevelopment into multi-story office, commercial, residential and hotel use.

SITE DENSITY

This redevelopment consists of four “Zones” with a variety of land uses on each. Zone A consists of a 200-key hotel, 184 multi-family residential units, 29,100 square feet (SF) of retail, a 6,420 SF art gallery and 119,040 SF of office space. Zone B consists of 21 multi-family residential units and 15,590 SF of retail space on the ground floor.

Zone C consists of 194 residential units in a 12-story high-rise with 27,700 SF of retail on the ground level. The residential units located in Zone C are comprised of the following:

- 1 Bedroom Condominiums – 25 DU’s
- 2 Bedroom Condominiums – 125 DU’s
- 3 Bedroom Condominiums – 44 DU’s

The six-story mid-rise at Zone D consists of 171 residential units and 10,427 SF of commercial area. The residential units located on Zone D are comprised of the following:

- Studio Condominiums – 21 DU’s
- 1 Bedroom Condominiums – 109 DU’s
- 2 Bedroom Condominiums – 29 DU’s
- Townhomes – 12 DU’s

SITE ACCESS

There are six (6) proposed site driveways, with four (4) of the six (6) already existing. Three (3) driveways will give access to Zone A, two (2) will give access to Zone C and one (1) will give access to Zone D. Access to all of the zones in the development are as follows:

Access A1 – is the east access for Zone A located on 6th Avenue. This is an existing driveway located approximately 250 feet west of Scottsdale Road on 6th Avenue. The southbound approach of the driveway consists of one (1) shared southbound left-turn/right-turn lane. There is on-street parking along 6th Avenue.

Access A2 – is the west access for Zone A located on 6th Avenue. This is a proposed driveway that will give access to the site for hotel guests, office employees and retail customers. This access point will be located approximately 120 feet west of Access A1 on 6th Avenue.

Access A3 – is the north access for Zone A located on Stetson Drive. This is an existing driveway that will give access to the site for hotel guests, office employees and retail customers. This access point will be located approximately 375 feet northeast of the intersection of Stetson Drive and 6th Avenue. The northbound approach of the driveway consists of one (1) right-turn lane, left-turns out of the site will be restricted. There is on-street parking on the north side of Stetson Drive.

Access C1 – is the east access for Zone C along Stetson Drive. This is an existing driveway located approximately 130 feet north of 5th Avenue on Stetson Drive. There is one (1) shared left-turn/right-turn lane exiting the driveway. There is on-street parking along Stetson Drive, however, this is going to be removed by full-build of the site and replaced with landscaping.

Access C2 – is the west access for Zone C located on 5th Avenue. This is an existing driveway located approximately 315 feet northeast of the intersection of Goldwater Boulevard and 5th Avenue. The southbound approach of the driveway consists of one (1) right-turn lane, left-turns out of the site will be restricted. There is on-street parking along 5th Avenue east of the access point. There are only four (4) on-street parking spots west of the driveway on the north side of 5th Avenue.

Access D – is the only access point for Zone D located on 5th Avenue. This is an existing Driveway located approximately 420 feet southwest of the intersection of Goldwater Boulevard and 5th Avenue. The southbound approach of the driveway consists of one (1) shared left-turn/right-turn lane. East of the driveway, there is on-street parking on the south side of 5th Avenue. West of the driveway, there is on-street parking located on both the north and south sides of 5th Avenue.

Zone B will not provide any on-site parking for people visiting this building. The hotel parking garage located at Zone A will reserve some spaces for the employees of Zone B. The remaining trips going to Zone B will have to use public parking. This analysis evaluates that the remaining trips will use the public parking garage located directly south of Zone B, north of 3rd Avenue and west of Scottsdale Road. It is assumed that approximately 85% of the trips to Zone B will use the Zone A parking garage and the other 15% will use the public parking garage south of Zone B. The intersection of Scottsdale Road and 3rd Avenue is a signalized intersection with no restricted movements, meaning that it will not be difficult for vehicles to access this garage from 3rd Avenue. The parking garage can also be accessed from 5th Avenue, however, the entrance is set back from the road, as opposed to fronting the road on 3rd Avenue, so it will be assumed that most people will use the 3rd Avenue access rather than the 5th Avenue access.

The proposed site plan with access points is provided in **Figure 5**.



Figure 5: Site Plan and Access

TRIP GENERATION

The potential trip generation for the proposed development was estimated utilizing the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition* and *Trip Generation Handbook, 3rd Edition*. The ITE *Trip Generation Manual* contains data collected by various transportation professionals for a wide range of different land uses. The data are summarized in the report and average rates and equations have been established that correlate the relationship between an independent variable that describes the development size and generated trips for each categorized land use. The report provides information for daily and peak hour trips.

Each zone was analyzed separately as it is assumed that there will be very little interaction between the four zones and they also encompass a large area of Old Town Scottsdale.

Zone A consists of a 200-key hotel, 184 residential dwelling units, office space and retail space/art gallery. The retail space is divided among a few areas on the Zone, however, since the LUC 820 for a shopping center is very inaccurate for retail of such small square footage, all of the shops were combined and analyzed as a single shopping center of the combined square footage of all the retail on this Zone.

Zone B consists of a single building with retail on the ground floor and residential units above. The LUC 820 for a shopping center is used, but since the floor area of the retail space is so small, the weighted averages were used instead of the fitted curve. The LUC 220 for a low-rise multi-family development was used for the residential units located above the retail.

Zone C consists of a high-rise condominium with retail on the ground level. While there is a land use code (LUC) available for this type of development (LUC 232), there are very few data points, meaning that the average rates are not very accurate and percentages for vehicles entering and exiting the site are not provided. Since there is not enough data provided for this land use, the retail and condominiums were analyzed separately using LUC 820 for the retail and LUC 222 for high-rise multi-family units.

Zone D consists of mid-rise condominiums with a total of 171 dwelling units and some retail space. The LUC 221 for mid-rise multi-family housing includes condominiums in the land use description and will be used for this Zone. The LUC 820 was used for the retail portion of the zone.

Internal Capture

According to data presented in the *ITE Trip Generation Handbook, 3rd Edition*, trips attracted to residential, office, or retail land uses are often shared. This means that a single trip (vehicle) to the proposed Zone A could visit the office and retail space/art gallery without being counted as two separate trips, an occurrence known as internal capture or internal interaction. In order to remain conservative, internal capture percentages were found per zone since each of the zones consists of multiple land uses. This has the effect of reducing the external trip generating potential of the proposed site.

CivTech calculated internal capture percentages using the ITE methodology. For Zone A, a daily internal capture of 13% was calculated with 9% in the AM peak hour and 17% in the PM peak hour. For Zone B, a daily internal capture of 10% was calculated with 0% in the AM peak hour and 19% in the PM peak hour. For Zone C, a daily internal capture of 11% was calculated with 2% in the AM peak hour and 21% in the PM peak hour. Lastly, for Zone D, a daily internal capture of 6% was calculated with 0% in the AM peak hour and 12% in the PM peak hour. Internal capture worksheets are shown in **Appendix E**.

The existing trip generation, using land uses and sizes from the Maricopa County Assessor website, is summarized in **Table 6**. Although this area of Scottsdale does not necessarily behave like a shopping center (LUC 820), using this land use as opposed to Arts and Crafts Store (LUC 879), Furniture Store (LUC 882), Hair Salon (LUC 918) etc. for each of the individual businesses located in this area is a more conservative estimate given the existing traffic counts collected in the area. Using the more specific land uses estimates a significantly higher existing trip generation than what the existing traffic counts suggest for the surrounding study intersections. The anticipated trip generation for the Southbridge expansion is summarized in **Table 7**. Detailed trip generation calculations are provided in **Appendix E**.

Table 6 – Existing Trip Generation

Proposed Use	ITE LUC	Size	Units	Weekday Trips						
				Daily	AM Peak Hour		PM Peak Hour			
				Total	In	Out	Total	In	Out	Total
Zone A										
Geisha-A-Go-Go	931	4.511	KSF	378	2	1	3	23	12	35
Cowboy Ciao	931	6.142	KSF	514	3	1	4	32	16	48
The Montauk	932	4.054	KSF	454	22	18	40	25	15	40
Diego Pops	932	2.7	KSF	302	15	12	27	16	10	26
Shopping Center	820	11.204	KSF	422	7	4	11	21	22	43
Zone B										
HRW Builders	710	3	KSF	36	3	0	3	1	3	4
Apartments	220	6	DU	44	1	2	3	3	2	5
Shopping Center	820	8.8	KSF	332	5	3	8	16	18	34
Zone C										
Shopping Center	820	30.618	KSF	1,156	18	11	29	56	61	117
Subtotals				3,638	76	52	128	193	159	352
<i>Internal Capture Reduction</i>				<i>(278)</i>	<i>(2)</i>	<i>(2)</i>	<i>(4)</i>	<i>(24)</i>	<i>(18)</i>	<i>(42)</i>
Total External Vehicle Trips				3,360	74	50	124	169	141	310

The existing development generates approximately 3,360 external weekday daily trips with 124 trips occurring during the AM peak hour (74 in/50 out), and 310 trips occurring during the PM peak hour (169 in/141 out). All proposed access points are existing today with the exception of Access A2. The existing trips are assumed to use all existing access points as well as the public parking garage located south of Zone B between 5th Avenue and 3rd Avenue and west of Scottsdale Road.

Table 7 – Proposed Trip Generation

Proposed Use	ITE LUC	Size	Units	Weekday Trips						
				Daily		AM Peak Hour		PM Peak Hour		
				Total	In	Out	Total	In	Out	Total
Zone A										
Apartments	221	184	DU	1,002	16	46	62	49	31	80
Hotel	310	200	Rooms	1,832	56	39	95	63	61	124
General Office Building	710	119.04	KSF	1,256	119	19	138	21	113	134
Commercial Area and Art Gallery	820	35.52	KSF	1,340	20	13	33	65	70	135
Zone B										
Apartments	220	21	DU	118	3	8	11	9	6	15
Shopping Center	820	15.59	KSF	588	9	6	15	28	31	59
Zone C										
Apartments	222	194	DU	988	16	52	68	46	30	76
Shopping Center	820	27.7	KSF	1,046	16	10	26	51	55	106
Zone D										
Apartments	221	171	DU	930	15	43	58	45	29	74
Shopping Center	820	10.427	KSF	394	6	4	10	19	21	40
Subtotals				9,494	276	240	516	396	447	843
Internal Capture Reduction				(1,080)	(19)	(13)	(32)	(69)	(78)	(147)
Total External Vehicle Trips				8,414	257	227	484	327	369	696

The proposed redevelopment is anticipated to generate 8,414 external weekday daily trips with 484 trips occurring during the AM peak hour (257 in/227 out), and 696 trips occurring during the PM peak hour (327 in/369 out).

The proposed redevelopment is anticipated to generate an additional 5,054 external daily trips with 360 additional trips in the AM peak hour and an additional 386 trips in the PM peak hour when compared to the trips already generated by existing development in Zones A, B and C. Zone D is a paved parking lot presently and provides public parking for those visiting surrounding businesses and is considered to generate no trips in the existing condition.

TRIP DISTRIBUTION AND ASSIGNMENT

Two trip distribution patterns were assumed for the proposed development, one for population and the other for employment in the surrounding area. It is expected that the proposed development will generate trips based on future employment and population within a 10-mile radius of the site. Zone A and Zone B trips will be generated based on surrounding population. These sites will consist of office buildings, hotels and some retail, which will be utilized by people who live in the surrounding area. Zone C and Zone D trips will be generated based on surrounding employment. These sites will consists of multi-family condominiums, in which the primary trips taken to and from these sites will be people travelling to and from work. Future total employment and population within a 10-mile radius of the site, as predicted by the 2020/2030 socio-economic data compiled by the Maricopa Association of Governments (MAG), was used as a basis to estimate trip distribution. The resulting trip distribution percentages for the study area are shown in **Table 8**. The trip distribution calculations are included in **Appendix F**.

Table 8 – Site Trip Distribution

Direction (To/From)	Percentage Pop (EMP)
West on Camelback Rd (west of 68 th St)	18% (29%)
East on Camelback Rd (east of 76 th St)	2% (0%)
North on 68 th St (north of Camelback Rd)	3% (0%)
South on 68 th St (south of Indian School Rd)	8% (8%)
West on Indian School Rd (west of 68 th St)	14% (20%)
East on Indian School Rd (east of 76 th St)	22% (13%)
North on Scottsdale Rd (north of Chaparral Rd)	8% (5%)
South on Scottsdale Rd (south of Indian School Rd)	12% (15%)
South on Miller Rd (south of Indian School Rd)	3% (5%)
East on Chaparral Rd (east of 76 th St)	10% (5%)
Total	100% (100%)

Figure 6 illustrates the trip distribution percentages noted in **Table 8** on the roadway network within the study area. The percentages presented in **Figure 6** were applied to the site trips generated to determine the AM and PM peak hour site traffic at the intersections within the study area.

Zone B is not providing any on-site parking for the office employees or customers of the retail, instead, Zone A has underground parking that will be available to everyone visiting Zone B. There is also a public parking garage just south of Zone B which can also be accessed by anyone visiting the Zone. It was assumed that approximately 85% of people visiting Zone B will use the parking garage underneath the hotel on Zone A’s lot and that the other 15% of people visiting the Zone will use the public garage. Since site generated traffic will have very little effect on the entrance to the parking garage, it is not being analyzed in this study and is not considered one of the access points to the proposed site. The site trips that will be utilizing the parking garage will still affect the surrounding roadway network, but will not be explicitly shown as trips that are entering and exiting the site at the existing garage entry.

Figures 7A and **7B** presents the resulting site generated traffic for the proposed development.

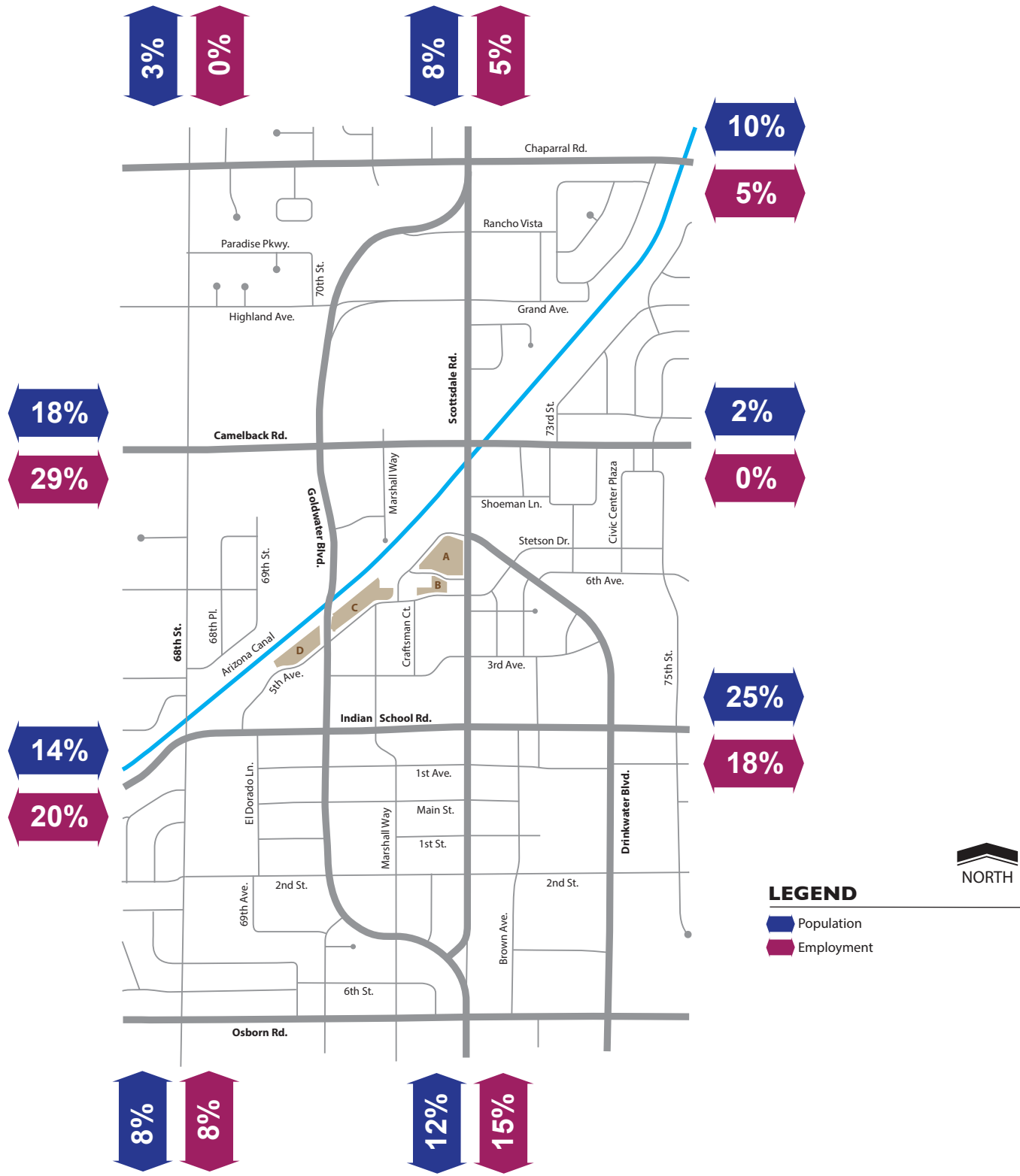


Figure 6: Trip Distribution

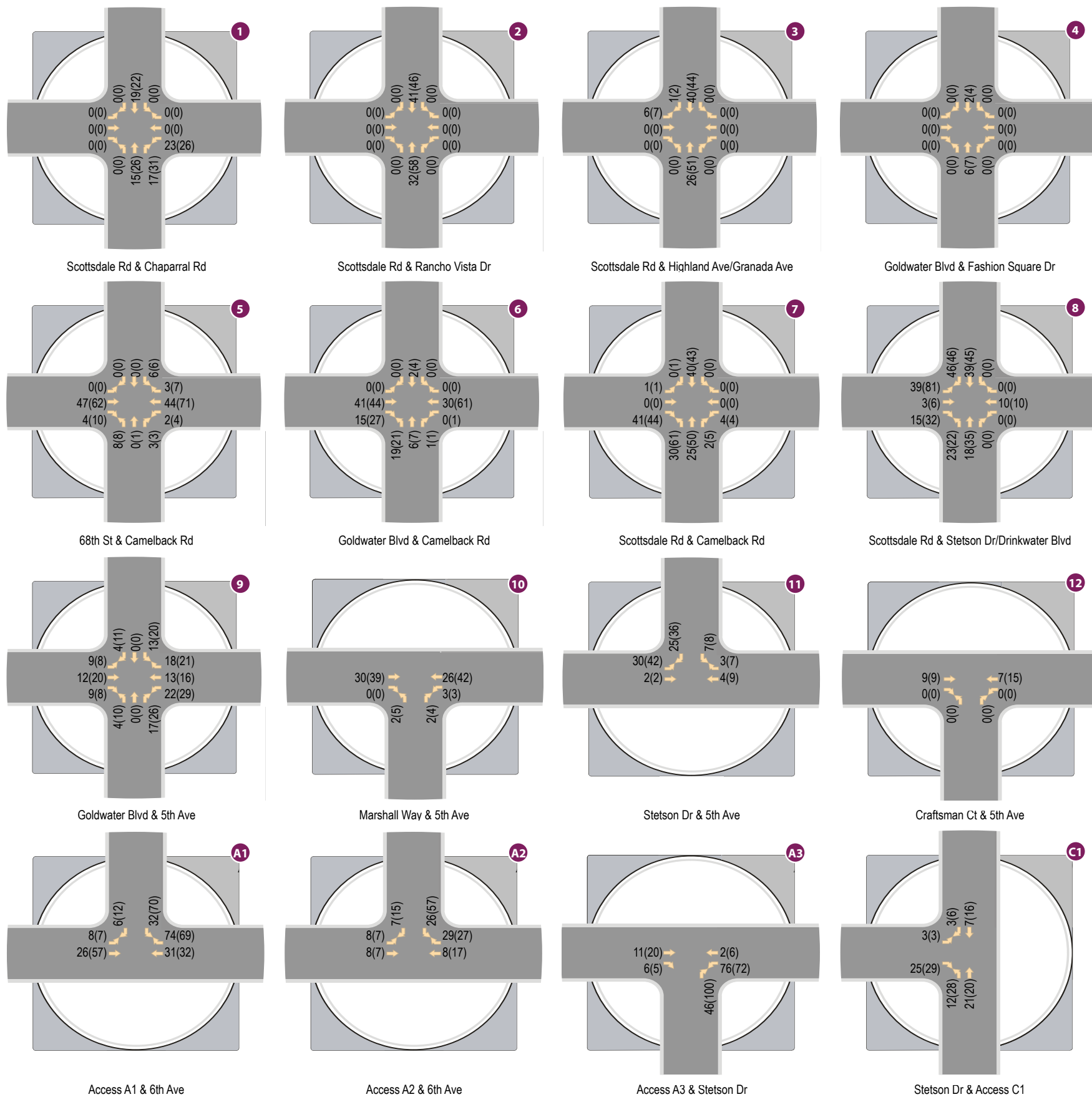


Figure 7A: Proposed Site Generated Traffic Volumes

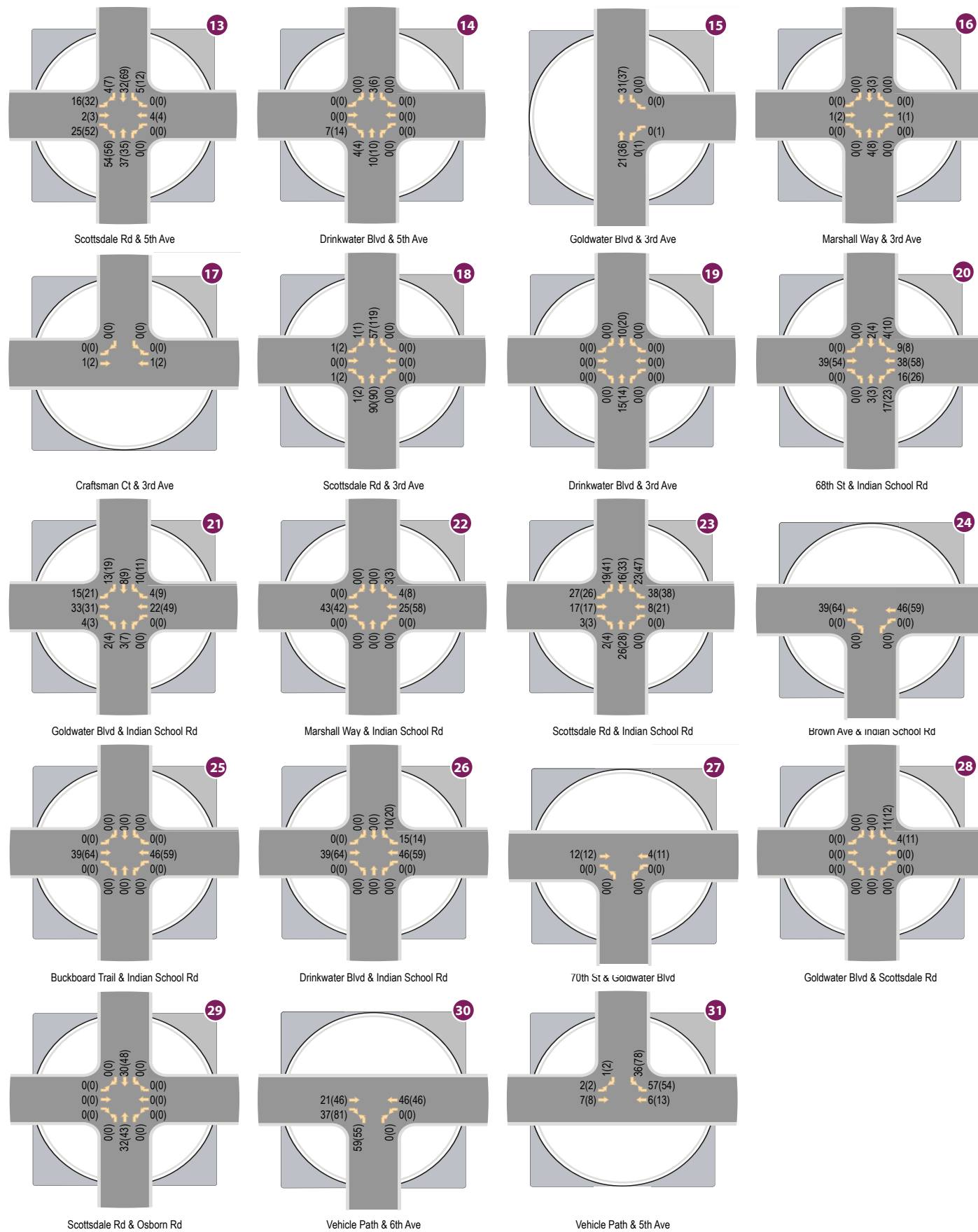


Figure 7B: Proposed Site Generated Traffic Volumes

FUTURE BACKGROUND TRAFFIC

Per the *City of Scottsdale Design Standards & Policies Manual 2018*, for a redevelopment project, such as Southbridge, the existing site generated volumes need to be subtracted from the existing adjusted traffic volumes to obtain the base traffic that would be present if the existing developments on Zones A, B and C were undeveloped. Peak hour site generated traffic volumes for the existing development are presented in **Figures 8A** and **8B**. These volumes were then subtracted from the existing adjusted volumes and the total is presented in **Figures 9A** and **9B**. The volumes presented in these figures represent the base volumes that are present with no development on Zones A, B and C.

CivTech then applied a growth rate to the base volumes to obtain the future background traffic volumes along the adjacent roadway network. In reviewing the City of Scottsdale Traffic Counts Map, a 1.7% average growth rate was found within the proposed study area. **Table 9** shows the expansion factor used for the proposed opening year 2022 and the horizon year 2032.

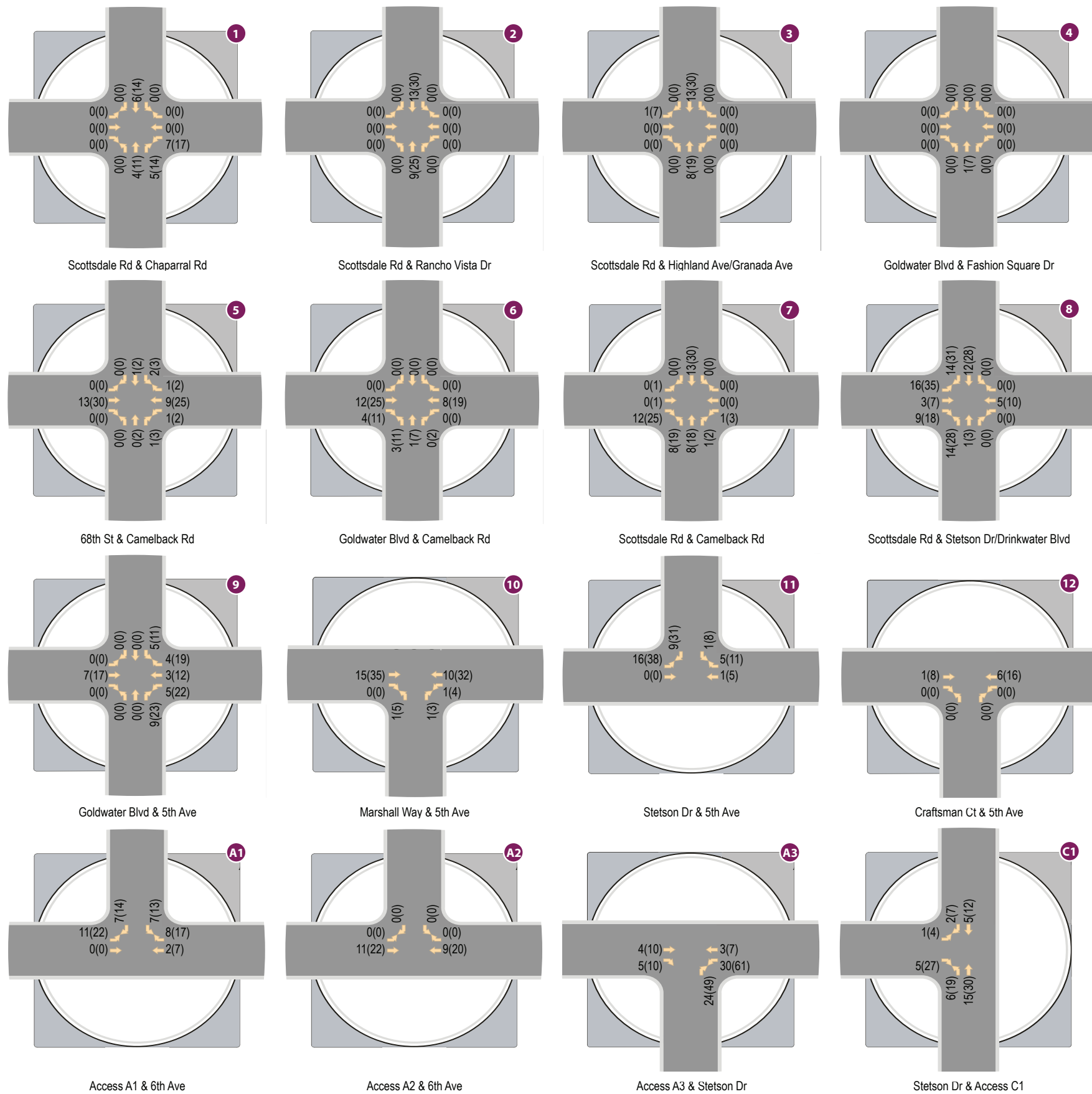
Table 9 – Growth Rate Expansion Factors

Horizon Year	Expansion Factor
2022	1.070
2032	1.266

Applying the growth rate to the 2018 base traffic volumes predicts the volume of traffic anticipated on the surrounding area roads without the addition of proposed site generated traffic or existing site generated traffic. This growth rate also assumes that the same percentage of overall traffic will remain pedestrians or have an alternate mode of transportation, such as carpooling. This calculation assumes that no new roadway improvements are provided on the study area roadways and that the regional road network remains the same. Calculated background traffic for opening year 2022 and horizon year 2032 is presented in **Figures 10A, 10B, 11A** and **11B** respectively. Background and site traffic calculations worksheets are included in **Appendix G**.

TOTAL TRAFFIC

Total traffic was determined by adding the proposed site generated traffic to the estimated projected background traffic. Total peak hour traffic volumes for the horizon years of 2022 and 2032 are shown in **Figures 12A, 12B, 13A** and **13B**, respectively.



Legend
 XX(XX) - AM(PM) Peak Hour Traffic Volumes

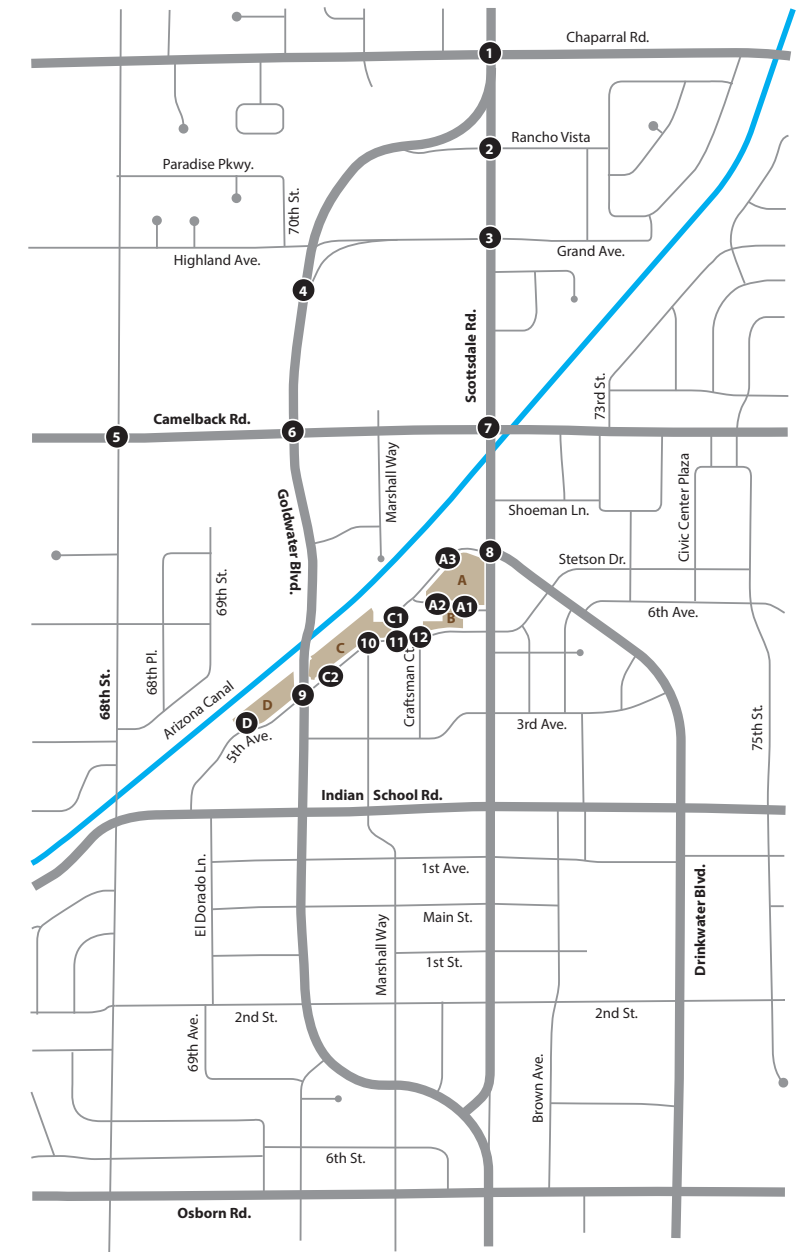
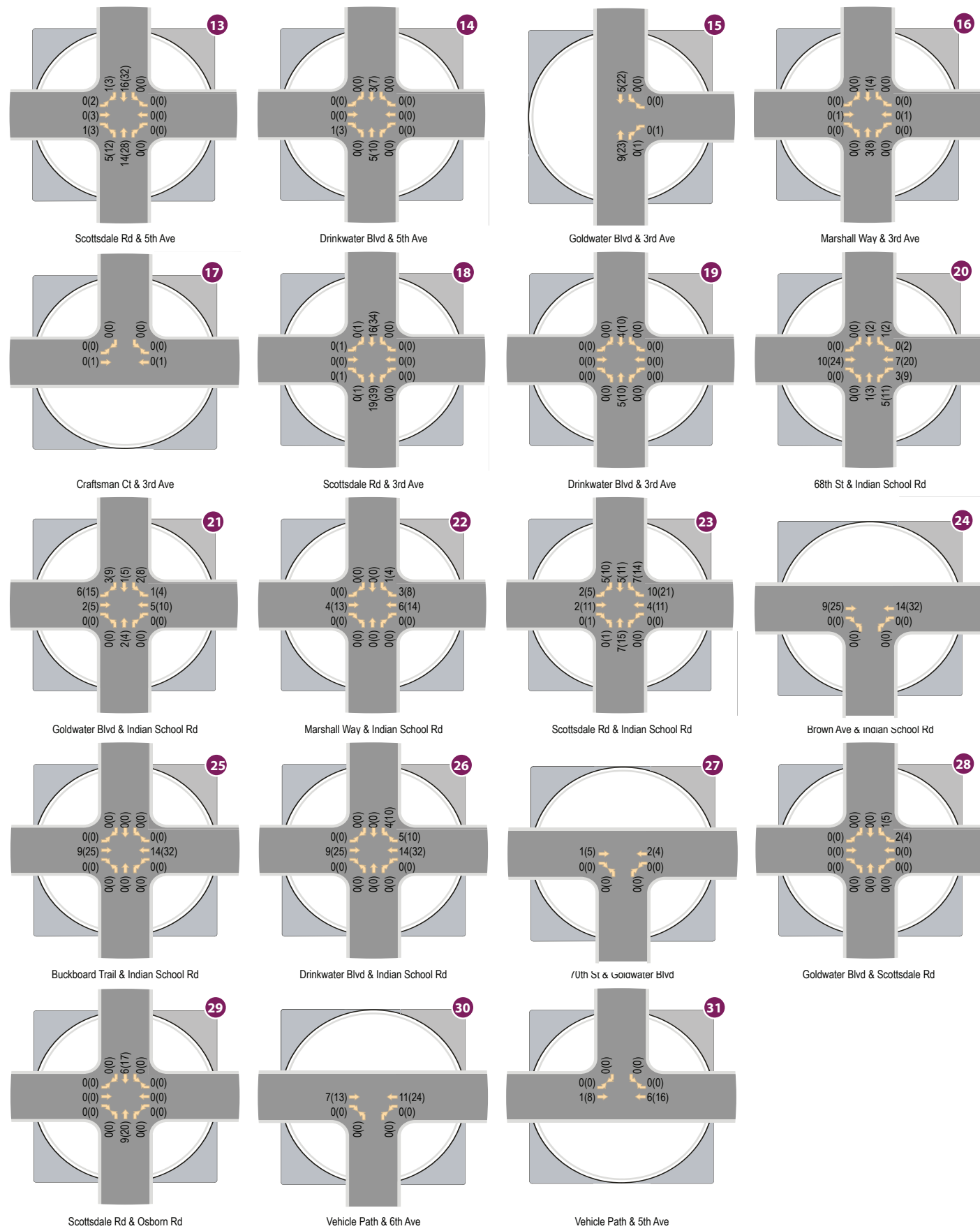


Figure 8A: Existing Site Generated Traffic Volumes



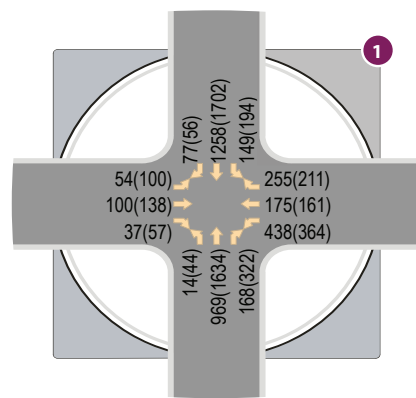
Legend

XX(X) - AM(PM) Peak Hour Traffic Volumes

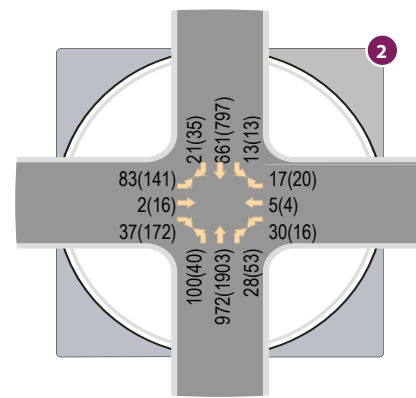
X,XXX - Average Daily Traffic Volumes



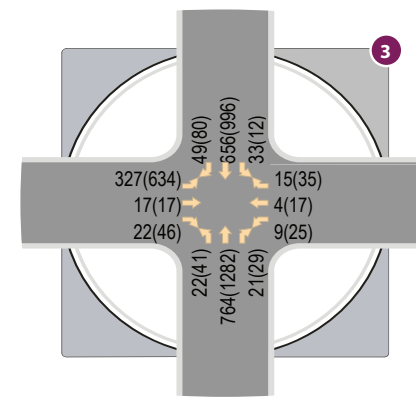
Figure 8B: Existing Site Generated Traffic Volumes



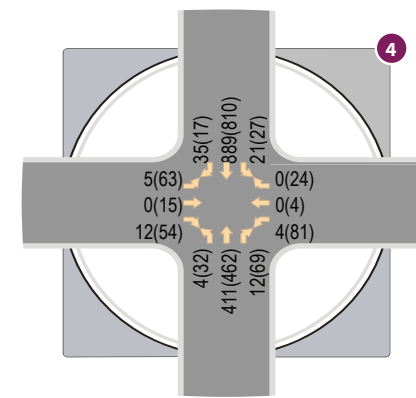
Scottsdale Rd & Chaparral Rd



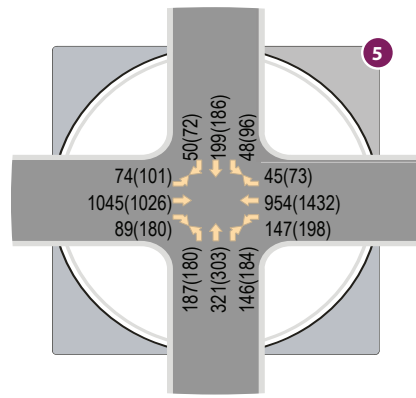
Scottsdale Rd & Rancho Vista Dr



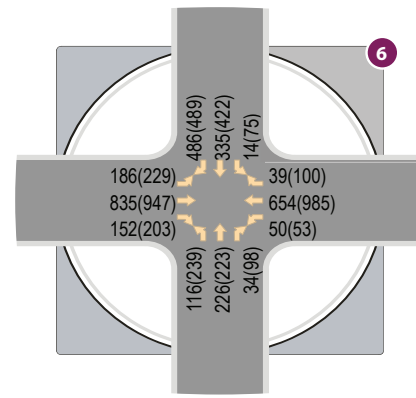
Scottsdale Rd & Highland Ave/Granada Ave



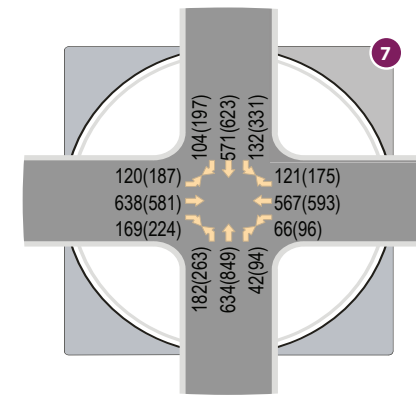
Goldwater Blvd & Fashion Square Dr



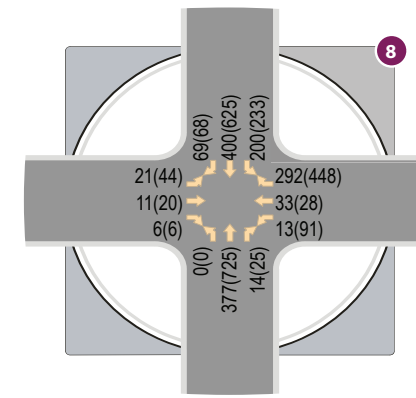
68th St & Camelback Rd



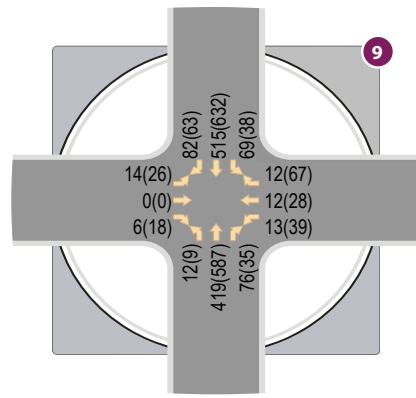
Goldwater Blvd & Camelback Rd



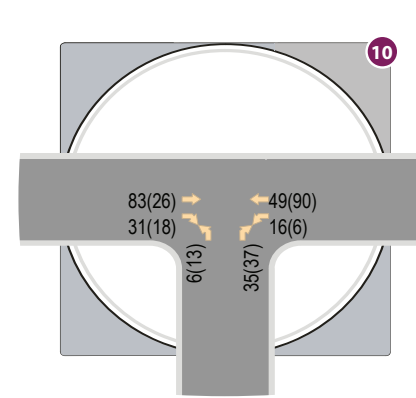
Scottsdale Rd & Camelback Rd



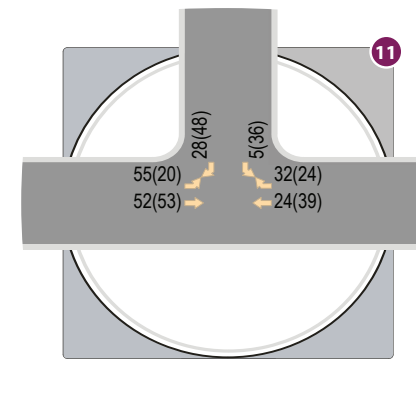
Scottsdale Rd & Stetson Dr/Drinkwater Blvd



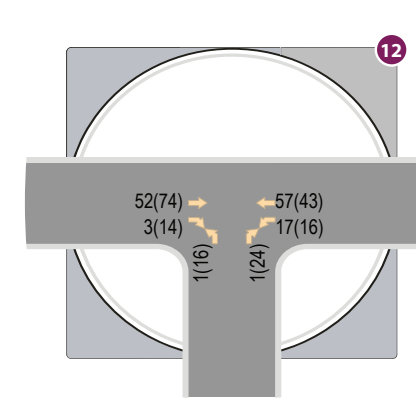
Goldwater Blvd & 5th Ave



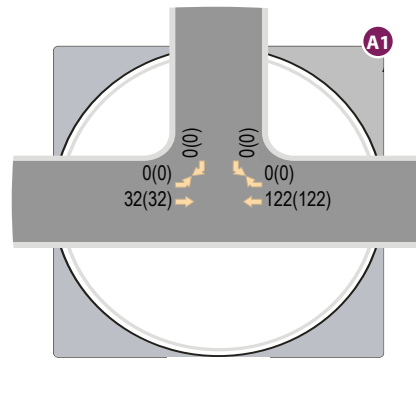
Marshall Way & 5th Ave



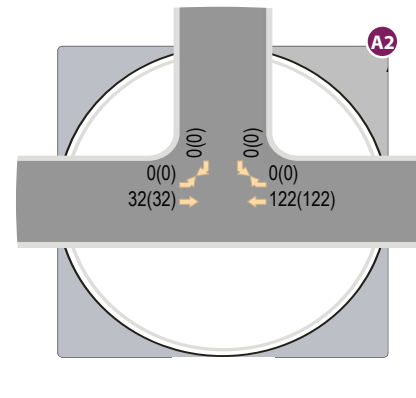
Stetson Dr & 5th Ave



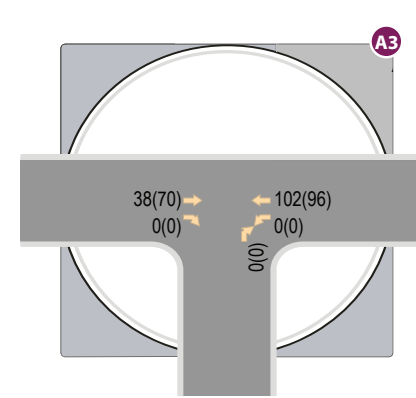
Craftsman Ct & 5th Ave



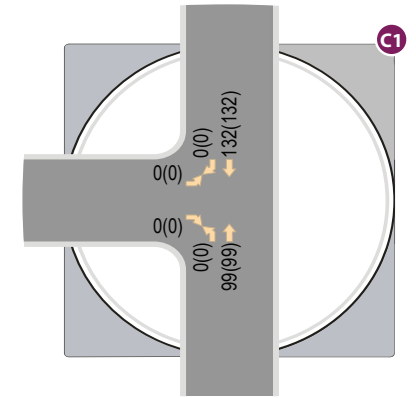
Access A1 & 6th Ave



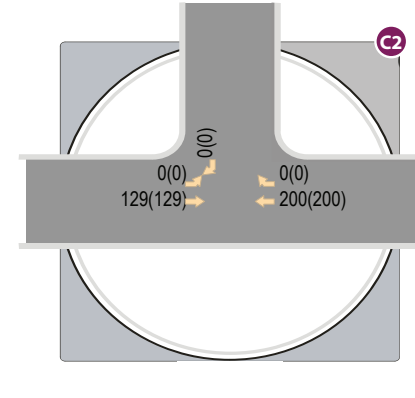
Access A2 & 6th Ave



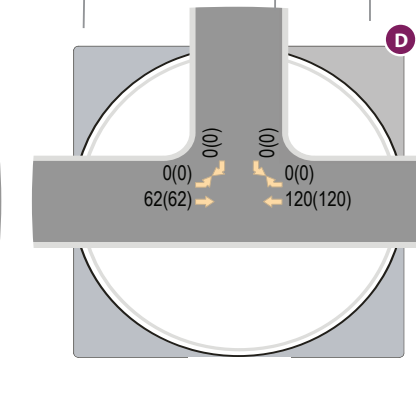
Access A3 & Stetson Dr



Stetson Dr & Access C1



Access C2 & 5th Ave



Access D & 5th Ave

Legend

XX(XX) - AM(PM) Peak Hour Traffic Volumes

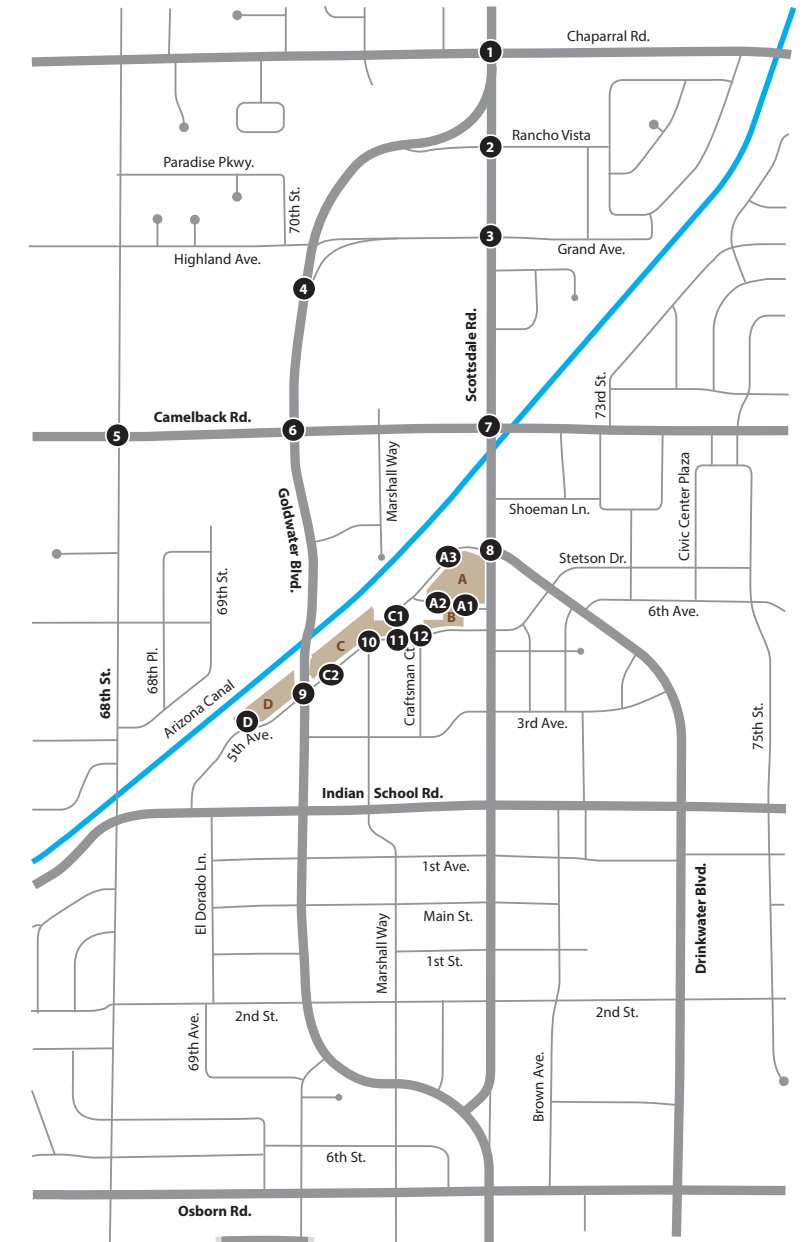


Figure 9A: Base Traffic Volumes

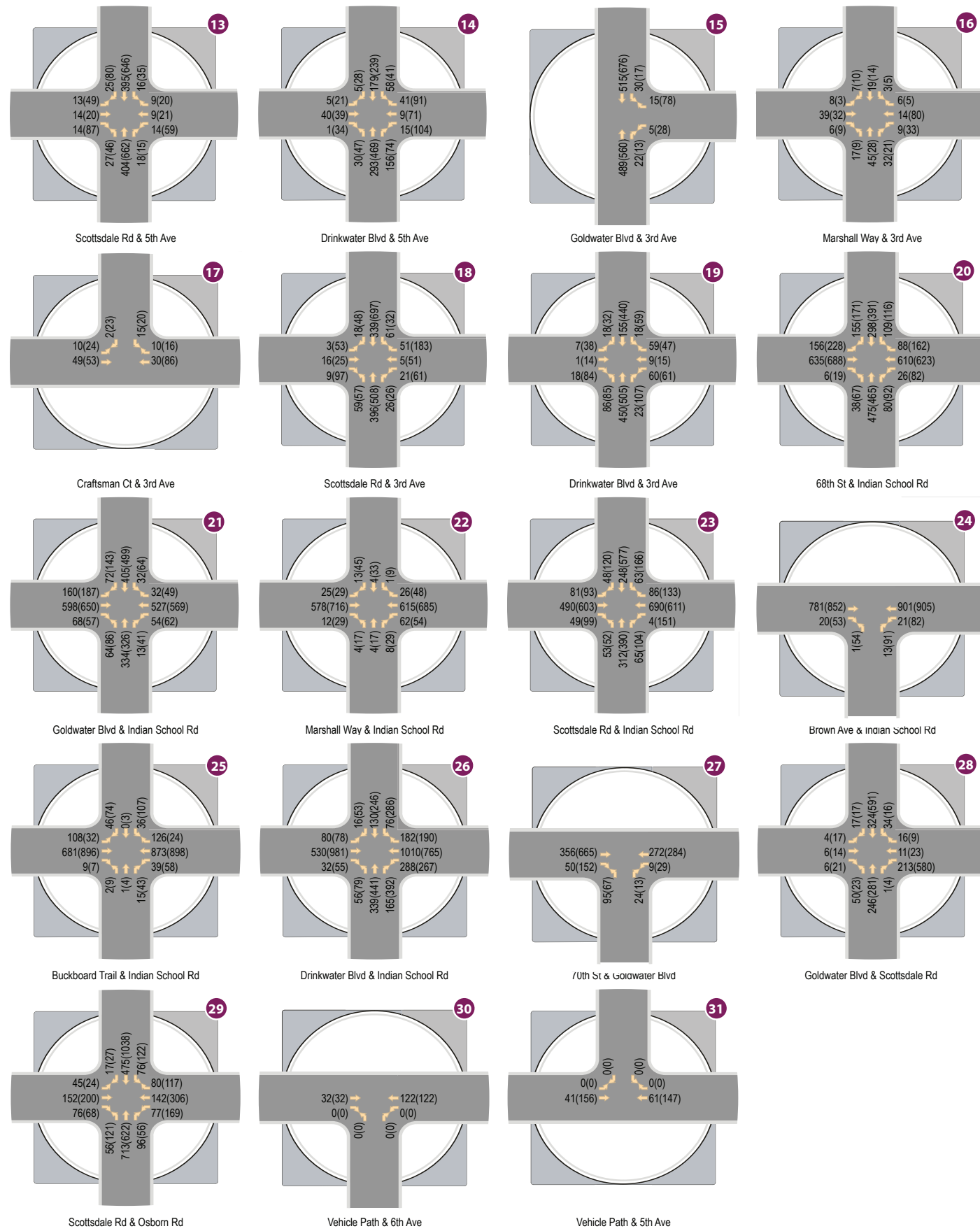
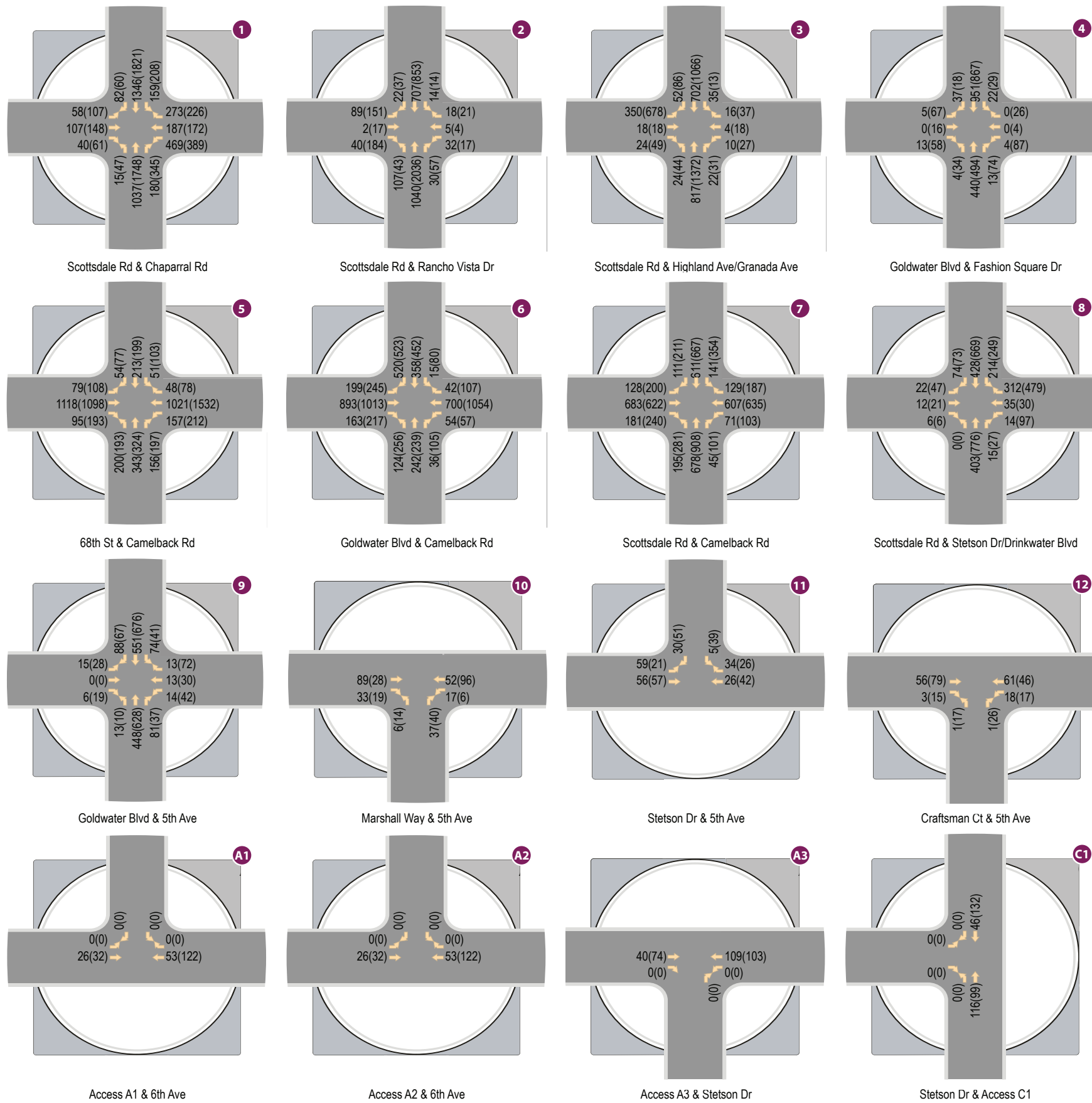


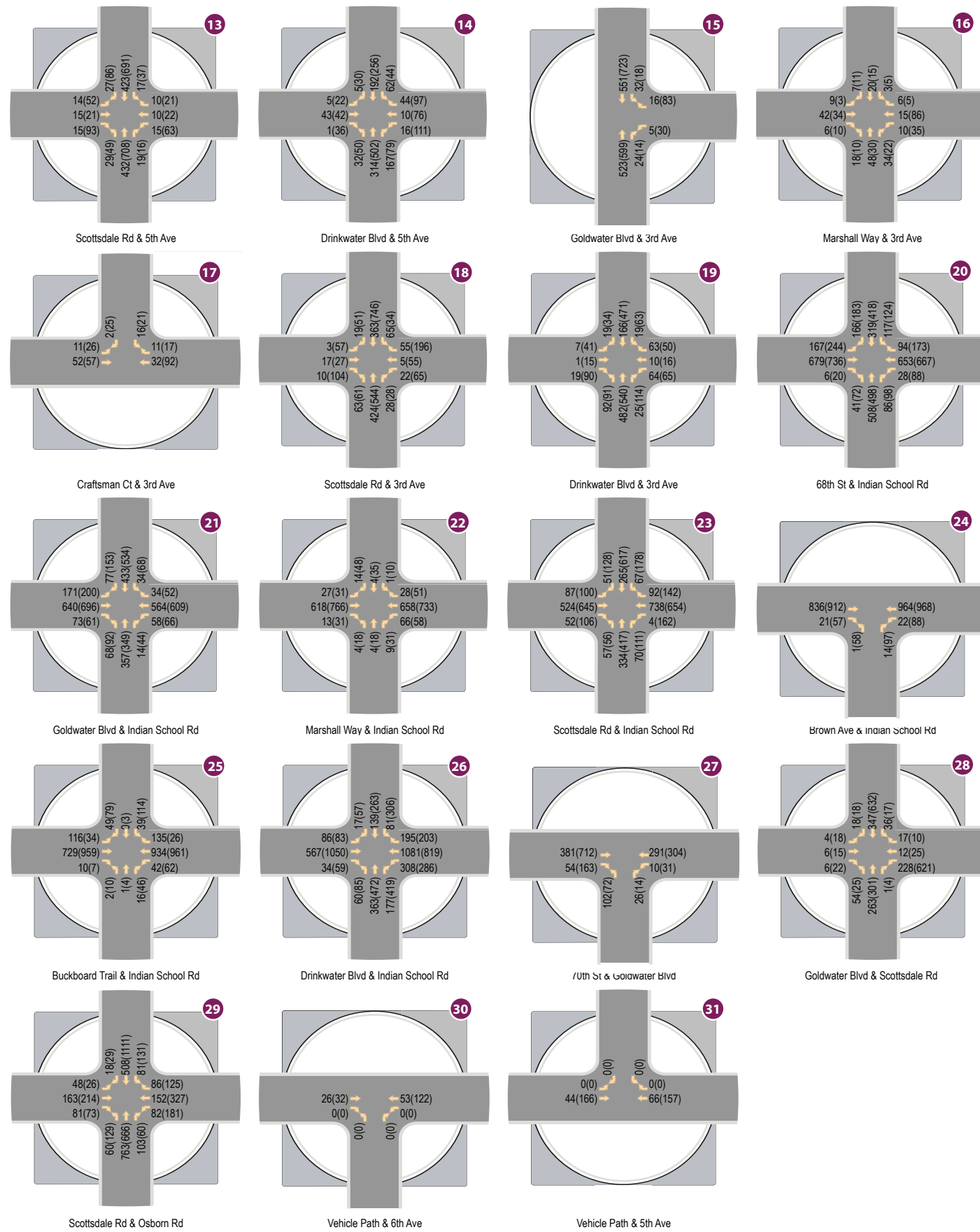
Figure 9B: Base Traffic Volumes



Legend
XX(XX) - AM(PM) Peak Hour Traffic Volumes



Figure 10A: 2022 Background Traffic Volumes



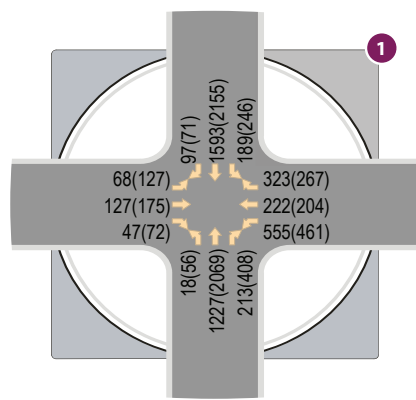
Legend

XX(XX) - AM(PM) Peak Hour Traffic Volumes
 X,XXX - Average Daily Traffic Volumes

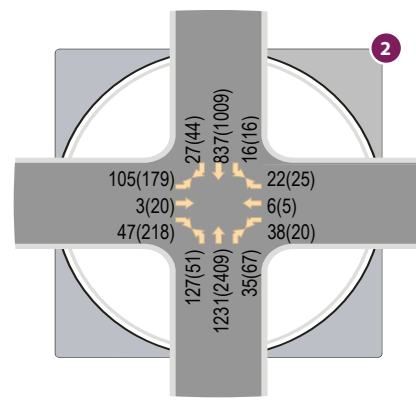
Legend NORTH



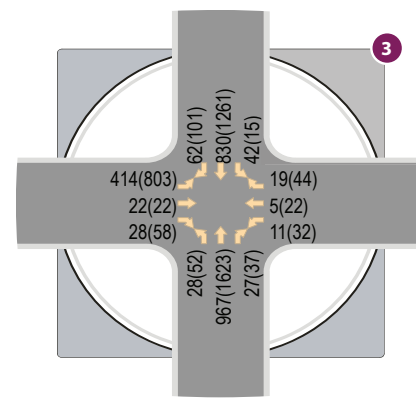
Figure 10B: 2022 Background Traffic Volumes



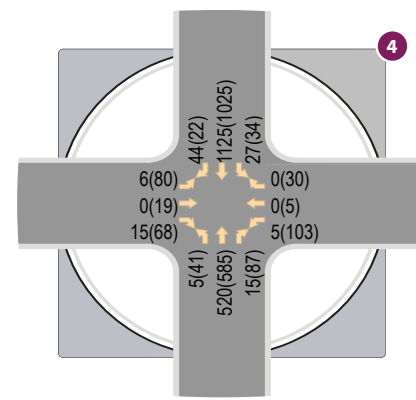
Scottsdale Rd & Chaparral Rd



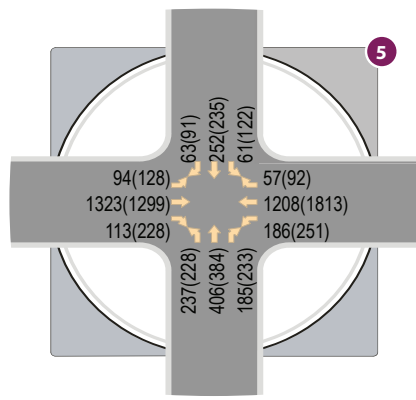
Scottsdale Rd & Rancho Vista Dr



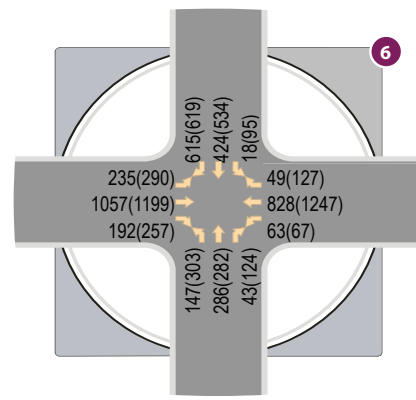
Scottsdale Rd & Highland Ave/Granada Ave



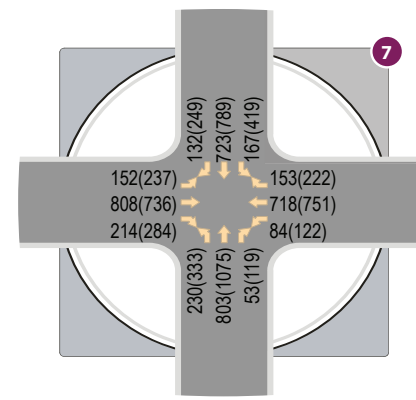
Goldwater Blvd & Fashion Square Dr



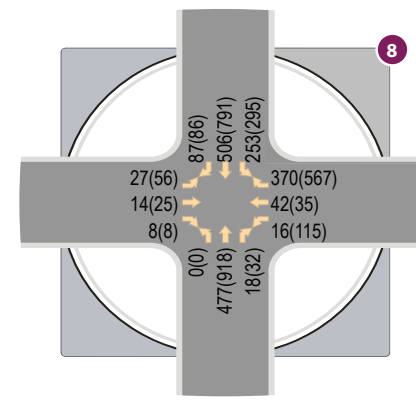
68th St & Camelback Rd



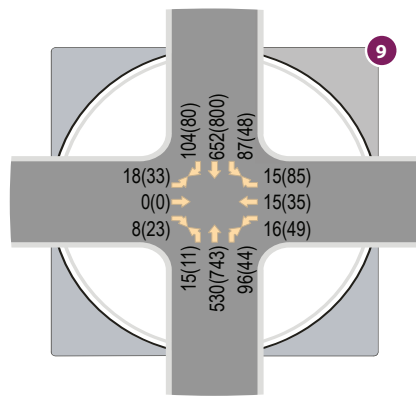
Goldwater Blvd & Camelback Rd



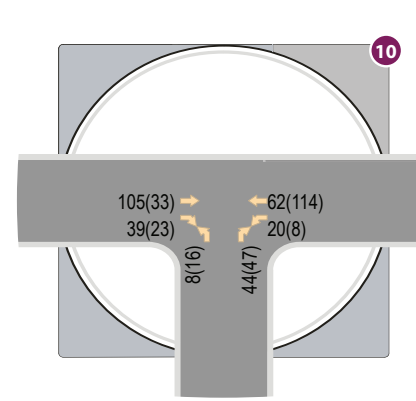
Scottsdale Rd & Camelback Rd



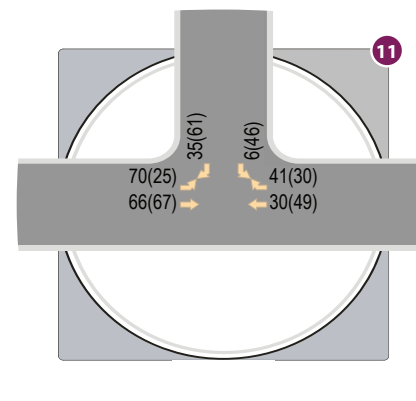
Scottsdale Rd & Stetson Dr/Drinkwater Blvd



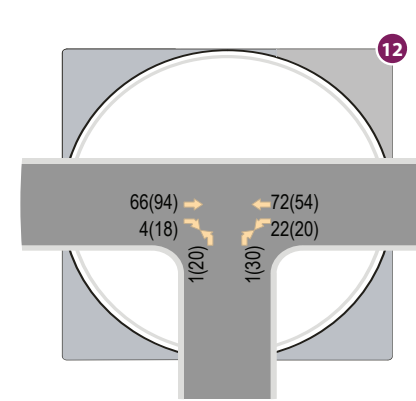
Goldwater Blvd & 5th Ave



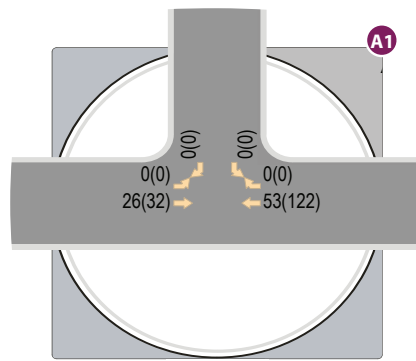
Marshall Way & 5th Ave



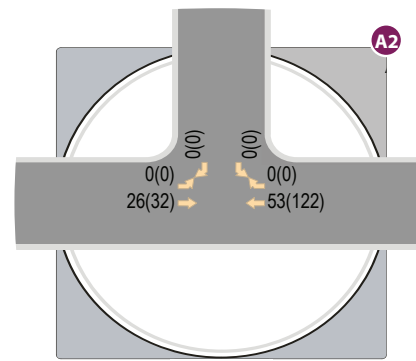
Stetson Dr & 5th Ave



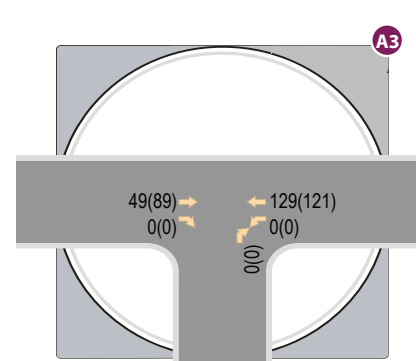
Craftsman Ct & 5th Ave



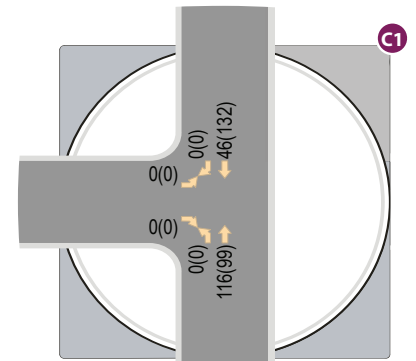
Access A1 & 6th Ave



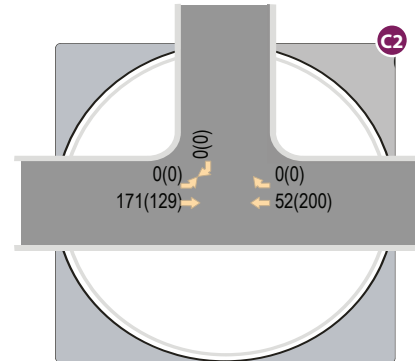
Access A2 & 6th Ave



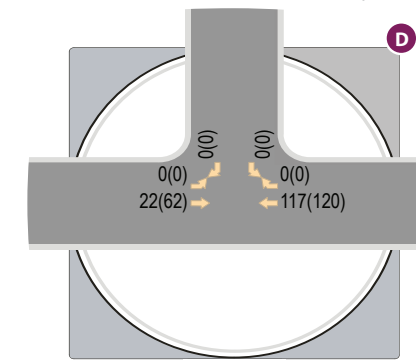
Access A3 & Stetson Dr



Stetson Dr & Access C1



Access C2 & 5th Ave



Access D & 5th Ave

Legend

XX(XX) - AM(PM) Peak Hour Traffic Volumes



NORTH

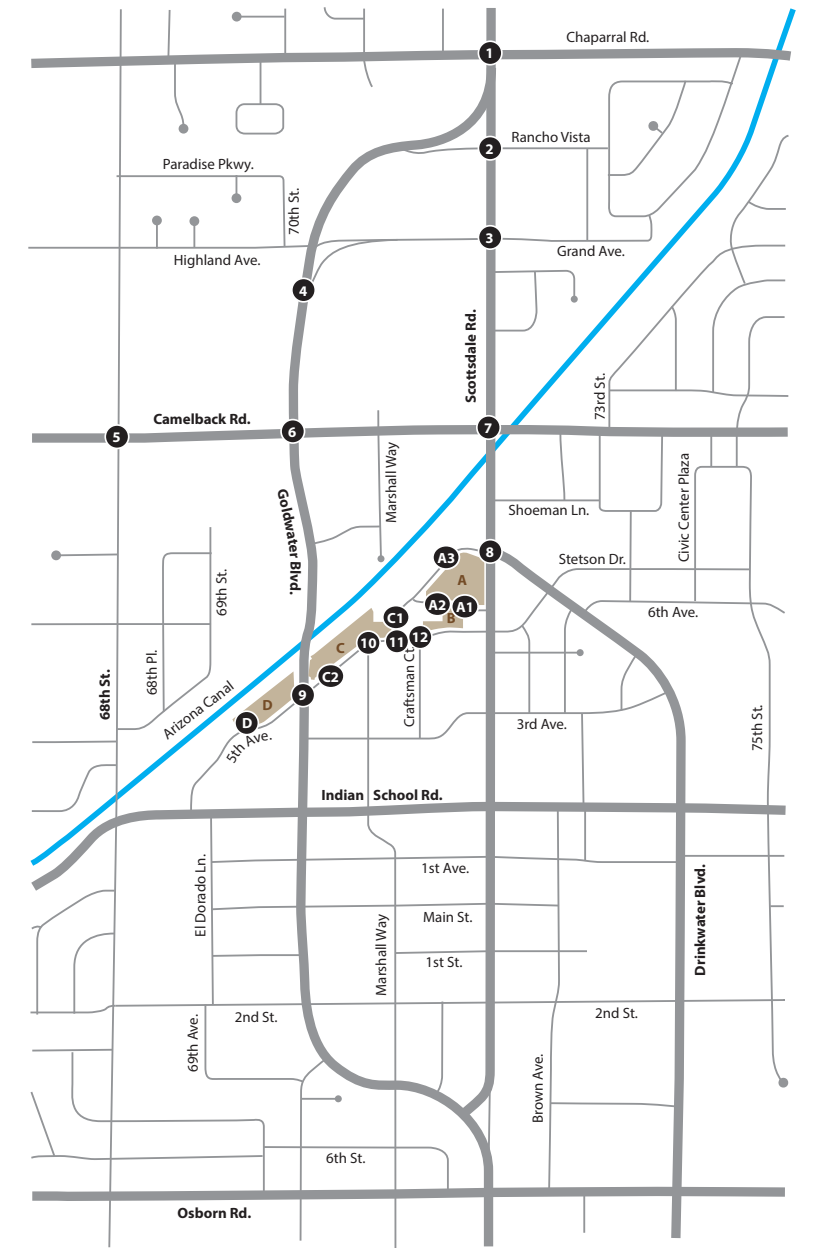


Figure 11A: 2032 Background Traffic Volumes

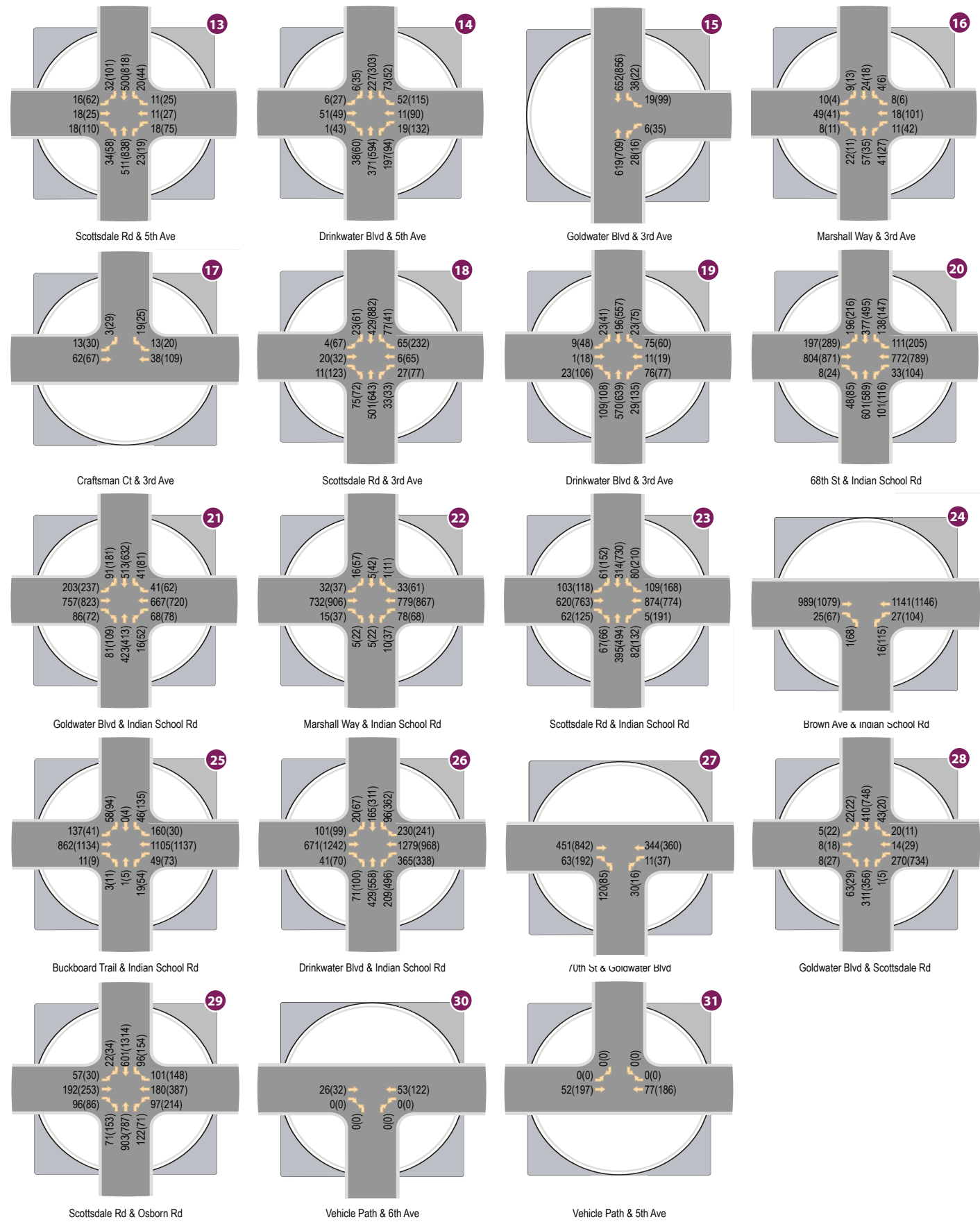
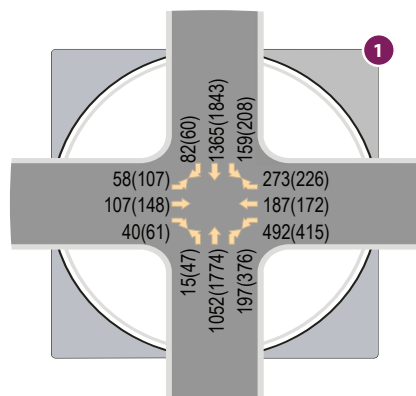
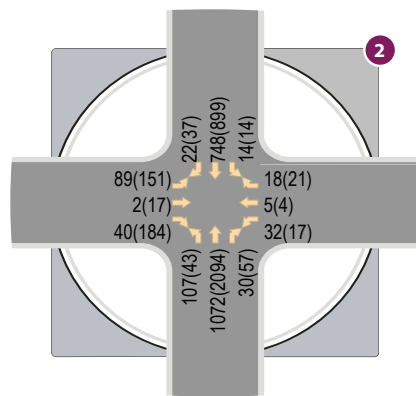


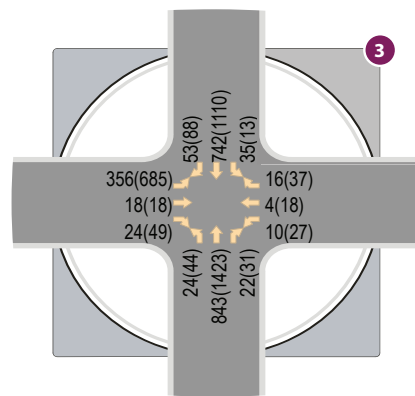
Figure 1 B: 2032 Background Traffic Volumes



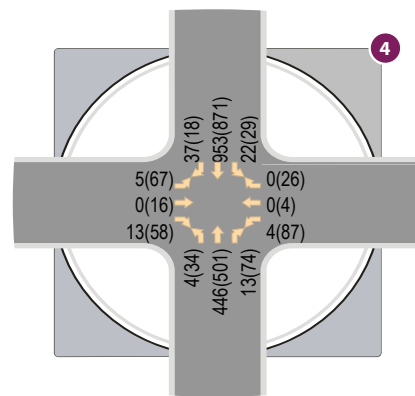
Scottsdale Rd & Chaparral Rd



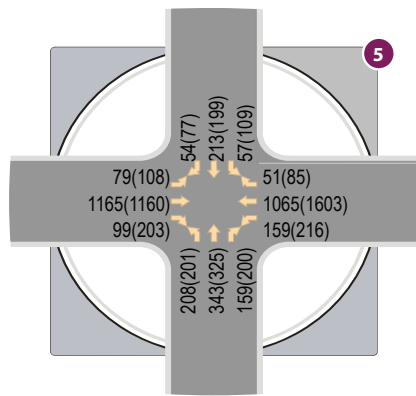
Scottsdale Rd & Rancho Vista Dr



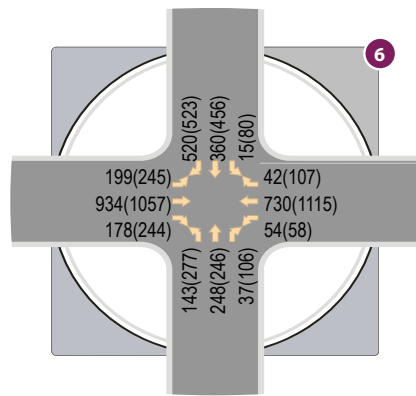
Scottsdale Rd & Highland Ave/Granada Ave



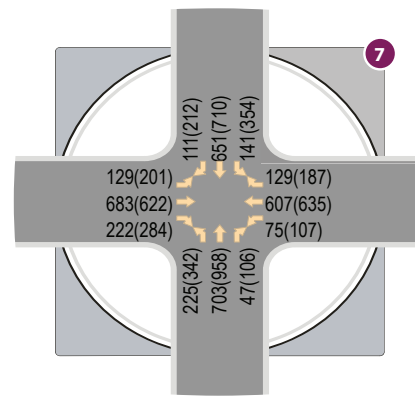
Goldwater Blvd & Fashion Square Dr



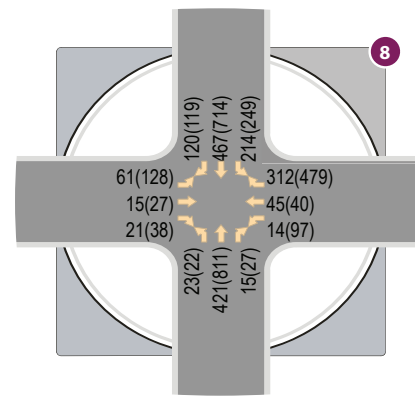
68th St & Camelback Rd



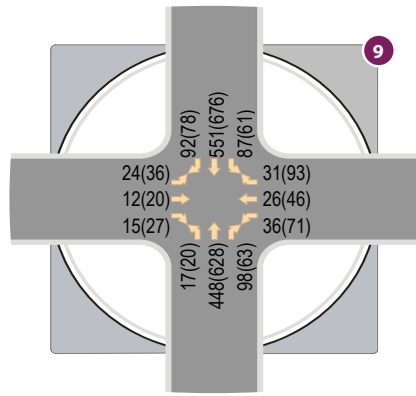
Goldwater Blvd & Camelback Rd



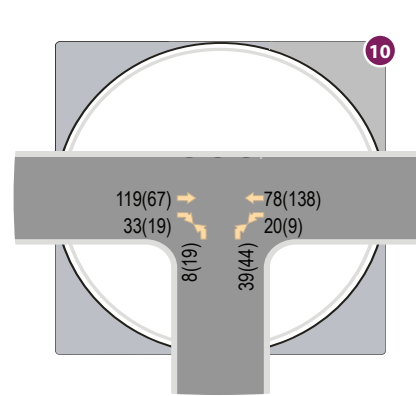
Scottsdale Rd & Camelback Rd



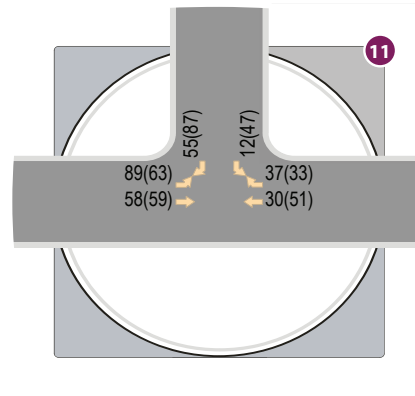
Scottsdale Rd & Stetson Dr/Drinkwater Blvd



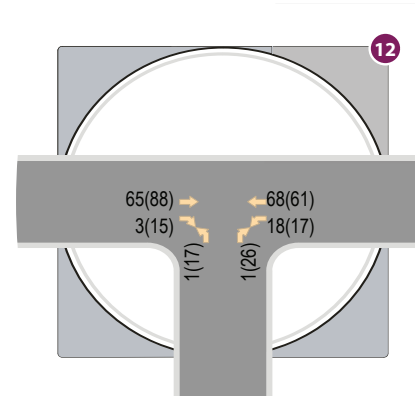
Goldwater Blvd & 5th Ave



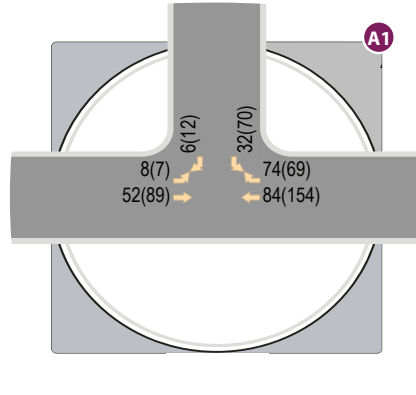
Marshall Way & 5th Ave



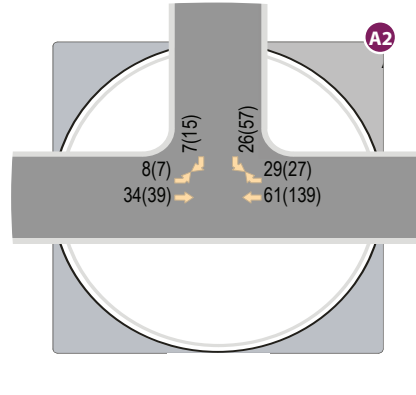
Stetson Dr & 5th Ave



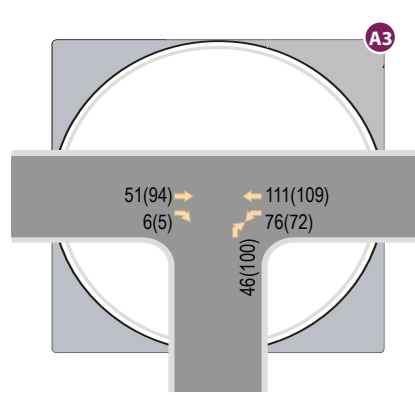
Craftsman Ct & 5th Ave



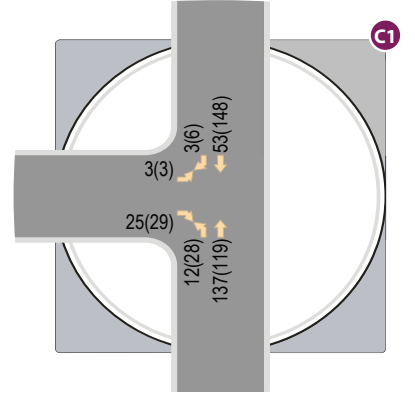
Access A1 & 6th Ave



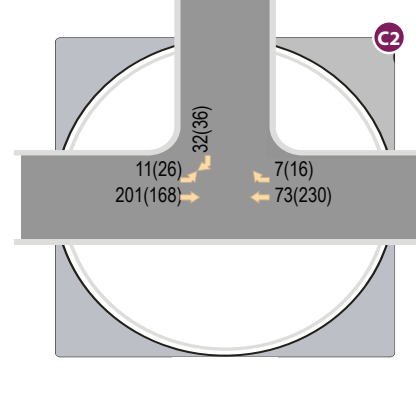
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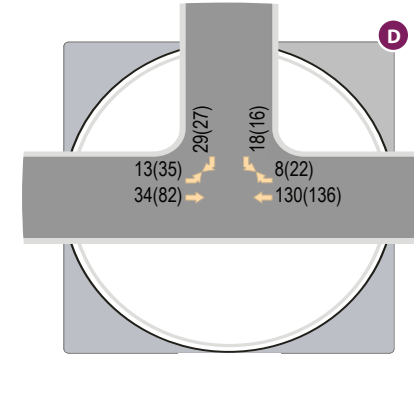
Access A3 & Stetson Dr



Stetson Dr & Access C1



Access C2 & 5th Ave

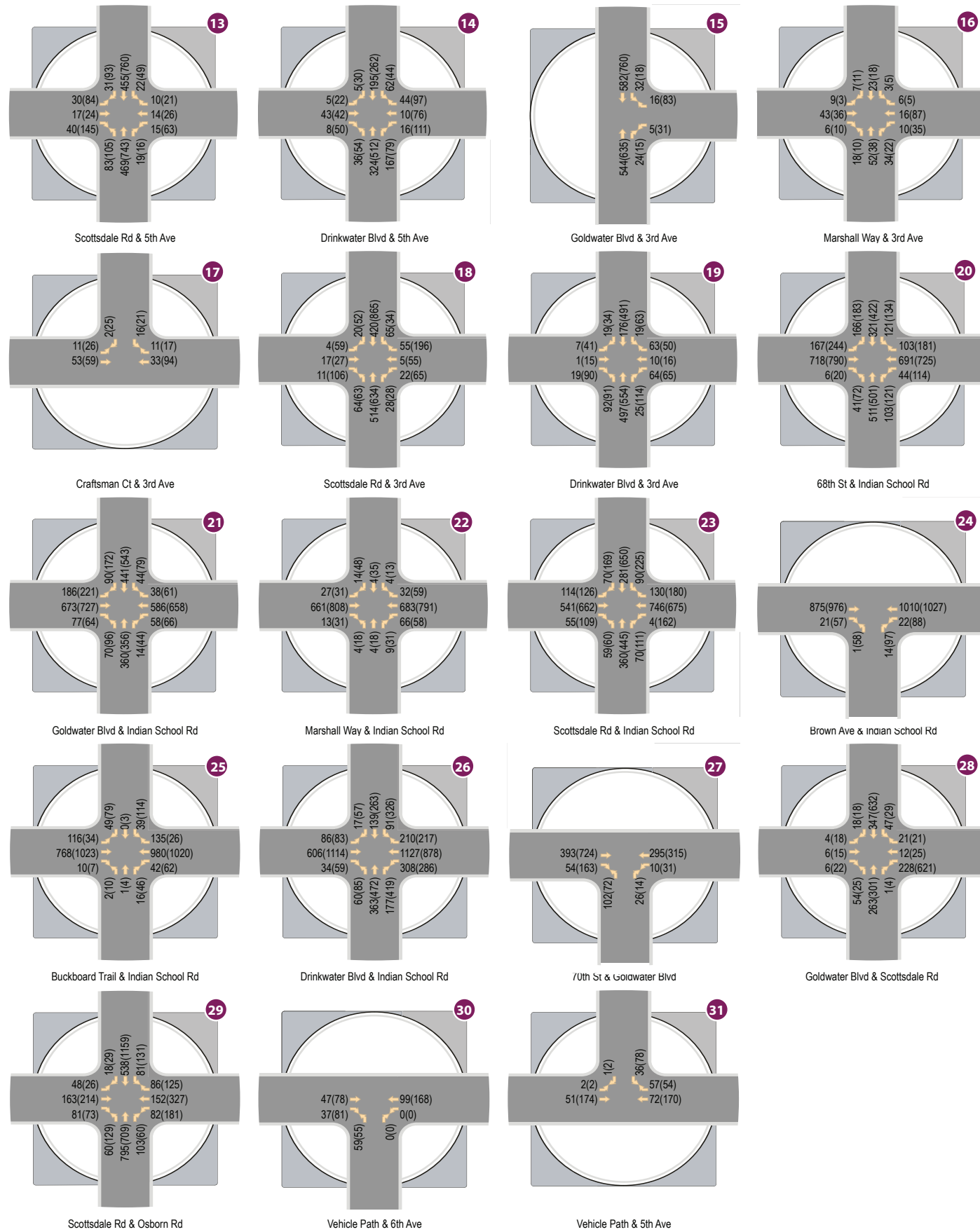


Access D & 5th Ave

Legend
XX(XX) - AM(PM) Peak Hour Traffic Volumes



Figure 12A: 2022 Total Traffic Volumes



Legend

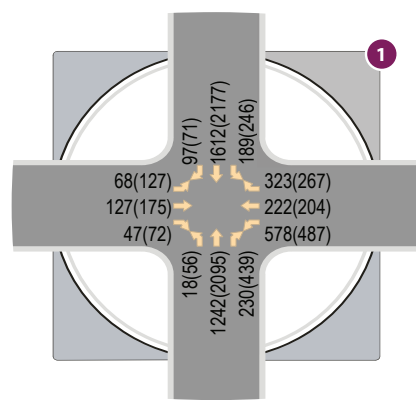
XX(XX) - AM(PM) Peak Hour Traffic Volumes

X,XXX - Average Daily Traffic Volumes

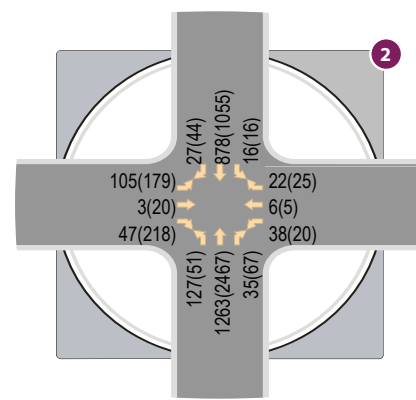
NORTH



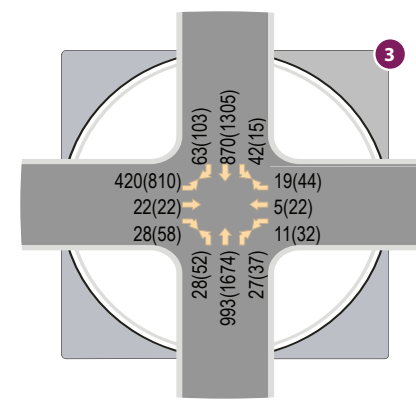
Figure 12B: 2022 Total Traffic Volumes



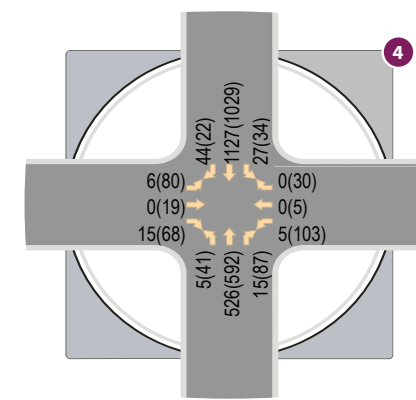
Scottsdale Rd & Chaparral Rd



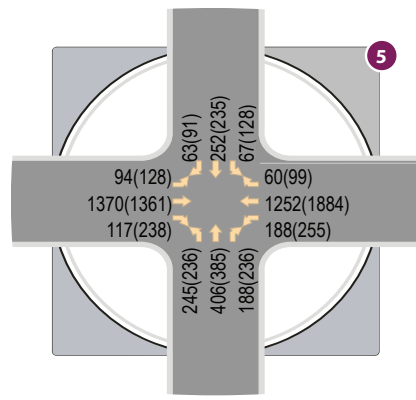
Scottsdale Rd & Rancho Vista Dr



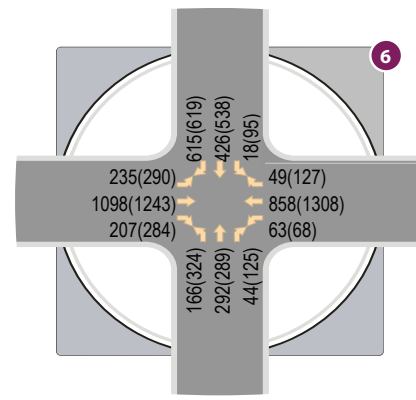
Scottsdale Rd & Highland Ave/Granada Ave



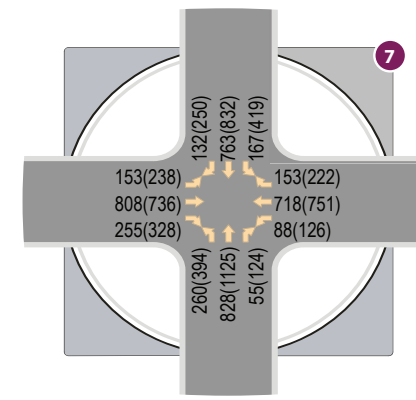
Goldwater Blvd & Fashion Square Dr



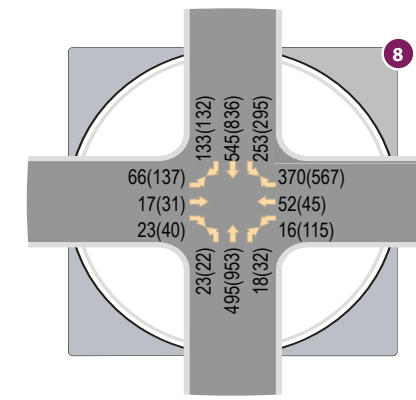
68th St & Camelback Rd



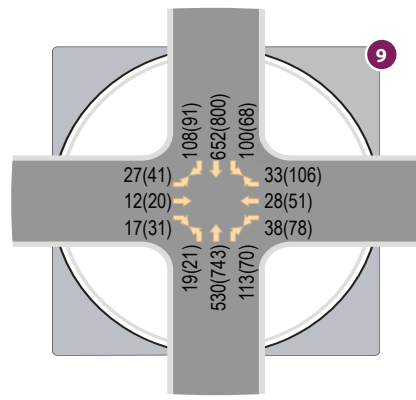
Goldwater Blvd & Camelback Rd



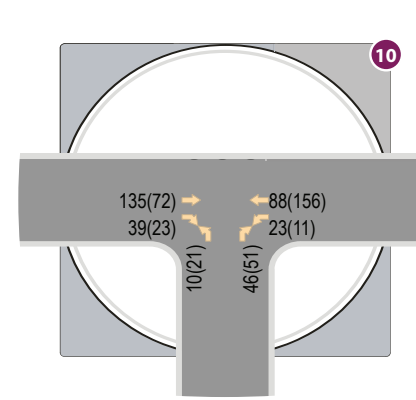
Scottsdale Rd & Camelback Rd



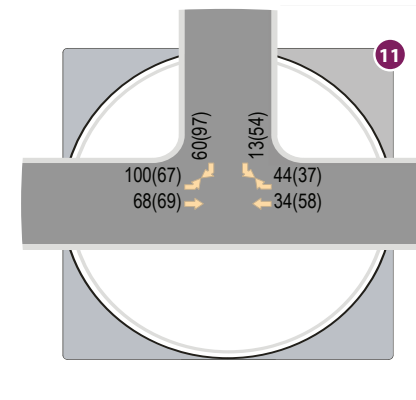
Scottsdale Rd & Stetson Dr/Drinkwater Blvd



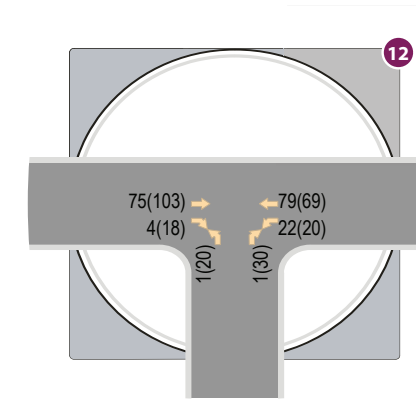
Goldwater Blvd & 5th Ave



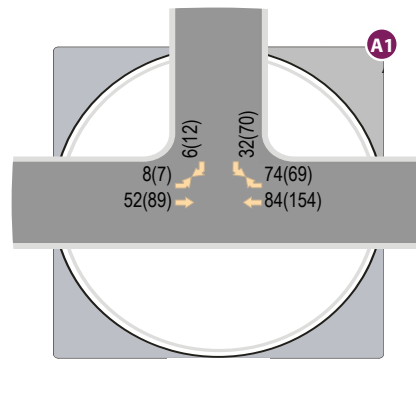
Marshall Way & 5th Ave



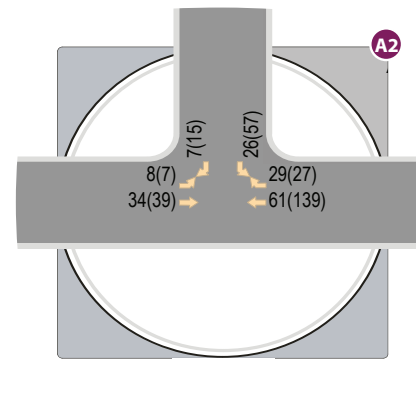
Stetson Dr & 5th Ave



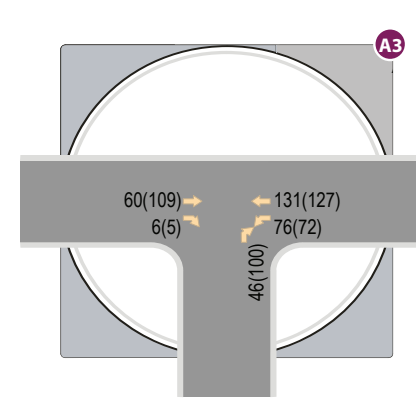
Craftsman Ct & 5th Ave



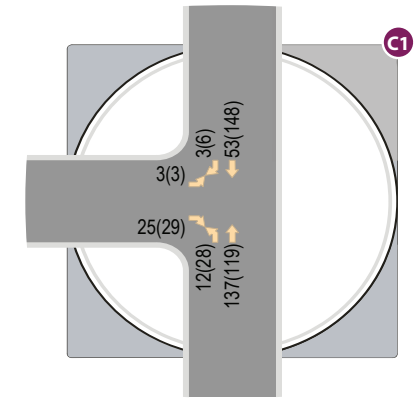
Access A1 & 6th Ave



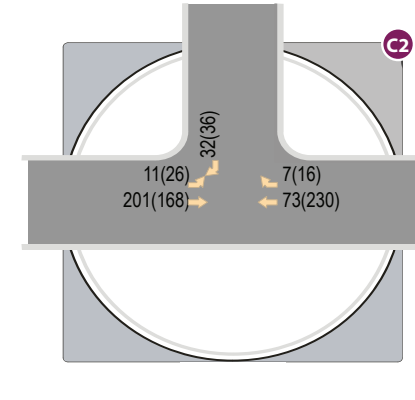
Access A2 & 6th Ave



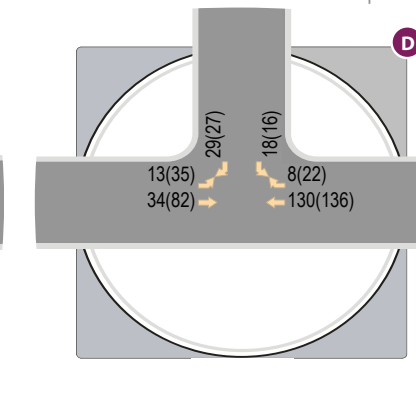
Access A3 & Stetson Dr



Stetson Dr & Access C1



Access C2 & 5th Ave



Access D & 5th Ave

Legend
XX(XX) - AM(PM) Peak Hour Traffic Volumes

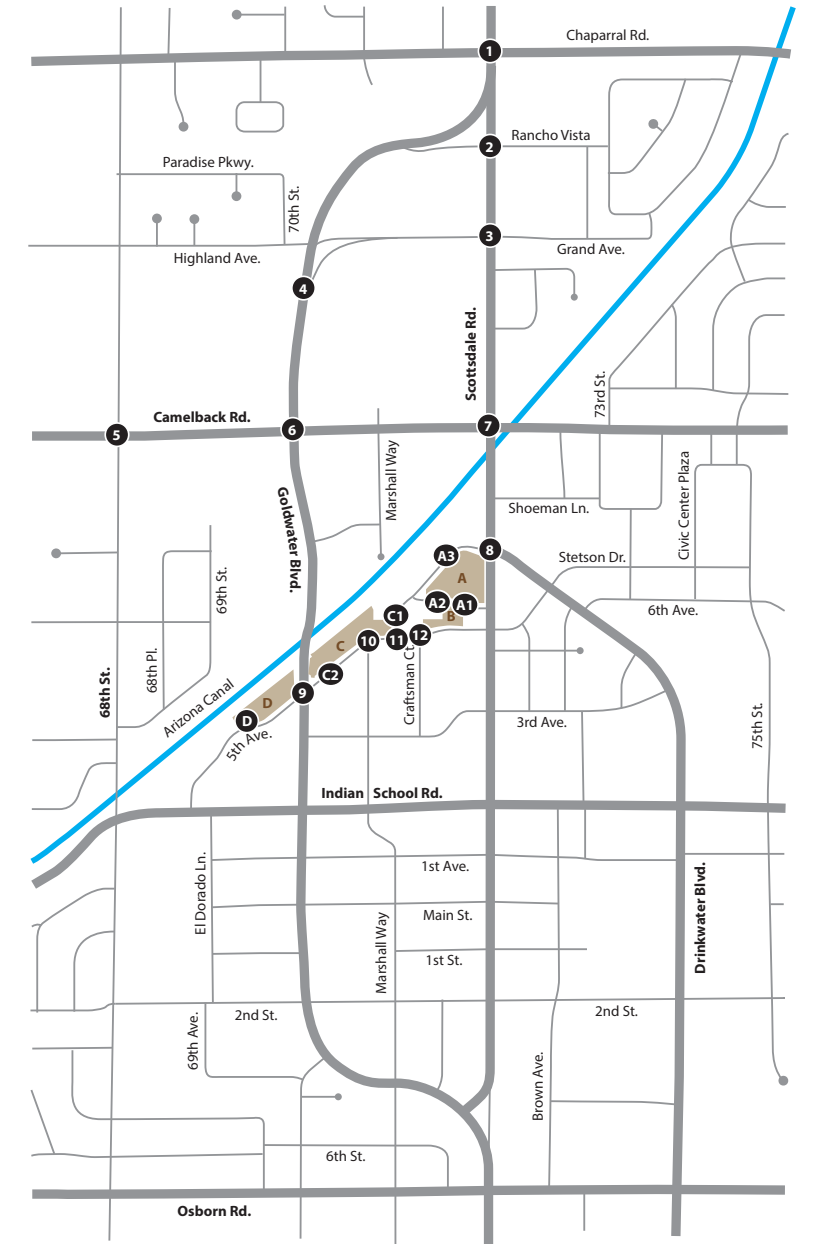
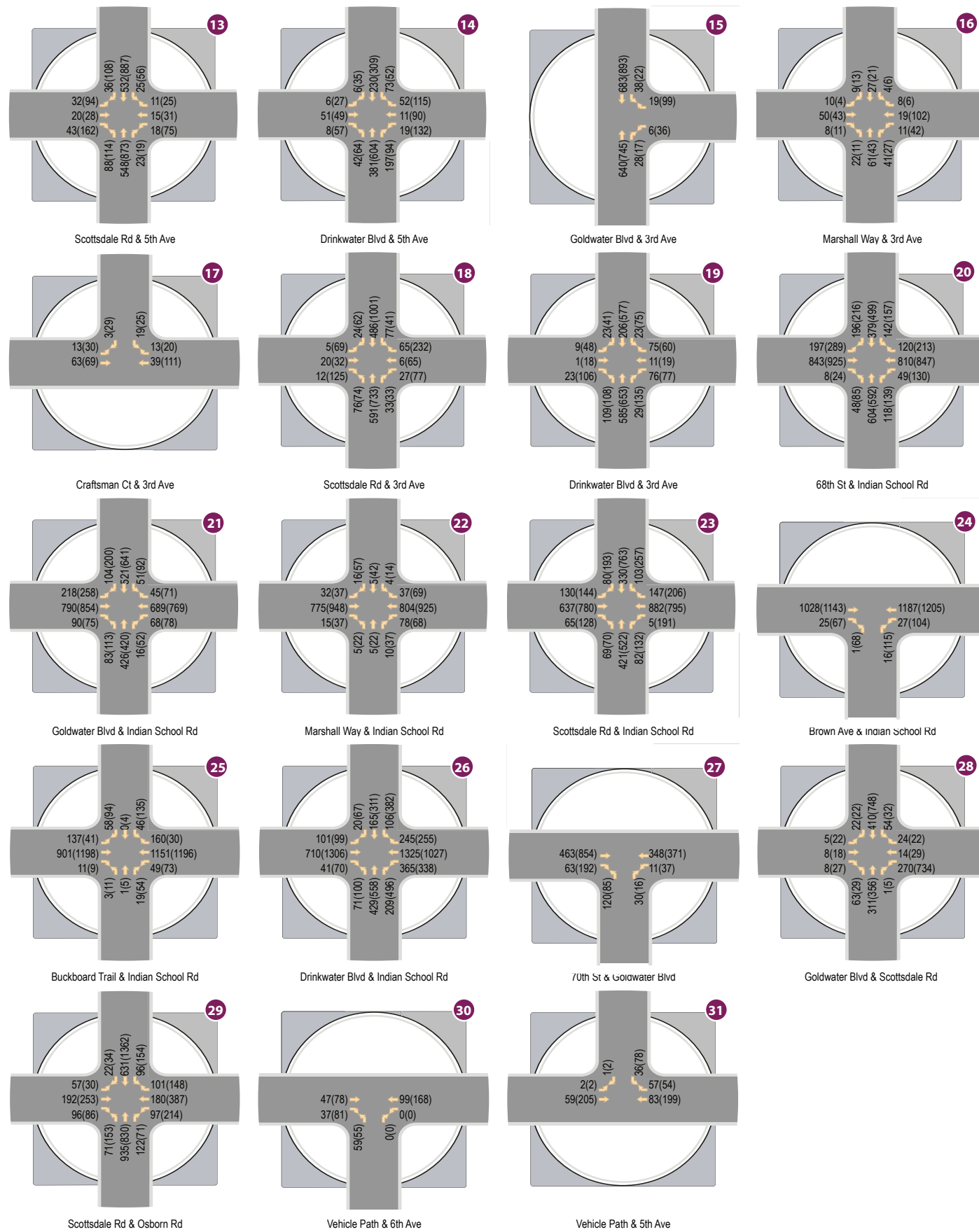


Figure 13A: 2032 Total Traffic Volumes



Legend

XX(XX) - AM(PM) Peak Hour Traffic Volumes

X,XXX - Average Daily Traffic Volumes

NORTH



Figure 13B: 2032 Total Traffic Volumes

INTERSECTION CAPACITY ANALYSIS

Future peak hour capacity analyses have been conducted for the study intersections. All intersections have been analyzed using the methodologies presented in the *Highway Capacity Manual (HCM)*, and Synchro 10 as previously described.

Opening Year 2022

Results of the peak hour level-of-service are summarized in **Table 10** for the 2022 opening year. Worksheets for both AM and PM peak hour analyses have been included within **Appendix H** for the 2022 opening year.

Table 10 – 2022 Peak Hour Levels of Service

ID	Intersection	Control	Approach	No Build AM(PM)	Build AM(PM)	Mitigated AM(PM)
1	Scottsdale Rd & Chaparral Rd	Signal	NB	C (D)	C (D)	C (E)
			SB	D (F)	D (F)	D (E)
			EB	E (E)	E (E)	E (E)
			WB	E (E)	E (E)	E (E)
			Overall	D (E)	D (E)	D (E)
2	Scottsdale Rd & Rancho Vista Dr	Signal	NB	A (A)	A (A)	[Not Mitigated]
			SB	A (A)	A (A)	
			EB	D (D)	D (D)	
			WB	D (D)	D (D)	
			Overall	A (B)	A (B)	
3	Scottsdale Rd & Highland Ave/Granada Ave	Signal	NB	A (B)	A (B)	A (B)
			SB	A (B)	A (B)	A (B)
			EB	D (D)	D (D)	D (D)
			WB	E (E)	E (E)	E (D)
			Overall	B (C)	B (C)	B (C)
4	Goldwater Blvd & Fashion Square Dr	Signal	NB	A (A)	A (A)	A (A)
			SB	A (A)	A (A)	A (A)
			EB	E (E)	E (E)	D (D)
			WB	E (E)	E (E)	D (D)
			Overall	A (B)	A (B)	A (B)
5	68 th St & Camelback Rd	Signal	NB	D (F)	D (F)	D (D)
			SB	D (E)	D (F)	D (C)
			EB	B (B)	B (B)	B (C)
			WB	C (C)	C (C)	C (D)
			Overall	C (E)	C (E)	C (D)
6	Goldwater Blvd & Camelback Rd	Signal	NB	D (D)	D (D)	D (D)
			SB	E (D)	E (D)	D (D)
			EB	C (D)	C (D)	C (D)
			WB	C (D)	C (D)	C (D)
			Overall	D (D)	D (D)	D (D)
7	Scottsdale Rd & Camelback Rd	Signal	NB	D (D)	D (D)	D (D)
			SB	C (D)	C (D)	C (D)
			EB	D (D)	D (D)	D (D)
			WB	D (E)	D (E)	D (D)
			Overall	D (D)	D (D)	D (D)
8	Scottsdale Rd & Stetson Dr/Drinkwater Blvd	Signal	NB	B (B)	B (B)	B (D)
			SB	A (A)	A (A)	A (C)
			EB	D (D)	D (D)	D (C)
			WB	F (F)	E (F)	E (B)
			Overall	C (D)	C (D)	C (C)

Table 10 (continued) – 2022 Peak Hour Levels of Service

ID	Intersection	Control	Approach	No Build AM(PM)	Build AM(PM)	Mitigated AM(PM)
9	Goldwater Blvd & 5 th Ave	Signal	NB	A (A)	A (A)	[Not Mitigated]
			SB	A (A)	A (A)	
			EB	D (D)	D (D)	
			WB	D (D)	D (D)	
			Overall	A (A)	A (B)	
10	Marshall Way & 5 th Ave	All-way stop controlled roundabout	NB	A (A)	A (A)	[Not Mitigated]
			EB	A (A)	A (A)	
			WB	A (A)	A (A)	
11	Stetson Dr & 5 th Ave	1-way stop (SB)	SB Shared	A (A)	A (A)	[Not Mitigated]
			EB Left	A (A)	A (A)	
			WB Right	A (A)	A (A)	
12	Craftsman Ct & 5 th Ave	1-way stop (NB)	NB Shared	A (A)	A (A)	[Not Mitigated]
			WB Left	A (A)	A (A)	
13	Scottsdale Rd & 5 th Ave	Signal	NB	A (B)	A (B)	[Not Mitigated]
			SB	A (B)	A (C)	
			EB	C (B)	C (C)	
			WB	C (B)	C (B)	
			Overall	A (B)	B (B)	
14	Drinkwater Blvd & 5 th Ave/Stetson Dr	Signal	NB	A (B)	A (B)	[Not Mitigated]
			SB	A (A)	A (A)	
			EB	D (D)	D (D)	
			WB	D (D)	D (D)	
			Overall	A (C)	A (C)	
15	Goldwater Blvd & 3 rd Ave	1-way stop (WB)	SB Left	A (A)	A (A)	[Not Mitigated]
			WB Shared	B (B)	B (B)	
16	Marshall Way & 3 rd Ave	All-way stop	NB Shared	A (A)	A (A)	[Not Mitigated]
			SB Shared	A (A)	A (A)	
			EB Shared	A (A)	A (A)	
			WB Shared	A (A)	A (A)	
17	Craftsman Ct & 3 rd Ave	1-way stop (SB)	SB Shared	A (A)	A (A)	[Not Mitigated]
			EB Left	A (A)	A (A)	
18	Scottsdale Rd & 3 rd Ave	Signal	NB	A (A)	A (A)	[Not Mitigated]
			SB	A (A)	A (A)	
			EB	C (B)	C (B)	
			WB	C (B)	C (B)	
			Overall	A (A)	A (A)	
19	Drinkwater Blvd & 3 rd Ave	Signal	NB	A (A)	A (A)	[Not Mitigated]
			SB	A (A)	A (A)	
			EB	D (D)	D (D)	
			WB	D (E)	D (E)	
			Overall	B (B)	B (B)	
20	68 th St & Indian School Rd	Signal	NB	D (D)	D (D)	D (D)
			SB	D (E)	D (E)	
			EB	C (C)	C (C)	
			WB	C (D)	D (D)	
			Overall	D (D)	D (D)	D (D)
21	Goldwater Blvd & Indian School Rd	Signal	NB	E (D)	E (D)	[Not Mitigated]
			SB	D (D)	D (D)	
			EB	C (C)	C (C)	
			WB	C (C)	C (C)	
			Overall	D (D)	D (D)	
22	Marshall Way & Indian School Rd	Signal	NB	D (D)	D (D)	[Not Mitigated]
			SB	D (D)	D (D)	
			EB	A (A)	A (A)	
			WB	A (A)	A (A)	
			Overall	A (A)	A (A)	

Table 10 (continued) – 2022 Peak Hour Levels of Service

ID	Intersection	Control	Approach	No Build AM(PM)	Build AM(PM)	Mitigated AM(PM)
23	Scottsdale Rd & Indian School Rd	Signal	NB	D (D)	D (D)	[Not Mitigated]
			SB	D (D)	D (D)	
			EB	B (C)	B (D)	
			WB	B (D)	C (D)	
			Overall	C (D)	C (D)	
24	Brown Ave & Indian School Rd	Signal	NB	D (D)	D (D)	[Not Mitigated]
			EB	A (B)	A (B)	
			WB	A (A)	A (A)	
			Overall	A (B)	A (B)	
25	Buckboard Trail & Indian School Rd	Signal	NB	D (D)	D (D)	[Not Mitigated]
			SB	D (D)	D (D)	
			EB	A (A)	A (A)	
			WB	A (B)	A (B)	
			Overall	A (B)	A (B)	
26	Drinkwater Blvd & Indian School Rd	Signal	NB	D (E)	D (E)	[Not Mitigated]
			SB	D (D)	D (D)	
			EB	C (D)	C (D)	
			WB	C (E)	C (E)	
			Overall	C (E)	C (E)	
27	70 th St & Goldwater Blvd	1-way stop (NB)	NB Left	C (D)	C (D)	[Not Mitigated]
			NB Right	B (B)	B (B)	
			WB Left	B (B)	B (B)	
28	Goldwater Blvd & Scottsdale Rd	Signal	NB	A (B)	A (B)	[Not Mitigated]
			SB	A (B)	A (B)	
			EB	E (E)	E (E)	
			WB	E (D)	E (D)	
			Overall	C (C)	C (C)	
29	Scottsdale Rd & Osborn Rd	Signal	NB	B (C)	B (C)	[Not Mitigated]
			SB	B (C)	B (C)	
			EB	D (D)	D (D)	
			WB	D (D)	D (D)	
			Overall	C (C)	C (C)	
30	Vehicle Path & 6 th Ave	1-way stop (NB)	NB Shared	- (-)	A (B)	[Not Mitigated]
			WB Left	- (-)	A (A)	
31	Vehicle Path & 5 th Ave	1-way stop (SB)	SB Shared	- (-)	A (B)	[Not Mitigated]
			EB Left	- (-)	A (A)	
A1	Access A1 & 6 th Ave	1-way stop (SB)	SB Shared	- (-)	A (B)	[Not Mitigated]
			EB Left	- (-)	A (A)	
A2	Access A2 & 6 th Ave	1-way stop (SB)	SB Shared	- (-)	A (B)	[Not Mitigated]
			EB Left	- (-)	A (A)	
A3	Access A3 & Stetson Dr	1-way stop (NB)	NB Right	- (-)	A (A)	[Not Mitigated]
			EB Left	- (-)	A (A)	
C1	Stetson Dr & Access C1	1-way stop (EB)	NB Left	- (-)	A (A)	[Not Mitigated]
			EB Shared	- (-)	A (A)	
C2	Access C2 & 5 th Ave	1-way stop (SB)	SB Right	- (-)	A (A)	[Not Mitigated]
			EB Left	- (-)	A (A)	
D	Access D & 5 th Ave	1-way stop (SB)	SB Shared	- (-)	A (A)	[Not Mitigated]
			EB Left	- (-)	A (A)	

All 2022 study intersections are projected to operate at level of service LOS D or better during the AM and PM peak hours under the existing lane configurations and traffic controls with the exception of the following intersections:

Without mitigation, the signalized intersection of **Scottsdale Road and Chaparral Road** is anticipated to operate at LOS E during the PM peak hour with or without the site. In order to mitigate this delay, it is recommended that the minimum initial green time for the southbound left phase be increased from 5 seconds to 7 seconds, the northbound/southbound through phase be extended from 10 seconds to 12 seconds, the southbound left turn phase be extended from 17 seconds to 24 seconds and the southbound through phase be extended from 57 seconds to 62 seconds. With these mitigation measures applied the southbound delay is expected to decrease from 118.5 seconds per vehicle to 75.1 seconds per vehicle. Although the intersection is still anticipated to operate at an overall LOS E during the PM peak hour, the delays at each approach are more even and one approach does not experience significantly more delay than another.

Without mitigation, the westbound approach of **Scottsdale Road and Highland Avenue** is anticipated to operate at LOS E during both the AM and PM peak hours with or without the site. During the AM peak hour, the delay is very close to the threshold for an acceptable level of service and no mitigation is recommended at this time. During the PM peak hour, it is recommended that the eastbound/westbound minimum initial green time be increased from 7 seconds to 10 seconds. This is expected to decrease the westbound delay from 56.3 seconds per vehicle to 54.6 seconds per vehicle during the PM peak hour.

Without mitigation, the eastbound and westbound approaches of **Goldwater Boulevard and Fashion Square Drive** are anticipated to operate at LOS E during both the AM and PM peak hours with or without the site. During the AM peak hour, it is recommended that the vehicle recall mode be changed from “none” to “min” and during the PM peak hour it is recommended that the vehicle recall mode be changed from “none” to “max.” With the vehicle recall mode set to “none”, if no vehicles approach the eastbound or westbound approaches as the northbound and southbound phases come to an end, their phase will be skipped and the cycle will return to the northbound and southbound phases. However, if a vehicle does not approach the intersection from the east or west during this detection phase, the eastbound and westbound phase will still be skipped and the vehicle will have to wait for the next cycle. By changing the recall mode to “min”, it means that the minimum green time will always occur on the minor approach whether a vehicle approaches or not. The vehicle recall mode “max” means that the maximum green time will always occur on the minor approach with or without a vehicle approaching. Changing the recall mode will add more delay to the northbound and southbound approaches, however, since the northbound and southbound approaches experience very little delay, it is reasonable to change the recall mode to significantly decrease the delay on the eastbound and westbound approaches. During the AM peak hour, the eastbound delay is anticipated to decrease from 57.3 seconds per vehicle to 53.2 seconds per vehicle and the westbound delay is anticipated to decrease from 57.8 seconds per vehicle to 53.2 seconds per vehicle. During the PM peak hour, the eastbound delay is anticipated to decrease from 56.8 seconds per vehicle to 36.9 seconds per vehicle and the westbound delay is anticipated to decrease from 64.5 seconds per vehicle to 36.2 seconds per vehicle.

Without mitigation, the signalized intersection of **68th Street and Camelback Road** is anticipated to operate at LOS E during the PM peak hour with or without the site. It is recommended that the northbound/southbound through phase be extended from 15 seconds to 24 seconds and the northbound/southbound left turn phase be extended from 10 seconds to 19 seconds. With these mitigation measures applied, the northbound delay is expected to decrease from 229.3 seconds per vehicle to 48.4 seconds per vehicle and the southbound delay is expected to decrease from 85.7 seconds per vehicle to 33.9 seconds per vehicle during the PM peak hour.

Without mitigation, the southbound approach of **Goldwater Boulevard and Camelback Road** is anticipated to operate at LOS E during the AM peak hour with or without the site. It is recommended that the vehicle recall mode for the southbound left and southbound through phases be changed from “none” to “min” and the southbound right turn overlap phase be extended from 24 seconds to 25 seconds. With these mitigation measures applied, the southbound delay is anticipated to decrease from 60.9 seconds per vehicle to 54.8 seconds per vehicle.

Without mitigation, the westbound approach of **Scottsdale Road and Camelback Road** is anticipated to operate at LOS E during the PM peak hour with or without the site. It is recommended that the eastbound/westbound through phase be extended from 40 seconds to 41 seconds in order to decrease the anticipated delay from 56.2 seconds per vehicle to 53.9 seconds per vehicle.

Without mitigation, the westbound approach of **Scottsdale Road and Stetson Drive/Drinkwater Boulevard** is expected to operate at LOS E during the AM and PM peak hours with or without the site. During the AM peak hour, it is recommended that the westbound right turn overlap phase be extended from 25 seconds to 28 seconds. With this mitigation it is anticipated that the westbound approach delay will decrease from 76.2 seconds per vehicle to 67.4 seconds per vehicle, which is lower than what is anticipated without the addition of site traffic. During the PM peak hour, it is recommended that the vehicle recall mode on the eastbound and westbound approaches be changed from “none” to “max” to allow for more vehicles to utilize the intersection on the minor approach during the peak hour. With this mitigation applied, the westbound approach delay is expected to decrease from 134.3 seconds per vehicle to 16.3 seconds per vehicle. By opening year 2022, this intersection will also be improved by the developer to include a dedicated eastbound left turn lane.

Without mitigation, the southbound approach of **68th Street and Indian School Road** is anticipated to operate at LOS E during the PM peak hour with or without the site. It is recommended that the southbound through phase be extended from 39 seconds to 41 seconds, the southbound left turn phase be extended from 17 seconds to 25 seconds and the westbound left turn phase be extended from 15 seconds to 16 seconds. With these mitigation measures applied, the southbound delay is anticipated to decrease from 65.1 seconds per vehicle to 58.3 seconds per vehicle during the PM peak hour, which is lower than what is anticipated without the addition of site traffic.

Horizon Year 2032

Results of the peak hour level-of-service are summarized in **Table 11** for the 2032 horizon year. The lane configurations and signal timing proposed for the 2022 horizon year have been used for the Build scenario in the 2032 horizon year. Worksheets for both AM and PM peak hour analyses have been included within **Appendix I** for the 2032 horizon year.

Table 11 – 2032 Peak Hour Levels of Service

ID	Intersection	Control	Approach	No Build AM(PM)	Build AM(PM)	Mitigated AM(PM)
1	Scottsdale Rd & Chaparral Rd	Signal	NB	C (F)	C (F)	C (F)
			SB	F (F)	F (F)	E (F)
			EB	E (E)	E (E)	E (E)
			WB	E (E)	D (E)	D (E)
			Overall	E (F)	E (F)	D (F)
2	Scottsdale Rd & Rancho Vista Dr	Signal	NB	A (B)	A (B)	[Not Mitigated]
			SB	A (A)	A (A)	
			EB	D (E)	D (E)	
			WB	D (D)	D (D)	
			Overall	A (B)	A (B)	
3	Scottsdale Rd & Highland Ave/Granada Ave	Signal	NB	A (C)	A (C)	A (C)
			SB	A (C)	A (C)	A (C)
			EB	D (E)	D (E)	D (D)
			WB	E (E)	E (E)	E (E)
			Overall	B (C)	B (C)	B (C)
4	Goldwater Blvd & Fashion Square Dr	Signal	NB	A (A)	A (A)	[Not Mitigated]
			SB	A (A)	A (A)	
			EB	E (E)	D (D)	
			WB	E (E)	D (D)	
			Overall	A (B)	A (B)	
5	68 th St & Camelback Rd	Signal	NB	E (F)	E (F)	E (E)
			SB	D (F)	D (D)	D (D)
			EB	C (C)	C (D)	C (C)
			WB	D (C)	E (F)	D (E)
			Overall	D (F)	D (F)	D (D)
6	Goldwater Blvd & Camelback Rd	Signal	NB	D (D)	D (D)	D (D)
			SB	F (E)	F (E)	E (E)
			EB	C (D)	C (D)	C (D)
			WB	C (D)	C (D)	C (D)
			Overall	D (D)	D (D)	D (D)
7	Scottsdale Rd & Camelback Rd	Signal	NB	D (D)	D (E)	D (E)
			SB	D (D)	D (E)	D (E)
			EB	D (D)	D (D)	D (D)
			WB	D (F)	D (E)	D (F)
			Overall	D (E)	D (E)	D (E)
8	Scottsdale Rd & Stetson Dr/Drinkwater Blvd	Signal	NB	B (B)	B (D)	[Not Mitigated]
			SB	A (A)	A (C)	
			EB	D (D)	D (C)	
			WB	E (F)	E (D)	
			Overall	C (E)	B (C)	
9	Goldwater Blvd & 5 th Ave	Signal	NB	A (A)	A (A)	[Not Mitigated]
			SB	A (A)	A (A)	
			EB	D (D)	D (D)	
			WB	D (D)	D (D)	
			Overall	A (B)	A (B)	
10	Marshall Way & 5 th Ave	All-way stop controlled roundabout	NB	A (A)	A (A)	[Not Mitigated]
			EB	A (A)	A (A)	
			WB	A (A)	A (A)	

Table 11 (continued) – 2032 Peak Hour Levels of Service

ID	Intersection	Control	Approach	No Build AM(PM)	Build AM(PM)	Mitigated AM(PM)
11	Stetson Dr & 5 th Ave	1-way stop (SB)	SB Shared EB Left WB Right	A (A) A (A) A (A)	A (A) A (A) A (A)	[Not Mitigated]
12	Craftsman Ct & 5 th Ave	1-way stop (NB)	NB Shared WB Left	A (A) A (A)	A (A) A (A)	[Not Mitigated]
13	Scottsdale Rd & 5 th Ave	Signal	NB SB EB WB	A (B) A (B) C (C) C (B)	B (C) B (C) C (C) C (C)	[Not Mitigated]
			Overall	A (B)	B (B)	
14	Drinkwater Blvd & 5 th Ave/Stetson Dr	Signal	NB SB EB WB	A (B) A (A) D (D) D (D)	A (B) A (A) D (D) D (D)	[Not Mitigated]
			Overall	A (C)	A (C)	
15	Goldwater Blvd & 3 rd Ave	1-way stop (WB)	SB Left WB Shared	A (A) B (C)	A (A) B (C)	[Not Mitigated]
16	Marshall Way & 3 rd Ave	All-way stop	NB Shared SB Shared EB Shared WB Shared	A (A) A (A) A (A) A (A)	A (A) A (A) A (A) A (A)	[Not Mitigated]
17	Craftsman Ct & 3 rd Ave	1-way stop (SB)	SB Shared EB Left	A (A) A (A)	A (A) A (A)	[Not Mitigated]
18	Scottsdale Rd & 3 rd Ave	Signal	NB SB EB WB	A (A) A (A) C (B) C (B)	A (A) A (A) C (B) C (B)	[Not Mitigated]
			Overall	A (A)	A (A)	
19	Drinkwater Blvd & 3 rd Ave	Signal	NB SB EB WB	A (B) A (A) D (D) D (F)	A (B) A (A) D (D) D (F)	[Not Mitigated]
			Overall	B (B)	B (B)	
20	68 th St & Indian School Rd	Signal	NB SB EB WB	D (D) D (E) C (D) D (D)	D (D) D (E) C (D) D (D)	[Not Mitigated]
			Overall	D (D)	D (D)	
21	Goldwater Blvd & Indian School Rd	Signal	NB SB EB WB	E (D) D (D) D (D) D (C)	E (D) D (D) D (D) D (C)	[Not Mitigated]
			Overall	D (D)	D (D)	
22	Marshall Way & Indian School Rd	Signal	NB SB EB WB	D (D) D (D) A (A) A (A)	D (D) D (D) A (A) A (A)	[Not Mitigated]
			Overall	A (A)	A (A)	
23	Scottsdale Rd & Indian School Rd	Signal	NB SB EB WB	D (D) D (D) B (D) B (D)	D (D) D (D) C (D) B (D)	[Not Mitigated]
			Overall	C (D)	C (D)	
24	Brown Ave & Indian School Rd	Signal	NB EB WB	D (D) A (A) A (A)	D (D) A (A) A (A)	[Not Mitigated]
			Overall	A (A)	A (A)	

Table 11 (continued) – 2032 Peak Hour Levels of Service

ID	Intersection	Control	Approach	No Build AM(PM)	Build AM(PM)	Mitigated AM(PM)
25	Buckboard Trail & Indian School Rd	Signal	NB	D (D)	D (D)	[Not Mitigated]
			SB	D (D)	D (D)	
			EB	A (A)	A (A)	
			WB	A (A)	A (A)	
			Overall	A (B)	A (A)	
26	Drinkwater Blvd & Indian School Rd	Signal	NB	D (F)	D (F)	D (E)
			SB	D (E)	D (E)	D (E)
			EB	C (F)	C (F)	C (F)
			WB	D (F)	D (F)	D (F)
			Overall	D (F)	D (F)	D (E)
27	70 th St & Goldwater Blvd	1-way stop (NB)	NB Left	C (F)	C (F)	[Not Mitigated]
			NB Right	B (B)	B (B)	
			WB Left	B (C)	B (C)	
28	Goldwater Blvd & Scottsdale Rd	Signal	NB	A (B)	A (B)	[Not Mitigated]
			SB	A (B)	A (B)	
			EB	E (E)	E (E)	
			WB	E (D)	E (D)	
			Overall	C (C)	C (C)	
29	Scottsdale Rd & Osborn Rd	Signal	NB	B (D)	B (D)	[Not Mitigated]
			SB	B (C)	B (C)	
			EB	D (D)	D (D)	
			WB	D (D)	D (D)	
			Overall	C (D)	C (D)	
30	Vehicle Path & 6 th Ave	1-way stop (NB)	NB Shared	- (-)	A (B)	[Not Mitigated]
			WB Left	- (-)	A (A)	
31	Vehicle Path & 5 th Ave	1-way stop (SB)	SB Shared	- (-)	A (B)	[Not Mitigated]
			EB Left	- (-)	A (A)	
A1	Access A1 & 6 th Ave	1-way stop (SB)	SB Shared	- (-)	A (B)	[Not Mitigated]
			EB Left	- (-)	A (A)	
A2	Access A2 & 6 th Ave	1-way stop (SB)	SB Shared	- (-)	A (B)	[Not Mitigated]
			EB Left	- (-)	A (A)	
A3	Access A3 & Stetson Dr	1-way stop (NB)	NB Right	- (-)	A (A)	[Not Mitigated]
			EB Left	- (-)	A (A)	
C1	Stetson Dr & Access C1	1-way stop (EB)	NB Left	- (-)	A (A)	[Not Mitigated]
			EB Shared	- (-)	A (A)	
C2	Access C2 & 5 th Ave	1-way stop (SB)	SB Right	- (-)	A (A)	[Not Mitigated]
			EB Left	- (-)	A (A)	
D	Access D & 5 th Ave	1-way stop (SB)	SB Shared	- (-)	A (A)	[Not Mitigated]
			EB Left	- (-)	A (A)	

All 2032 study intersections are projected to operate overall at LOS D or better during the AM and PM peak hours under the existing lane configurations and stop controls with the exception of the following intersections:

Without mitigation, the signalized intersection of **Scottsdale Road and Chaparral Road** is anticipated to operate at LOS E during both the AM and PM peak hours with or without the site. In order to mitigate this delay, it is recommended that the dedicated southbound right turn lane be restriped to a shared through/right turn lane. Although this would force vehicles heading southbound through the intersection from this to use the Goldwater Boulevard off-shoot, many existing vehicles prefer this route as opposed to driving straight down Scottsdale Road. With this change in lane, the eastbound delay during the AM peak hour is anticipated to decrease from 119.8 seconds per vehicle to 56.7 seconds per vehicle. During the PM peak hour, it is recommended that the southbound phase be extended from 62 seconds to 66 seconds, the northbound left turn phase be extended from 12 seconds to 26 seconds and the northbound phase be extended from 50 seconds to 71 seconds. With these mitigation measures applied, the northbound delay is expected to decrease from 216.8 seconds per vehicle to 116.4 seconds per vehicle and the southbound delay is expected to decrease from 192.7 seconds per vehicle to 101.2 seconds per vehicle, both of which are lower than the delays anticipated without the addition of site traffic.

Without mitigation, the eastbound and westbound approaches of **Scottsdale Road and Highland Avenue** are anticipated to operate at LOS E during the PM peak hour with or without the site. In order to mitigate this delay, it is recommended that the eastbound through phase be extended from 38 seconds to 42 seconds and the westbound through phase be extended from 15 seconds to 18 seconds. With these mitigation measures applied, it is anticipated that the eastbound delay will decrease from 63.3 seconds per vehicle to 52.3 seconds per vehicle and the westbound delay will decrease from 61.1 seconds per vehicle to 56.3 seconds per vehicle. Although the AM peak hour also experiences delay on the westbound approach, it does not increase with the addition of site traffic.

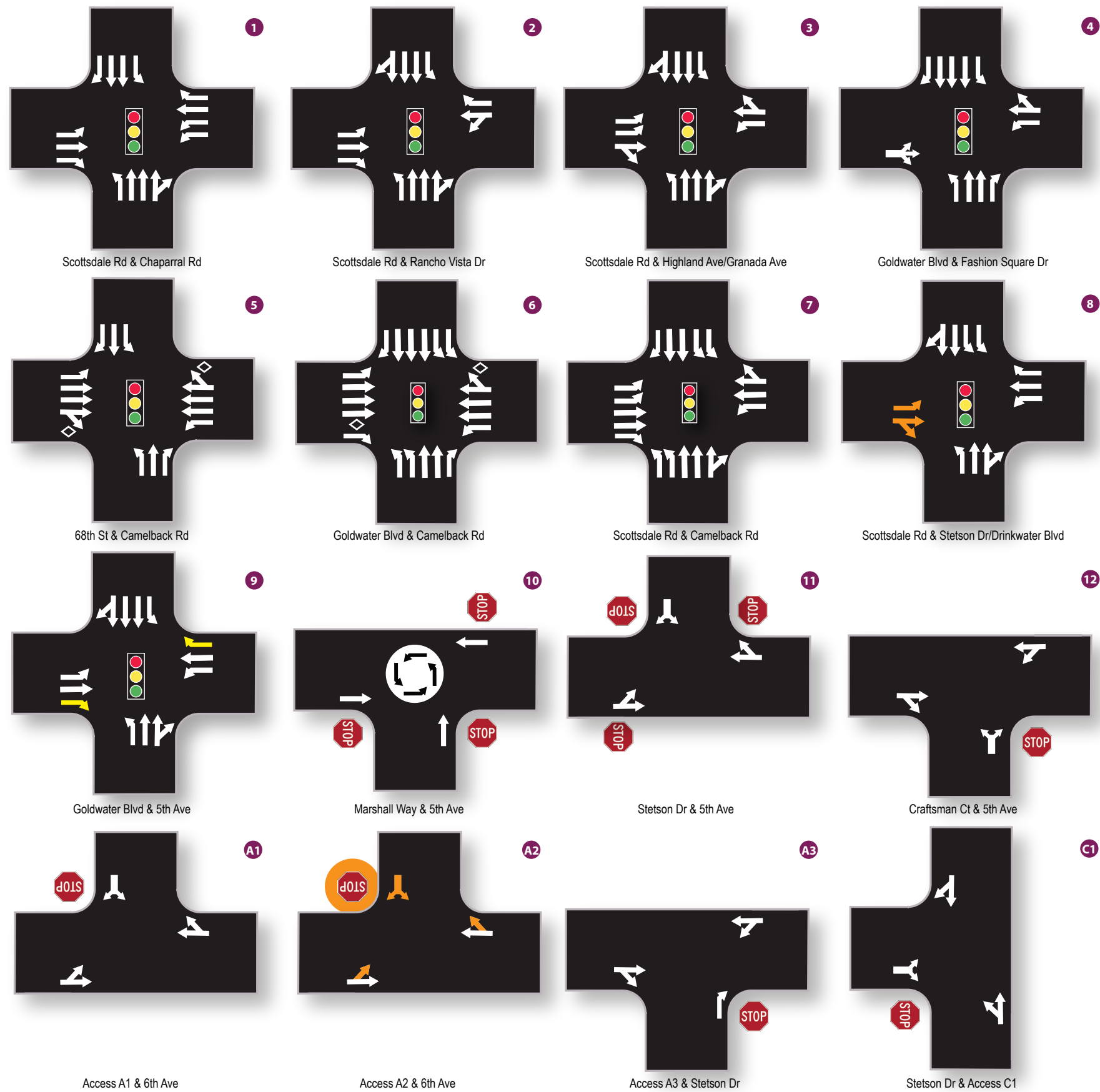
Without mitigation, the northbound approach of **68th Street and Camelback Road** is anticipated to operate at LOS E or worse during the AM and PM peak hours with or without the site. The westbound approach is also anticipated to operate at LOS E or worse during both the AM and PM peak hours only with the addition of site traffic. During the AM peak hour, by extending the cycle length from 109 seconds to 110 seconds, the westbound approach delay is expected to decrease from 57.2 seconds per vehicle to 50.9 seconds per vehicle. The northbound approach delay is similar with and without site traffic and since only minimal site traffic is added to this approach, no mitigation was applied. During the PM peak hour, it is recommended that the eastbound/westbound phases be extended from 38 seconds to 49 seconds and the northbound/southbound through phases be extended from 24 seconds to 33 seconds. With these mitigation measures applied, the northbound delay is anticipated to decrease from 89.7 seconds per vehicle to 66.2 seconds per vehicle and the westbound approach delay is anticipated to decrease from 112.2 seconds per vehicle to 65 seconds per vehicle.

Without mitigation, the southbound approach of **Goldwater Boulevard and Camelback Road** is anticipated to operate at LOS E or worse during the AM and PM peak hours with or without the site. During the AM peak hour, it is recommended that the southbound right turn overlap phase be extended from 25 seconds to 35 seconds in order to decrease the anticipated delay from 91.4 seconds per vehicle to 59.5 seconds per vehicle. During the PM peak hour, only 4 site trips are added to the southbound through movement and since the delay is present without the addition of site traffic, any mitigation measures would be the responsibility of the City of Scottsdale.

Without mitigation, the signalized intersection of **Scottsdale Road and Camelback Road** is anticipated to operate at an overall LOS E during the PM peak hour with or without the addition of site traffic. It is recommended that the northbound left turn phase be extended from 22 seconds to 28 seconds and the southbound left turn phase be extended from 25 seconds to 28 seconds. Although this does not eliminate the delay, all of the approach delays are more even and no one approach is anticipated to experience a significantly higher delay than another.

Without mitigation, the signalized intersection of **Drinkwater Boulevard and Indian School Road** is anticipated to operate at an overall LOS E during the PM peak hour with or without the addition of site traffic. In order to mitigate this delay, it is recommended that the northbound right turn include an overlap phase, the eastbound/westbound left turn phase be extended from 19 seconds to 21 seconds, the eastbound/westbound through phase be extended from 48 seconds to 50 seconds and the southbound left turn phase be extended from 22 seconds to 24 seconds. With these mitigation measures applied, the overall delay during the PM peak hour is anticipated to decrease from 94.2 seconds per vehicle to 77.3 seconds per vehicle, which is lower than what is anticipated without the addition of site traffic.

The unsignalized intersection of **70th Street and Goldwater Boulevard** experiences delay during the PM peak hour on the northbound left-turn movement. In the no-build scenario, this movement experiences a delay of approximately 55 seconds. A delay of 58 seconds is anticipated in the full-build scenario. The addition of site generated traffic does not add any northbound left turns and adds no more than 15 through vehicles in either peak hour in either the eastbound or westbound directions. For horizon year 2032, a signal warrant analysis was performed and this intersection does not meet any of the criteria for a signal with the major road speed limit of 35 mph. If a design speed of 40 mph is considered for this study, both the no-build and full-build scenarios would warrant a signal at this intersection using the eight-hour vehicular volume, four-hour vehicular volumes and the peak hour warrants. The developer would not be responsible for the installation of a signal since the signal is warranted without the addition of site generated traffic.



LEGEND

- Thru or Turning Movement
- Two-Way Left Turn-Lane
- Roundabout
- Bike Lane
- Raised Median
- Traffic Signal
- Stop Sign
- Right-Turn Slip-Lane
- Improvements made by developer 2022



Figure 14A: Proposed Lane Configurations and Traffic Controls

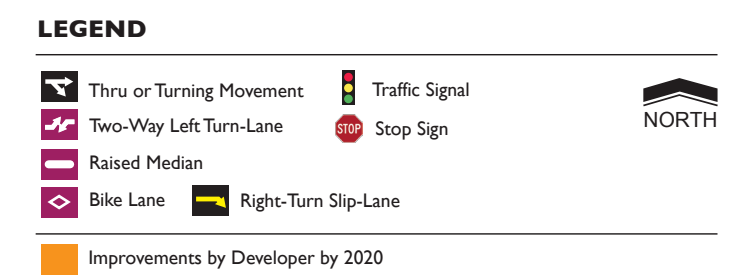
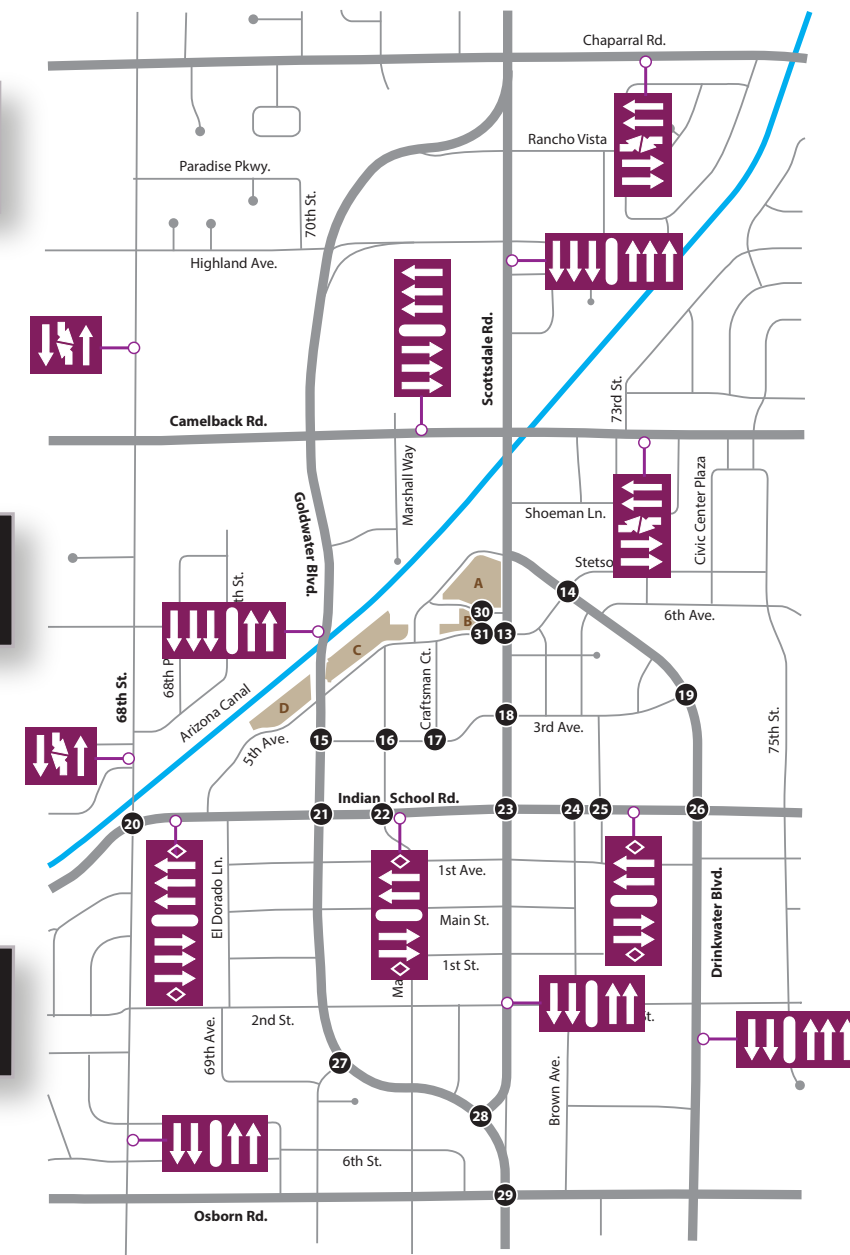


Figure 14B: Proposed Lane Configurations and Traffic Controls

QUEUING ANALYSIS

The site access points were analyzed to determine the storage needed to accommodate the expected traffic volumes for the horizon year 2032 at the left and right-turn lanes.

LEFT TURN STORAGE ANALYSIS

Left-turn lanes are required at all street intersections on major collectors and arterials per the City of Scottsdale *Design Standards and Policy Manual (DS&PM)*. Dual left turn lanes should be considered at intersections in which the peak hour turning volume exceeds 300 vehicles, the opposing volume exceeds 1,000 vehicles per hour or the delay of the left-turns exceeds 45 seconds per section 5-3.123 of the *DS&PM*.

A queuing analysis for left turns was performed for all intersection turn lanes within the study area. The intersections were analyzed to determine the left turn storage needed to accommodate the expected traffic volumes for the horizon year 2032. The formulas used for the calculations are stated below. The resulting turn lane storage requirements for the 2032 horizon year are summarized in **Table 12**.

Two (2) methods were utilized to calculate the likely queue storage needed at the intersections for the 2032 horizon year. Synchro analysis software provided values for the 50th and 95th percentile queue storage. The 95th percentile has been reported herein. AASHTO also provides the following guidance:

For signalized intersections, the storage length is determined by the following formula:

$$\text{Storage Length} = [2 \times (\text{veh/hr}) / (\text{cycles/hr})] \times 25 \text{ feet}$$

For unsignalized intersections, the storage length is determined by the following formula:

$$\text{Storage Length} = [(\text{veh/hr}) / (30 \text{ periods/hr})] \times 25 \text{ feet}$$

Queue storage length recommendations at all study intersections herein are based on the 2032 projected traffic volumes.

RIGHT-TURN AUXILIARY LANES

Right-turn auxiliary lanes are required at all street intersections on major arterials per the City of Scottsdale *DS&PM* section 5-3.206. The standard storage length for a deceleration lane is 150 feet, with a 100-foot minimum length.

DECELERATION LANES

Per the City of Scottsdale *DS&PM*, section 5-3.206, right-turn deceleration lanes are generally deemed warranted at a driveway when the following three conditions are satisfied:

- ◆ *At least 5,000 vehicles per day are expected to use the adjacent street;*
- ◆ *The 85th percentile traffic speed on the adjacent street is 35 MPH or higher, or 45 MPH or higher for a one (1) lane per direction roadway;*
- ◆ *At least 30 vehicles will make right-turns into a driveway during a peak hour.*

None of the five (5) access points included in this study warrant a right-turn deceleration lane, and according to the Synchro analysis performed, they all operate at an acceptable level of service under the proposed lane configurations.

Table 12 – Queue Length Analysis

ID	Intersection	Intersection Control	Approach	Existing Storage	AASHTO	Maximum Synchro 95 th Percentile Queue	Recommended Storage
1	Scottsdale Rd & Chaparral Rd	Signal	WB Left	⁽²⁾ 250'	975'	⁽³⁾ 420'	⁽²⁾ 250'
3	Scottsdale Rd & Highland Ave/Granada Ave	Signal	EB Left	⁽²⁾ 250'	1350'	455'	⁽²⁾⁽⁴⁾ 250'
5	68th St & Camelback Rd	Signal	NB Left	145'	425'	260'	260'
			SB Left	160'	225'	175'	175'
6	Goldwater Blvd & Camelback Rd	Signal	NB Left	⁽²⁾ 180'	550'	⁽³⁾ 205'	⁽²⁾ 180'
			EB Right	100'	475'	185'	185'
7	Scottsdale Rd & Camelback Rd	Signal	NB Left	⁽²⁾ 190'	675'	⁽³⁾ 225'	⁽²⁾ 190'
			WB Left	100'	225'	230'	230'
			EB Right	160'	550'	180'	180'
8	Scottsdale Rd & Stetson Dr/Drinkwater Blvd	Signal	NB Left	95'	50'	35'	⁽¹⁾⁽⁶⁾ 100'
			EB Left	N/A	250'	150'	⁽¹⁾ 150'
9	Goldwater Blvd & 5th Ave	Signal	NB Left	105'	50'	<25'	105'
			SB Left	195'	175'	60'	195'
			EB Left	60'	75'	60'	⁽¹⁾⁽⁶⁾ 100'
			WB Left	30'	150'	100'	⁽¹⁾⁽⁶⁾ 100'
13	Scottsdale Rd & 5th Ave	Signal	NB Left	90'	200'	75'	⁽¹⁾⁽⁶⁾ 100'
			SB Left	80'	100'	40'	⁽¹⁾⁽⁶⁾ 100'
			WB Left	75'	125'	90'	⁽¹⁾ 100'

- (1) Recommended right turn lane lengths according to the City of Scottsdale is 150 feet with a 100 foot minimum.
- (2) Dual Left turn lanes.
- (3) Total length of both turn lanes.
- (4) Limited space available, extending turn lane may not be possible
- (5) Recommended maximum length of 350'.
- (6) Not the responsibility of the developer

Table 12 (continued) – Queue Length Analysis

ID	Intersection	Intersection Control	Approach	Existing Storage	AASHTO	Maximum Synchro 95 th Percentile Queue	Recommended Storage
14	Drinkwater Blvd & 5th Ave	Signal	NB Left	160'	125'	<25'	160'
18	Scottsdale Rd & 3rd Ave	Signal	NB Left	105'	150'	55'	(1)(4)105'
			SB Right	75'	125'	<25'	75'
20	68th St & Indian School Rd	Signal	SB Left	165'	275'	265'	(4)165'
			WB Left	130'	225'	265'	(1)(4) 130'
			NB Right	80'	250'	145'	(1)150'
			WB Right	100'	375'	95'	100'
21	Goldwater Blvd & Indian School Rd	Signal	NB Left	105'	200'	210'	(4)105'
			SB Left	180'	175'	140'	180'
			EB Left	(2)275'	450'	(3)180'	(2)275'
			EB Right	165'	150'	30'	165'
23	Scottsdale Rd & Indian School Rd	Signal	NB Left	130'	125'	75'	(1)(4)130'
			SB Left	315'	450'	340'	(4)315'
			EB Left	180'	250'	205'	205'
			SB Right	180'	325'	60'	180'
26	Drinkwater Blvd & Indian School Rd	Signal	SB Left	(2) 135'	650'	250'	(2)135'
			WB Right	55'	425'	155'	155'

- (1) Recommended right turn lane lengths according to the City of Scottsdale is 150 feet with a 100 foot minimum.
- (2) Dual Left turn lanes.
- (3) Recommended Synchro 50th Percentile dual queue storage lengths.
- (4) Limited space available, extending turn lane may not be possible
- (5) Recommended maximum length of 350'.
- (6) Not the responsibility of the developer

The proposed storage lengths for the existing turn lanes impacted by site generated traffic are summarized in **Table 12**. It is recommended by the City of Scottsdale that all storage lanes be a minimum of 100 feet. All storage lengths that fall below this minimum, which have additional and available space have been recommended at this length. Additional storage length calculations should be completed prior to traffic signal installation, a change in intersection stop control or installation of raised medians. Turn queue storage length calculations can be found in the **Appendix J**.

SIGHT DISTANCE ANALYSIS

Adequate sight distance must be provided at the intersections to allow safe turning movements into and out of the development. A sight triangle is the area encompassed by the line of sight from a stopped vehicle on the minor roadway to the approaching vehicle on

the major roadway: there must be sufficient unobstructed sight distance along both approaches of a street or driveway intersection and across their included corners to allow operators of vehicles to see each other in time to prevent a collision. There must also be sufficient sight distance along the major street to allow a driver intending to turn left into the site to see an oncoming vehicle in the opposing direction.

Sight distance is largely based on the design speed of the roadway. Per the *City of Scottsdale Design Standards and Policies Manual, dated 2018* intersection sight distance should adhere to *Appendix 5-3B*. *Sight Distance tables in Appendix 5-3B* presents the required sight distance for varying roadway widths and design speeds for passenger cars, single unit trucks and combination trucks. Typically, the posted speed limit is less than the design speed of a roadway. There is no posted speed limit on 6th Avenue, Stetson Drive or 5th Avenue. For the purpose of this study, a design speed of 30 mph was used on all three (3) of these roads. The posted speed limit on this portion of Scottsdale Road is 30 mph and a design speed of 35 mph can be considered for the sake of this study.

The contractor should ensure that adequate sight distance is provided at all site access points to allow safe left and right-turning movements from the development. Fixed objects within the safety triangle cannot be taller than 2.5-feet measured from the adjacent roadway surface (edge of pavement); vegetation should be trimmed to 2.5-feet tall measured from the adjacent roadway surface. Trees placed within the sight triangle shall have canopies no lower than eight (8) feet. It is recommended that sight triangles be designed at all site access driveways to provide the required sight distance shown in *Appendix 5-3B* within the *City of Scottsdale Design Standards and Policies Manual*. Excerpts from the *City of Scottsdale Design Standards and Policies Manual* and tables have been included in **Appendix K**.

CONCLUSIONS

The following conclusions have been documented in this study.

General

- The Southbridge expansion is a proposed redevelopment of an existing site located in Old Town Scottsdale. The site currently consists of approximately 80,000 square feet of retail, one quality restaurant, two high turnover restaurants, 3,000 square feet of office space and approximately 6 multi-family apartments.
- The existing development generates approximately 3,360 external weekday daily trips with 124 trips occurring during the AM peak hour (74 in/50 out), and 310 trips occurring during the PM peak hour (169 in/141 out).
- This redevelopment consists of four “Zones” with a variety of land uses on each.
 - Zone A consists of a 200-key hotel, 184 multi-family residential units, 29,100 square feet (SF) of retail, a 6,420 SF art gallery and 119,040 SF of office space.
 - Zone B consists of 21 multi-family residential units and 15,590 SF of retail space on the ground floor.
 - Zone C consists of 194 residential units in a 12-story high-rise with 27,700 SF of retail on the ground level. The residential units located in Zone C are comprised of the following:
 - 1 Bedroom Condominiums – 25 DU’s
 - 2 Bedroom Condominiums – 125 DU’s
 - 3 Bedroom Condominiums – 44 DU’s
 - The six-story mid-rise at Zone D consists of 171 residential units and 10,427 SF of commercial area. The residential units located on Zone D are comprised of the following:
 - Studio Condominiums – 21 DU’s
 - 1 Bedroom Condominiums – 109 DU’s
 - 2 Bedroom Condominiums – 29 DU’s
 - Townhomes – 12 DU’s
- The proposed redevelopment is anticipated to generate 8,414 external weekday daily trips with 484 trips occurring during the AM peak hour (257 in/227 out), and 696 trips occurring during the PM peak hour (327 in/369 out).
- The proposed redevelopment is anticipated to generate an additional 5,054 external daily trips with 360 additional trips in the AM peak hour and an additional 386 trips in the PM peak hour when compared to the trips already generated by existing development in Zones A, B and C. Zone D is a paved parking lot presently and

provides public parking for those visiting surrounding businesses and is considered to generate no trips in the existing condition.

- The contractor should ensure that adequate sight distance is provided at all site access points to allow safe left and right-turning movements from the development. It is recommended that sight triangles be designed at all site access driveways to provide the required sight distance shown in *Appendix 5-3B* within the *City of Scottsdale Design Standards and Policies Manual*.

Existing

- The results of the existing conditions analysis summarized in **Table 2** indicates that all study intersections operate with acceptable levels of service (LOS D or better), with the exception of the intersection of Scottsdale Road and Chaparral Road.
 - The signalized intersection of **Scottsdale Road and Chaparral Road** operates overall at LOS E during the PM peak hour. The delay is caused by the relatively high traffic volume entering the intersection and the split phase operation of the signal. The intersection's average delay per vehicle during the PM peak hour is evaluated to be approximately 61 seconds.

Opening Year 2022

- All 2022 study intersections are projected to operate at level of service LOS D or better during the AM and PM peak hours under the existing lane configurations and traffic controls with the exception of the following intersections:
 - Without mitigation, the signalized intersection of **Scottsdale Road and Chaparral Road** is anticipated to operate at LOS E during the PM peak hour with or without the site. In order to mitigate this delay, it is recommended that the minimum initial green time for the southbound left phase be increased from 5 seconds to 7 seconds, the northbound/southbound through phase be extended from 10 seconds to 12 seconds, the southbound left turn phase be extended from 17 seconds to 24 seconds and the southbound through phase be extended from 57 seconds to 62 seconds. With these mitigation measures applied the southbound delay is expected to decrease from 118.5 seconds per vehicle to 75.1 seconds per vehicle. Although the intersection is still anticipated to operate at an overall LOS E during the PM peak hour, the delays at each approach are more even and one approach does not experience significantly more delay than another.
 - Without mitigation, the westbound approach of **Scottsdale Road and Highland Avenue** is anticipated to operate at LOS E during both the AM and PM peak hours with or without the site. During the AM peak hour, the delay is very close to the threshold for an acceptable level of service and no mitigation is recommended at this time. During the PM peak hour, it is recommended that the eastbound/westbound minimum initial green time be increased from 7 seconds to 10 seconds. This is expected to decrease the westbound delay from 56.3 seconds per vehicle to 54.6 seconds per vehicle during the PM peak hour.

- Without mitigation, the eastbound and westbound approaches of **Goldwater Boulevard and Fashion Square Drive** are anticipated to operate at LOS E during both the AM and PM peak hours with or without the site. During the AM peak hour, it is recommended that the vehicle recall mode be changed from “none” to “min” and during the PM peak hour it is recommended that the vehicle recall mode be changed from “none” to “max.”
 - With the vehicle recall mode set to “none”, if no vehicles approach the eastbound or westbound approaches as the northbound and southbound phases come to an end, their phase will be skipped and the cycle will return to the northbound and southbound phases. However, if a vehicle does not approach the intersection from the east or west during this detection phase, the eastbound and westbound phase will still be skipped and the vehicle will have to wait for the next cycle. By changing the recall mode to “min”, it means that the minimum green time will always occur on the minor approach whether a vehicle approaches or not. The vehicle recall mode “max” means that the maximum green time will always occur on the minor approach with or without a vehicle approaching. Changing the recall mode will add more delay to the northbound and southbound approaches, however, since the northbound and southbound approaches experience very little delay, it is reasonable to change the recall mode to significantly decrease the delay on the eastbound and westbound approaches.
 - During the AM peak hour, the eastbound delay is anticipated to decrease from 57.3 seconds per vehicle to 53.2 seconds per vehicle and the westbound delay is anticipated to decrease from 57.8 seconds per vehicle to 53.2 seconds per vehicle. During the PM peak hour, the eastbound delay is anticipated to decrease from 56.8 seconds per vehicle to 36.9 seconds per vehicle and the westbound delay is anticipated to decrease from 64.5 seconds per vehicle to 36.2 seconds per vehicle.
- Without mitigation, the signalized intersection of **68th Street and Camelback Road** is anticipated to operate at LOS E during the PM peak hour with or without the site. It is recommended that the northbound/southbound through phase be extended from 15 seconds to 24 seconds and the northbound/southbound left turn phase be extended from 10 seconds to 19 seconds. With these mitigation measures applied, the northbound delay is expected to decrease from 229.3 seconds per vehicle to 48.4 seconds per vehicle and the southbound delay is expected to decrease from 85.7 seconds per vehicle to 33.9 seconds per vehicle during the PM peak hour.

- Without mitigation, the southbound approach of **Goldwater Boulevard and Camelback Road** is anticipated to operate at LOS E during the AM peak hour with or without the site. It is recommended that the vehicle recall mode for the southbound left and southbound through phases be changed from “none” to “min” and the southbound right turn overlap phase be extended from 24 seconds to 25 seconds. With these mitigation measures applied, the southbound delay is anticipated to decrease from 60.9 seconds per vehicle to 54.8 seconds per vehicle.
- Without mitigation, the westbound approach of **Scottsdale Road and Camelback Road** is anticipated to operate at LOS E during the PM peak hour with or without the site. It is recommended that the eastbound/westbound through phase be extended from 40 seconds to 41 seconds in order to decrease the anticipated delay from 56.2 seconds per vehicle to 53.9 seconds per vehicle.
- Without mitigation, the westbound approach of **Scottsdale Road and Stetson Drive/Drinkwater Boulevard** is expected to operate at LOS E during the AM and PM peak hours with or without the site. During the AM peak hour, it is recommended that the westbound right turn overlap phase be extended from 25 seconds to 28 seconds. With this mitigation it is anticipated that the westbound approach delay will decrease from 76.2 seconds per vehicle to 67.4 seconds per vehicle, which is lower than what is anticipated without the addition of site traffic.
 - During the PM peak hour, it is recommended that the vehicle recall mode on the eastbound and westbound approaches be changed from “none” to “max” to allow for more vehicles to utilize the intersection on the minor approach during the peak hour. With this mitigation applied, the westbound approach delay is expected to decrease from 134.3 seconds per vehicle to 16.3 seconds per vehicle. By opening year 2022, this intersection will also be improved by the developer to include a dedicated eastbound left turn lane.
- Without mitigation, the southbound approach of **68th Street and Indian School Road** is anticipated to operate at LOS E during the PM peak hour with or without the site. It is recommended that the southbound through phase be extended from 39 seconds to 41 seconds, the southbound left turn phase be extended from 17 seconds to 25 seconds and the westbound left turn phase be extended from 15 seconds to 16 seconds. With these mitigation measures applied, the southbound delay is anticipated to decrease from 65.1 seconds per vehicle to 58.3 seconds per vehicle during the PM peak hour, which is lower than what is anticipated without the addition of site traffic.

Horizon Year 2032

- All 2032 study intersections are projected to operate overall at LOS D or better during the AM and PM peak hours under the existing lane configurations and stop controls with the exception of the following intersections:

- Without mitigation, the signalized intersection of **Scottsdale Road and Chaparral Road** is anticipated to operate at LOS E during both the AM and PM peak hours with or without the site. In order to mitigate this delay, it is recommended that the dedicated southbound right turn lane be restriped to a shared through/right turn lane. Although this would force vehicles heading southbound through the intersection from this to use the Goldwater Boulevard off-shoot, many existing vehicles prefer this route as opposed to driving straight down Scottsdale Road. With this change in lane, the eastbound delay during the AM peak hour is anticipated to decrease from 119.8 seconds per vehicle to 56.7 seconds per vehicle.
 - During the PM peak hour, it is recommended that the southbound phase be extended from 62 seconds to 66 seconds, the northbound left turn phase be extended from 12 seconds to 26 seconds and the northbound phase be extended from 50 seconds to 71 seconds. With these mitigation measures applied, the northbound delay is expected to decrease from 216.8 seconds per vehicle to 116.4 seconds per vehicle and the southbound delay is expected to decrease from 192.7 seconds per vehicle to 101.2 seconds per vehicle, both of which are lower than the delays anticipated without the addition of site traffic.

LIST OF REFERENCES

A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials, Washington, D.C., 2004.

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TECHNICAL APPENDICES

APPENDIX A:	REVIEW COMMENTS (RESERVED)
APPENDIX B:	EXISTING TRAFFIC COUNTS
APPENDIX C:	EXISTING PEAK HOUR ANALYSIS
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APPENDIX F:	TRIP DISTRIBUTION
APPENDIX G:	BACKGROUND TRAFFIC CALCULATIONS
APPENDIX H:	2022 PEAK HOUR TRAFFIC ANALYSIS
APPENDIX I:	2032 PEAK HOUR TRAFFIC ANALYSIS
APPENDIX J:	QUEUE LENGTH ANALYSIS
APPENDIX K:	SIGHT DISTANCE ANALYSIS

APPENDIX A

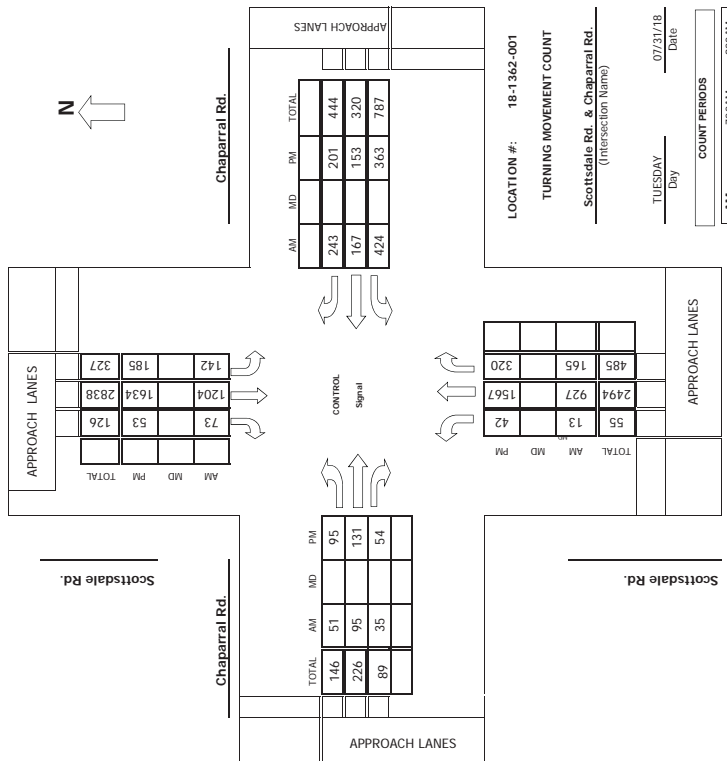
REVIEW COMMENTS AND RESPONSES

APPENDIX B

EXISTING TRAFFIC COUNTS

Project #: 18-1362-001

TMC SUMMARY OF Scottsdale Rd. & Chaparral Rd.



AM	MD	PM	TOTAL
142	1204	142	1466
185	1634	185	1999
327	2838	327	3492

AM	MD	PM	TOTAL
73	53	73	199
1204	1634	1204	3042
53	2838	53	3444

AM	MD	PM	TOTAL
243	201	243	444
167	153	167	320
424	363	424	787

AM	MD	PM	TOTAL
55	13	55	123
2494	927	2494	5915
13	1567	13	1593

LOCATION #: 18-1362-001
TURNING MOVEMENT COUNT
Scottsdale Rd. & Chaparral Rd.
(Intersection Name)
TUESDAY 07/31/18 Date
COUNT PERIODS
AM 7:00AM - 9:00AM
PM 4:00PM - 6:00PM

AM PEAK HOUR 7:30 AM
NOON PEAK HOUR
PM PEAK HOUR 4:30 PM



Pedestrian & Bicycle Study

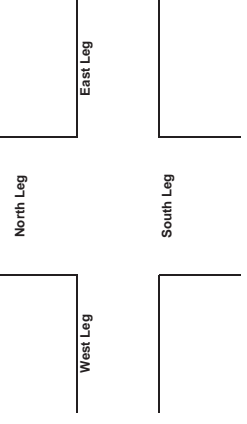
N-S STREET: Scottsdale Rd. Date: 07/31/18 City: Scottsdale
E-W STREET: Chaparral Rd. Day: TUESDAY Project#: 18-1362-001

	PEDESTRIANS			TOTAL
	N-LEG	S-LEG	W-LEG	
7:00 AM	0	1	0	1
7:15 AM	0	0	1	1
7:30 AM	1	0	1	2
7:45 AM	0	1	0	1
8:00 AM	0	0	1	1
8:15 AM	1	1	0	2
8:30 AM	0	2	0	2
8:45 AM	1	0	0	1
TOTAL	3	5	3	3

	BICYCLES			TOTAL
	N-LEG	S-LEG	W-LEG	
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

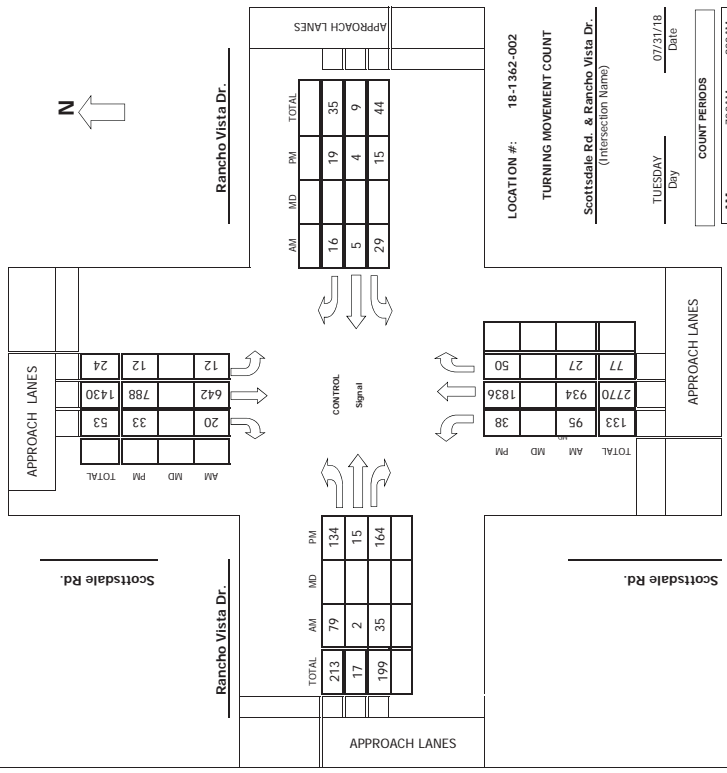
	PEDESTRIANS			TOTAL
	N-LEG	S-LEG	W-LEG	
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0

	BICYCLES			TOTAL
	N-LEG	S-LEG	W-LEG	
4:00 PM	0	0	0	0
4:15 PM	1	0	0	1
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	1	0	0	1
5:45 PM	0	0	0	0
TOTAL	2	0	0	2



Project #: 18-1362-002

TMC SUMMARY OF Scottsdale Rd. & Rancho Vista Dr.



AM	MD	PM	TOTAL
12	20	33	642
12	33	788	1430
24	53	12	12

TOTAL	AM	MD	PM
213	79	134	134
17	2	15	15
199	35	164	164

AM	MD	PM	TOTAL
16	19	35	35
5	4	9	9
29	15	44	44

TOTAL	AM	MD	PM
133	95	38	38
2770	934	1836	1836
77	27	50	50

LOCATION #: 18-1362-002
TURNING MOVEMENT COUNT
Scottsdale Rd. & Rancho Vista Dr.
(Intersection Name)
TUESDAY 07/31/18 Date
COUNT PERIODS
AM 7:00AM - 9:00AM
NOON 12:00PM - 2:00PM
PM 4:00PM - 6:00PM

AM PEAK HOUR 7:30 AM
NOON PEAK HOUR
PM PEAK HOUR 4:15 PM

N-S STREET: Scottsdale Rd.
E-W STREET: Rancho Vista Dr.

Date: 07/31/18
Day: TUESDAY

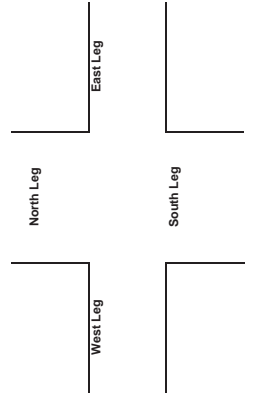
City: Scottsdale
Project #: 18-1362-002

	PEDESTRIANS			TOTAL
	N-LEG	S-LEG	E-LEG	
7:00 AM	0	0	0	0
7:15 AM	0	0	2	2
7:30 AM	0	0	1	1
7:45 AM	0	0	0	0
8:00 AM	0	0	1	1
8:15 AM	0	0	1	2
8:30 AM	0	0	2	1
8:45 AM	0	0	1	0
TOTAL	0	0	8	6

	BICYCLES			TOTAL
	N-LEG	S-LEG	E-LEG	
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	1	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	1	0

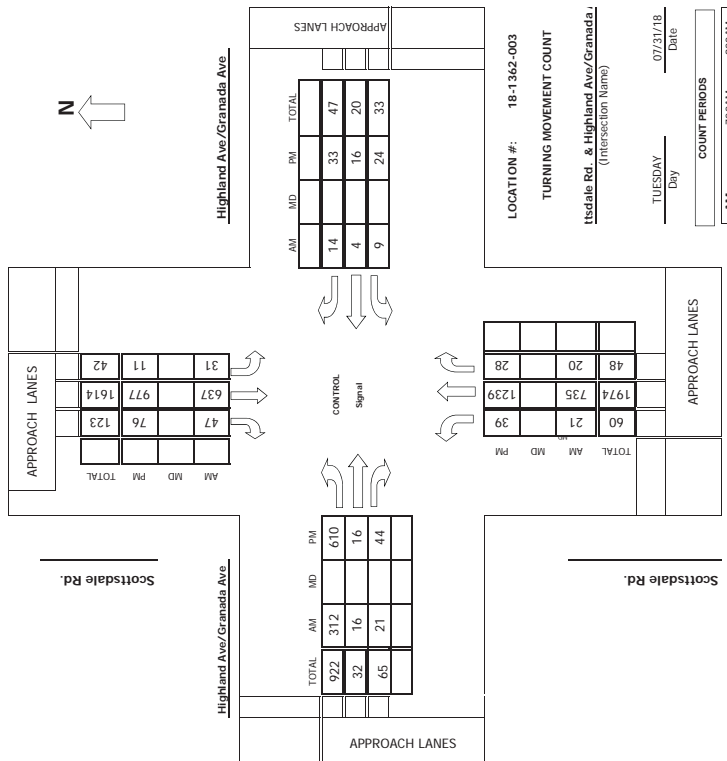
	PEDESTRIANS			TOTAL
	N-LEG	S-LEG	E-LEG	
4:00 PM	0	0	1	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	1	1
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	1
5:45 PM	0	0	0	0
TOTAL	0	0	2	3

	BICYCLES			TOTAL
	N-LEG	S-LEG	E-LEG	
4:00 PM	0	0	0	0
4:15 PM	1	0	1	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	1	0	1	0



Project #: 18-1362-003

TMC SUMMARY OF Scottsdale Rd. & Highland Ave/Granada Ave.



LOCATION #: 18-1362-003
 TURNING MOVEMENT COUNT
 Scottsdale Rd. & Highland Ave/Granada Ave.
 (Intersection Name)

TUESDAY 07/31/18
 Day Date

COUNT PERIODS	
AM	7:00AM - 9:00AM
NOON	12:00PM - 2:00PM
PM	4:00PM - 6:00PM

AM PEAK HOUR: 7:45 AM
 NOON PEAK HOUR: _____
 PM PEAK HOUR: 4:45 PM



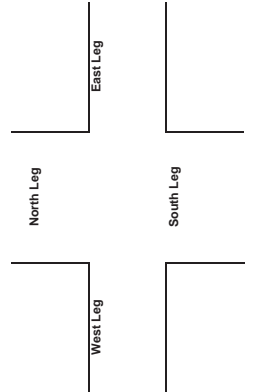
FIELD DATA SERVICES OF ARIZONA, INC.
 520.316.6745
 veracitytrafficgroup

Pedestrian & Bicycle Study

N-S STREET: Scottsdale Rd.
 E-W STREET: Highland Ave/Granada Ave
 Date: 07/31/18
 Day: TUESDAY
 City: Scottsdale
 Project #: 18-1362-003

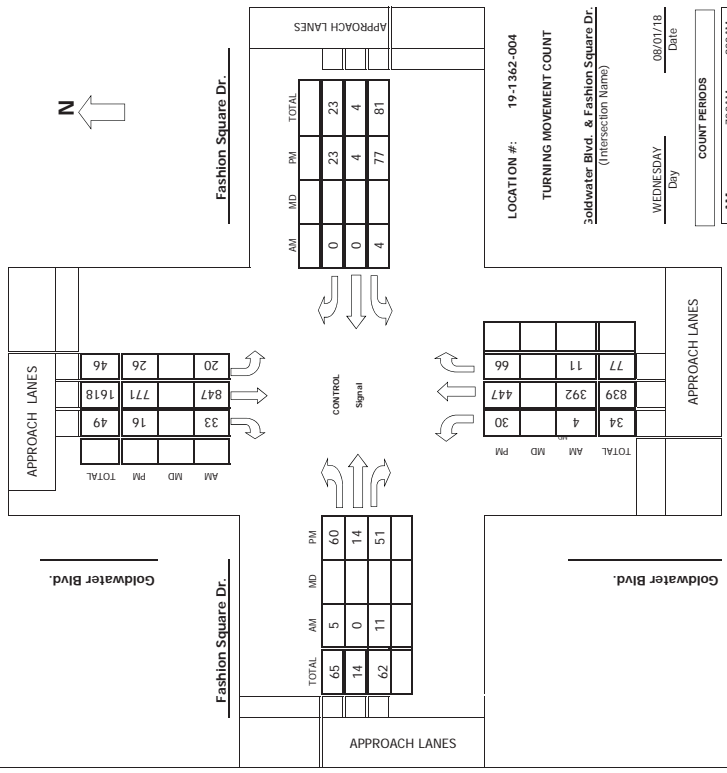
Time	PEDESTRIANS			BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	1	1	0	0	0	0	0
7:15 AM	0	0	1	0	0	0	0	0
7:30 AM	0	0	0	1	0	0	0	0
7:45 AM	0	1	1	1	0	0	0	0
8:00 AM	0	0	2	1	0	0	0	0
8:15 AM	0	1	1	1	0	0	0	0
8:30 AM	0	1	0	1	0	0	0	0
8:45 AM	0	0	0	0	0	0	1	0
TOTAL	0	4	6	6	0	0	1	0

Time	PEDESTRIANS			BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0	0	0	0	0
4:15 PM	0	3	1	1	0	0	0	0
4:30 PM	0	2	0	0	0	0	0	0
4:45 PM	0	1	0	1	0	0	1	0
5:00 PM	0	0	0	0	0	0	0	0
5:15 PM	0	1	1	1	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0
5:45 PM	0	1	0	0	0	0	0	0
TOTAL	0	8	2	4	0	0	1	0



Project #: 19-1362-004

TMC SUMMARY OF Goldwater Blvd. & Fashion Square Dr.



LOCATION #: 19-1362-004
 TURNING MOVEMENT COUNT
 Goldwater Blvd. & Fashion Square Dr.
 (Intersection Name)

WEDNESDAY 08/01/18
 Day Date

COUNT PERIODS	
AM	7:00AM - 9:00AM
NOON	12:00PM - 1:00PM
PM	4:00PM - 6:00PM

AM PEAK HOUR	7:15 AM
NOON PEAK HOUR	
PM PEAK HOUR	4:30 PM

Pedestrian & Bicycle Study

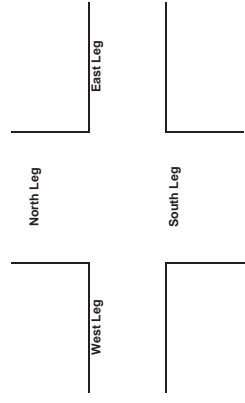
N-S STREET: Goldwater Blvd.
 E-W STREET: Fashion Square Dr.
 Date: 08/01/18
 Day: WEDNESDAY
 City: Scottsdale
 Project #: 19-1362-004

	PEDESTRIANS			TOTAL
	N-LEG	S-LEG	E-LEG	
7:00 AM	0	0	0	0
7:15 AM	0	0	1	0
7:30 AM	1	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	1	0
8:15 AM	1	0	1	0
8:30 AM	2	0	0	0
8:45 AM	0	0	0	1
TOTAL	4	0	2	2

	BICYCLES			TOTAL
	N-LEG	S-LEG	E-LEG	
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

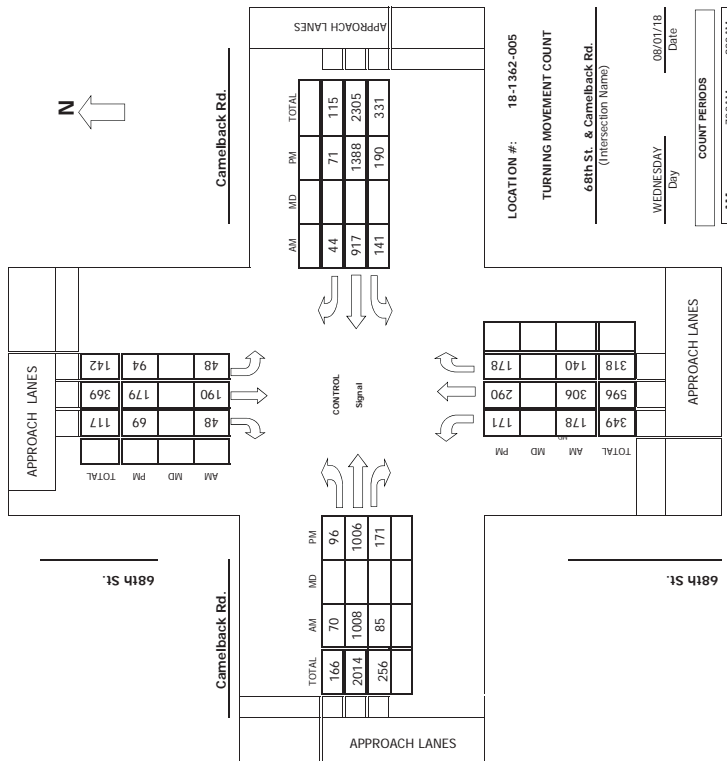
	PEDESTRIANS			TOTAL
	N-LEG	S-LEG	E-LEG	
4:00 PM	1	0	1	0
4:15 PM	0	0	2	1
4:30 PM	1	0	0	0
4:45 PM	0	1	1	0
5:00 PM	1	0	0	0
5:15 PM	1	0	1	0
5:30 PM	0	0	1	0
5:45 PM	0	1	0	1
TOTAL	3	3	5	3

	BICYCLES			TOTAL
	N-LEG	S-LEG	E-LEG	
4:00 PM	0	0	0	0
4:15 PM	0	0	1	0
4:30 PM	1	0	0	1
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	1	0	1	1



Project #: 18-1362-005

TMC SUMMARY OF 68th St. & Camelback Rd.



LOCATION #: 18-1362-005
 TURNING MOVEMENT COUNT
68th St. & Camelback Rd.
 (Intersection Name)
 WEDNESDAY 08/01/18 Date
 Day

COUNT PERIODS	
AM	7:00AM - 9:00AM
NOON	12:00PM - 2:00PM
PM	4:00PM - 6:00PM

AM PEAK HOUR 7:30 AM
 NOON PEAK HOUR _____
 PM PEAK HOUR 4:30 PM

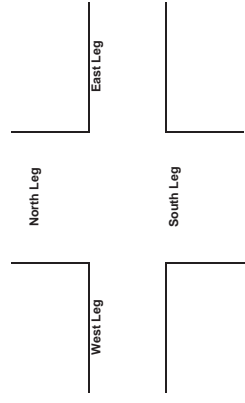
Pedestrian & Bicycle Study

Date: 08/01/18
 Day: WEDNESDAY
 City: Scottsdale
 Project #: 18-1362-005

N-S STREET: 68th St.
 E-W STREET: Camelback Rd.

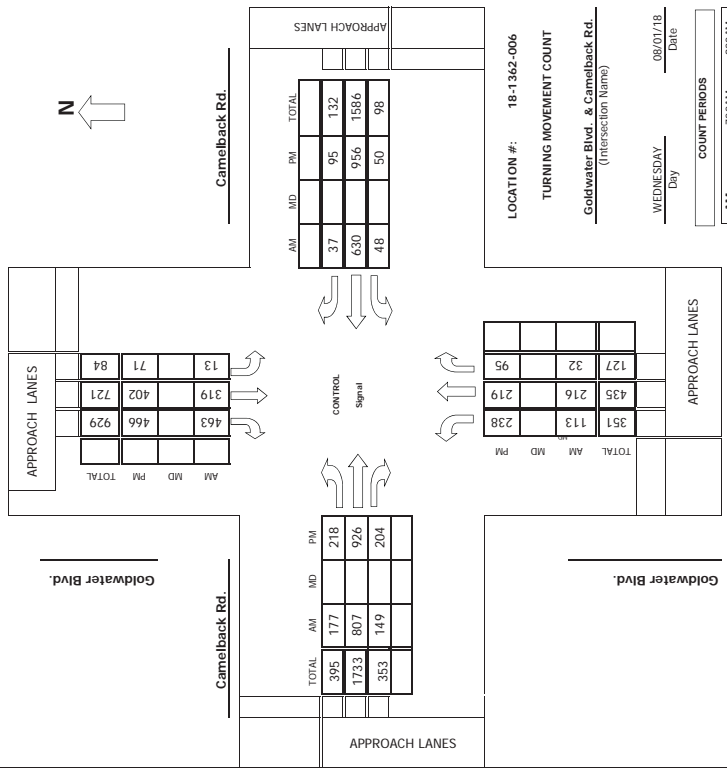
	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	W-LEG	N-LEG	S-LEG	W-LEG
7:00 AM	0	0	0	0	0	0
7:15 AM	1	1	1	0	0	0
7:30 AM	1	0	1	0	0	0
7:45 AM	0	0	1	0	0	0
8:00 AM	2	1	1	0	0	0
8:15 AM	1	0	1	1	0	0
8:30 AM	0	1	1	0	0	0
8:45 AM	1	0	0	0	0	0
TOTAL	6	3	4	1	0	0

	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	W-LEG	N-LEG	S-LEG	W-LEG
4:00 PM	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0
4:30 PM	1	0	2	0	1	0
4:45 PM	1	1	1	0	0	0
5:00 PM	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0
TOTAL	2	1	3	0	2	1



Project #: 18-1362-006

TMC SUMMARY OF Goldwater Blvd. & Camelback Rd.



LOCATION #: 18-1362-006

TURNING MOVEMENT COUNT

Goldwater Blvd. & Camelback Rd.
 (Intersection Name)

WEDNESDAY Day 08/01/18 Date

COUNT PERIODS	
AM	7:00AM - 9:00AM
PM	4:00PM - 6:00PM

AM PEAK HOUR 7:30 AM
 NOON PEAK HOUR _____
 PM PEAK HOUR 4:45 PM

N-S STREET: Goldwater Blvd.
 E-W STREET: Camelback Rd.

Date: 08/01/18
 Day: WEDNESDAY

City: Scottsdale
 Project #: 18-1362-006

	PEDESTRIANS			TOTAL
	N-LEG	S-LEG	E-LEG	
7:00 AM	1	0	0	1
7:15 AM	2	1	0	3
7:30 AM	1	0	1	2
7:45 AM	0	1	1	2
8:00 AM	1	0	2	3
8:15 AM	0	1	1	2
8:30 AM	1	2	0	3
8:45 AM	0	0	1	1
TOTAL	6	5	6	17

	BICYCLES			TOTAL
	N-LEG	S-LEG	E-LEG	
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	1	0	0	1
TOTAL	1	0	0	1

	PEDESTRIANS			TOTAL
	N-LEG	S-LEG	E-LEG	
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	1	0	0	1
4:45 PM	0	0	0	0
5:00 PM	2	1	1	4
5:15 PM	1	0	0	1
5:30 PM	0	1	1	2
5:45 PM	1	0	0	1
TOTAL	5	3	2	10

	BICYCLES			TOTAL
	N-LEG	S-LEG	E-LEG	
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0

West Leg

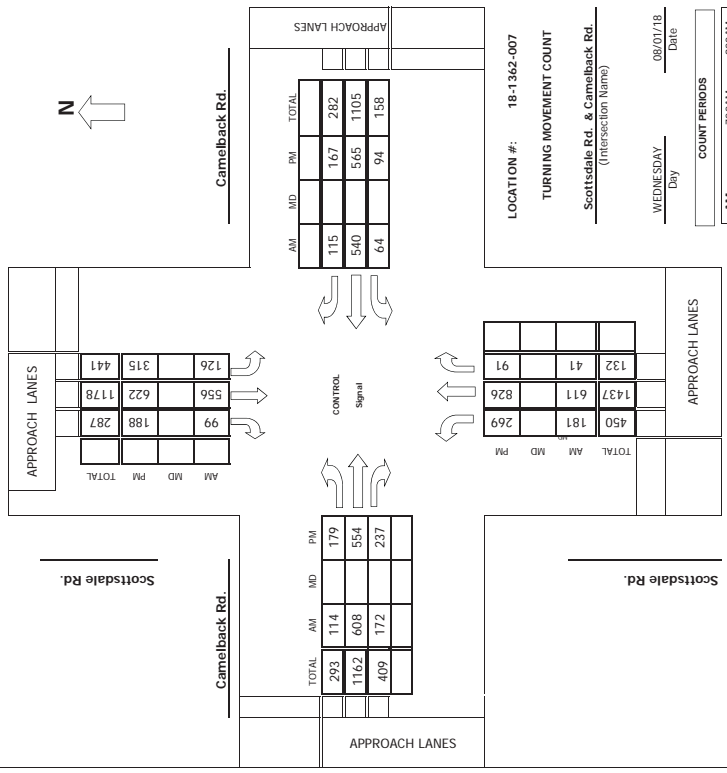
North Leg

South Leg

East Leg

Project #: 18-1362-007

TMC SUMMARY OF Scottsdale Rd. & Camelback Rd.



LOCATION #: 18-1362-007

TURNING MOVEMENT COUNT

Scottsdale Rd. & Camelback Rd.
(Intersection Name)

WEDNESDAY _____ Date
Day: 08/01/18

COUNT PERIODS	
AM	7:00AM - 9:00AM
NOON	12:00PM - 2:00PM
PM	4:00PM - 6:00PM

AM PEAK HOUR _____ 7:45 AM
NOON PEAK HOUR _____
PM PEAK HOUR _____ 4:15 PM

N-S STREET: Scottsdale Rd.
E-W STREET: Camelback Rd.

Date: 08/01/18
Day: WEDNESDAY

City: Scottsdale
Project #: 18-1362-007

	PEDESTRIANS			BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	3	1	2	2	0	4	0	0
7:15 AM	3	2	1	5	1	1	0	1
7:30 AM	6	1	4	2	0	0	2	1
7:45 AM	2	0	2	4	0	0	1	0
8:00 AM	5	1	5	1	0	0	1	1
8:15 AM	1	3	1	5	2	1	1	2
8:30 AM	4	2	5	2	3	2	0	0
8:45 AM	1	1	3	6	0	0	0	0
TOTAL	25	11	23	27	8	8	4	5

	PEDESTRIANS			BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	2	1	0	0	0	0
4:15 PM	1	1	3	2	1	0	1	0
4:30 PM	2	0	2	0	0	1	0	1
4:45 PM	3	1	1	1	1	1	1	0
5:00 PM	2	3	0	3	2	1	0	2
5:15 PM	5	2	1	2	1	0	0	1
5:30 PM	1	1	2	1	0	1	0	0
5:45 PM	4	0	1	0	0	0	0	1
TOTAL	18	8	12	10	5	4	4	4

West Leg

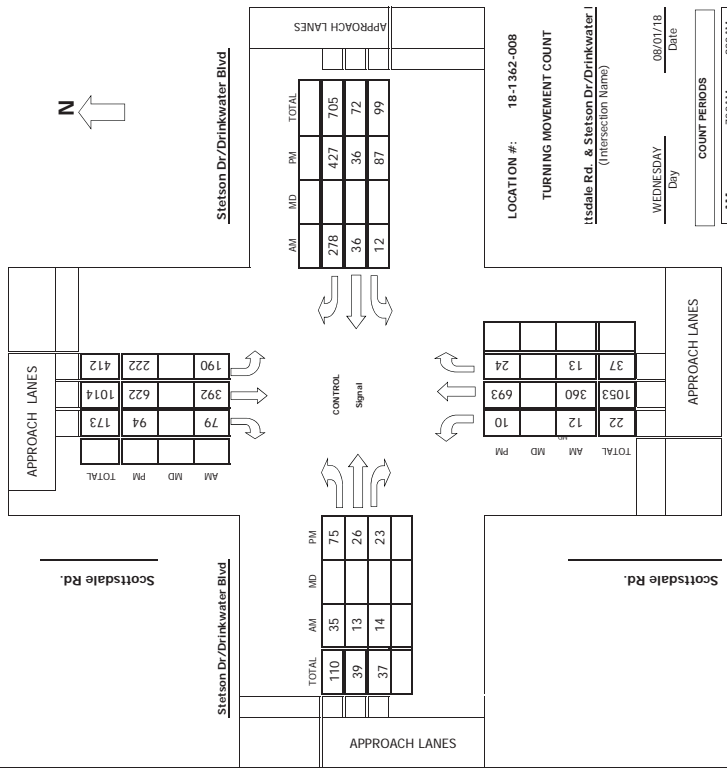
North Leg

East Leg

South Leg

Project #: 18-1362-008

TMC SUMMARY OF Scottsdale Rd. & Stetson Dr/Drinkwater Blvd



AM	MD	PM	TOTAL
392	190	412	1014
79	173	1014	190
94	622	222	1014
173	190	412	1014

AM	MD	PM	TOTAL
278	427	705	1410
36	36	72	144
12	87	99	198

AM	MD	PM	TOTAL
22	1053	37	1112
10	360	13	573
10	693	24	1427

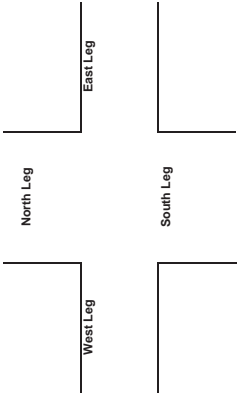
LOCATION #: 18-1362-008
 TURNING MOVEMENT COUNT
 Stetson Dr./Drinkwater |
 (Intersection Name)
 WEDNESDAY 08/01/18 Date
 Day
 COUNT PERIODS
 AM 7:00AM - 9:00AM
 NOON 12:00PM - 2:00PM
 PM 4:00PM - 6:00PM

AM PEAK HOUR 7:30 AM
 NOON PEAK HOUR
 PM PEAK HOUR 4:15 PM

N-S STREET: Scottsdale Rd.
 E-W STREET: Stetson Dr/Drinkwater Blvd
 Date: 08/01/18
 Day: WEDNESDAY
 City: Scottsdale
 Project #: 18-1362-008

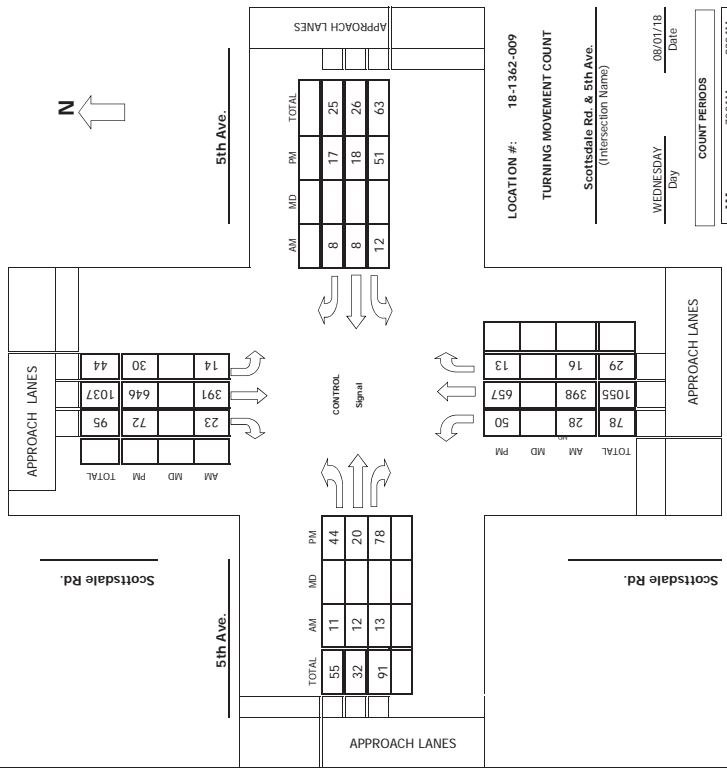
	PEDESTRIANS			BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	14	1	2	2	0	0	1	0
7:15 AM	10	0	3	8	1	0	1	0
7:30 AM	11	1	6	6	0	1	0	1
7:45 AM	9	0	2	3	1	2	0	0
8:00 AM	5	1	5	2	0	1	0	0
8:15 AM	8	2	1	5	1	0	0	1
8:30 AM	4	1	4	5	0	1	0	0
8:45 AM	7	3	1	4	0	0	1	1
TOTAL	68	9	24	35	3	5	3	3

	PEDESTRIANS			BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	12	1	4	5	1	1	0	0
4:15 PM	9	0	1	8	0	0	2	1
4:30 PM	11	1	5	5	0	0	1	0
4:45 PM	9	3	2	9	0	0	0	1
5:00 PM	5	2	6	6	1	1	1	0
5:15 PM	8	1	3	3	0	1	0	1
5:30 PM	5	1	2	2	1	0	1	0
5:45 PM	1	2	1	0	0	0	0	0
TOTAL	60	11	24	38	3	3	5	3



Project #: 18-1362-009

TMC SUMMARY OF Scottsdale Rd. & 5th Ave.



LOCATION #: 18-1362-009
TURNING MOVEMENT COUNT
Scottsdale Rd. & 5th Ave.
(Intersection Name)
WEDNESDAY 08/01/18 Date
COUNT PERIODS
AM 7:00AM - 9:00AM
NOON 12:00PM - 1:00PM
PM 4:00PM - 6:00PM

AM PEAK HOUR 7:45 AM
NOON PEAK HOUR
PM PEAK HOUR 4:30 PM

N-S STREET: Scottsdale Rd.
E-W STREET: 5th Ave.
Date: 08/01/18
Day: WEDNESDAY
City: Scottsdale
Project #: 18-1362-009

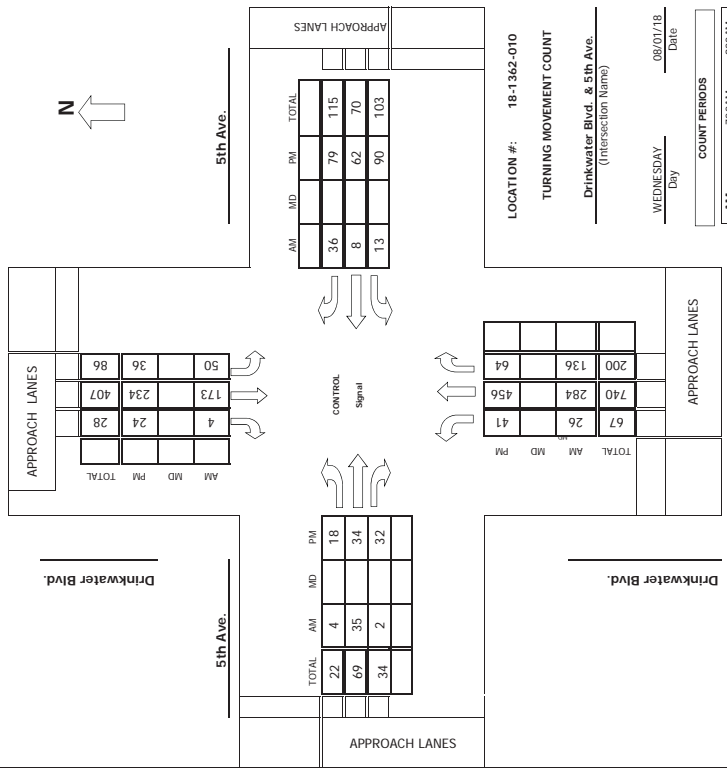
	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	W-LEG	N-LEG	S-LEG	W-LEG
7:00 AM	2	0	0	0	0	0
7:15 AM	5	1	1	0	0	0
7:30 AM	2	0	0	1	0	0
7:45 AM	3	1	1	0	0	0
8:00 AM	6	2	2	0	0	0
8:15 AM	2	1	1	0	0	0
8:30 AM	5	0	0	0	0	0
8:45 AM	2	1	1	0	0	0
TOTAL	27	6	6	2	2	0

	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	W-LEG	N-LEG	S-LEG	W-LEG
4:00 PM	1	1	2	0	0	0
4:15 PM	4	0	2	0	1	1
4:30 PM	1	3	3	0	0	0
4:45 PM	2	2	2	0	0	0
5:00 PM	3	1	1	0	0	0
5:15 PM	1	4	5	0	0	0
5:30 PM	0	1	1	0	2	1
5:45 PM	1	2	4	0	0	0
TOTAL	13	14	20	2	3	3

North Leg _____ West Leg _____ East Leg _____
South Leg _____

Project #: 18-1362-010

TMC SUMMARY OF Drinkwater Blvd. & 5th Ave.



LOCATION #: 18-1362-010

TURNING MOVEMENT COUNT

Drinkwater Blvd. & 5th Ave.
 (Intersection Name)

WEDNESDAY
 Day: 08/01/18
 Date:

COUNT PERIODS	
AM	7:00AM - 9:00AM
NOON	12:00PM - 2:00PM
PM	4:00PM - 6:00PM

AM PEAK HOUR	7:15 AM
NOON PEAK HOUR	
PM PEAK HOUR	4:30 PM

N-S STREET: Drinkwater Blvd.
 E-W STREET: 5th Ave.

Date: 08/01/18
 Day: WEDNESDAY

City: Scottsdale
 Project #: 18-1362-010

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	1	1	0	0
7:15 AM	0	0	1	1
7:30 AM	1	0	1	2
7:45 AM	2	1	1	1
8:00 AM	3	0	0	0
8:15 AM	1	1	0	1
8:30 AM	2	2	0	3
8:45 AM	1	0	1	1
TOTAL	11	5	4	9

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	1
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	1	0	0	0
8:00 AM	0	0	0	0
8:15 AM	1	1	1	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	2	1	1	1

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	1	1	1	2
4:15 PM	4	0	1	1
4:30 PM	1	1	2	0
4:45 PM	2	2	3	1
5:00 PM	3	0	1	2
5:15 PM	1	1	2	1
5:30 PM	2	2	0	1
5:45 PM	1	1	1	1
TOTAL	15	8	11	9

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	1	1	1	0
4:30 PM	0	0	0	1
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	2	1
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	1	1	3	2

West Leg

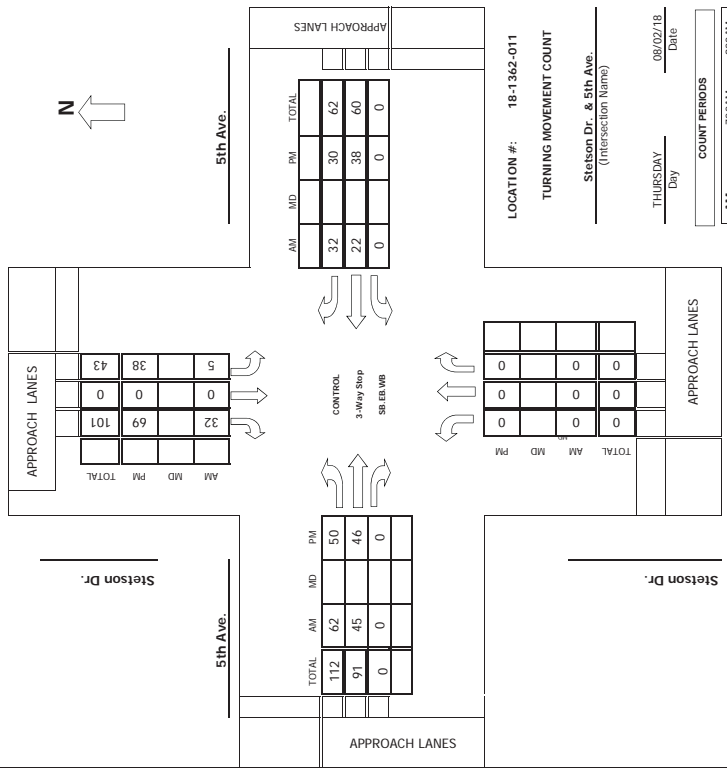
North Leg

South Leg

East Leg

Project #: 18-1362-011

TMC SUMMARY OF Stetson Dr. & 5th Ave.



LOCATION #: 18-1362-011
 TURNING MOVEMENT COUNT
 Stetson Dr. & 5th Ave.
 (Intersection Name)

THURSDAY 08/02/18
 Day Date

COUNT PERIODS	
AM	7:00AM - 9:00AM
NOON	12:00PM - 2:00PM
PM	4:00PM - 6:00PM

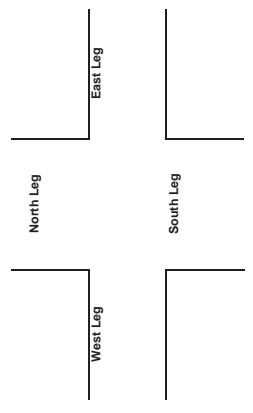
AM PEAK HOUR 7:45 AM
 NOON PEAK HOUR
 PM PEAK HOUR 5:00 PM

Pedestrian & Bicycle Study

N-S STREET: Stetson Dr.
 E-W STREET: 5th Ave.
 Date: 08/02/18
 Day: THURSDAY
 City: Scottsdale
 Project #: 18-1362-01

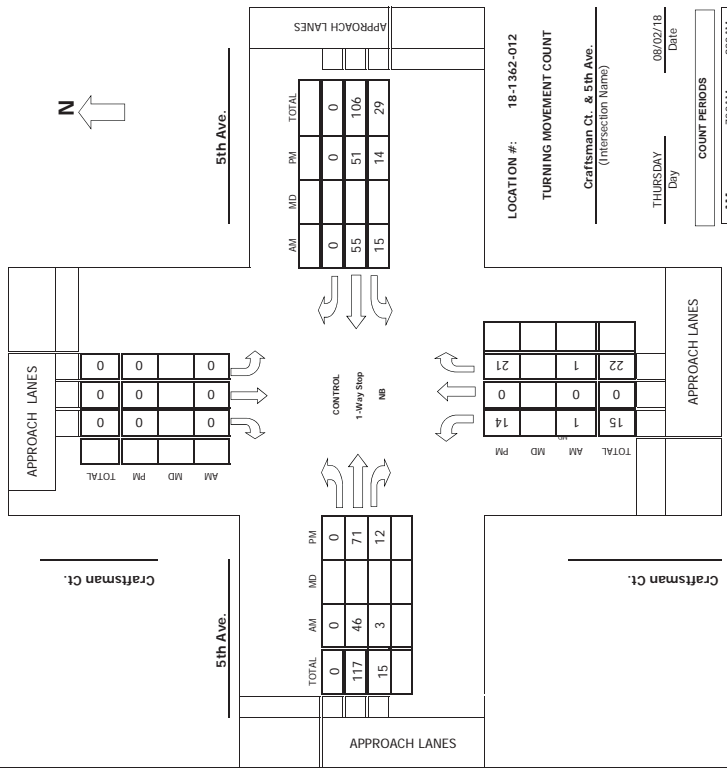
	PEDESTRIANS			BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0	0	0	0	0
7:15 AM	0	0	1	0	0	0	0	0
7:30 AM	0	0	2	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0
8:00 AM	0	0	1	0	0	0	0	0
8:15 AM	0	0	1	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0
TOTAL	0	0	5	0	0	0	0	0

	PEDESTRIANS			BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	2	1	1	0	0	0	0
4:15 PM	0	0	3	0	0	0	0	0
4:30 PM	0	2	1	2	0	0	0	0
4:45 PM	0	2	0	0	0	0	0	0
5:00 PM	0	1	1	0	0	0	0	0
5:15 PM	0	2	2	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0
5:45 PM	0	3	0	0	0	0	0	0
TOTAL	0	12	8	3	0	0	0	0



Project #: 18-1362-012

TMC SUMMARY OF Craftsman Ct. & 5th Ave.



LOCATION #: 18-1362-012
 TURNING MOVEMENT COUNT
 Craftsman Ct. & 5th Ave.
 (Intersection Name)

THURSDAY 08/02/18
 Day Date

COUNT PERIODS	
AM	7:00AM - 9:00AM
NOON	12:00PM - 2:00PM
PM	4:00PM - 6:00PM

AM PEAK HOUR 7:30 AM
 NOON PEAK HOUR
 PM PEAK HOUR 5:00 PM

Pedestrian & Bicycle Study

N-S STREET, Craftsman Ct.
 E-W STREET, 5th Ave.

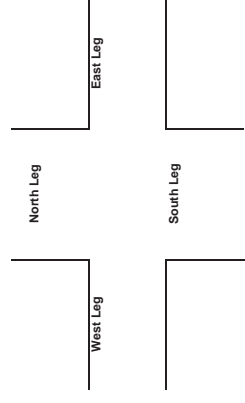
Date: 08/02/18
 Day: THURSDAY
 City: Scottsdale
 Project #: 18-1362-01

	PEDESTRIANS			TOTAL
	N-LEG	S-LEG	E-LEG	
7:00 AM	0	1	0	1
7:15 AM	0	0	0	0
7:30 AM	0	1	0	1
7:45 AM	0	1	1	2
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	1	2	3
8:45 AM	0	0	0	0
TOTAL	0	4	3	6

	BICYCLES			TOTAL
	N-LEG	S-LEG	E-LEG	
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

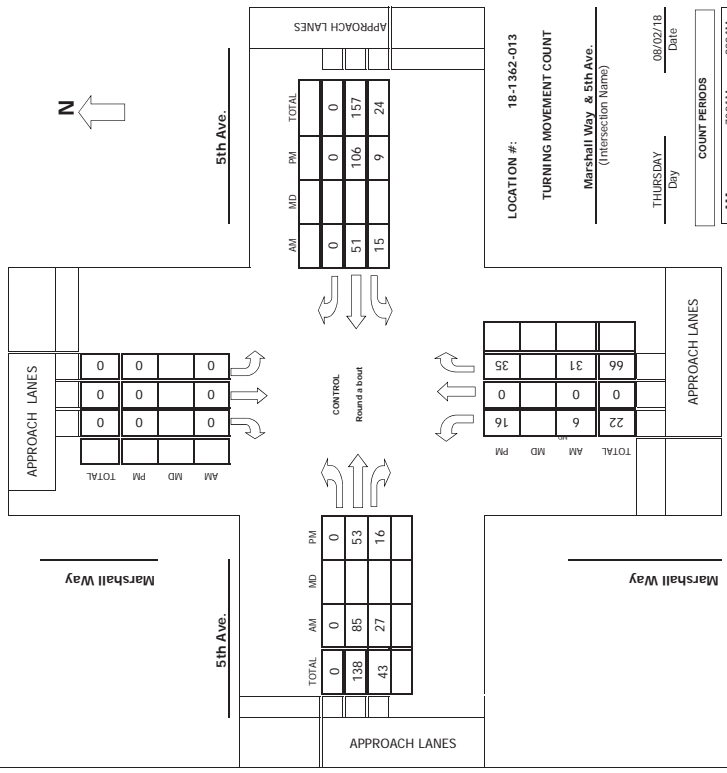
	PEDESTRIANS			TOTAL
	N-LEG	S-LEG	E-LEG	
4:00 PM	0	4	0	4
4:15 PM	0	2	0	2
4:30 PM	0	5	0	5
4:45 PM	0	3	1	4
5:00 PM	0	4	1	5
5:15 PM	0	1	0	1
5:30 PM	0	0	9	9
5:45 PM	0	0	3	3
TOTAL	0	28	7	12

	BICYCLES			TOTAL
	N-LEG	S-LEG	E-LEG	
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0



Project #: 18-1362-013

TMC SUMMARY OF Marshall Way & 5th Ave.



LOCATION #: 18-1362-013

TURNING MOVEMENT COUNT

Marshall Way & 5th Ave.
(Intersection Name)

THURSDAY 08/02/18
Day Date

COUNT PERIODS	
AM	7:00AM - 9:00AM
NOON	12:00PM - 1:00PM
PM	4:00PM - 6:00PM

AM PEAK HOUR 8:00 AM
NOON PEAK HOUR _____
PM PEAK HOUR 4:45 PM

Pedestrian & Bicycle Study

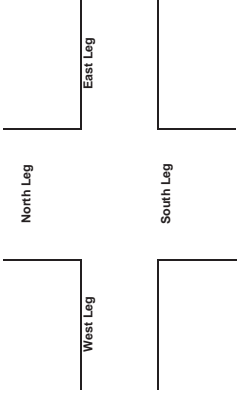
N-S STREET: Marshall Way
E-W STREET: 5th Ave.

Date: 08/02/18
Day: THURSDAY

City: Scottsdale
Project #: 18-1362-01

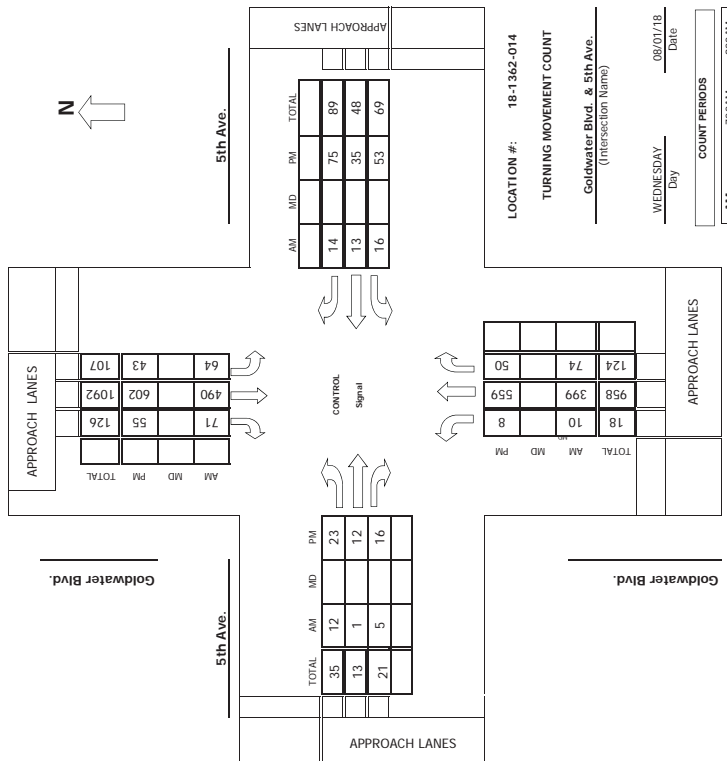
	PEDESTRIANS			BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	1	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0
7:30 AM	0	4	1	0	0	0	0	0
7:45 AM	0	1	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0
8:30 AM	0	2	1	0	0	0	0	0
8:45 AM	0	3	0	1	0	0	0	0
TOTAL	0	10	3	1	0	0	0	0

	PEDESTRIANS			BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	1	1	0	0	0	0	0
4:15 PM	0	8	2	0	0	0	0	0
4:30 PM	0	0	2	0	0	0	0	0
4:45 PM	0	0	0	2	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0
5:30 PM	0	3	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0
TOTAL	0	12	7	1	0	0	0	0



Project #: 18-1362-014

TMC SUMMARY OF Goldwater Blvd. & 5th Ave.



AM	MD	PM	TOTAL
14	75	89	
13	35	48	
16	53	69	
TOTAL			

LOCATION #: 18-1362-014
TURNING MOVEMENT COUNT
Goldwater Blvd. & 5th Ave.
(Intersection Name)
WEDNESDAY 08/01/18 Date
COUNT PERIODS
AM 7:00AM - 9:00AM
NOON 12:00PM - 1:00PM
PM 4:00PM - 6:00PM

AM	MD	PM	TOTAL
18	958	124	
10	399	74	
8	559	50	
TOTAL			

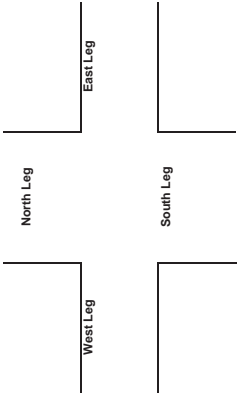


Pedestrian & Bicycle Study

N-S STREET: Goldwater Blvd.
E-W STREET: 5th Ave.
Date: 08/01/18
Day: WEDNESDAY
City: Scottsdale
Project #: 18-1362-014

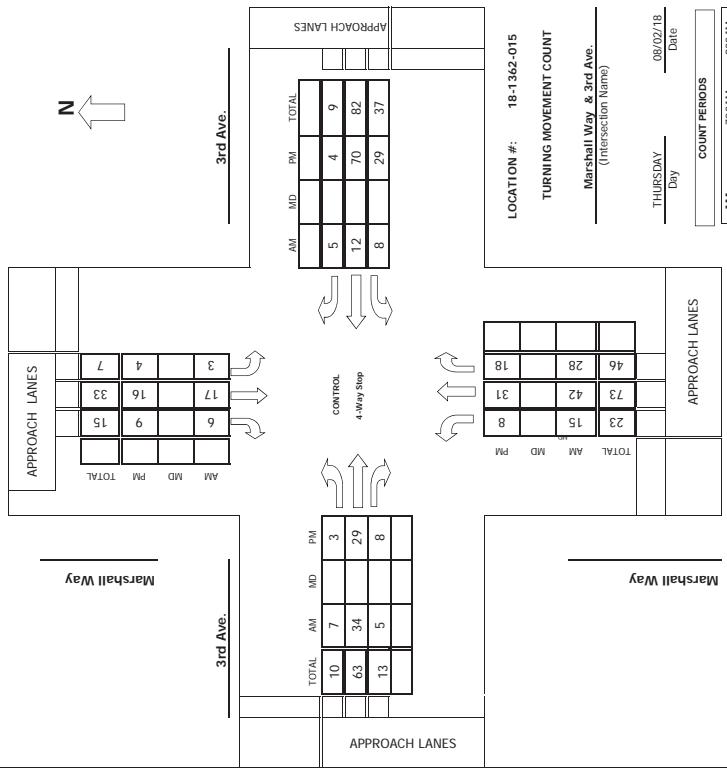
	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	W-LEG	N-LEG	S-LEG	W-LEG
7:00 AM	0	0	0	0	0	0
7:15 AM	0	1	0	0	0	0
7:30 AM	1	0	1	0	1	0
7:45 AM	0	0	1	0	0	0
8:00 AM	0	1	0	0	0	1
8:15 AM	0	0	1	0	0	0
8:30 AM	2	0	1	0	0	0
8:45 AM	1	0	0	0	0	0
TOTAL	4	2	3	0	1	1

	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	W-LEG	N-LEG	S-LEG	W-LEG
4:00 PM	0	0	0	0	0	0
4:15 PM	0	1	0	0	1	0
4:30 PM	1	0	1	0	0	0
4:45 PM	1	1	1	0	0	0
5:00 PM	0	0	1	0	0	0
5:15 PM	2	1	1	0	0	0
5:30 PM	1	0	0	0	1	0
5:45 PM	0	0	0	0	0	0
TOTAL	5	3	2	0	2	0



Project #: 18-1362-015

TMC SUMMARY OF Marshall Way & 3rd Ave.



AM PEAK HOUR
 NOON PEAK HOUR
 PM PEAK HOUR

LOCATION #: 18-1362-015
 TURNING MOVEMENT COUNT
 Marshall Way & 3rd Ave.
 (Intersection Name)

THURSDAY 08/02/18
 Date

COUNT PERIODS	
AM	7:00AM - 9:00AM
PM	4:00PM - 6:00PM

Pedestrian & Bicycle Study

N-S STREET: Marshall Way
 E-W STREET: 3rd Ave.

Date: 08/02/18
 Day: THURSDAY

City: Scottsdale
 Project #: 18-1362-01

	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	E-LEG	N-LEG	S-LEG	E-LEG
7:00 AM	1	0	0	0	0	0
7:15 AM	0	0	2	0	0	0
7:30 AM	0	2	0	0	0	0
7:45 AM	0	0	1	0	0	0
8:00 AM	0	0	0	0	0	0
8:15 AM	0	2	0	0	0	0
8:30 AM	0	1	1	0	0	0
8:45 AM	0	1	2	0	0	0
TOTAL	1	5	6	0	0	0

	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	E-LEG	N-LEG	S-LEG	E-LEG
4:00 PM	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0
4:30 PM	0	0	2	0	0	0
4:45 PM	0	0	0	0	0	0
5:00 PM	0	1	1	0	1	0
5:15 PM	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0
5:45 PM	0	0	2	0	0	0
TOTAL	0	1	3	0	1	0

West Leg

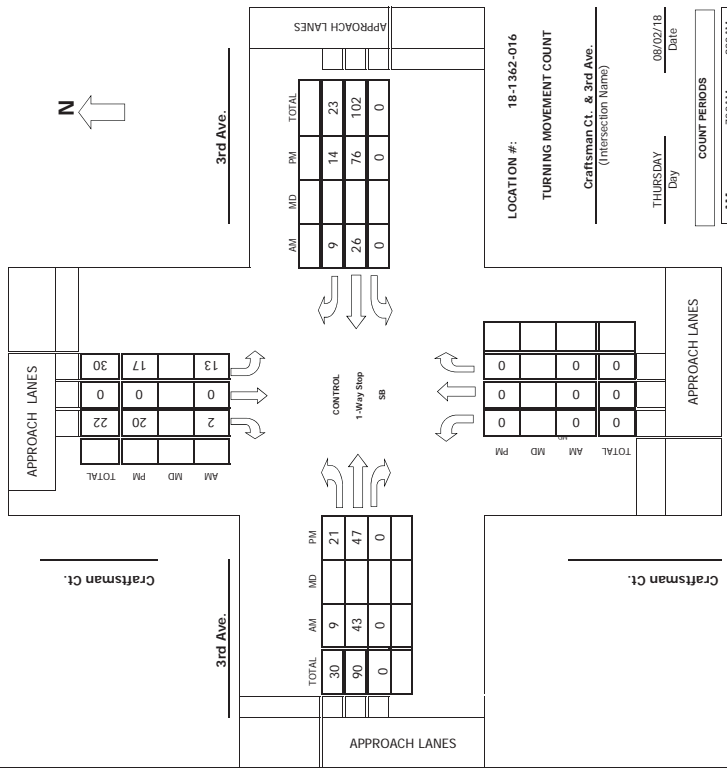
North Leg

South Leg

East Leg

Project #: 18-1362-016

TMC SUMMARY OF Craftsman Ct. & 3rd Ave.



LOCATION #: 18-1362-016
 TURNING MOVEMENT COUNT

Craftsman Ct. & 3rd Ave.
 (Intersection Name)

THURSDAY _____ Date: 08/02/18

COUNT PERIODS	
AM	7:00AM - 9:00AM
PM	4:00PM - 6:00PM

AM PEAK HOUR _____ 8:00 AM
 NOON PEAK HOUR _____
 PM PEAK HOUR _____ 4:30 PM

Pedestrian & Bicycle Study

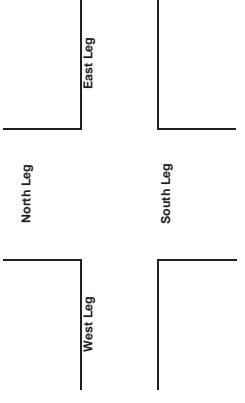
N-S STREET, Craftsman Ct.
 E-W STREET, 3rd Ave.

Date: 08/02/18
 Day: THURSDAY

City: Scottsdale
 Project #: 18-1362-01

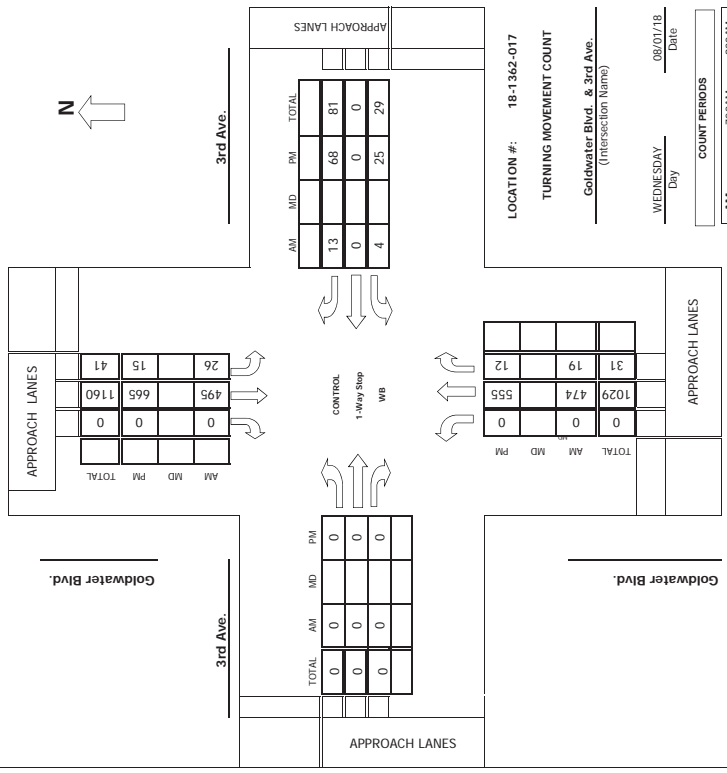
	PEDESTRIANS			BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0	0	0	0	0
7:15 AM	1	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0
8:00 AM	0	0	1	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0
TOTAL	1	0	1	0	0	0	0	0

	PEDESTRIANS			BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0	1	0	0	0
4:15 PM	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0
5:30 PM	1	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0
TOTAL	1	0	0	0	1	0	0	0



Project #: 18-1362-017

TMC SUMMARY OF Goldwater Blvd. & 3rd Ave.



LOCATION #: 18-1362-017
TURNING MOVEMENT COUNT
Goldwater Blvd. & 3rd Ave.
(Intersection Name)
WEDNESDAY 08/01/18 Date
COUNT PERIODS
AM 7:00AM - 9:00AM
NOON 12:00PM - 2:00PM
PM 4:00PM - 6:00PM

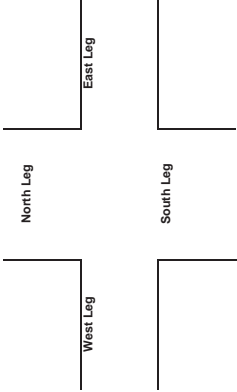
AM PEAK HOUR 7:30 AM
NOON PEAK HOUR
PM PEAK HOUR 4:15 PM

Pedestrian & Bicycle Study

N-S STREET, Goldwater Blvd.
E-W STREET, 3rd Ave.
Date: 08/01/18 City: Scottsdale
Day: WEDNESDAY Project #: 18-1362-01

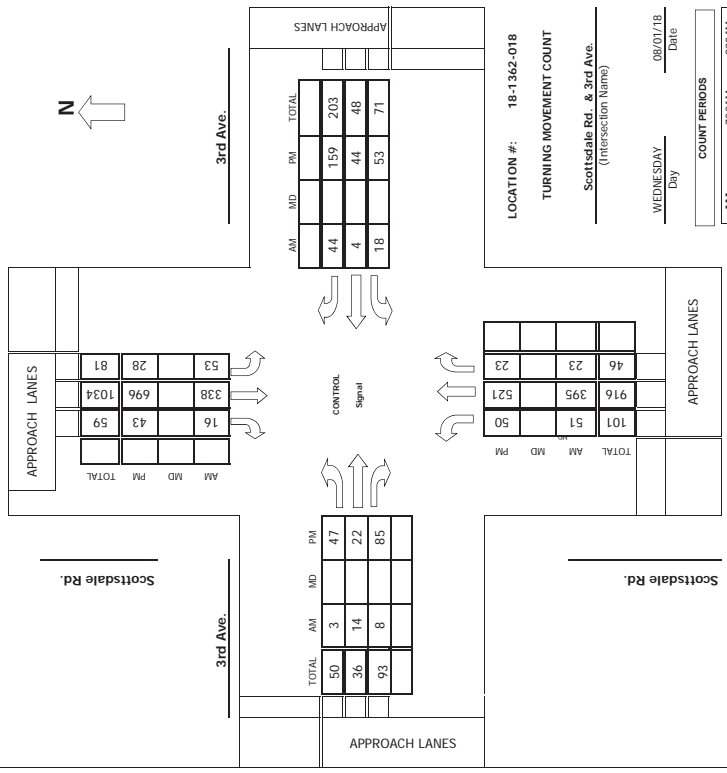
	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	E-LEG	N-LEG	S-LEG	E-LEG
7:00 AM	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0

	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	E-LEG	N-LEG	S-LEG	E-LEG
4:00 PM	0	0	0	0	0	0
4:15 PM	0	1	0	0	1	0
4:30 PM	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0
5:30 PM	0	0	1	0	0	0
5:45 PM	0	0	0	0	0	0
TOTAL	0	1	1	0	1	0



Project #: 18-1362-018

TMC SUMMARY OF Scottsdale Rd. & 3rd Ave.



LOCATION #: 18-1362-018

TURNING MOVEMENT COUNT

Scottsdale Rd. & 3rd Ave.
(Intersection Name)

WEDNESDAY 08/01/18
Day Date

COUNT PERIODS	
AM	7:00AM - 9:00AM
NOON	
PM	4:00PM - 6:00PM

AM PEAK HOUR 7:45 AM
NOON PEAK HOUR
PM PEAK HOUR 4:30 PM

Pedestrian & Bicycle Study

Date: 08/01/18
Day: WEDNESDAY
City: Scottsdale
Project #: 18-1362-018

N-S STREET: Scottsdale Rd.
E-W STREET: 3rd Ave.

	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	W-LEG	N-LEG	S-LEG	W-LEG
7:00 AM	0	1	0	0	0	0
7:15 AM	1	0	1	0	0	0
7:30 AM	1	1	2	1	0	0
7:45 AM	1	2	1	1	0	0
8:00 AM	0	1	2	0	0	1
8:15 AM	1	0	1	0	0	1
8:30 AM	2	1	0	0	0	2
8:45 AM	1	3	1	0	0	0
TOTAL	7	9	8	1	3	3

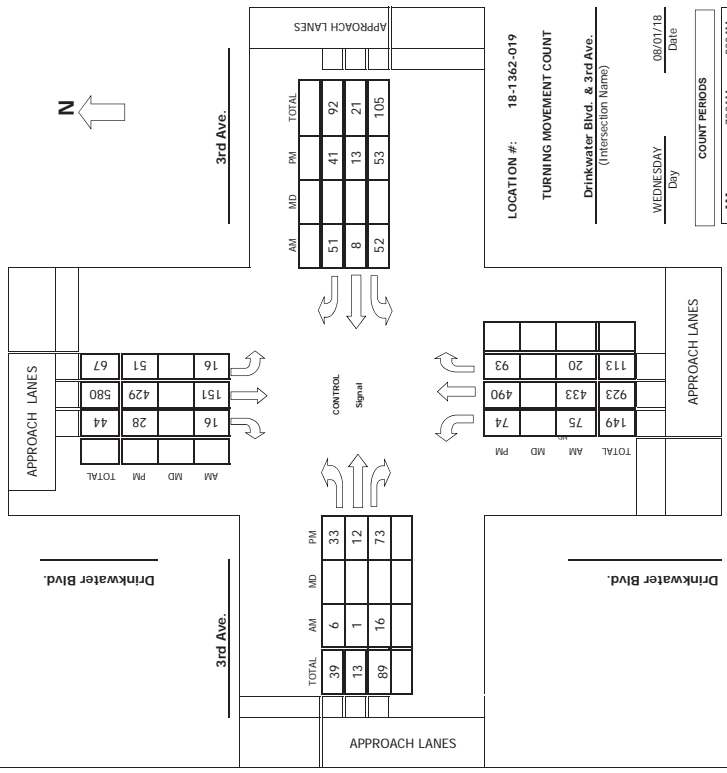
	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	W-LEG	N-LEG	S-LEG	W-LEG
4:00 PM	1	3	1	0	0	1
4:15 PM	0	2	1	1	0	1
4:30 PM	1	0	2	0	1	0
4:45 PM	2	1	3	1	0	0
5:00 PM	5	3	6	0	1	0
5:15 PM	2	2	2	0	2	0
5:30 PM	3	1	5	0	2	0
5:45 PM	2	1	1	0	0	0
TOTAL	16	13	21	2	4	3

North Leg _____ West Leg _____ East Leg _____

South Leg _____

Project #: 18-1362-019

TMC SUMMARY OF Drinkwater Blvd. & 3rd Ave.



LOCATION #: 18-1362-019
TURNING MOVEMENT COUNT
Drinkwater Blvd. & 3rd Ave.
(Intersection Name)
WEDNESDAY 08/01/18 Date
COUNT PERIODS
AM 7:00AM - 9:00AM
NOON 12:00PM - 1:00PM
PM 4:00PM - 6:00PM

AM PEAK HOUR 7:30 AM
NOON PEAK HOUR
PM PEAK HOUR 4:45 PM

N-S STREET: Drinkwater Blvd.
E-W STREET: 3rd Ave.
Date: 08/01/18
Day: WEDNESDAY
City: Scottsdale
Project #: 18-1362-019

	PEDESTRIANS			TOTAL
	N-LEG	S-LEG	E-LEG	
7:00 AM	0	0	0	0
7:15 AM	0	1	0	1
7:30 AM	0	0	0	0
7:45 AM	1	0	0	1
8:00 AM	1	0	2	3
8:15 AM	0	0	1	1
8:30 AM	2	0	0	2
8:45 AM	0	0	1	1
TOTAL	4	1	4	7

	BICYCLES			TOTAL
	N-LEG	S-LEG	E-LEG	
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	1	1
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	1	0	0	1
8:45 AM	0	0	0	0
TOTAL	1	0	1	2

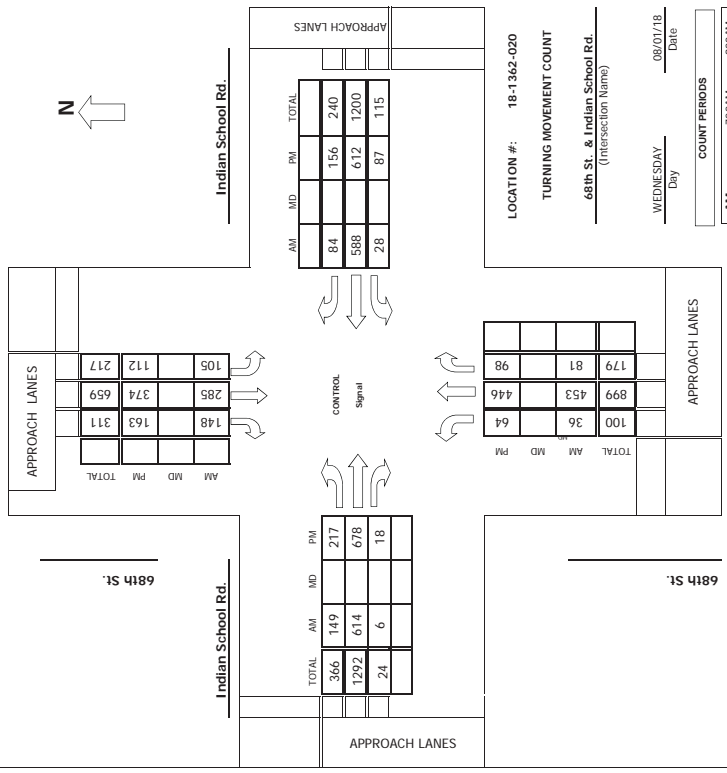
	PEDESTRIANS			TOTAL
	N-LEG	S-LEG	E-LEG	
4:00 PM	0	1	0	1
4:15 PM	1	0	2	3
4:30 PM	2	1	1	4
4:45 PM	3	0	0	3
5:00 PM	1	0	0	1
5:15 PM	0	1	0	1
5:30 PM	1	0	0	1
5:45 PM	0	0	0	0
TOTAL	8	3	3	14

	BICYCLES			TOTAL
	N-LEG	S-LEG	E-LEG	
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	2	0	1	3

North Leg _____
West Leg _____
East Leg _____
South Leg _____

Project #: 18-1362-020

TMC SUMMARY OF 68th St. & Indian School Rd.



LOCATION #: 18-1362-020

TURNING MOVEMENT COUNT

68th St. & Indian School Rd.
(Intersection Name)

WEDNESDAY 08/01/18
Day Date

COUNT PERIODS	7:00AM - 9:00AM	4:00PM - 6:00PM
AM	700AM	900AM
NOON		
PM	400PM	600PM

AM PEAK HOUR 7:15 AM
NOON PEAK HOUR
PM PEAK HOUR 4:15 PM

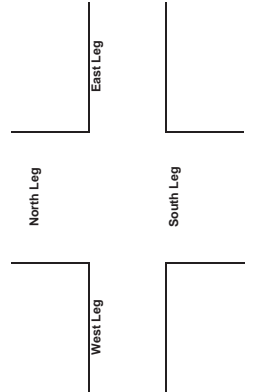
Pedestrian & Bicycle Study

Date: 08/01/18
Day: WEDNESDAY
City: Scottsdale
Project #: 18-1362-020

N-S STREET: 68th St.
E-W STREET: Indian School Rd.

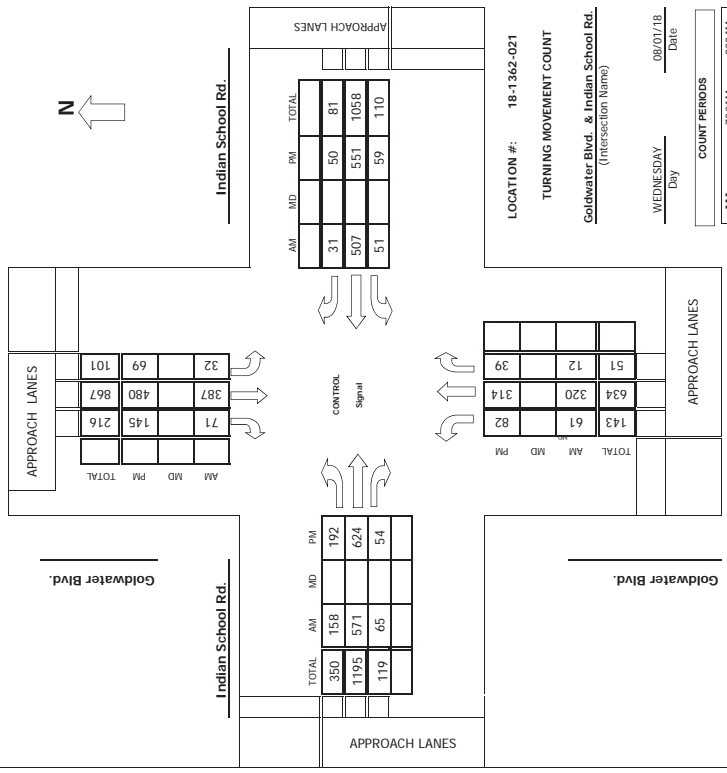
	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	W-LEG	N-LEG	S-LEG	W-LEG
7:00 AM	0	0	1	0	0	0
7:15 AM	1	1	0	0	0	0
7:30 AM	0	0	3	0	0	0
7:45 AM	1	1	2	0	0	0
8:00 AM	2	2	1	0	0	0
8:15 AM	1	0	0	0	0	0
8:30 AM	0	1	2	0	0	0
8:45 AM	1	0	1	0	0	0
TOTAL	6	5	9	0	0	0

	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	W-LEG	N-LEG	S-LEG	W-LEG
4:00 PM	0	0	0	0	0	0
4:15 PM	1	0	3	1	1	0
4:30 PM	0	2	1	0	0	0
4:45 PM	2	1	0	1	0	0
5:00 PM	1	0	2	0	0	0
5:15 PM	1	0	1	0	0	0
5:30 PM	0	0	0	0	0	0
5:45 PM	0	0	1	0	0	0
TOTAL	5	3	8	2	2	0



Project #: 18-1362-021

TMC SUMMARY OF Goldwater Blvd. & Indian School Rd.



LOCATION #: 18-1362-021
TURNING MOVEMENT COUNT
Goldwater Blvd. & Indian School Rd.
(Intersection Name)
WEDNESDAY 08/01/18 Date
COUNT PERIODS
AM 7:00AM - 9:00AM
NOON 12:00PM - 1:00PM
PM 4:00PM - 6:00PM

AM PEAK HOUR 7:30 AM
NOON PEAK HOUR
PM PEAK HOUR 4:15 PM

N-S STREET: Goldwater Blvd.
E-W STREET: Indian School Rd.

Date: 08/01/18
Day: WEDNESDAY

City: Scottsdale
Project #: 18-1362-021

	PEDESTRIANS			TOTAL
	N-LEG	S-LEG	E-LEG	
7:00 AM	0	0	0	0
7:15 AM	0	1	0	1
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	1	0	1
8:15 AM	1	0	0	1
8:30 AM	1	0	0	1
8:45 AM	0	0	0	0
TOTAL	2	2	0	4

	BICYCLES			TOTAL
	N-LEG	S-LEG	E-LEG	
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

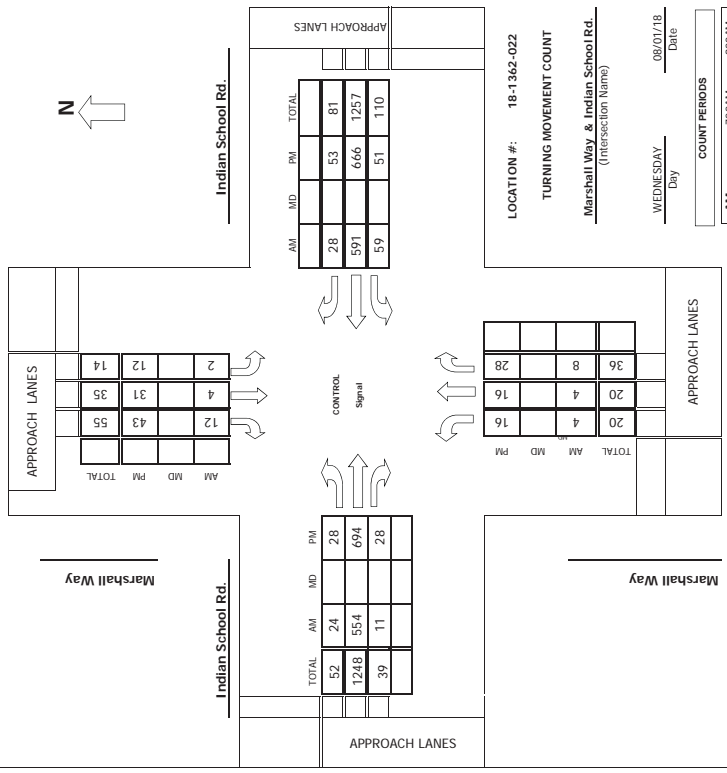
	PEDESTRIANS			TOTAL
	N-LEG	S-LEG	E-LEG	
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	1	0	1
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	1	0	1

	BICYCLES			TOTAL
	N-LEG	S-LEG	E-LEG	
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0

West Leg North Leg East Leg South Leg

Project #: 18-1362-022

TMC SUMMARY OF Marshall Way & Indian School Rd.



LOCATION #: 18-1362-022

TURNING MOVEMENT COUNT

Marshall Way & Indian School Rd.
(Intersection Name)

WEDNESDAY 08/01/18 Date

AM	7:00AM	9:00AM
NOON		
PM	4:00PM	6:00PM

AM PEAK HOUR 7:30 AM

NOON PEAK HOUR _____

PM PEAK HOUR 4:30 PM

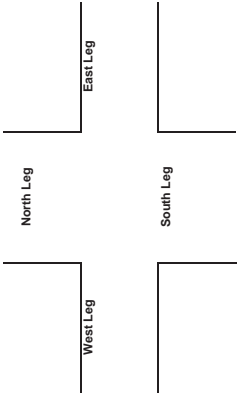
N-S STREET: Marshall Way
E-W STREET: Indian School Rd.

Date: 08/01/18
Day: WEDNESDAY

City: Scottsdale
Project #: 18-1362-022

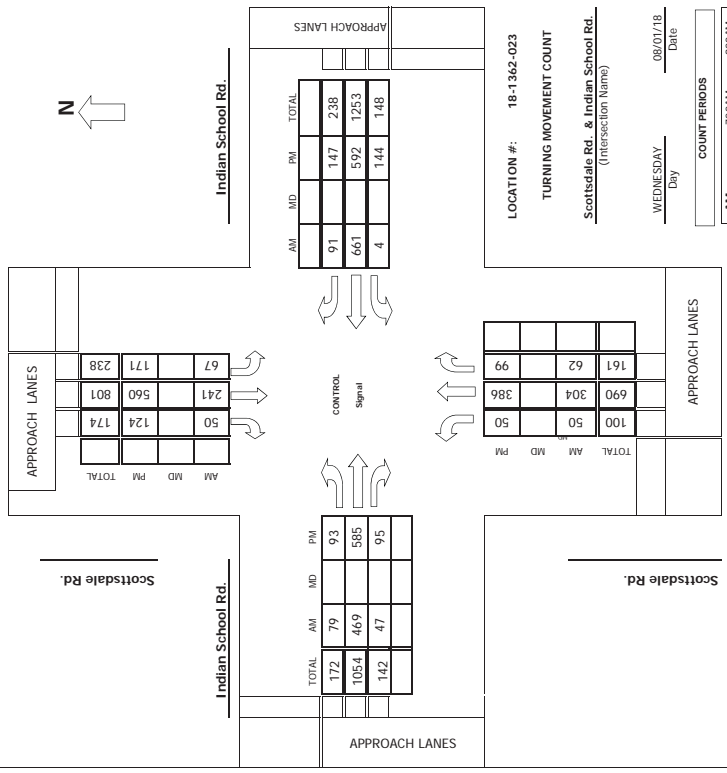
	PEDESTRIANS			BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	1	0	0	0	0	0
7:15 AM	0	1	0	0	0	0	0	0
7:30 AM	1	0	1	0	0	0	0	0
7:45 AM	1	1	2	1	0	0	0	0
8:00 AM	1	2	0	0	0	0	0	0
8:15 AM	0	1	1	1	0	0	0	0
8:30 AM	0	0	3	0	0	0	0	0
8:45 AM	1	1	2	0	0	0	0	1
TOTAL	4	6	10	4	0	0	0	1

	PEDESTRIANS			BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	1	0	1	0	0	1	0	0
4:15 PM	0	1	0	2	0	0	1	0
4:30 PM	1	1	1	1	0	0	1	0
4:45 PM	2	0	2	0	0	0	0	1
5:00 PM	0	2	1	2	0	0	0	0
5:15 PM	1	1	0	1	0	0	0	0
5:30 PM	1	0	1	0	0	0	0	0
5:45 PM	0	1	1	1	0	0	0	0
TOTAL	6	6	7	7	1	1	2	1



Project #: 18-1362-023

TMC SUMMARY OF Scottsdale Rd. & Indian School Rd.



AM PEAK HOUR 7:45 AM

NOON PEAK HOUR _____

PM PEAK HOUR 4:30 PM

LOCATION #: 18-1362-023

TURNING MOVEMENT COUNT

Scottsdale Rd. & Indian School Rd.
(Intersection Name)

WEDNESDAY _____ Date
Day 08/01/18

COUNT PERIODS	
AM	7:00AM - 9:00AM
NOON	12:00PM - 2:00PM
PM	4:00PM - 6:00PM

N-S STREET: Scottsdale Rd.
E-W STREET: Indian School Rd.

Date: 08/01/18
Day: WEDNESDAY

City: Scottsdale
Project #: 18-1362-023

	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	W-LEG	N-LEG	S-LEG	W-LEG
7:00 AM	5	1	1	0	0	0
7:15 AM	2	0	1	1	0	0
7:30 AM	3	1	2	0	0	2
7:45 AM	6	3	1	0	0	1
8:00 AM	9	2	4	0	0	0
8:15 AM	2	1	2	1	1	1
8:30 AM	5	1	5	0	0	1
8:45 AM	2	4	2	0	0	0
TOTAL	34	13	18	2	2	5

	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	W-LEG	N-LEG	S-LEG	W-LEG
4:00 PM	0	3	0	0	0	3
4:15 PM	2	2	1	0	0	0
4:30 PM	1	1	0	0	0	0
4:45 PM	0	4	1	1	0	2
5:00 PM	1	2	2	0	0	0
5:15 PM	2	1	2	0	0	0
5:30 PM	5	3	0	0	0	0
5:45 PM	1	5	1	0	0	0
TOTAL	12	21	6	2	1	6

West Leg

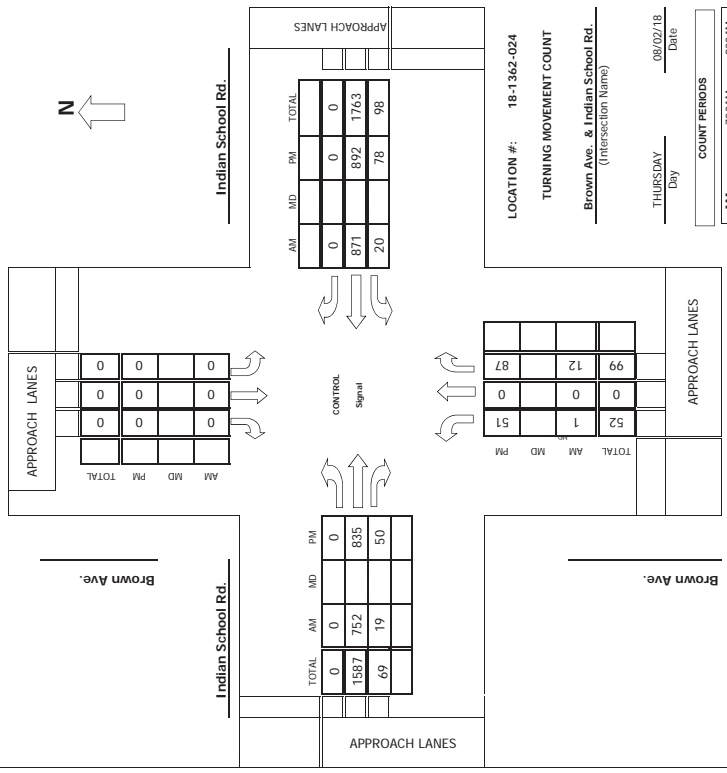
North Leg

East Leg

South Leg

Project #: 18-1362-024

TMC SUMMARY OF Brown Ave. & Indian School Rd.



LOCATION #: 18-1362-024

TURNING MOVEMENT COUNT

Brown Ave. & Indian School Rd.
(Intersection Name)

THURSDAY 08/02/18
Day Date

COUNT PERIODS	
AM	7:00AM - 9:00AM
NOON	12:00PM - 2:00PM
PM	4:00PM - 6:00PM

AM PEAK HOUR 7:30 AM
NOON PEAK HOUR _____
PM PEAK HOUR 4:45 PM

N-S STREET: Brown Ave.
E-W STREET: Indian School Rd.

Date: 08/02/18
Day: THURSDAY

City: Scottsdale
Project #: 18-1362-024

	PEDESTRIANS			TOTAL
	N-LEG	S-LEG	E-LEG	
7:00 AM	0	1	1	3
7:15 AM	0	0	0	1
7:30 AM	0	1	1	0
7:45 AM	0	2	2	1
8:00 AM	0	1	1	2
8:15 AM	0	0	0	1
8:30 AM	0	1	1	0
8:45 AM	0	0	2	1
TOTAL	0	6	8	9

	BICYCLES			TOTAL
	N-LEG	S-LEG	E-LEG	
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	1
7:45 AM	0	0	0	0
8:00 AM	0	0	0	1
8:15 AM	0	0	0	1
8:30 AM	0	0	0	1
8:45 AM	0	0	0	0
TOTAL	0	0	2	2

	PEDESTRIANS			TOTAL
	N-LEG	S-LEG	E-LEG	
4:00 PM	0	1	0	1
4:15 PM	0	0	1	0
4:30 PM	0	1	2	1
4:45 PM	0	0	0	2
5:00 PM	0	1	1	3
5:15 PM	0	2	3	1
5:30 PM	0	0	2	0
5:45 PM	0	1	1	1
TOTAL	0	6	10	9

	BICYCLES			TOTAL
	N-LEG	S-LEG	E-LEG	
4:00 PM	0	0	0	1
4:15 PM	0	0	1	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	1
TOTAL	0	0	2	1

West Leg

North Leg

East Leg

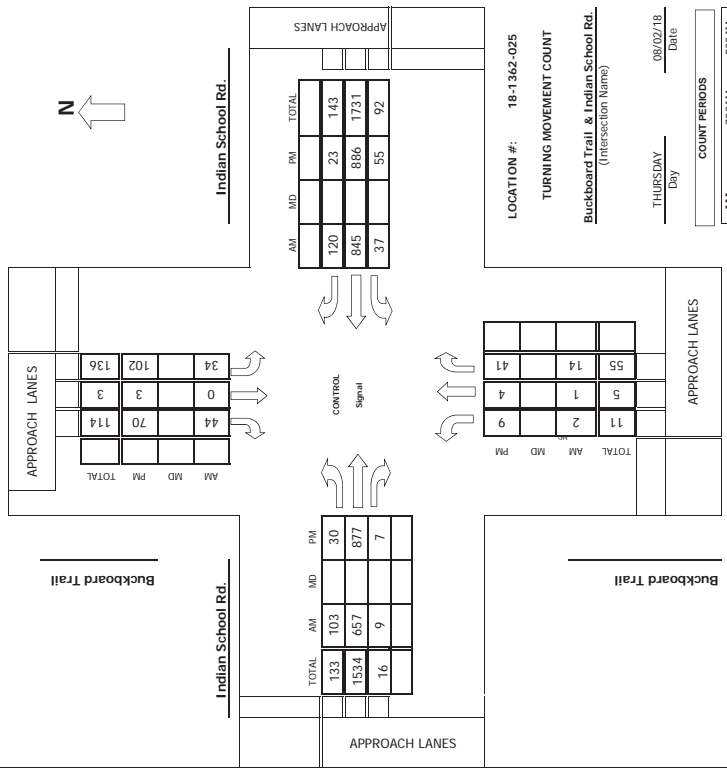
South Leg

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520-316.6745

Project #: 18-1362-025

TMC SUMMARY OF Buckboard Trail & Indian School Rd.



	AM	MD	PM	TOTAL
Indian School Rd. (Northbound)	120	23	143	
Indian School Rd. (Southbound)	845	886	1731	
Buckboard Trail (Eastbound)	37	55	92	
Buckboard Trail (Westbound)	11	2	4	17
Indian School Rd. (Eastbound)	114	70	44	228
Indian School Rd. (Westbound)	3	3	0	6
Buckboard Trail (Northbound)	136	102	34	272
Buckboard Trail (Southbound)	114	70	44	228
TOTAL	17	15	21	53

LOCATION #: 18-1362-025
TURNING MOVEMENT COUNT
Buckboard Trail & Indian School Rd.
(Intersection Name)
THURSDAY 08/02/18
Date

COUNT PERIODS	
AM	7:00AM - 9:00AM
NOON	12:00PM - 2:00PM
PM	4:00PM - 6:00PM

AM PEAK HOUR 7:30 AM
NOON PEAK HOUR _____
PM PEAK HOUR 4:45 PM

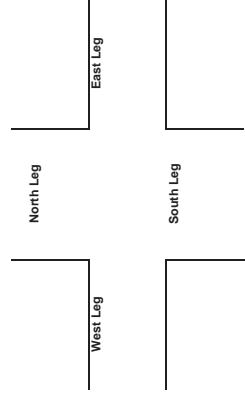


Pedestrian & Bicycle Study

N-S STREET: Buckboard Trail
E-W STREET: Indian School Rd.
Date: 08/02/18
Day: THURSDAY
City: Scottsdale
Project #: 18-1362-02

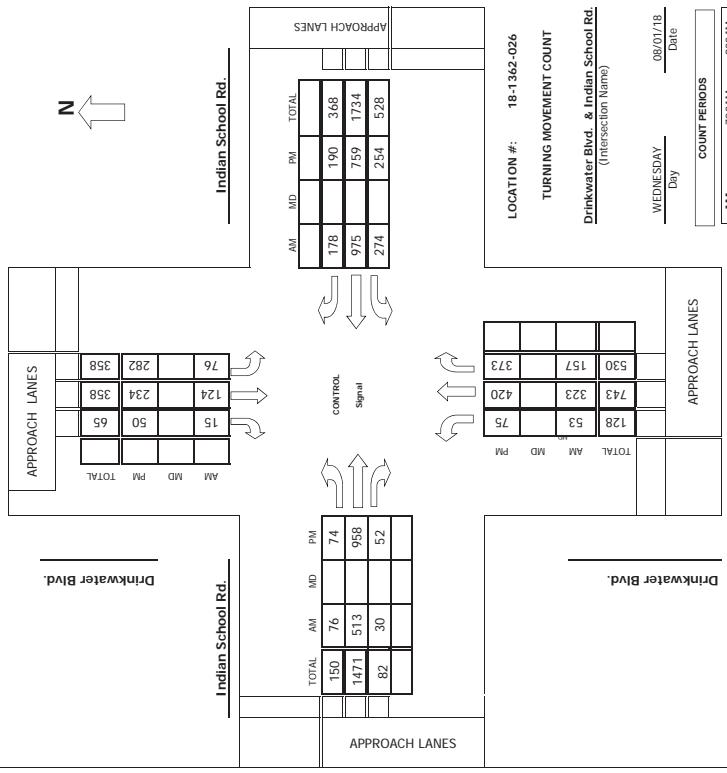
	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	E-LEG	N-LEG	S-LEG	E-LEG
7:00 AM	1	1	0	0	0	0
7:15 AM	0	0	0	0	0	0
7:30 AM	2	1	0	0	0	0
7:45 AM	1	0	0	0	0	0
8:00 AM	0	1	0	0	0	0
8:15 AM	1	1	0	0	0	0
8:30 AM	1	2	0	0	0	0
8:45 AM	2	2	0	0	1	0
TOTAL	8	8	0	0	1	0

	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	E-LEG	N-LEG	S-LEG	E-LEG
4:00 PM	5	4	4	0	0	0
4:15 PM	2	0	3	0	0	0
4:30 PM	2	1	0	0	0	1
4:45 PM	1	3	2	0	0	0
5:00 PM	2	2	3	0	0	0
5:15 PM	3	3	3	0	0	0
5:30 PM	1	1	6	0	0	0
5:45 PM	1	1	1	0	0	0
TOTAL	17	15	21	0	0	1



Project #: 18-1362-026

TMC SUMMARY OF Drinkwater Blvd. & Indian School Rd.



AM	MD	PM	TOTAL
178	190	368	
975	759	1734	
274	254	528	

AM	MD	PM	TOTAL
128	53	75	
743	323	420	
530	157	373	

LOCATION #: 18-1362-026
TURNING MOVEMENT COUNT
Drinkwater Blvd. & Indian School Rd.
(Intersection Name)
WEDNESDAY 08/01/18
Date

COUNT PERIODS	
AM	7:00AM - 9:00AM
NOON	12:00PM - 2:00PM
PM	4:00PM - 6:00PM

AM PEAK HOUR 7:30 AM
NOON PEAK HOUR
PM PEAK HOUR 4:45 PM



FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745
veracitytrafficgroup
Pedestrian & Bicycle Study

N-S STREET: Drinkwater Blvd.
E-W STREET: Indian School Rd.
Date: 08/01/18
Day: WEDNESDAY
City: Scottsdale
Project #: 18-1362-026

	PEDESTRIANS			TOTAL
	N-LEG	S-LEG	E-LEG	
7:00 AM	0	1	1	0
7:15 AM	0	0	3	1
7:30 AM	1	1	1	2
7:45 AM	0	2	0	0
8:00 AM	1	0	2	1
8:15 AM	2	1	1	3
8:30 AM	1	3	0	2
8:45 AM	0	0	1	1
TOTAL	5	8	9	10

	BICYCLES			TOTAL
	N-LEG	S-LEG	E-LEG	
7:00 AM	0	0	0	0
7:15 AM	0	0	0	1
7:30 AM	0	0	0	0
7:45 AM	0	0	2	0
8:00 AM	0	0	1	0
8:15 AM	0	0	1	0
8:30 AM	0	0	0	0
8:45 AM	1	0	0	0
TOTAL	1	0	4	1

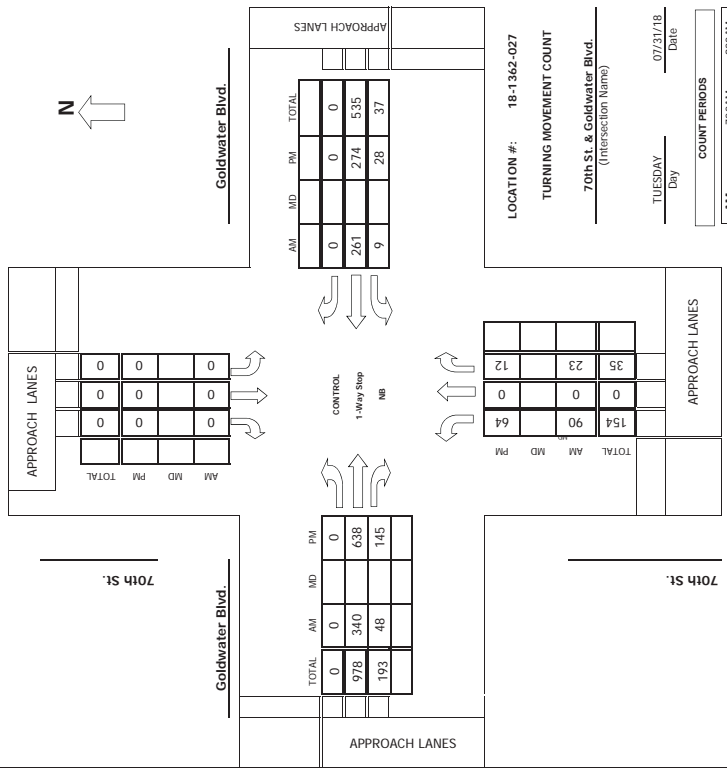
	PEDESTRIANS			TOTAL
	N-LEG	S-LEG	E-LEG	
4:00 PM	0	0	0	0
4:15 PM	0	1	0	1
4:30 PM	0	1	0	0
4:45 PM	0	1	1	1
5:00 PM	0	0	0	1
5:15 PM	1	1	2	0
5:30 PM	0	0	1	1
5:45 PM	1	0	0	0
TOTAL	2	3	5	4

	BICYCLES			TOTAL
	N-LEG	S-LEG	E-LEG	
4:00 PM	0	0	0	0
4:15 PM	0	0	0	1
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	1

North Leg _____
West Leg _____
East Leg _____
South Leg _____

Project #: 18-1362-027

TMC SUMMARY OF 70th St. & Goldwater Blvd.



LOCATION #: 18-1362-027
 TURNING MOVEMENT COUNT
 70th St. & Goldwater Blvd.
 (Intersection Name)
 TUESDAY 07/31/18
 Date

COUNT PERIODS	
AM	7:00AM - 9:00AM
NOON	
PM	4:00PM - 6:00PM

AM PEAK HOUR 7:30 AM
 NOON PEAK HOUR
 PM PEAK HOUR 4:30 PM



Pedestrian & Bicycle Study

Date: 07/31/18
 Day: TUESDAY
 City: Scottsdale
 Project #: 18-1362-027

N-S STREET: 70th St.
 E-W STREET: Goldwater Blvd.

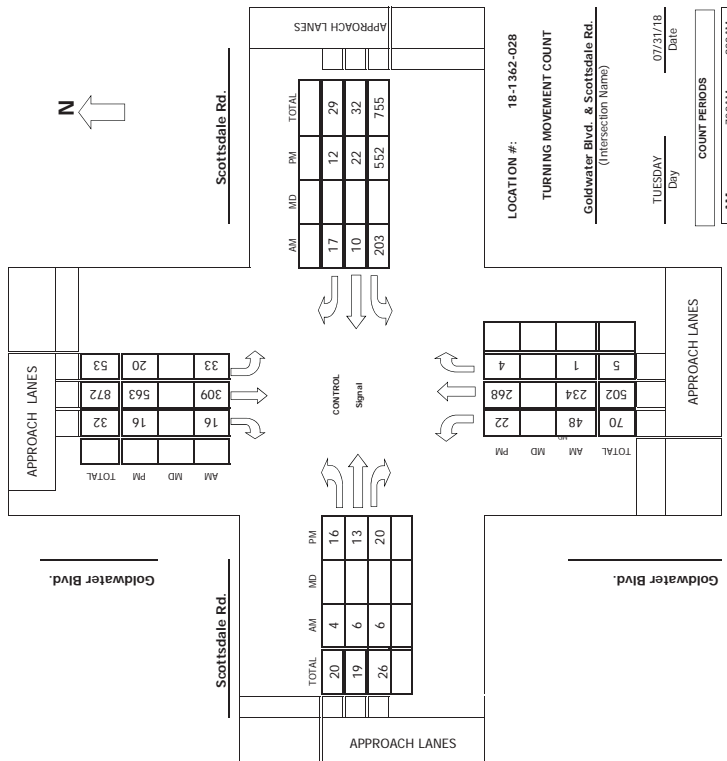
	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	W-LEG	N-LEG	S-LEG	W-LEG
7:00 AM	0	1	0	0	0	0
7:15 AM	0	0	0	0	0	0
7:30 AM	0	1	1	0	0	0
7:45 AM	0	2	0	0	0	0
8:00 AM	0	1	0	0	0	0
8:15 AM	0	0	1	0	0	0
8:30 AM	0	1	1	0	0	0
8:45 AM	0	3	1	0	0	0
TOTAL	0	9	4	0	0	0

	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	W-LEG	N-LEG	S-LEG	W-LEG
4:00 PM	0	1	0	0	0	0
4:15 PM	0	0	0	0	0	0
4:30 PM	0	1	0	0	0	0
4:45 PM	0	3	0	0	0	0
5:00 PM	0	2	1	0	0	0
5:15 PM	0	1	1	0	0	0
5:30 PM	0	0	2	0	1	0
5:45 PM	0	1	1	0	0	0
TOTAL	0	9	5	0	2	0

North Leg _____ East Leg _____
 West Leg _____ South Leg _____

Project #: 18-1362-028

TMC SUMMARY OF Goldwater Blvd. & Scottsdale Rd.



AM	MD	PM	TOTAL
17	12	29	
10	22	32	
203	552	755	

LOCATION #: 18-1362-028
TURNING MOVEMENT COUNT
Goldwater Blvd. & Scottsdale Rd.
(Intersection Name)
TUESDAY 07/31/18
Date

COUNT PERIODS	
AM	7:00AM - 9:00AM
NOON	12:00PM - 1:00PM
PM	4:00PM - 6:00PM

AM PEAK HOUR 7:15 AM
NOON PEAK HOUR
PM PEAK HOUR 4:30 PM



Pedestrian & Bicycle Study

Date: 07/31/18
Day: TUESDAY
City: Scottsdale
Project #: 18-1362-028

N-S STREET: Goldwater Blvd.
E-W STREET: Scottsdale Rd.

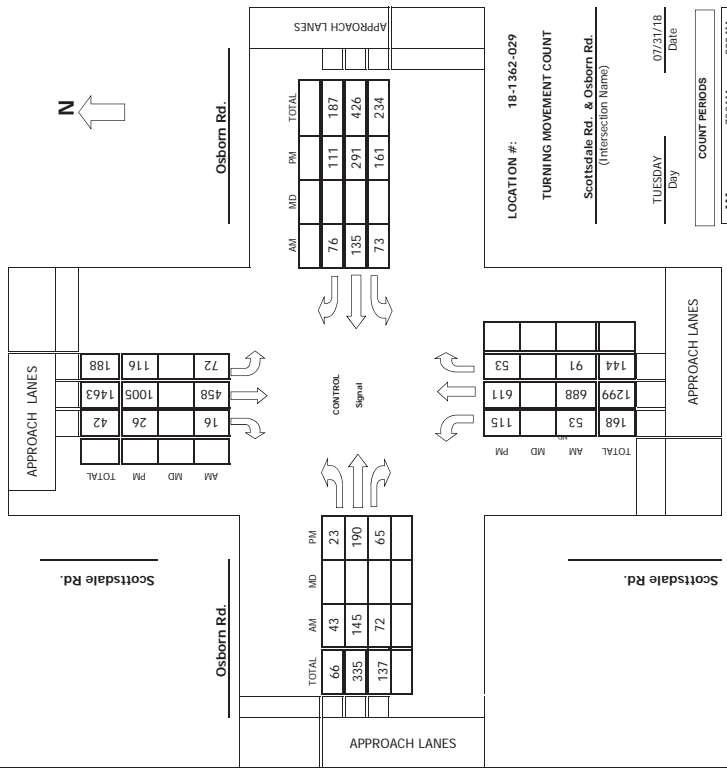
	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	E-LEG	N-LEG	S-LEG	E-LEG
7:00 AM	0	1	1	0	0	0
7:15 AM	0	0	2	0	0	0
7:30 AM	2	1	0	0	0	0
7:45 AM	1	0	1	0	0	0
8:00 AM	0	1	3	0	0	1
8:15 AM	1	2	2	0	0	0
8:30 AM	0	0	1	0	0	0
8:45 AM	1	0	0	0	0	1
TOTAL	5	5	10	0	0	2

	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	E-LEG	N-LEG	S-LEG	E-LEG
4:00 PM	0	1	0	0	0	1
4:15 PM	1	0	1	0	0	0
4:30 PM	0	1	1	0	0	1
4:45 PM	1	2	0	0	0	0
5:00 PM	2	0	2	0	0	0
5:15 PM	1	1	1	0	0	0
5:30 PM	0	1	0	0	0	0
5:45 PM	1	0	1	0	0	0
TOTAL	6	6	6	0	0	4

North Leg _____
West Leg _____
East Leg _____
South Leg _____

Project #: 18-1362-029

TMC SUMMARY OF Scottsdale Rd. & Osborn Rd.



LOCATION #: 18-1362-029

TURNS MOVEMENT COUNT

Scottsdale Rd. & Osborn Rd.
(Intersection Name)

TUESDAY Day 07/31/18 Date

COUNT PERIODS	
AM	7:00AM - 9:00AM
NOON	12:00PM - 2:00PM
PM	4:00PM - 6:00PM

AM PEAK HOUR	<u>7:30 AM</u>
NOON PEAK HOUR	<u> </u>
PM PEAK HOUR	<u>4:30 PM</u>

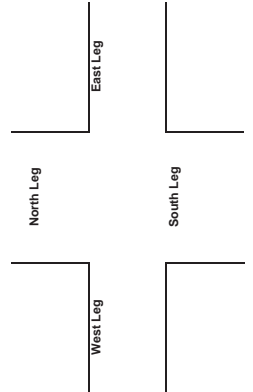
N-S STREET: Scottsdale Rd.
 E-W STREET: Osborn Rd.

Date: 07/31/18
 Day: TUESDAY

City: Scottsdale
 Project #: 18-1362-029

	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	W-LEG	N-LEG	S-LEG	W-LEG
7:00 AM	0	1	2	0	0	0
7:15 AM	1	0	1	1	0	0
7:30 AM	1	1	0	0	0	1
7:45 AM	1	2	1	1	0	0
8:00 AM	2	1	3	0	1	0
8:15 AM	1	0	2	0	0	2
8:30 AM	0	1	1	0	0	0
8:45 AM	1	3	1	0	0	0
TOTAL	7	9	10	2	2	3

	PEDESTRIANS			BICYCLES		
	N-LEG	S-LEG	W-LEG	N-LEG	S-LEG	W-LEG
4:00 PM	2	0	2	0	0	0
4:15 PM	2	1	1	0	2	0
4:30 PM	3	3	4	0	0	0
4:45 PM	1	2	2	1	0	1
5:00 PM	0	1	3	1	1	1
5:15 PM	1	4	1	0	0	0
5:30 PM	2	1	0	0	0	0
5:45 PM	1	2	2	0	0	0
TOTAL	12	14	12	2	3	2



APPENDIX C

EXISTING PEAK HOUR ANALYSIS

Existing AM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

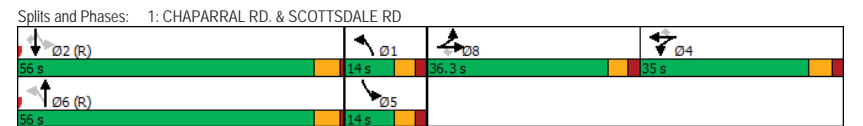
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	54	100	37	445	175	255	14	973	173	149	1264	77
Future Volume (vph)	54	100	37	445	175	255	14	973	173	149	1264	77
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4	5.6	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.97	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1676	1945	1478	3252	1945	1478	1676	5197	1676	3711	1458	1458
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.06	1.00	0.15	1.00	1.00	1.00
Satd. Flow (perm)	1676	1945	1478	3252	1945	1478	114	5197	258	3711	1458	1458
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.89	0.89	0.89	0.88	0.88	0.88
Adj. Flow (vph)	57	105	39	489	192	280	16	1093	194	169	1436	88
RTOR Reduction (vph)	0	0	0	0	0	230	0	14	0	0	0	44
Lane Group Flow (vph)	57	105	39	489	192	50	16	1273	0	169	1436	44
Confl. Peds. (#/hr)			2			2			2			2
Bus Blockages (#/hr)	0	2	0	0	2	0	0	2	0	0	2	0
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	Perm
Protected Phases	8	8		4	4		1	6	5	2		
Permitted Phases			8			4	6		2			2
Actuated Green, G (s)	14.9	14.9	14.9	25.3	25.3	25.3	78.8	70.4	78.8	70.4	70.4	70.4
Effective Green, g (s)	14.9	14.9	14.9	25.3	25.3	25.3	78.8	70.4	78.8	70.4	70.4	70.4
Actuated g/C Ratio	0.11	0.11	0.11	0.18	0.18	0.18	0.56	0.50	0.56	0.50	0.50	0.50
Clearance Time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4	5.6	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.2	2.0	0.2	0.2	0.2
Lane Grp Cap (vph)	176	205	155	582	348	264	156	2589	228	1848	726	726
v/s Ratio Prot	0.03	c0.05		c0.15	0.10		0.01	0.24	c0.04	c0.39		
v/s Ratio Perm			0.03			0.03	0.05		0.37		0.03	
v/c Ratio	0.32	0.51	0.25	0.84	0.55	0.19	0.10	0.49	0.74	0.78	0.06	0.06
Uniform Delay, d1	58.5	59.8	58.1	56.0	52.8	49.3	43.7	23.6	39.1	29.0	18.3	18.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.9	0.3	10.1	1.1	0.1	0.1	0.7	10.8	3.3	0.2	0.2
Delay (s)	58.9	60.7	58.4	66.2	53.9	49.4	43.8	24.2	49.9	32.3	18.5	18.5
Level of Service	E	E	E	E	D	D	D	C	D	C	B	B
Approach Delay (s)		59.7			58.9			24.5		33.3		
Approach LOS		E			E			C		C		

Intersection Summary			
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	141.3	Sum of lost time (s)	
Intersection Capacity Utilization	76.5%	ICU Level of Service	
Analysis Period (min)	15		
Description: Last Update: Feb 2018			
c Critical Lane Group			

Existing AM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag		Lag			Lead	
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	14	56	35	14	56	36.3
Maximum Split (%)	9.9%	39.6%	24.8%	9.9%	39.6%	25.7%
Minimum Split (s)	11	16	35	11	16	36.3
Yellow Time (s)	3.6	4.4	4	3.6	4.4	3.3
All-Red Time (s)	2	1	2	2	1	2
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	9
Flash Dont Walk (s)		10	22		14	22
Dual Entry	No	Yes	No	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	106	50	15	106	50	120
End Time (s)	120	106	50	120	106	15
Yield/Force Off (s)	114.4	100.6	44	114.4	100.6	9.7
Yield/Force Off 170(s)	114.4	90.6	22	114.4	86.6	129
Local Start Time (s)	56	0	106.3	56	0	70
Local Yield (s)	64.4	50.6	135.3	64.4	50.6	101
Local Yield 170(s)	64.4	40.6	113.3	64.4	36.6	79



Existing AM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	83	2	37	30	5	17	100	981	28	13	674	21
Future Volume (vph)	83	2	37	30	5	17	100	981	28	13	674	21
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1	5.1	5.6	5.6	5.6	5.6	5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	0.91	1.00	0.91
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.96	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1961	1480	1881	1500	1676	5326	1676	5323	1676	5323	1676
Flt Permitted	0.73	1.00	1.00	0.78	1.00	0.36	1.00	0.24	1.00	0.24	1.00	1.00
Satd. Flow (perm)	1290	1961	1480	1525	1500	628	5326	415	5323	415	5323	415
Peak-hour factor, PHF	0.84	0.84	0.84	0.88	0.88	0.88	0.90	0.90	0.90	0.93	0.93	0.93
Adj. Flow (vph)	99	2	44	34	6	19	111	1090	31	14	725	23
RTOR Reduction (vph)	0	0	38	0	0	16	0	1	0	0	2	0
Lane Group Flow (vph)	99	2	6	0	40	3	111	1120	0	14	746	0
Confl. Peds. (#/hr)			1						3			4
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		8			4			6				2
Permitted Phases	8		8	4		4	6			2		
Actuated Green, G (s)	17.1	17.1	17.1		17.1	17.1	97.3	97.3		97.3	97.3	
Effective Green, g (s)	17.1	17.1	17.1		17.1	17.1	97.3	97.3		97.3	97.3	
Actuated g/C Ratio	0.14	0.14	0.14		0.14	0.14	0.78	0.78		0.78	0.78	
Clearance Time (s)	5.1	5.1	5.1		5.1	5.1	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	176	268	202		208	205	488	4142		322	4140	
v/s Ratio Prot		0.00					c0.21				0.14	
v/s Ratio Perm	c0.08		0.00		0.03	0.00	0.18			0.03		
v/c Ratio	0.56	0.01	0.03		0.19	0.01	0.23	0.27		0.04	0.18	
Uniform Delay, d1	50.5	46.7	46.8		47.9	46.7	3.8	3.9		3.2	3.6	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	0.0	0.0		0.2	0.0	1.1	0.2		0.3	0.1	
Delay (s)	52.9	46.7	46.8		48.0	46.7	4.8	4.1		3.5	3.7	
Level of Service	D	D	D		D	D	A	A		A	A	
Approach Delay (s)		51.0			47.6		4.1			3.7		
Approach LOS		D			D		A			A		

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	125.1	Sum of lost time (s)	10.7
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

Description: Last Update: Sept 2017
c Critical Lane Group

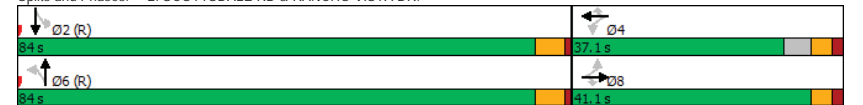
Existing AM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	84	37.1	84	41.1
Maximum Split (%)	67.1%	29.7%	67.1%	32.9%
Minimum Split (s)	16	37.1	16	41.1
Yellow Time (s)	4.4	3.3	4.4	3.3
All-Red Time (s)	1.2	1.8	1.2	1.8
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	11
Flash Dont Walk (s)	18	25	13	25
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	93	51.9	93	51.9
End Time (s)	51.9	93	51.9	93
Yield/Force Off (s)	46.3	87.9	46.3	87.9
Yield/Force Off 170(s)	28.3	62.9	33.3	62.9
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.4	120	78.4	120
Local Yield 170(s)	60.4	95	65.4	95

Intersection Summary	
Cycle Length	125.1
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 93 (74%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	

Splits and Phases: 2: SCOTTSDALE RD & RANCHO VISTA DR.



Existing AM Southbridge Expansion
 3: HIGHLAND AVE/Granada Ave & SCOTTSDALE RD HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (vph)	328	17	22	9	4	15	22	772	21	33	669	49
Future Volume (vph)	328	17	22	9	4	15	22	772	21	33	669	49
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.88		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3252	1782		1676	1728		1676	5327		1676	5292	
Flt Permitted	0.95	1.00		0.95	1.00		0.34	1.00		0.29	1.00	
Satd. Flow (perm)	3252	1782		1676	1728		600	5327		515	5292	
Peak-hour factor, PHF	0.91	0.91	0.91	0.81	0.81	0.81	0.88	0.88	0.88	0.93	0.93	0.93
Adj. Flow (vph)	360	19	24	11	5	19	25	877	24	35	719	53
RTOR Reduction (vph)	0	20	0	0	18	0	0	2	0	0	5	0
Lane Group Flow (vph)	360	23	0	11	6	0	25	899	0	35	767	0
Confl. Peds. (#/hr)			2						4			2
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6			2	
Permitted Phases							6			2		
Actuated Green, G (s)	19.9	19.9		4.2	4.2		81.1	81.1		81.1	81.1	
Effective Green, g (s)	19.9	19.9		4.2	4.2		81.1	81.1		81.1	81.1	
Actuated g/C Ratio	0.16	0.16		0.03	0.03		0.67	0.67		0.67	0.67	
Clearance Time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	534	292		58	59		401	3567		344	3544	
v/s Ratio Prot	c0.11	0.01		c0.01	0.00			c0.17			0.14	
v/s Ratio Perm							0.04			0.07		
v/c Ratio	0.67	0.08		0.19	0.10		0.06	0.25		0.10	0.22	
Uniform Delay, d1	47.6	42.8		56.8	56.6		6.9	7.9		7.1	7.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.6	0.0		0.6	0.3		0.3	0.2		0.6	0.1	
Delay (s)	50.2	42.9		57.4	56.9		7.2	8.1		7.7	7.9	
Level of Service	D	D		E	E		A	A		A	A	
Approach Delay (s)		49.4			57.0			8.1			7.9	
Approach LOS		D			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	15.9
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		

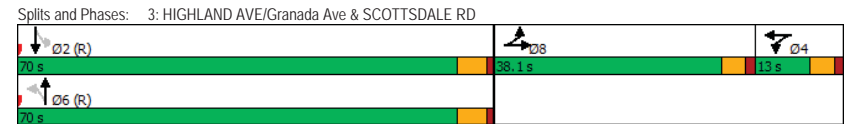
Description: Last Update: Sept 2017

c Critical Lane Group

Existing AM Southbridge Expansion
 3: HIGHLAND AVE/Granada Ave & SCOTTSDALE RD Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	70	13	70	38.1
Maximum Split (%)	57.8%	10.7%	57.8%	31.5%
Minimum Split (s)	30.7	13	28.7	38.1
Yellow Time (s)	4.4	3.6	4.4	3.6
All-Red Time (s)	1.3	1.5	1.3	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	1	2	1	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8		7	9
Flash Dont Walk (s)	17		16	24
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	42	29	42	112
End Time (s)	112	42	112	29
Yield/Force Off (s)	106.3	36.9	106.3	23.9
Yield/Force Off 170(s)	89.3	36.9	90.3	121
Local Start Time (s)	0	108.1	0	70
Local Yield (s)	64.3	116	64.3	103
Local Yield 170(s)	47.3	116	48.3	79

Intersection Summary	
Cycle Length	121.1
Control Type	Actuated-Coordinated
Natural Cycle	85
Offset: (35%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



Existing AM
4: Fashion Square Drive

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	5	0	12	4	0	0	4	412	12	21	889	35
Future Volume (vph)	5	0	12	4	0	0	4	412	12	21	889	35
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		5.5		5.2			5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor		1.00		1.00			1.00	0.95	1.00	1.00	0.91	1.00
Frbp, ped/bikes		1.00		1.00			1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00			1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.90		1.00			1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99		0.95			0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1745		1676			1676	3725	1465	1676	5353	1466
Flt Permitted		0.91		1.00			0.28	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)		1602		1765			502	3725	1465	870	5353	1466
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	0	13	4	0	0	4	448	13	23	966	38
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	1	0	0	4
Lane Group Flow (vph)	0	0	0	4	0	0	4	448	12	23	966	34
Confl. Peds. (#/hr)						1			1			1
Turn Type	Perm	NA		Perm			Perm	NA	Perm	Perm	NA	Perm
Protected Phases		8		4		4		6		6		2
Permitted Phases	8			4			6		6	2		2
Actuated Green, G (s)		2.9		3.2			106.4	106.4	106.4	106.4	106.4	106.4
Effective Green, g (s)		2.9		3.2			106.4	106.4	106.4	106.4	106.4	106.4
Actuated g/C Ratio		0.02		0.03			0.89	0.89	0.89	0.89	0.89	0.89
Clearance Time (s)		5.5		5.2			5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)		3.0		3.0			3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		38		47			445	3302	1298	771	4746	1299
v/s Ratio Prot								0.12			c0.18	
v/s Ratio Perm		0.00		c0.00			0.01		0.01	0.03		0.02
v/c Ratio		0.01		0.09			0.01	0.14	0.01	0.03	0.20	0.03
Uniform Delay, d1		57.2		57.0			0.8	0.9	0.8	0.8	0.9	0.8
Progression Factor		1.00		1.00			1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.1		0.8			0.0	0.1	0.0	0.1	0.1	0.0
Delay (s)		57.3		57.8			0.8	1.0	0.8	0.9	1.0	0.8
Level of Service		E		E			A	A	A	A	A	A
Approach Delay (s)		57.3			57.8			1.0			1.0	
Approach LOS		E			E			A			A	
Intersection Summary												
HCM 2000 Control Delay		1.8					HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio		0.20										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)		10.7			
Intersection Capacity Utilization		41.6%					ICU Level of Service		A			
Analysis Period (min)		15										
c Critical Lane Group												

Existing AM
4: Fashion Square Drive

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	82	38	82	38
Maximum Split (%)	68.3%	31.7%	68.3%	31.7%
Minimum Split (s)	16	21.2	16	21.5
Yellow Time (s)	4	3	4	3.3
All-Red Time (s)	1.2	2.2	1.2	2.2
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	5
Flash Dont Walk (s)	16	11	10	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	82	0	82
End Time (s)	82	0	82	0
Yield/Force Off (s)	76.8	114.8	76.8	114.5
Yield/Force Off 170(s)	60.8	103.8	66.8	103.5
Local Start Time (s)	0	82	0	82
Local Yield (s)	76.8	114.8	76.8	114.5
Local Yield 170(s)	60.8	103.8	66.8	103.5
Intersection Summary				
Cycle Length	120			
Control Type	Actuated-Coordinated			
Natural Cycle	40			
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				



Existing AM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	74	1058	89	148	963	46	187	321	147	50	200	50
Future Volume (vph)	74	1058	89	148	963	46	187	321	147	50	200	50
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5285		1676	5313		1676	1961	1479	1676	1961	1478
Flt Permitted	0.21	1.00		0.16	1.00		0.51	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)	362	5285		289	5313		907	1961	1479	443	1961	1478
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	1150	97	161	1047	50	203	349	160	54	217	54
RTOR Reduction (vph)	0	8	0	0	5	0	0	0	108	0	0	42
Lane Group Flow (vph)	80	1239	0	161	1092	0	203	349	52	54	217	12
Confl. Peds. (#/hr)			1			5			2			3
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	3		4	3		2	1		2	1	
Permitted Phases	3			3			1		1	1		1
Actuated Green, G (s)	54.2	50.2		54.2	50.2		26.1	22.1	22.1	26.1	22.1	22.1
Effective Green, g (s)	54.2	50.2		54.2	50.2		26.1	22.1	22.1	26.1	22.1	22.1
Actuated g/C Ratio	0.54	0.50		0.54	0.50		0.26	0.22	0.22	0.26	0.22	0.22
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	245	2619		209	2632		264	427	322	162	427	322
v/s Ratio Prot	0.01	0.23		c0.03	0.21		c0.03	c0.18		0.01	0.11	
v/s Ratio Perm	0.16			c0.38			0.17		0.04	0.07		0.01
v/c Ratio	0.33	0.47		0.77	0.42		0.77	0.82	0.16	0.33	0.51	0.04
Uniform Delay, d1	18.8	16.8		28.3	16.2		37.8	37.7	32.1	39.8	34.8	31.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.0		14.7	0.0		11.4	11.0	0.1	0.4	0.3	0.0
Delay (s)	19.1	16.9		43.0	16.3		49.3	48.6	32.2	40.2	35.2	31.2
Level of Service	B	B		D	B		D	D	C	D	D	C
Approach Delay (s)		17.0			19.7			45.1			35.4	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	101.3	Sum of lost time (s)	21.0
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

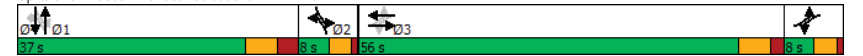
Existing AM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4
Movement	NBSB	NBSBL	EBWB	EBWBL
Lead/Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize				
Recall Mode	None	None	Ped	None
Maximum Split (s)	37	8	56	8
Maximum Split (%)	33.9%	7.3%	51.4%	7.3%
Minimum Split (s)	37	8	56	8
Yellow Time (s)	4.2	3	4.2	3
All-Red Time (s)	2.8	1	1.8	1
Minimum Initial (s)	8	4	10	4
Vehicle Extension (s)	2	1	1	1
Minimum Gap (s)	3	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		33	
Flash Dont Walk (s)	23		17	
Dual Entry	No	No	No	No
Inhibit Max	No	Yes	No	Yes
Start Time (s)	0	37	45	101
End Time (s)	37	45	101	0
Yield/Force Off (s)	30	41	95	105
Yield/Force Off 170(s)	7	41	78	105
Local Start Time (s)	72	0	8	64
Local Yield (s)	102	4	58	68
Local Yield 170(s)	79	4	41	68

Intersection Summary	
Cycle Length	109
Control Type	Actuated-Uncoordinated
Natural Cycle	110

Splits and Phases: 5: 68th Street & CAMELBACK RD.



Existing AM
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↘↘↘	↘	↘	↘↘↘	↘	↘↘	↘↘	↘	↘↘	↘↘↘	↘
Traffic Volume (vph)	186	847	156	50	662	39	119	227	34	14	335	486
Future Volume (vph)	186	847	156	50	662	39	119	227	34	14	335	486
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5353	1479	1676	5304		3252	3725	1486	3252	5353	1490
Flt Permitted	0.26	1.00	1.00	0.20	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	461	5353	1479	359	5304		3252	3725	1486	3252	5353	1490
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	214	974	179	59	779	46	135	258	39	16	372	540
RTOR Reduction (vph)	0	0	81	0	5	0	0	0	24	0	0	48
Lane Group Flow (vph)	214	974	98	59	820	0	135	258	15	16	372	492
Confl. Peds. (#/hr)			2			2			5			3
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	3	8		7	4		1	6	7	5	2	3
Permitted Phases	8		8	4					6			2
Actuated Green, G (s)	68.7	46.3	46.3	68.7	46.3		12.1	25.7	48.1	5.0	18.6	41.0
Effective Green, g (s)	68.7	46.3	46.3	68.7	46.3		12.1	25.7	48.1	5.0	18.6	41.0
Actuated g/C Ratio	0.56	0.38	0.38	0.56	0.38		0.10	0.21	0.40	0.04	0.15	0.34
Clearance Time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Vehicle Extension (s)	2.0	0.2	0.2	2.0	0.2		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	484	2038	563	445	2019		323	787	656	133	818	571
v/s Ratio Prot	0.08	c0.18		0.02	0.15		c0.04	0.07	0.00	0.00	0.07	c0.16
v/s Ratio Perm	0.17		0.07	0.05					0.01			0.17
v/c Ratio	0.44	0.48	0.17	0.13	0.41		0.42	0.33	0.02	0.12	0.45	0.86
Uniform Delay, d1	25.4	28.5	25.0	20.2	27.6		51.4	40.6	22.4	56.2	46.9	37.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1	0.1	0.0	0.0		0.3	1.1	0.0	0.1	1.8	12.3
Delay (s)	25.6	28.6	25.0	20.3	27.6		51.8	41.7	22.4	56.3	48.7	50.0
Level of Service	C	C	C	C	C		D	D	C	E	D	D
Approach Delay (s)		27.6			27.1			43.1			49.6	
Approach LOS		C			C			D			D	

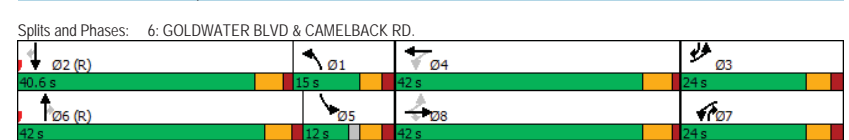
Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	121.6	Sum of lost time (s)	22.2
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		

Description: Last Update: Sept 17
c Critical Lane Group

Existing AM
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBTL	SBL	NBT	WBL	EBTL
Lead/Lag	Lag	Lead			Lag	Lead		
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Ped	None	C-Min	None	Ped
Maximum Split (s)	15	40.6	24	42	12	42	24	42
Maximum Split (%)	12.3%	33.4%	19.7%	34.5%	9.9%	34.5%	19.7%	34.5%
Minimum Split (s)	11	40.6	11	31	11	35.6	11	33
Yellow Time (s)	3.3	4	3.6	4.4	3.3	4	3.6	4.4
All-Red Time (s)	2	1.6	2	1.3	2	1.6	2	1.3
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	0.2	2	2	2	0.2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		7		7		7
Flash Dont Walk (s)		27		24		23		26
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	40.6	0	97.6	55.6	42	0	97.6	55.6
End Time (s)	55.6	40.6	0	97.6	55.6	42	0	97.6
Yield/Force Off (s)	50.3	35	116	91.9	50.3	36.4	116	91.9
Yield/Force Off 170(s)	50.3	8	116	67.9	50.3	13.4	116	65.9
Local Start Time (s)	40.6	0	97.6	55.6	42	0	97.6	55.6
Local Yield (s)	50.3	35	116	91.9	50.3	36.4	116	91.9
Local Yield 170(s)	50.3	8	116	67.9	50.3	13.4	116	65.9



Existing AM
7: SCOTTSDALE RD & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	120	638	181	67	567	121	190	642	43	132	584	104
Future Volume (vph)	120	638	181	67	567	121	190	642	43	132	584	104
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.91		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3252	3725	1479	1676	3608		3252	5292		3252	3725	1451
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3252	3725	1479	1676	3608		3252	5292		3252	3725	1451
Peak-hour factor, PHF	0.81	0.81	0.81	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	148	788	223	73	616	132	207	698	47	139	615	109
RTOR Reduction (vph)	0	0	69	0	16	0	0	6	0	0	0	69
Lane Group Flow (vph)	148	788	154	73	732	0	207	739	0	139	615	40
Confl. Peds. (#/hr)			6			18			16			16
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8	1	7	4		1	6		5	2	
Permitted Phases			8									2
Actuated Green, G (s)	11.4	32.3	44.5	9.9	30.8		12.2	43.6		12.8	44.4	44.4
Effective Green, g (s)	11.4	32.3	44.5	9.9	30.8		12.2	43.6		12.8	44.4	44.4
Actuated g/C Ratio	0.10	0.27	0.37	0.08	0.26		0.10	0.36		0.11	0.37	0.37
Clearance Time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	308	1002	610	138	926		330	1922		346	1378	536
v/s Ratio Prot	c0.05	c0.21	0.03	0.04	0.20		c0.06	0.14		0.04	c0.17	
v/s Ratio Perm			0.08									0.03
v/c Ratio	0.48	0.79	0.25	0.53	0.79		0.63	0.38		0.40	0.45	0.08
Uniform Delay, d1	51.5	40.7	26.2	52.8	41.6		51.7	28.3		50.0	28.5	24.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.03	1.10		1.00	1.00	1.00
Incremental Delay, d2	0.4	3.8	0.1	1.7	4.3		2.6	0.6		0.3	1.0	0.3
Delay (s)	51.9	44.5	26.3	54.5	45.9		56.0	31.8		50.3	29.6	24.8
Level of Service	D	D	C	D	D		E	C		D	C	C
Approach Delay (s)		41.9			46.7			37.0				32.3
Approach LOS		D			D			D				C

Intersection Summary			
HCM 2000 Control Delay	39.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.4
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

Description: Last Update: Sept 2017

c Critical Lane Group

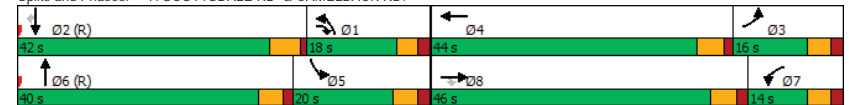
Existing AM
7: SCOTTSDALE RD & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBT	SBL	NBT	WBL	EBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	18	42	16	44	20	40	14	46
Maximum Split (%)	15.0%	35.0%	13.3%	36.7%	16.7%	33.3%	11.7%	38.3%
Minimum Split (s)	10	32.4	11	40.5	11	33	11	34.5
Yellow Time (s)	3	4.4	3.3	4	3.6	3.6	3.3	4
All-Red Time (s)	2	1	2	1.5	2	1.4	2	1.5
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		23		31		24		25
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	10	88	72	28	8	88	74	28
End Time (s)	28	10	88	72	28	8	88	74
Yield/Force Off (s)	23	4.6	82.7	66.5	22.4	3	82.7	68.5
Yield/Force Off 170(s)	23	101.6	82.7	35.5	22.4	99	82.7	43.5
Local Start Time (s)	42	0	104	60	40	0	106	60
Local Yield (s)	55	36.6	114.7	98.5	54.4	35	114.7	100.5
Local Yield 170(s)	55	13.6	114.7	67.5	54.4	11	114.7	75.5

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 88 (73%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green	

Splits and Phases: 7: SCOTTSDALE RD & CAMELBACK RD.



Existing AM Southbridge Expansion
 8: Stetson Dr/DRINKWATER BLVD & SCOTTSDALE RD HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	37	14	15	13	38	292	13	378	14	200	412	83
Future Volume (vph)	37	14	15	13	38	292	13	378	14	200	412	83
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		5.2		5.2	5.2	5.0	5.1	5.1		5.0	5.1	
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frbp, ped/bikes		0.99		1.00	1.00	0.96	1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97		1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected		0.97		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1840		1676	1961	1441	1676	3701		3252	3580	
Flt Permitted		0.83		0.71	1.00	1.00	0.46	1.00		0.45	1.00	
Satd. Flow (perm)		1566		1256	1961	1441	810	3701		1553	3580	
Peak-hour factor, PHF	0.80	0.80	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	46	18	19	14	42	324	14	420	16	211	434	87
RTOR Reduction (vph)	0	0	0	0	0	206	0	2	0	0	12	0
Lane Group Flow (vph)	0	83	0	14	42	118	14	434	0	211	509	0
Confl. Peds. (#/hr)			8			35			14			18
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		8		4	5		6			5	2	
Permitted Phases	8		4		4	6		2				
Actuated Green, G (s)		25.6		25.6	25.6	32.8	71.9	71.9		84.1	84.1	
Effective Green, g (s)		25.6		25.6	25.6	32.8	71.9	71.9		84.1	84.1	
Actuated g/C Ratio		0.21		0.21	0.21	0.27	0.60	0.60		0.70	0.70	
Clearance Time (s)		5.2		5.2	5.2	5.0	5.1	5.1		5.0	5.1	
Vehicle Extension (s)		2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		334		267	418	393	485	2217		1190	2508	
v/s Ratio Prot				0.02	c0.02		0.12			0.01	c0.14	
v/s Ratio Perm		0.05		0.01		0.06	0.02			0.11		
v/c Ratio		0.25		0.05	0.10	0.30	0.03	0.20		0.18	0.20	
Uniform Delay, d1		39.2		37.6	37.9	34.5	9.8	10.9		6.0	6.3	
Progression Factor		1.00		0.95	0.98	3.59	1.00	1.00		0.60	0.66	
Incremental Delay, d2		0.1		0.0	0.0	0.2	0.1	0.2		0.0	0.2	
Delay (s)		39.4		35.9	37.3	124.0	9.9	11.1		3.6	4.3	
Level of Service		D		D	D	F	A	B		A	A	
Approach Delay (s)		39.4			111.2			11.1			4.1	
Approach LOS		D			F			B			A	

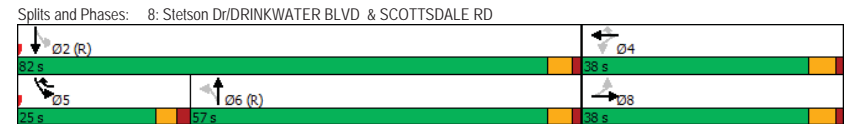
Intersection Summary			
HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		

Description: Last Update: Sept 2017
 c Critical Lane Group

Existing AM Southbridge Expansion
 8: Stetson Dr/DRINKWATER BLVD & SCOTTSDALE RD Timing Report, Sorted By Phase

Phase Number	2	4	5	6	8
Movement	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag		Lead	Lag		
Lead-Lag Optimize					
Recall Mode	C-Max	None	None	C-Max	None
Maximum Split (s)	82	38	25	57	38
Maximum Split (%)	68.3%	31.7%	20.8%	47.5%	31.7%
Minimum Split (s)	21.1	37.2	10	38.1	33.2
Yellow Time (s)	3.6	4	3	3.6	4
All-Red Time (s)	1.5	1.2	2	1.5	1.2
Minimum Initial (s)	10	7	5	10	7
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	9	9		9	7
Flash Dont Walk (s)	7	23		24	21
Dual Entry	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	93	55	93	118	55
End Time (s)	55	93	118	55	93
Yield/Force Off (s)	49.9	87.8	113	49.9	87.8
Yield/Force Off 170(s)	42.9	64.8	113	25.9	66.8
Local Start Time (s)	0	82	0	25	82
Local Yield (s)	76.9	114.8	20	76.9	114.8
Local Yield 170(s)	69.9	91.8	20	52.9	93.8

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 93 (78%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



Existing AM
9: GOLDWATER BLVD & 5TH AVE

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	14	1	6	18	15	16	12	419	85	74	515	82
Future Volume (vph)	14	1	6	18	15	16	12	419	85	74	515	82
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2	5.2	4.0	4.0	4.0	5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.91	1.00	0.91
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	0.98	1.00	0.98
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1676	1961	1478	1676	1961	1475	1676	3617	1676	5222	1676	5222
Flt Permitted	0.75	1.00	1.00	0.76	1.00	1.00	0.39	1.00	0.44	1.00	0.44	1.00
Satd. Flow (perm)	1318	1961	1478	1336	1961	1475	685	3617	782	5222	782	5222
Peak-hour factor, PHF	0.80	0.92	0.80	0.92	0.92	0.92	0.90	0.90	0.92	0.92	0.90	0.90
Adj. Flow (vph)	18	1	8	20	16	17	13	466	92	80	572	91
RTOR Reduction (vph)	0	0	7	0	0	15	0	7	0	0	9	0
Lane Group Flow (vph)	18	1	1	20	16	2	13	551	0	80	654	0
Confl. Peds. (#/hr)			2			2			2			3
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4		4	6		2		2	
Actuated Green, G (s)	11.4	11.4	11.4	12.6	12.6	12.6	98.2	98.2	98.2	98.2	98.2	98.2
Effective Green, g (s)	11.4	11.4	11.4	12.6	12.6	12.6	98.2	98.2	98.2	98.2	98.2	98.2
Actuated g/C Ratio	0.10	0.10	0.10	0.10	0.10	0.10	0.82	0.82	0.82	0.82	0.82	0.82
Clearance Time (s)	5.2	5.2	5.2	4.0	4.0	4.0	5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	125	186	140	140	205	154	560	2959	639	4273	639	4273
v/s Ratio Prot		0.00			0.01			c0.15			0.13	
v/s Ratio Perm	0.01		0.00	c0.01		0.00	0.02		0.10			
v/c Ratio	0.14	0.01	0.01	0.14	0.08	0.01	0.02	0.19	0.13	0.15	0.13	0.15
Uniform Delay, d1	49.8	49.2	49.2	48.8	48.5	48.1	2.0	2.3	2.2	2.3	2.2	2.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0	0.0	0.5	0.2	0.0	0.1	0.1	0.4	0.1	0.4	0.1
Delay (s)	50.0	49.2	49.2	49.3	48.6	48.2	2.1	2.5	2.6	2.3	2.6	2.3
Level of Service	D	D	D	D	D	D	A	A	A	A	A	A
Approach Delay (s)		49.7			48.7			2.5			2.4	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.4
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		

Description: Last Update: Sept 2017
c Critical Lane Group

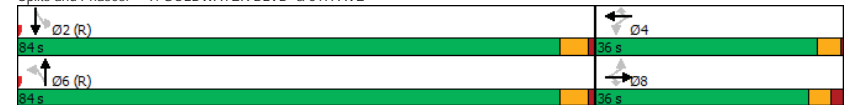
Existing AM
9: GOLDWATER BLVD & 5TH AVE

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	Min
Maximum Split (s)	84	36	84	36
Maximum Split (%)	70.0%	30.0%	70.0%	30.0%
Minimum Split (s)	16	20	16	34.2
Yellow Time (s)	4	3.5	4	3.3
All-Red Time (s)	1.2	0.5	1.2	1.9
Minimum Initial (s)	10	4	10	7
Vehicle Extension (s)	2	3	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	8
Flash Dont Walk (s)	14	11	11	21
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	20	104	20	104
End Time (s)	104	20	104	20
Yield/Force Off (s)	98.8	16	98.8	14.8
Yield/Force Off 170(s)	84.8	5	87.8	14.8
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.8	116	78.8	114.8
Local Yield 170(s)	64.8	105	67.8	114.8

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	55
Offset: 20 (17%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	

Splits and Phases: 9: GOLDWATER BLVD & 5TH AVE



Existing AM
10: Marshall Way & 5TH AVE.

Southbridge Expansion
HCM 6th Roundabout

Intersection			
Intersection Delay, s/veh 3.4			
Intersection LOS A			
Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	141	82	47
Demand Flow Rate, veh/h	144	83	48
Vehicles Circulating, veh/h	18	8	109
Vehicles Exiting, veh/h	73	149	53
Ped Vol Crossing Leg, #/h	0	1	5
Ped Cap Adj	1.000	1.000	0.999
Approach Delay, s/veh	3.6	3.1	3.3
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	144	83	48
Cap Entry Lane, veh/h	1355	1369	1235
Entry HV Adj Factor	0.978	0.985	0.979
Flow Entry, veh/h	141	82	47
Cap Entry, veh/h	1325	1347	1208
V/C Ratio	0.106	0.061	0.039
Control Delay, s/veh	3.6	3.1	3.3
LOS	A	A	A
95th %tile Queue, veh	0	0	0

Existing AM
10: Marshall Way & 5TH AVE.

Southbridge Expansion
HCM 6th AWSC

Intersection						
Intersection Delay, s/veh 7.6						
Intersection LOS A						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	98	31	17	59	7	36
Future Vol, veh/h	98	31	17	59	7	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	107	34	18	64	8	39
Number of Lanes	1	0	0	1	1	0
Approach	EB	WB	NB			
Opposing Approach	WB	EB				
Opposing Lanes	1	1	0			
Conflicting Approach Left		NB	EB			
Conflicting Lanes Left	0	1	1			
Conflicting Approach Right	NB		WB			
Conflicting Lanes Right	1	0	1			
HCM Control Delay	7.7	7.7	7.1			
HCM LOS	A	A	A			
Lane	NBLn1	EBLn1	WBLn1			
Vol Left, %	16%	0%	22%			
Vol Thru, %	0%	76%	78%			
Vol Right, %	84%	24%	0%			
Sign Control	Stop	Stop	Stop			
Traffic Vol by Lane	43	129	76			
LT Vol	7	0	17			
Through Vol	0	98	59			
RT Vol	36	31	0			
Lane Flow Rate	47	140	83			
Geometry Grp	1	1	1			
Degree of Util (X)	0.05	0.153	0.096			
Departure Headway (Hd)	3.843	3.935	4.168			
Convergence, Y/N	Yes	Yes	Yes			
Cap	915	909	857			
Service Time	1.939	1.97	2.208			
HCM Lane V/C Ratio	0.051	0.154	0.097			
HCM Control Delay	7.1	7.7	7.7			
HCM Lane LOS	A	A	A			
HCM 95th-tile Q	0.2	0.5	0.3			

Existing AM
11: 5TH AVE. & Stetson Dr

Southbridge Expansion
HCM 6th AWSC

Intersection						
Intersection Delay, s/veh	7.6					
Intersection LOS	A					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	71	52	25	37	6	37
Future Vol, veh/h	71	52	25	37	6	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	77	57	27	40	7	40
Number of Lanes	0	1	1	0	1	0
Approach	EB	WB	SB			
Opposing Approach	WB	EB				
Opposing Lanes	1	1	0			
Conflicting Approach Left	SB		WB			
Conflicting Lanes Left	1	0	1			
Conflicting Approach Right		SB	EB			
Conflicting Lanes Right	0	1	1			
HCM Control Delay	8	7.1	7.1			
HCM LOS	A	A	A			
Lane	EBLn1	WBLn1	SBLn1			
Vol Left, %	58%	0%	14%			
Vol Thru, %	42%	40%	0%			
Vol Right, %	0%	60%	86%			
Sign Control	Stop	Stop	Stop			
Traffic Vol by Lane	123	62	43			
LT Vol	71	0	6			
Through Vol	52	25	0			
RT Vol	0	37	37			
Lane Flow Rate	134	67	47			
Geometry Grp	1	1	1			
Degree of Util (X)	0.155	0.07	0.049			
Departure Headway (Hd)	4.183	3.759	3.789			
Convergence, Y/N	Yes	Yes	Yes			
Cap	858	948	930			
Service Time	2.206	1.804	1.876			
HCM Lane V/C Ratio	0.156	0.071	0.051			
HCM Control Delay	8	7.1	7.1			
HCM Lane LOS	A	A	A			
HCM 95th-tile Q	0.5	0.2	0.2			

Existing AM
12: Craftsman Ct & 5TH AVE.

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	53	3	17	63	1	1
Future Vol, veh/h	53	3	17	63	1	1
Conflicting Peds, #/hr	0	2	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	58	3	18	68	1	1
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	63	0	166	63
Stage 1	-	-	-	-	62	-
Stage 2	-	-	-	-	104	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1540	-	824	1002
Stage 1	-	-	-	-	961	-
Stage 2	-	-	-	-	920	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1537	-	812	999
Mov Cap-2 Maneuver	-	-	-	-	812	-
Stage 1	-	-	-	-	948	-
Stage 2	-	-	-	-	920	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	1.6	9			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	896	-	-	1537	-	
HCM Lane V/C Ratio	0.002	-	-	0.012	-	
HCM Control Delay (s)	9	-	-	7.4	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

Existing AM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (vph)	13	14	15	14	9	9	32	418	18	16	411	26
Future Volume (vph)	13	14	15	14	9	9	32	418	18	16	411	26
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		6.0		6.0	6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Flpb. ped/bikes		0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb. ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.95		1.00	0.93		1.00	0.99		1.00	0.99	
Flt Protected		0.98		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1828		1676	1795		1676	3698		1676	3685	
Flt Permitted		0.89		0.77	1.00		0.48	1.00		0.48	1.00	
Satd. Flow (perm)		1648		1357	1795		847	3698		848	3685	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	15	16	15	10	10	35	454	20	17	447	28
RTOR Reduction (vph)	0	12	0	0	9	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	33	0	15	11	0	35	473	0	17	473	0
Confl. Peds. (#/hr)			6			14			4			12
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		3			3		2	1		2	1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		5.2		5.2	5.2		31.2	27.6		31.2	27.6	
Effective Green, g (s)		5.2		5.2	5.2		31.2	27.6		31.2	27.6	
Actuated g/C Ratio		0.10		0.10	0.10		0.60	0.53		0.60	0.53	
Clearance Time (s)		6.0		6.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0		3.0	3.0		1.0	0.2		1.0	0.2	
Lane Grp Cap (vph)		163		134	178		561	1947		561	1940	
v/s Ratio Prot				0.01			0.00	0.13		0.00	0.13	
v/s Ratio Perm		c0.02		0.01			0.03			0.02		
v/c Ratio		0.20		0.11	0.06		0.06	0.24		0.03	0.24	
Uniform Delay, d1		21.7		21.5	21.4		4.4	6.7		4.3	6.7	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6		0.4	0.1		0.0	0.0		0.0	0.0	
Delay (s)		22.3		21.9	21.5		4.4	6.8		4.3	6.8	
Level of Service		C		C	C		A	A		A	A	
Approach Delay (s)		22.3			21.7			6.6			6.7	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	52.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Existing AM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3
Movement	NBSB	NBSBL	EBWB
Lead/Lag	Lag	Lead	
Lead-Lag Optimize			
Recall Mode	Ped	None	None
Maximum Split (s)	74	74	46
Maximum Split (%)	38.1%	38.1%	23.7%
Minimum Split (s)	30	30	30
Yellow Time (s)	3.2	3.2	3.1
All-Red Time (s)	1.8	1.8	2.9
Minimum Initial (s)	10	10	6
Vehicle Extension (s)	0.2	1	3
Minimum Gap (s)	0.2	0.2	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)	10		9
Flash Dont Walk (s)	10		15
Dual Entry	No	No	No
Inhibit Max	No	No	No
Start Time (s)	74	0	148
End Time (s)	148	74	0
Yield/Force Off (s)	143	69	188
Yield/Force Off 170(s)	133	69	173
Local Start Time (s)	74	0	148
Local Yield (s)	143	69	188
Local Yield 170(s)	133	69	173

Intersection Summary		
Cycle Length		194
Control Type	Actuated-Uncoordinated	
Natural Cycle		90

Splits and Phases: 13: SCOTTSDALE RD & 5TH AVE.



Existing AM Southbridge Expansion
 14: 5TH AVE./STETSON DR. & DRINKWATER BLVD HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	4	2	15	9	41	30	298	156	58	182	5
Traffic Volume (vph)	5	40	2	15	9	41	30	298	156	58	182	5
Future Volume (vph)	5	40	2	15	9	41	30	298	156	58	182	5
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.88		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	1943		1676	1691		1676	3725	1456	1676	3706	
Flt Permitted	0.72	1.00		0.72	1.00		0.62	1.00	1.00	0.55	1.00	
Satd. Flow (perm)	1271	1943		1275	1691		1094	3725	1456	963	3706	
Peak-hour factor, PHF	0.80	0.80	0.80	0.90	0.90	0.90	0.87	0.87	0.87	0.89	0.89	0.89
Adj. Flow (vph)	6	50	2	17	10	46	34	343	179	65	204	6
RTOR Reduction (vph)	0	2	0	0	38	0	0	0	58	0	1	0
Lane Group Flow (vph)	6	51	0	17	18	0	34	343	121	65	209	0
Confl. Peds. (#/hr)			1			7			3			4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	20.0	20.0		20.0	20.0		85.4	81.4	81.4	85.4	81.4	
Effective Green, g (s)	20.0	20.0		20.0	20.0		85.4	81.4	81.4	85.4	81.4	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.71	0.68	0.68	0.71	0.68	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	0.2	0.2	2.0	0.2	
Lane Grp Cap (vph)	211	323		212	281		797	2526	987	709	2513	
v/s Ratio Prot		c0.03			0.01		0.00	c0.09		c0.00	0.06	
v/s Ratio Perm	0.00			0.01			0.03		0.08	0.06		
v/c Ratio	0.03	0.16		0.08	0.06		0.04	0.14	0.12	0.09	0.08	
Uniform Delay, d1	41.9	42.8		42.2	42.1		5.1	6.8	6.8	5.3	6.6	
Progression Factor	1.00	1.00		1.00	1.00		0.86	0.86	0.61	0.61	0.57	
Incremental Delay, d2	0.0	0.1		0.1	0.0		0.0	0.1	0.3	0.0	0.1	
Delay (s)	41.9	42.9		42.3	42.1		4.4	6.0	4.4	3.3	3.8	
Level of Service	D	D		D	D		A	A	A	A	A	
Approach Delay (s)		42.8			42.2			5.4			3.7	
Approach LOS		D			D			A			A	

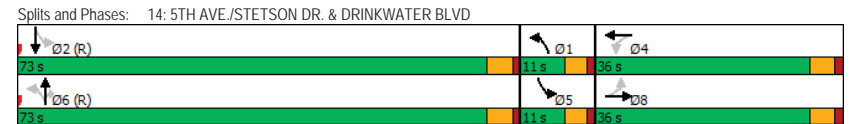
Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.14		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

Description: Last Update: Sept 2017
 c Critical Lane Group

Existing AM Southbridge Expansion
 14: 5TH AVE./STETSON DR. & DRINKWATER BLVD Timing Report, Sorted By Phase

Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag						
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	11	73	36	11	73	36
Maximum Split (%)	9.2%	60.8%	30.0%	9.2%	60.8%	30.0%
Minimum Split (s)	11	16	36	11	16	35
Yellow Time (s)	3.3	4	3.5	3.3	4	3.5
All-Red Time (s)	1.3	1	1.5	1.3	1	1.5
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	8		7	7
Flash Dont Walk (s)		13	23		12	23
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	3	50	14	3	50	14
End Time (s)	14	3	50	14	3	50
Yield/Force Off (s)	9.4	118	45	9.4	118	45
Yield/Force Off 170(s)	9.4	105	22	9.4	106	22
Local Start Time (s)	73	0	84	73	0	84
Local Yield (s)	79.4	68	115	79.4	68	115
Local Yield 170(s)	79.4	55	92	79.4	56	92

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 50 (42%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



Existing AM
15: GOLDWATER BLVD & 3rd Ave

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕		↔	↔
Traffic Vol, veh/h	5	15	498	22	30	520
Future Vol, veh/h	5	15	498	22	30	520
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	16	541	24	33	565
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	845	283	0	0	565	0
Stage 1	553	-	-	-	-	-
Stage 2	292	-	-	-	-	-
Critical Hdwy	6.29	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.67	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	334	714	-	-	1003	-
Stage 1	523	-	-	-	-	-
Stage 2	695	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	323	714	-	-	1003	-
Mov Cap-2 Maneuver	403	-	-	-	-	-
Stage 1	506	-	-	-	-	-
Stage 2	695	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	11.2	0	0.5			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	599	1003	-	
HCM Lane V/C Ratio	-	-	0.036	0.033	-	
HCM Control Delay (s)	-	-	11.2	8.7	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-	

Existing AM
16: 3rd Ave & Marshall Way

Southbridge Expansion
HCM 6th AWSC

Intersection												
Intersection Delay, s/veh	7.5											
Intersection LOS	A											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	39	6	9	14	6	17	48	32	3	20	7
Future Vol, veh/h	8	39	6	9	14	6	17	48	32	3	20	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	42	7	10	15	7	18	52	35	3	22	8
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB	WB	NB	SB								
Opposing Approach	WB	EB	SB	NB								
Opposing Lanes	1	1	1	1								
Conflicting Approach Left	SB	NB	EB	WB								
Conflicting Lanes Left	1	1	1	1								
Conflicting Approach Right	NB	SB	WB	EB								
Conflicting Lanes Right	1	1	1	1								
HCM Control Delay	7.5	7.4	7.5	7.3								
HCM LOS	A	A	A	A								
Lane	NBLn1	EBLn1	WBLn1	SBLn1								
Vol Left, %	18%	15%	31%	10%								
Vol Thru, %	49%	74%	48%	67%								
Vol Right, %	33%	11%	21%	23%								
Sign Control	Stop	Stop	Stop	Stop								
Traffic Vol by Lane	97	53	29	30								
LT Vol	17	8	9	3								
Through Vol	48	39	14	20								
RT Vol	32	6	6	7								
Lane Flow Rate	105	58	32	33								
Geometry Grp	1	1	1	1								
Degree of Util (X)	0.116	0.067	0.036	0.037								
Departure Headway (Hd)	3.95	4.16	4.156	4.049								
Convergence, Y/N	Yes	Yes	Yes	Yes								
Cap	900	853	852	875								
Service Time	2.004	2.226	2.229	2.116								
HCM Lane V/C Ratio	0.117	0.068	0.038	0.038								
HCM Control Delay	7.5	7.5	7.4	7.3								
HCM Lane LOS	A	A	A	A								
HCM 95th-tile Q	0.4	0.2	0.1	0.1								


Existing AM
17: 3rd Ave & Craftsman Ct

Southbridge Expansion
HCM 6th WSC

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	10	49	30	10	15	2
Future Vol, veh/h	10	49	30	10	15	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	53	33	11	16	2
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	44	0	0	114	39	
Stage 1	-	-	-	39	-	
Stage 2	-	-	-	75	-	
Critical Hdwy	4.12	-	-	6.42	6.22	
Critical Hdwy Stg 1	-	-	-	5.42	-	
Critical Hdwy Stg 2	-	-	-	5.42	-	
Follow-up Hdwy	2.218	-	-	3.518	3.318	
Pot Cap-1 Maneuver	1564	-	-	882	1033	
Stage 1	-	-	-	983	-	
Stage 2	-	-	-	948	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	1564	-	-	876	1033	
Mov Cap-2 Maneuver	-	-	-	876	-	
Stage 1	-	-	-	976	-	
Stage 2	-	-	-	948	-	
Approach	EB	WB	SB			
HCM Control Delay, s	1.2	0	9.1			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1564	-	-	-	892	
HCM Lane V/C Ratio	0.007	-	-	-	0.021	
HCM Control Delay (s)	7.3	0	-	-	9.1	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

Existing AM
18: SCOTTSDALE RD & 3RD AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	3	16	9	21	5	51	59	415	26	61	355	18
Future Volume (vph)	3	16	9	21	5	51	59	415	26	61	355	18
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.86		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1840		1676	1668		1676	3687		1676	3725	1464
Flt Permitted	1.00	1.00		1.00	1.00		0.52	1.00		0.48	1.00	1.00
Satd. Flow (perm)	1765	1840		1765	1668		924	3687		844	3725	1464
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	17	10	23	5	55	64	451	28	66	386	20
RTOR Reduction (vph)	0	9	0	0	51	0	0	3	0	0	0	6
Lane Group Flow (vph)	3	18	0	23	9	0	64	476	0	66	386	14
Confl. Peds. (#/hr)			7			4			8			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		1
Actuated Green, G (s)	3.9	3.9		3.9	3.9		35.8	35.8		35.8	35.8	35.8
Effective Green, g (s)	3.9	3.9		3.9	3.9		35.8	35.8		35.8	35.8	35.8
Actuated g/C Ratio	0.08	0.08		0.08	0.08		0.72	0.72		0.72	0.72	0.72
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	138	144		138	130		665	2655		607	2683	1054
v/s Ratio Prot		0.01			0.01			c0.13			0.10	
v/s Ratio Perm	0.00			c0.01			0.07			0.08		0.01
v/c Ratio	0.02	0.12		0.17	0.07		0.10	0.18		0.11	0.14	0.01
Uniform Delay, d1	21.1	21.3		21.4	21.2		2.1	2.2		2.1	2.2	2.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.0	0.1		0.2	0.1		0.0	0.0		0.0	0.0	0.0
Delay (s)	21.2	21.5		21.6	21.3		2.1	2.2		2.1	2.2	2.0
Level of Service	C	C		C	C		A	A		A	A	A
Approach Delay (s)		21.4			21.4			2.2			2.2	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay	4.1		HCM 2000 Level of Service				A					
HCM 2000 Volume to Capacity ratio	0.18											
Actuated Cycle Length (s)	49.7				Sum of lost time (s)				10.0			
Intersection Capacity Utilization	54.9%		ICU Level of Service				A					
Analysis Period (min)	15											
c Critical Lane Group												

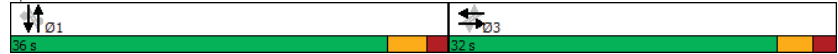
Existing AM
18: SCOTTSDALE RD & 3RD AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

	1	3
Phase Number	1	3
Movement	NBSB	EBWB
Lead/Lag		
Lead-Lag Optimize		
Recall Mode	Ped	None
Maximum Split (s)	36	32
Maximum Split (%)	52.9%	47.1%
Minimum Split (s)	36	32
Yellow Time (s)	3.2	3
All-Red Time (s)	1.8	2
Minimum Initial (s)	10	6
Vehicle Extension (s)	0.2	2
Minimum Gap (s)	1	2
Time Before Reduce (s)	0	0
Time To Reduce (s)	0	0
Walk Time (s)	18	6
Flash Dont Walk (s)	12	15
Dual Entry	No	No
Inhibit Max	No	No
Start Time (s)	0	36
End Time (s)	36	0
Yield/Force Off (s)	31	63
Yield/Force Off 170(s)	19	48
Local Start Time (s)	0	36
Local Yield (s)	31	63
Local Yield 170(s)	19	48

Intersection Summary	
Cycle Length	68
Control Type	Actuated-Uncoordinated
Natural Cycle	70

Splits and Phases: 18: SCOTTSDALE RD & 3RD AVE.



Existing AM
19: DRINKWATER BLVD & 3RD AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	7	1	18	60	9	59	86	455	23	18	159	18
Future Volume (vph)	7	1	18	60	9	59	86	455	23	18	159	18
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00			0.99		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86			0.94		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1679			1784		1676	5306		1676	3725	1444
Flt Permitted	0.57	1.00			0.84		0.63	1.00		0.42	1.00	1.00
Satd. Flow (perm)	998	1679			1531		1109	5306		749	3725	1444
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.83	0.83	0.83	0.81	0.81	0.81
Adj. Flow (vph)	9	1	22	69	10	68	104	548	28	22	196	22
RTOR Reduction (vph)	0	0	0	0	31	0	0	3	0	0	0	5
Lane Group Flow (vph)	9	24	0	0	116	0	104	573	0	22	196	17
Confl. Peds. (#/hr)						2			4			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		8			4			6			2	2
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	16.1	16.1			16.1		93.8	93.8		93.8	93.8	93.8
Effective Green, g (s)	16.1	16.1			16.1		93.8	93.8		93.8	93.8	93.8
Actuated g/C Ratio	0.13	0.13			0.13		0.78	0.78		0.78	0.78	0.78
Clearance Time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	133	225			205		866	4147		585	2911	1128
v/s Ratio Prot		0.01						c0.11			0.05	
v/s Ratio Perm	0.01				c0.08		0.09			0.03		0.01
v/c Ratio	0.07	0.11			0.57		0.12	0.14		0.04	0.07	0.02
Uniform Delay, d1	45.4	45.6			48.7		3.2	3.2		2.9	3.0	2.9
Progression Factor	1.00	1.00			1.00		1.00	1.00		0.35	0.35	0.17
Incremental Delay, d2	0.1	0.1			2.1		0.3	0.1		0.1	0.0	0.0
Delay (s)	45.5	45.7			50.8		3.4	3.3		1.2	1.1	0.5
Level of Service	D	D			D		A	A		A	A	A
Approach Delay (s)		45.6			50.8			3.3			1.0	
Approach LOS		D			D			A			A	

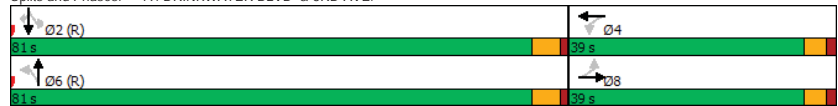
Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.1
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

Existing AM
19: DRINKWATER BLVD & 3RD AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

	↓	←	↑	→
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	Min	C-Min	None
Maximum Split (s)	81	39	81	39
Maximum Split (%)	67.5%	32.5%	67.5%	32.5%
Minimum Split (s)	22.2	38.9	16	30.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	9	7	7
Flash Dont Walk (s)	10	25	20	19
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	62	23	62	23
End Time (s)	23	62	23	62
Yield/Force Off (s)	17.8	57.1	17.8	57.1
Yield/Force Off 170(s)	7.8	57.1	117.8	38.1
Local Start Time (s)	0	81	0	81
Local Yield (s)	75.8	115.1	75.8	115.1
Local Yield 170(s)	65.8	115.1	55.8	96.1
Intersection Summary				
Cycle Length	120			
Control Type	Actuated-Coordinated			
Natural Cycle	65			
Offset: 62 (52%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				

Splits and Phases: 19: DRINKWATER BLVD & 3RD AVE.



Existing AM
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

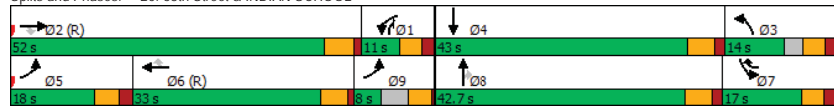
	↖	→	↘	↙	←	↖	↘	↙	↗	↘	↙	↗	↘	↙	↗	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations	↖	↖↖↖	↖	↖	↖↖↖	↖	↖	↖↖↖	↖	↖	↖↖↖	↖	↖↖↖	↖	↖↖↖	
Traffic Volume (vph)	156	645	6	29	617	88	38	476	85	110	299	155				
Future Volume (vph)	156	645	6	29	617	88	38	476	85	110	299	155				
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800				
Total Lost time (s)	5.6	5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5					
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	0.95	1.00					
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99					
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00					
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95					
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00					
Satd. Flow (prot)	1676	5353	1474	1676	5353	1468	1676	3725	1477	1676	3516					
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00					
Satd. Flow (perm)	1676	5353	1474	1676	5353	1468	1676	3725	1477	1676	3516					
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.86	0.86	0.86	0.84	0.84					
Adj. Flow (vph)	175	725	7	32	686	98	44	553	99	131	356					
RTOR Reduction (vph)	0	0	4	0	0	55	0	0	0	0	61					
Lane Group Flow (vph)	175	725	3	32	686	43	44	553	99	131	480					
Conf. Peds. (#/hr)			4			4			7		3					
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA					
Protected Phases	5 9	2		1	6	7	3	8	1	7	4					
Permitted Phases			2			6			8							
Actuated Green, G (s)	18.6	56.4	56.4	5.7	39.6	53.9	13.2	24.6	30.3	14.3	26.0					
Effective Green, g (s)	18.6	56.4	56.4	5.7	39.6	53.9	13.2	24.6	30.3	14.3	26.0					
Actuated g/C Ratio	0.15	0.46	0.46	0.05	0.32	0.44	0.11	0.20	0.25	0.12	0.21					
Clearance Time (s)		5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5					
Vehicle Extension (s)		1.0	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0					
Lane Grp Cap (vph)	254	2460	677	77	1727	644	180	746	428	195	745					
v/s Ratio Prot	c0.10	0.14		0.02	c0.13	0.01	0.03	c0.15	0.01	c0.08	0.14					
v/s Ratio Perm			0.00			0.02			0.06							
v/c Ratio	0.69	0.29	0.00	0.42	0.40	0.07	0.24	0.74	0.23	0.67	0.64					
Uniform Delay, d1	49.3	20.7	18.0	56.9	32.3	19.9	50.2	46.1	36.9	52.0	44.1					
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00					
Incremental Delay, d2	6.1	0.3	0.0	1.3	0.7	0.0	0.3	3.5	0.1	7.0	1.4					
Delay (s)	55.4	21.0	18.0	58.2	33.0	19.9	50.4	49.6	37.0	58.9	45.6					
Level of Service	E	C	B	E	C	B	D	D	D	E	D					
Approach Delay (s)		27.6			32.4			47.8			48.2					
Approach LOS		C			C			D			D					
Intersection Summary																
HCM 2000 Control Delay	37.9					HCM 2000 Level of Service					D					
HCM 2000 Volume to Capacity ratio	0.58															
Actuated Cycle Length (s)	122.7					Sum of lost time (s)					25.6					
Intersection Capacity Utilization	73.2%					ICU Level of Service					D					
Analysis Period (min)	15															
Description: Last Update: Sept 2017																
c Critical Lane Group																

Existing AM
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	↶	→	↷	↓	↶	↷	↶	↷	↑	↶
Phase Number	1	2	3	4	5	6	7	8	9	
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT	EBL	
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead		
Lead-Lag Optimize										
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None	
Maximum Split (s)	11	52	14	43	18	33	17	42.7	8	
Maximum Split (%)	9.0%	42.4%	11.4%	35.0%	14.7%	26.9%	13.9%	34.8%	6.5%	
Minimum Split (s)	11	32.4	11	39.5	11	33	11	42.7	8	
Yellow Time (s)	3.3	4.4	3.3	4	3.6	4	3.3	4	3.5	
All-Red Time (s)	2	1	1.9	1.5	2	1	2	1.7	0.5	
Minimum Initial (s)	5	10	5	7	5	10	5	7	4	
Vehicle Extension (s)	2	1	2	2	2	1	2	2	2	
Minimum Gap (s)	1	1	1	1	1	1	1	1	1	
Time Before Reduce (s)	0	0	0	0	0	0	0	0	0	
Time To Reduce (s)	0	0	0	0	0	0	0	0	0	
Walk Time (s)		4		4		4		4		
Flash Dont Walk (s)		23		30		24		33		
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes	No	
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Start Time (s)	64	12	118	75	12	30	117.7	75	63	
End Time (s)	75	64	12	118	30	63	12	117.7	75	
Yield/Force Off (s)	69.7	58.6	6.8	112.5	24.4	58	6.7	112	71	
Yield/Force Off 170(s)	69.7	35.6	6.8	82.5	24.4	34	6.7	79	71	
Local Start Time (s)	52	0	106	63	0	18	105.7	63	51	
Local Yield (s)	57.7	46.6	117.5	100.5	12.4	46	117.4	100	59	
Local Yield 170(s)	57.7	23.6	117.5	70.5	12.4	22	117.4	67	59	
Intersection Summary										
Cycle Length	122.7									
Control Type	Actuated-Coordinated									
Natural Cycle	110									
Offset: 12 (10%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green										

Splits and Phases: 20: 68th Street & INDIAN SCHOOL



Existing AM
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↶	→	↷	↶	↷	↶	↷	↑	↶	↷	↓	↶
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶↷	↶↷	↶↷	↶↷	↶↷	↶↷	↶↷	↶↷	↶↷	↶↷	↶↷	↶↷
Traffic Volume (vph)	166	600	68	54	532	33	64	336	13	34	406	75
Future Volume (vph)	166	600	68	54	532	33	64	336	13	34	406	75
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	1000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.0	3.0	5.3	5.0		5.3	5.3		5.3	5.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		1.00	0.95		1.00	0.91	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3317	3725	1510	3317	3694		1710	1854		1710	5233	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3317	3725	1510	3317	3694		1710	1854		1710	5233	
Peak-hour factor, PHF	0.87	0.87	0.87	0.89	0.89	0.89	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	191	690	78	61	598	37	78	410	16	41	495	91
RTOR Reduction (vph)	0	0	42	0	3	0	0	2	0	0	26	0
Lane Group Flow (vph)	191	690	36	61	632	0	78	424	0	41	560	0
Confl. Peds. (#/hr)	1			1			1			2		
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2											
Actuated Green, G (s)	12.7	56.9	56.9	8.0	52.2		18.3	33.4		7.1	22.2	
Effective Green, g (s)	12.7	56.9	58.9	8.0	52.2		18.3	33.4		7.1	22.2	
Actuated g/C Ratio	0.10	0.45	0.47	0.06	0.41		0.14	0.26		0.06	0.18	
Clearance Time (s)	5.3	5.0	5.0	5.3	5.0		5.3	5.3		5.3	5.3	
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0		2.0	1.0		2.0	1.0	
Lane Grp Cap (vph)	333	1678	704	210	1526		247	490		96	919	
v/s Ratio Prot	c0.06	c0.19		0.02	0.17		0.05	c0.23		c0.02	0.11	
v/s Ratio Perm	0.02											
v/c Ratio	0.57	0.41	0.05	0.29	0.41		0.32	0.86		0.43	0.61	
Uniform Delay, d1	54.2	23.4	18.4	56.4	26.2		48.4	44.3		57.6	48.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	0.7	0.1	0.3	0.8		0.3	14.2		1.1	0.8	
Delay (s)	55.7	24.1	18.6	56.7	27.1		48.7	58.5		58.7	48.8	
Level of Service	E	C	B	E	C		D	E		E	D	
Approach Delay (s)	30.0			29.7			57.0			49.5		
Approach LOS	C			C			E			D		

Intersection Summary

HCM 2000 Control Delay	39.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	126.3	Sum of lost time (s)	20.9
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

Existing AM
21: GOLDWATER BLVD & INDIAN SCHOOL

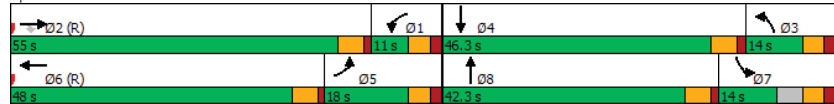
Southbridge Expansion
Timing Report, Sorted By Phase

	1	2	3	4	5	6	7	8
Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	11	55	14	46.3	18	48	14	42.3
Maximum Split (%)	8.7%	43.5%	11.1%	36.7%	14.3%	38.0%	11.1%	33.5%
Minimum Split (s)	11	37	11	46.3	11	35	11	42.3
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1	2	1.3	2	1	2	1.3
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	1	2	1	2	1	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		9		8		9
Flash Dont Walk (s)		24		32		22		28
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	75	20	6	86	68	20	2	86
End Time (s)	86	75	20	6	86	68	20	2
Yield/Force Off (s)	80.7	70	14.7	0.7	80.7	63	14.7	123
Yield/Force Off 170(s)	80.7	46	14.7	0.7	80.7	41	14.7	123
Local Start Time (s)	55	0	112.3	66	48	0	108.3	66
Local Yield (s)	60.7	50	121	107	60.7	43	121	103
Local Yield 170(s)	60.7	26	121	107	60.7	21	121	103

Intersection Summary

Cycle Length	126.3
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 20 (16%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	

Splits and Phases: 21: GOLDWATER BLVD & INDIAN SCHOOL



Existing AM
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↕		↔	↕↕			↕↕				↕↕
Traffic Volume (vph)	25	582	12	62	621	29	4	4	8	2	4	13
Future Volume (vph)	25	582	12	62	621	29	4	4	8	2	4	13
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2				5.1			5.1
Lane Util. Factor	1.00	0.95		1.00	0.95				1.00			1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00				0.99			0.99
Ftpb, ped/bikes	1.00	1.00		1.00	1.00				1.00			1.00
Frt	1.00	1.00		1.00	0.99				0.94			0.91
Flt Protected	0.95	1.00		0.95	1.00				0.99			0.99
Satd. Flow (prot)	1676	3711		1676	3695				1796			1756
Flt Permitted	0.35	1.00		0.41	1.00				0.91			0.96
Satd. Flow (perm)	613	3711		727	3695				1661			1696
Peak-hour factor, PHF	0.94	0.94	0.94	0.81	0.81	0.81	0.86	0.86	0.86	0.80	0.80	0.80
Adj. Flow (vph)	27	619	13	77	767	36	5	5	9	2	5	16
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	8	0	0	15
Lane Group Flow (vph)	27	631	0	77	802	0	0	11	0	0	9	0
Confl. Peds. (#/hr)			4			3			4			2
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			8	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	102.0	102.0		102.0	102.0			7.8			7.8	
Effective Green, g (s)	102.0	102.0		102.0	102.0			7.8			7.8	
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.06			0.06	
Clearance Time (s)	5.2	5.2		5.2	5.2			5.1			5.1	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	520	3151		617	3138			107			110	
v/s Ratio Prot		0.17			c0.22							
v/s Ratio Perm	0.04			0.11			c0.01				0.01	
v/c Ratio	0.05	0.20		0.12	0.26			0.10			0.08	
Uniform Delay, d1	1.4	1.6		1.5	1.7			52.8			52.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	0.1		0.4	0.2			0.1			0.1	
Delay (s)	1.6	1.8		1.9	1.9			53.0			52.9	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		1.8			1.9			53.0			52.9	
Approach LOS		A			A			D			D	

Intersection Summary

HCM 2000 Control Delay	3.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	10.3
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

Description: Last Update: Sept 2017

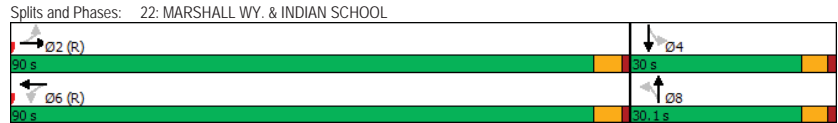
c Critical Lane Group

Existing AM
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	←	↓	→	↑
Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	90	30	90	30.1
Maximum Split (%)	74.9%	25.0%	74.9%	25.1%
Minimum Split (s)	16	29.1	16	30.1
Yellow Time (s)	4	3.6	4	3.6
All-Red Time (s)	1.2	1.5	1.2	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	8
Flash Dont Walk (s)	8	17	7	17
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	118	87.9	118	87.9
End Time (s)	87.9	118	87.9	118
Yield/Force Off (s)	82.7	112.9	82.7	112.9
Yield/Force Off 170(s)	74.7	95.9	75.7	95.9
Local Start Time (s)	0	90	0	90
Local Yield (s)	84.8	115	84.8	115
Local Yield 170(s)	76.8	98	77.8	98

Intersection Summary	
Cycle Length	120.1
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 118 (98%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green	



Existing AM
23: INDIAN SCHOOL & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↖	→	↘	↙	←	↖	↘	↙	↗	↓	↘	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗		↖	↖↗	↖
Traffic Volume (vph)	83	492	49	4	694	96	53	319	65	70	253	53
Future Volume (vph)	83	492	49	4	694	96	53	319	65	70	253	53
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	3667		1676	3641		1676	3616		1676	3725	1454
Flt Permitted	0.26	1.00		0.39	1.00		0.48	1.00		0.30	1.00	1.00
Satd. Flow (perm)	452	3667		695	3641		853	3616		532	3725	1454
Peak-hour factor, PHF	0.94	0.94	0.94	0.91	0.91	0.91	0.83	0.83	0.83	0.86	0.86	0.86
Adj. Flow (vph)	88	523	52	4	763	105	64	384	78	81	294	62
RTOR Reduction (vph)	0	5	0	0	7	0	0	16	0	0	0	46
Lane Group Flow (vph)	88	570	0	4	861	0	64	446	0	81	294	16
Confl. Peds. (#/hr)			8			21			11			20
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	70.1	64.5		70.1	64.5		30.0	26.0		30.0	26.0	31.6
Effective Green, g (s)	70.1	64.5		70.1	64.5		30.0	26.0		30.0	26.0	31.6
Actuated g/C Ratio	0.58	0.54		0.58	0.54		0.25	0.22		0.25	0.22	0.26
Clearance Time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	321	1971		451	1957		240	783		171	807	444
v/s Ratio Prot	c0.01	0.16		0.00	c0.24		0.01	c0.12		c0.02	0.08	0.00
v/s Ratio Perm	0.15			0.00			0.06			0.10		0.01
v/c Ratio	0.27	0.29		0.01	0.44		0.27	0.57		0.47	0.36	0.04
Uniform Delay, d1	20.0	15.2		13.2	16.8		39.3	42.0		45.9	40.0	32.9
Progression Factor	1.00	1.00		0.72	1.14		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.4		0.0	0.7		0.2	0.6		0.8	0.1	0.0
Delay (s)	20.2	15.6		9.5	19.8		39.6	42.6		46.7	40.1	32.9
Level of Service	C	B		A	B		D	D		D	D	C
Approach Delay (s)	16.2			19.7			42.3			40.3		
Approach LOS	B			B			D			D		

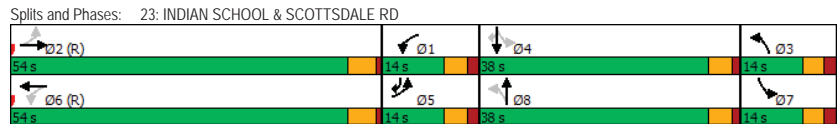
Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

Existing AM
23: INDIAN SCHOOL & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	14	54	14	38	14	54	14	38
Maximum Split (%)	11.7%	45.0%	11.7%	31.7%	11.7%	45.0%	11.7%	31.7%
Minimum Split (s)	11	30	10	32.8	11	33	10	34.8
Yellow Time (s)	3.3	4	3	3.6	3.3	4	3	3.6
All-Red Time (s)	1.8	1	2	1.2	1.8	1	2	1.2
Minimum Initial (s)	5	10	5	10	5	10	5	10
Vehicle Extension (s)	2	1	2	2	2	1	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		8		8
Flash Dont Walk (s)		18		21		20		22
Dual Entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	54	0	106	68	54	0	106	68
End Time (s)	68	54	0	106	68	54	0	106
Yield/Force Off (s)	62.9	49	115	101.2	62.9	49	115	101.2
Yield/Force Off 170(s)	62.9	31	115	80.2	62.9	29	115	79.2
Local Start Time (s)	54	0	106	68	54	0	106	68
Local Yield (s)	62.9	49	115	101.2	62.9	49	115	101.2
Local Yield 170(s)	62.9	31	115	80.2	62.9	29	115	79.2

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green	



Existing AM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	↑
Traffic Volume (vph)	790	20	21	915	1	13
Future Volume (vph)	790	20	21	915	1	13
Ideal Flow (vphpl)	2000	1800	1800	2000	1800	1800
Total Lost time (s)	5.2		5.2	5.2	5.1	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frbp, ped/bikes	1.00		1.00	1.00	0.98	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.87	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3708		1676	3725	1510	
Flt Permitted	1.00		0.32	1.00	1.00	
Satd. Flow (perm)	3708		556	3725	1510	
Peak-hour factor, PHF	0.92	0.92	0.93	0.93	0.80	0.80
Adj. Flow (vph)	859	22	23	984	1	16
RTOR Reduction (vph)	1	0	0	0	15	0
Lane Group Flow (vph)	880	0	23	984	2	0
Confl. Peds. (#/hr)		4				5
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	98.5		98.5	98.5	11.2	
Effective Green, g (s)	98.5		98.5	98.5	11.2	
Actuated g/C Ratio	0.82		0.82	0.82	0.09	
Clearance Time (s)	5.2		5.2	5.2	5.1	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	3043		456	3057	140	
v/s Ratio Prot	0.24			c0.26	c0.00	
v/s Ratio Perm			0.04			
v/c Ratio	0.29		0.05	0.32	0.02	
Uniform Delay, d1	2.5		2.0	2.6	49.4	
Progression Factor	0.62		0.35	0.29	1.00	
Incremental Delay, d2	0.2		0.2	0.3	0.0	
Delay (s)	1.8		0.9	1.0	49.4	
Level of Service	A		A	A	D	
Approach Delay (s)	1.8			1.0	49.4	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	1.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.3
Intersection Capacity Utilization	41.5%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

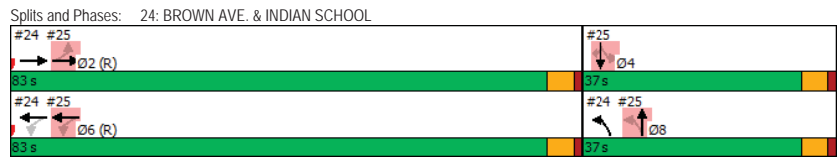
Existing AM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Node Number	24	25	24	24
Movement	EBT	SBTL	WBTL	NBL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	83	37	83	37
Maximum Split (%)	69.2%	30.8%	69.2%	30.8%
Minimum Split (s)	23.2	12.1	27.2	36.1
Yellow Time (s)	4	3.6	4	3.6
All-Red Time (s)	1.2	1.5	1.2	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	11		15	24
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	106	69	106	69
End Time (s)	69	106	69	106
Yield/Force Off (s)	63.8	100.9	63.8	100.9
Yield/Force Off 170(s)	52.8	100.9	48.8	76.9
Local Start Time (s)	0	83	0	83
Local Yield (s)	77.8	114.9	77.8	114.9
Local Yield 170(s)	66.8	114.9	62.8	90.9

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 106 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	



Existing AM
25: BUCKBOARD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	108	690	9	39	887	126	2	1	15	36	0	46
Future Volume (vph)	108	690	9	39	887	126	2	1	15	36	0	46
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2			5.1			5.1	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98			0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1676	3717		1676	3641			1731			1863	1500
Flt Permitted	0.25	1.00		0.35	1.00			0.97			0.74	1.00
Satd. Flow (perm)	446	3717		623	3641			1681			1456	1500
Peak-hour factor, PHF	0.90	0.90	0.90	0.94	0.94	0.94	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	120	767	10	41	944	134	2	1	19	45	0	58
RTOR Reduction (vph)	0	0	0	0	5	0	0	17	0	0	0	53
Lane Group Flow (vph)	120	777	0	41	1073	0	0	6	0	0	45	5
Confl. Peds. (#/hr)			3			5						
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	4
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	98.5	98.5		98.5	98.5			11.2			11.2	11.2
Effective Green, g (s)	98.5	98.5		98.5	98.5			11.2			11.2	11.2
Actuated g/C Ratio	0.82	0.82		0.82	0.82			0.09			0.09	0.09
Clearance Time (s)	5.2	5.2		5.2	5.2			5.1			5.1	5.1
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	2.0
Lane Grp Cap (vph)	366	3051		511	2988			156			135	140
v/s Ratio Prol		0.21			c0.29							
v/s Ratio Perm	0.27			0.07				0.00			c0.03	0.00
v/c Ratio	0.33	0.25		0.08	0.36			0.04			0.33	0.04
Uniform Delay, d1	2.6	2.4		2.1	2.7			49.5			50.9	49.5
Progression Factor	0.33	0.22		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	2.3	0.2		0.3	0.3			0.0			0.5	0.0
Delay (s)	3.2	0.7		2.4	3.1			49.5			51.4	49.5
Level of Service	A	A		A	A			D			D	D
Approach Delay (s)		1.1			3.0			49.5			50.4	
Approach LOS		A			A			D			D	

Intersection Summary

HCM 2000 Control Delay	5.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.3
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			

c Critical Lane Group

Existing AM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	80	539	32	288	1024	187	56	339	165	80	130	16
Future Volume (vph)	80	539	32	288	1024	187	56	339	165	80	130	16
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.1	5.3	5.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1710	3694		1710	3725	1503	1710	3725	1498	3317	3663	
Flt Permitted	0.16	1.00		0.34	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	289	3694		603	3725	1503	1710	3725	1498	3317	3663	
Peak-hour factor, PHF	0.85	0.85	0.85	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	94	634	38	310	1101	201	62	377	183	89	144	18
RTOR Reduction (vph)	0	3	0	0	0	56	0	0	155	0	10	0
Lane Group Flow (vph)	94	669	0	310	1101	145	62	377	28	89	152	0
Confl. Peds. (#/hr)			4			4			8			6
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6			8			
Actuated Green, G (s)	73.3	61.2		73.3	61.2	61.2	14.2	18.7	18.7	8.2	12.7	
Effective Green, g (s)	73.3	61.2		73.3	61.2	61.2	14.2	18.7	18.7	8.2	12.7	
Actuated g/C Ratio	0.61	0.51		0.61	0.51	0.51	0.12	0.15	0.15	0.07	0.10	
Clearance Time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.1	5.3	5.1	
Vehicle Extension (s)	2.0	0.2		2.0	0.2	0.2	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	316	1866		475	1882	759	200	575	231	224	384	
v/s Ratio Prot	0.03	0.18		c0.07	0.30		c0.04	c0.10		0.03	0.04	
v/s Ratio Perm	0.15			c0.33		0.10		0.02				
v/c Ratio	0.30	0.36		0.65	0.59	0.19	0.31	0.66	0.12	0.40	0.40	
Uniform Delay, d1	26.1	18.1		23.9	21.0	16.4	49.0	48.2	44.1	54.1	50.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.5		2.5	1.3	0.6	0.3	2.1	0.1	0.4	0.2	
Delay (s)	26.3	18.6		26.4	22.4	17.0	49.3	50.2	44.2	54.5	50.9	
Level of Service	C	B		C	C	B	D	D	D	D	D	
Approach Delay (s)		19.6			22.5			48.4			52.2	
Approach LOS		B			C			D			D	

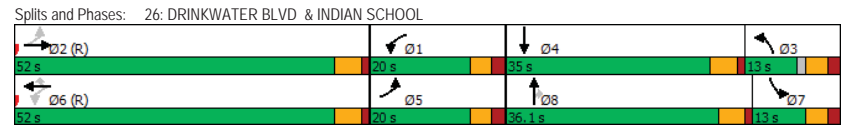
Intersection Summary			
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	
Intersection Capacity Utilization	74.6%	ICU Level of Service	
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

Existing AM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBT	EBL	WBTL	SBL	NBT
Lead/Lag			Lag	Lead			Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	20	52	13	35	20	52	13	36.1
Maximum Split (%)	16.5%	42.9%	10.7%	28.9%	16.5%	42.9%	10.7%	29.8%
Minimum Split (s)	11	33.2	11	34.1	11	31.2	11	36.1
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1.2	2	1.1	2	1.2	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	0.2	2	2	2	0.2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		9		7		11
Flash Dont Walk (s)		21		20		19		20
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	36.9	106	91.9	56.9	36.9	106	93	56.9
End Time (s)	56.9	36.9	106	91.9	56.9	36.9	106	93
Yield/Force Off (s)	51.6	31.7	100.7	86.8	51.6	31.7	100.7	87.9
Yield/Force Off 170(s)	51.6	10.7	100.7	86.8	51.6	12.7	100.7	87.9
Local Start Time (s)	52	0	107	72	52	0	108.1	72
Local Yield (s)	66.7	46.8	115.8	101.9	66.7	46.8	115.8	103
Local Yield 170(s)	66.7	25.8	115.8	101.9	66.7	27.8	115.8	103

Intersection Summary	
Cycle Length	121.1
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 106 (88%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green	



Existing AM
27: 70th St & GOLDWATER BLVD

Southbridge Expansion
HCM 6th WSC

Intersection						
Int Delay, s/veh	2.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑	↑	↑
Traffic Vol, veh/h	357	50	9	274	95	24
Future Vol, veh/h	357	50	9	274	95	24
Conflicting Peds, #/hr	0	4	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	70	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	388	54	10	298	103	26
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	446	0	588	226
Stage 1	-	-	-	-	419	-
Stage 2	-	-	-	-	169	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	718	-	467	662
Stage 1	-	-	-	-	556	-
Stage 2	-	-	-	-	812	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	716	-	459	659
Mov Cap-2 Maneuver	-	-	-	-	459	-
Stage 1	-	-	-	-	547	-
Stage 2	-	-	-	-	812	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.3	14.2			
HCM LOS			B			
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	459	659	-	-	716	-
HCM Lane V/C Ratio	0.225	0.04	-	-	0.014	-
HCM Control Delay (s)	15.1	10.7	-	-	10.1	-
HCM Lane LOS	C	B	-	-	B	-
HCM 95th %tile Q(veh)	0.9	0.1	-	-	0	-

Existing AM
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

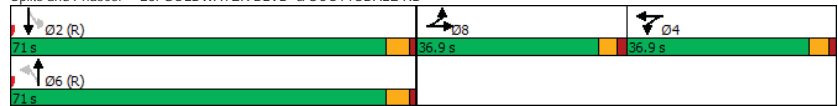
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑		↑	↑		↑	↑		↑	↑	↑
Traffic Volume (vph)	4	6	6	213	11	18	50	246	1	35	324	17
Future Volume (vph)	4	6	6	213	11	18	50	246	1	35	324	17
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.9			4.9			5.2			5.2		
Lane Util. Factor	1.00			0.95			1.00			0.95		
Frbp, ped/bikes	0.99			1.00			1.00			1.00		
Flpb, ped/bikes	1.00			1.00			1.00			1.00		
Frt	0.95			1.00			1.00			1.00		
Flt Protected	0.99			0.95			0.96			0.95		
Satd. Flow (prot)	1828			1593			1750			1676		
Flt Permitted	0.99			0.95			0.96			0.51		
Satd. Flow (perm)	1828			1593			1750			903		
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.82	0.82	0.82	0.87	0.87	0.87
Adj. Flow (vph)	5	8	8	245	13	21	61	300	1	40	372	20
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	21	0	140	134	0	61	301	0	40	390	0
Confl. Peds. (#/hr)	2			3			7			2		
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4		6	6		2	2	
Permitted Phases							6			2		
Actuated Green, G (s)	9.2			18.7			101.9			101.9		
Effective Green, g (s)	9.2			18.7			101.9			101.9		
Actuated g/C Ratio	0.06			0.13			0.70			0.70		
Clearance Time (s)	4.9			4.9			5.2			5.2		
Vehicle Extension (s)	2.0			2.0			2.0			2.0		
Lane Grp Cap (vph)	116			205			635			2619		
v/s Ratio Prot	c0.01			c0.09			0.08			c0.08		
v/s Ratio Perm							0.07			0.04		
v/c Ratio	0.18			0.68			0.59			0.10		
Uniform Delay, d1	64.2			60.2			59.5			6.8		
Progression Factor	1.00			1.00			1.00			1.00		
Incremental Delay, d2	0.3			7.3			2.8			0.3		
Delay (s)	64.5			67.5			62.2			7.1		
Level of Service	E			E			E			A		
Approach Delay (s)	64.5			64.9			7.0			6.9		
Approach LOS	E			E			A			A		
Intersection Summary												
HCM 2000 Control Delay	22.8			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.20											
Actuated Cycle Length (s)	144.8			Sum of lost time (s)			15.0					
Intersection Capacity Utilization	53.8%			ICU Level of Service			A					
Analysis Period (min)	15											
Description: Last Update: Sept 2017												
c Critical Lane Group												

Existing AM
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

	↓	↘	↑	↙
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag	Lag Lead			
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	71	36.9	71	36.9
Maximum Split (%)	49.0%	25.5%	49.0%	25.5%
Minimum Split (s)	23.2	36.9	27.2	36.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	8	8	9
Flash Dont Walk (s)	11	24	14	23
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	24	131.9	24	95
End Time (s)	95	24	95	131.9
Yield/Force Off (s)	89.8	19.1	89.8	127
Yield/Force Off 170(s)	78.8	139.9	75.8	104
Local Start Time (s)	0	107.9	0	71
Local Yield (s)	65.8	139.9	65.8	103
Local Yield 170(s)	54.8	115.9	51.8	80
Intersection Summary				
Cycle Length	144.8			
Control Type	Actuated-Coordinated			
Natural Cycle	105			
Offset: 24 (17%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				

Splits and Phases: 28: GOLDWATER BLVD & SCOTTSDALE RD



Existing AM
29: SCOTTSDALE RD & OSBORN RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↙	→	↘	↖	←	↗	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗	↖	↖↗	↖↗	↖↗
Traffic Volume (vph)	45	152	76	77	142	80	56	722	96	76	481	17
Future Volume (vph)	45	152	76	77	142	80	56	722	96	76	481	17
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.95		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3517		1676	3501		1676	3725	1473	1676	5322	
Flt Permitted	0.44	1.00		0.43	1.00		0.44	1.00	1.00	0.31	1.00	
Satd. Flow (perm)	773	3517		752	3501		772	3725	1473	547	5322	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	56	190	95	96	178	100	62	793	105	83	523	18
RTOR Reduction (vph)	0	61	0	0	78	0	0	0	41	0	2	0
Lane Group Flow (vph)	56	224	0	96	200	0	62	793	64	83	539	0
Confl. Peds. (#/hr)	6		6		6		5		9			
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	3	8		7	4		1	6	6	5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	21.5	16.5		21.5	16.5		77.2	73.2	73.2	77.2	73.2	
Effective Green, g (s)	21.5	16.5		21.5	16.5		77.2	73.2	73.2	77.2	73.2	
Actuated g/C Ratio	0.18	0.14		0.18	0.14		0.64	0.61	0.61	0.64	0.61	
Clearance Time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.4	
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	1.0	1.0	2.0	1.0	
Lane Grp Cap (vph)	175	483		173	480		526	2270	897	389	3243	
v/s Ratio Prot	0.01	0.06		c0.02	0.06		0.00	c0.21		c0.01	0.10	
v/s Ratio Perm	0.04			c0.08			0.07		0.04	0.13		
v/c Ratio	0.32	0.46		0.55	0.42		0.12	0.35	0.07	0.21	0.17	
Uniform Delay, d1	46.4	47.7		48.7	47.4		8.5	11.6	9.6	12.8	10.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.3		2.2	0.2		0.0	0.4	0.2	0.1	0.1	
Delay (s)	46.8	48.0		50.9	47.6		8.5	12.1	9.7	12.9	10.3	
Level of Service	D	D		D	D		A	B	A	B	B	
Approach Delay (s)	47.8		48.5		11.6		10.6					
Approach LOS	D		D		B		B					
Intersection Summary												
HCM 2000 Control Delay	22.7		HCM 2000 Level of Service		C							
HCM 2000 Volume to Capacity ratio	0.39											
Actuated Cycle Length (s)	120.1		Sum of lost time (s)		21.4							
Intersection Capacity Utilization	61.1%		ICU Level of Service		B							
Analysis Period (min)	15											
Description: Last Update: Sept 2017												
c Critical Lane Group												

Existing AM
29: SCOTTSDALE RD & OSBORN RD.

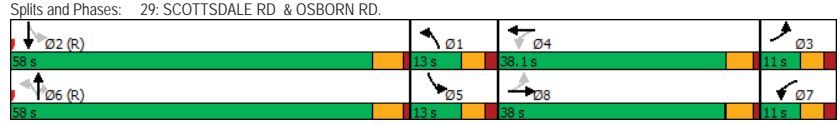
Southbridge Expansion
Timing Report, Sorted By Phase



Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	EBL	WBTL	SBL	NBTL	WBL	EBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	13	58	11	38.1	13	58	11	38
Maximum Split (%)	10.8%	48.3%	9.2%	31.7%	10.8%	48.3%	9.2%	31.6%
Minimum Split (s)	11	31.4	11	38.1	11	34.4	11	37.1
Yellow Time (s)	3.6	4.4	3.3	4	3.6	4.4	3.3	4
All-Red Time (s)	2	1	2	1.1	2	1	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	1	2	1	2	1	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		9		10		11
Flash Dont Walk (s)		18		24		19		21
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	58	0	109.1	71	58	0	109.1	71
End Time (s)	71	58	0	109.1	71	58	0	109.1
Yield/Force Off (s)	65.4	52.6	114.8	104	65.4	52.6	114.8	104
Yield/Force Off 170(s)	65.4	34.6	114.8	80	65.4	33.6	114.8	83
Local Start Time (s)	58	0	109.1	71	58	0	109.1	71
Local Yield (s)	65.4	52.6	114.8	104	65.4	52.6	114.8	104
Local Yield 170(s)	65.4	34.6	114.8	80	65.4	33.6	114.8	83

Intersection Summary

Cycle Length	120.1
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



Existing PM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

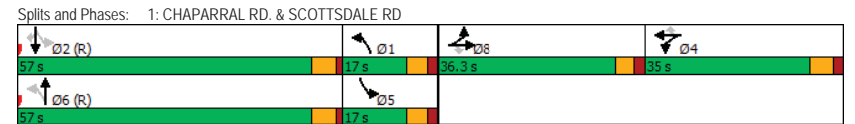
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	100	138	57	381	161	211	44	1645	336	194	1716	56	
Future Volume (vph)	100	138	57	381	161	211	44	1645	336	194	1716	56	
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800	
Total Lost time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4		5.6	5.4	5.4	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91		1.00	0.95	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1676	1945	1500	3252	1945	1500	1676	5203		1676	3711	1500	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.06	1.00		0.06	1.00	1.00	
Satd. Flow (perm)	1676	1945	1500	3252	1945	1500	103	5203		103	3711	1500	
Peak-hour factor, PHF	0.85	0.85	0.85	0.83	0.83	0.83	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	118	162	67	459	194	254	46	1732	354	204	1806	59	
RTOR Reduction (vph)	0	0	0	0	0	211	0	17	0	0	0	31	
Lane Group Flow (vph)	118	162	67	459	194	43	46	2069	0	204	1806	28	
Bus Blockages (#/hr)	0	2	0	0	2	0	0	2	0	0	2	0	
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	
Protected Phases	8	8		4	4		1	6		5	2		
Permitted Phases			8			4	6			2		2	
Actuated Green, G (s)	18.2	18.2	18.2	24.7	24.7	24.7	80.1	68.7		80.1	68.7	68.7	
Effective Green, g (s)	18.2	18.2	18.2	24.7	24.7	24.7	80.1	68.7		80.1	68.7	68.7	
Actuated g/C Ratio	0.13	0.13	0.13	0.17	0.17	0.17	0.55	0.47		0.55	0.47	0.47	
Clearance Time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4		5.6	5.4	5.4	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.2		2.0	0.2	0.2	
Lane Grp Cap (vph)	209	243	187	552	330	254	180	2460		180	1754	709	
v/s Ratio Prot	0.07	c0.08		c0.14	0.10		0.02	0.40		c0.09	0.49		
v/s Ratio Perm			0.04			0.03	0.12			c0.54		0.02	
w/c Ratio	0.56	0.67	0.36	0.83	0.59	0.17	0.26	0.84		1.13	1.03	0.04	
Uniform Delay, d1	59.8	60.7	58.2	58.3	55.6	51.5	59.6	33.5		57.4	38.3	20.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	2.1	5.3	0.4	9.9	1.7	0.1	0.3	3.7		107.5	29.5	0.1	
Delay (s)	61.9	65.9	58.6	68.2	57.3	51.7	59.9	37.2		164.8	67.8	20.7	
Level of Service	E	E	E	E	E	D	E	D		F	E	C	
Approach Delay (s)	63.1			61.2				37.7			76.0		
Approach LOS	E			E				D			E		

Intersection Summary			
HCM 2000 Control Delay	57.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	145.3	Sum of lost time (s)	22.3
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Last Update: April 2018			
c Critical Lane Group			

Existing PM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag	Lag	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	17	57	35	17	57	36.3
Maximum Split (%)	11.7%	39.2%	24.1%	11.7%	39.2%	25.0%
Minimum Split (s)	11	16	35	11	16	36.3
Yellow Time (s)	3.6	4.4	4	3.6	4.4	3.3
All-Red Time (s)	2	1	2	2	1	2
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	9
Flash Dont Walk (s)		10	22		14	22
Dual Entry	No	Yes	No	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	145	88	53	145	88	16.7
End Time (s)	16.7	145	88	16.7	145	53
Yield/Force Off (s)	11.1	139.6	82	11.1	139.6	47.7
Yield/Force Off 170(s)	11.1	129.6	60	11.1	125.6	25.7
Local Start Time (s)	57	0	110.3	57	0	74
Local Yield (s)	68.4	51.6	139.3	68.4	51.6	105
Local Yield 170(s)	68.4	41.6	117.3	68.4	37.6	83
Intersection Summary						
Cycle Length	145.3					
Control Type	Actuated-Coordinated					
Natural Cycle	150					
Offset: 88 (61%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green						



Existing PM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	141	16	172	16	4	20	40	1928	53	13	827	35
Future Volume (vph)	141	16	172	16	4	20	40	1928	53	13	827	35
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	0.91	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	1.00	1.00	1.00	1.00	0.99	1.00	0.99
Flt Protected	0.95	1.00	1.00	0.96	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1961	1500	1886	1480	1676	5328	1676	5315	1676	5315	1676
Flt Permitted	0.74	1.00	1.00	0.83	1.00	0.25	1.00	0.06	1.00	0.06	1.00	1.00
Satd. Flow (perm)	1309	1961	1500	1621	1480	449	5328	104	5315	104	5315	104
Peak-hour factor, PHF	0.81	0.81	0.81	0.86	0.86	0.86	0.90	0.90	0.90	0.83	0.83	0.83
Adj. Flow (vph)	174	20	212	19	5	23	44	2142	59	16	996	42
RTOR Reduction (vph)	0	0	112	0	0	18	0	2	0	0	3	0
Lane Group Flow (vph)	174	20	100	0	24	5	44	2199	0	16	1035	0
Confl. Peds. (#/hr)						1			2			2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4		4	6			2		
Actuated Green, G (s)	22.6	22.6	22.6		22.6	22.6	93.8	93.8		93.8	93.8	
Effective Green, g (s)	22.6	22.6	22.6		22.6	22.6	93.8	93.8		93.8	93.8	
Actuated g/C Ratio	0.18	0.18	0.18		0.18	0.18	0.74	0.74		0.74	0.74	
Clearance Time (s)	5.1	5.1	5.1		5.1	5.1	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	232	348	266		288	263	331	3932		76	3922	
v/s Ratio Prot		0.01						0.41			0.19	
v/s Ratio Perm	c0.13		0.07		0.01	0.00	0.10			0.15		
v/c Ratio	0.75	0.06	0.38		0.08	0.02	0.13	0.56		0.21	0.26	
Uniform Delay, d1	49.6	43.4	46.0		43.6	43.1	4.8	7.4		5.2	5.4	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.4	0.0	0.3		0.0	0.0	0.8	0.6		6.2	0.2	
Delay (s)	61.0	43.4	46.4		43.7	43.1	5.7	8.0		11.4	5.6	
Level of Service	E	D	D		D	D	A	A		B	A	
Approach Delay (s)		52.5			43.4			8.0			5.7	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	127.1	Sum of lost time (s)	10.7
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		

Description: Last Update: Sept 2017
c Critical Lane Group

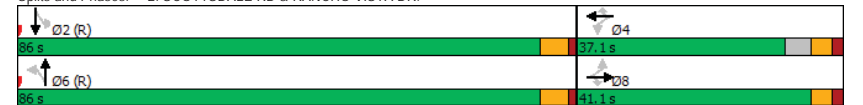
Existing PM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	86	37.1	86	41.1
Maximum Split (%)	67.7%	29.2%	67.7%	32.3%
Minimum Split (s)	16	37.1	16	41.1
Yellow Time (s)	4.4	3.3	4.4	3.3
All-Red Time (s)	1.2	1.8	1.2	1.8
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	11
Flash Dont Walk (s)	18	25	13	25
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	76	34.9	76	34.9
End Time (s)	34.9	76	34.9	76
Yield/Force Off (s)	29.3	70.9	29.3	70.9
Yield/Force Off 170(s)	11.3	45.9	16.3	45.9
Local Start Time (s)	0	86	0	86
Local Yield (s)	80.4	122	80.4	122
Local Yield 170(s)	62.4	97	67.4	97

Intersection Summary	
Cycle Length	127.1
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 76 (60%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	

Splits and Phases: 2: SCOTTSDALE RD & RANCHO VISTA DR.



Existing PM Southbridge Expansion
 3: SCOTTSDALE RD & HIGHLAND AVE/Granada Ave HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	641	17	46	25	17	35	41	1301	29	12	1026	80
Future Volume (vph)	641	17	46	25	17	35	41	1301	29	12	1026	80
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.90		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3252	1728		1676	1762		1676	5332		1676	5289	
Flt Permitted	0.95	1.00		0.95	1.00		0.17	1.00		0.13	1.00	
Satd. Flow (perm)	3252	1728		1676	1762		293	5332		222	5289	
Peak-hour factor, PHF	0.85	0.85	0.85	0.80	0.80	0.80	0.91	0.91	0.91	0.87	0.87	0.87
Adj. Flow (vph)	754	20	54	31	21	44	45	1430	32	14	1179	92
RTOR Reduction (vph)	0	40	0	0	24	0	0	2	0	0	7	0
Lane Group Flow (vph)	754	34	0	31	41	0	45	1460	0	14	1264	0
Confl. Peds. (#/hr)			2						2			2
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6			2	
Permitted Phases							6			2		
Actuated Green, G (s)	31.1	31.1		6.6	6.6		66.5	66.5		66.5	66.5	
Effective Green, g (s)	31.1	31.1		6.6	6.6		66.5	66.5		66.5	66.5	
Actuated g/C Ratio	0.26	0.26		0.05	0.05		0.55	0.55		0.55	0.55	
Clearance Time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	842	447		92	96		162	2952		122	2928	
v/s Ratio Prot	c0.23	0.02		0.02	c0.02			c0.27			0.24	
v/s Ratio Perm							0.15			0.06		
v/c Ratio	0.90	0.08		0.34	0.43		0.28	0.49		0.11	0.43	
Uniform Delay, d1	42.9	33.6		54.6	54.9		14.1	16.5		12.8	15.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.8	0.0		0.8	1.1		4.2	0.6		1.9	0.5	
Delay (s)	54.7	33.7		55.4	56.1		18.4	17.1		14.7	16.2	
Level of Service	D	C		E	E		B	B		B	B	
Approach Delay (s)		52.8			55.9			17.1			16.2	
Approach LOS		D			E			B			B	

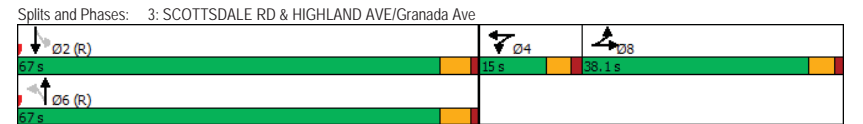
Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	15.9
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Sept 2017			

c Critical Lane Group

Existing PM Southbridge Expansion
 3: SCOTTSDALE RD & HIGHLAND AVE/Granada Ave Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	67	15	67	38.1
Maximum Split (%)	55.8%	12.5%	55.8%	31.7%
Minimum Split (s)	30.7	13	28.7	38.1
Yellow Time (s)	4.4	3.6	4.4	3.6
All-Red Time (s)	1.3	1.5	1.3	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	1	2	1	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8		7	9
Flash Dont Walk (s)	17		16	24
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	94	40.9	94	55.9
End Time (s)	40.9	55.9	40.9	94
Yield/Force Off (s)	35.2	50.8	35.2	88.9
Yield/Force Off 170(s)	18.2	50.8	19.2	64.9
Local Start Time (s)	0	67	0	82
Local Yield (s)	61.3	76.9	61.3	115
Local Yield 170(s)	44.3	76.9	45.3	91

Intersection Summary	
Cycle Length	120.1
Control Type	Actuated-Coordinated
Natural Cycle	85
Offset: 94 (78%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



Existing PM
4: Fashion Square Dr & Goldwater Blvd

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

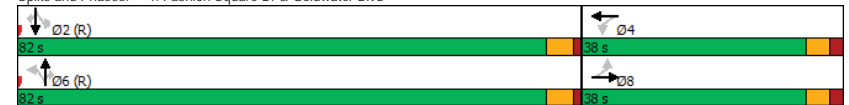
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	63	15	54	81	4	24	32	469	69	27	810	17
Future Volume (vph)	63	15	54	81	4	24	32	469	69	27	810	17
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		5.5		5.5	5.5		5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.91	1.00
Frbp, ped/bikes		0.99		1.00	0.98		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.94		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1796		1676	1678		1676	3725	1460	1676	5353	1466
Flt Permitted		0.83		0.57	1.00		0.31	1.00	1.00	0.46	1.00	1.00
Satd. Flow (perm)		1533		1010	1678		546	3725	1460	819	5353	1466
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	68	16	59	88	4	26	35	510	75	29	880	18
RTOR Reduction (vph)	0	25	0	0	23	0	0	0	16	0	0	4
Lane Group Flow (vph)	0	118	0	88	7	0	35	510	59	29	880	14
Confl. Peds. (#/hr)			2			3			2			1
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		8		4	4		6	6	6	2	2	2
Permitted Phases	8		4			6	6	6	2			2
Actuated Green, G (s)		14.7		14.7	14.7		94.6	94.6	94.6	94.6	94.6	94.6
Effective Green, g (s)		14.7		14.7	14.7		94.6	94.6	94.6	94.6	94.6	94.6
Actuated g/C Ratio		0.12		0.12	0.12		0.79	0.79	0.79	0.79	0.79	0.79
Clearance Time (s)		5.5		5.5	5.5		5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		187		123	205		430	2936	1150	645	4219	1155
v/s Ratio Prot				0.00			0.14				c0.16	
v/s Ratio Perm		0.08		c0.09			0.06		0.04	0.04		0.01
v/c Ratio		0.63		0.72	0.04		0.08	0.17	0.05	0.04	0.21	0.01
Uniform Delay, d1		50.1		50.6	46.4		2.9	3.1	2.8	2.8	3.2	2.7
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		6.5		17.9	0.1		0.4	0.1	0.1	0.1	0.1	0.0
Delay (s)		56.5		68.5	46.5		3.2	3.2	2.9	2.9	3.3	2.7
Level of Service		E		E	D		A	A	A	A	A	A
Approach Delay (s)		56.5		62.9			3.2		3.2		3.3	
Approach LOS		E		E			A		A		A	
Intersection Summary												
HCM 2000 Control Delay		11.4					HCM 2000 Level of Service		B			
HCM 2000 Volume to Capacity ratio		0.28										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)		10.7			
Intersection Capacity Utilization		50.9%					ICU Level of Service		A			
Analysis Period (min)		15										
c	Critical Lane Group											

Existing PM
4: Fashion Square Dr & Goldwater Blvd

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	82	38	82	38
Maximum Split (%)	68.3%	31.7%	68.3%	31.7%
Minimum Split (s)	16	21.5	16	21.5
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	2.2	1.2	2.2
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	5
Flash Dont Walk (s)	16	11	10	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	82	0	82
End Time (s)	82	0	82	0
Yield/Force Off (s)	76.8	114.5	76.8	114.5
Yield/Force Off 170(s)	60.8	103.5	66.8	103.5
Local Start Time (s)	0	82	0	82
Local Yield (s)	76.8	114.5	76.8	114.5
Local Yield 170(s)	60.8	103.5	66.8	103.5
Intersection Summary				
Cycle Length	120			
Control Type	Actuated-Coordinated			
Natural Cycle	40			
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				

Splits and Phases: 4: Fashion Square Dr & Goldwater Blvd



Existing PM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	101	1056	180	200	1457	75	180	305	187	99	188	72
Future Volume (vph)	101	1056	180	200	1457	75	180	305	187	99	188	72
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5226		1676	5310		1676	1961	1462	1676	1961	1500
Flt Permitted	0.14	1.00		0.14	1.00		0.52	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	242	5226		242	5310		913	1961	1462	861	1961	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	110	1148	196	217	1584	82	196	332	203	108	204	78
RTOR Reduction (vph)	0	23	0	0	5	0	0	0	125	0	0	69
Lane Group Flow (vph)	110	1321	0	217	1661	0	196	332	78	108	204	9
Confl. Peds. (#/hr)			1			2			5			
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	3		4	3		2	1		2	1	
Permitted Phases	3			3			1		1	1		1
Actuated Green, G (s)	39.1	29.2		39.1	29.2		14.3	8.2	8.2	14.3	8.2	8.2
Effective Green, g (s)	39.1	29.2		39.1	29.2		14.3	8.2	8.2	14.3	8.2	8.2
Actuated g/C Ratio	0.53	0.39		0.53	0.39		0.19	0.11	0.11	0.19	0.11	0.11
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	317	2051		317	2084		238	216	161	232	216	165
v/s Ratio Prot	0.05	0.25		c0.09	c0.31		c0.07	c0.17		0.04	0.10	
v/s Ratio Perm	0.14			0.27			0.09		0.05	0.05		0.01
v/c Ratio	0.35	0.64		0.68	0.80		0.82	1.54	0.49	0.47	0.94	0.05
Uniform Delay, d1	22.8	18.4		21.2	20.0		29.1	33.1	31.1	29.5	32.9	29.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.5		4.8	2.1		19.2	263.5	0.8	0.5	45.1	0.0
Delay (s)	23.1	18.9		26.0	22.0		48.3	296.6	32.0	30.1	78.0	29.7
Level of Service	C	B		C	C		D	F	C	C	E	C
Approach Delay (s)		19.2			22.5			156.6			55.0	
Approach LOS		B			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	46.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	74.4	Sum of lost time (s)	21.0
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

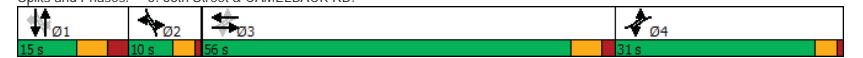
Existing PM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4
Movement	NBSB	NBSBL	EBWB	EBWBL
Lead/Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	15	10	56	31
Maximum Split (%)	13.4%	8.9%	50.0%	27.7%
Minimum Split (s)	15	8	56	31
Yellow Time (s)	4.2	3	4.2	3
All-Red Time (s)	2.8	1	1.8	1
Minimum Initial (s)	8	4	10	4
Vehicle Extension (s)	2	1	1	1
Minimum Gap (s)	1	1	1	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)		0	33	
Flash Dont Walk (s)		0	17	
Dual Entry	No	No	No	No
Inhibit Max	No	No	No	No
Start Time (s)	0	15	25	81
End Time (s)	15	25	81	0
Yield/Force Off (s)	8	21	75	108
Yield/Force Off 170(s)	8	21	58	108
Local Start Time (s)	97	0	10	66
Local Yield (s)	105	6	60	93
Local Yield 170(s)	105	6	43	93

Intersection Summary	
Cycle Length	112
Control Type	Actuated-Uncoordinated
Natural Cycle	120

Splits and Phases: 5: 68th Street & CAMELBACK RD.



Existing PM
6: GOLDWATER BLVD & CAMELBACK RD. Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵ ↶ ↷			↵ ↶ ↷			↵ ↶ ↷			↵ ↶ ↷		
Traffic Volume (vph)	229	972	214	53	1004	100	250	230	100	75	422	489
Future Volume (vph)	229	972	214	53	1004	100	250	230	100	75	422	489
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5353	1479	1676	5273		3252	3725	1489	3252	5353	1491
Flt Permitted	0.12	1.00	1.00	0.12	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	213	5353	1479	213	5273		3252	3725	1489	3252	5353	1491
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95	0.88	0.88	0.88
Adj. Flow (vph)	249	1057	233	58	1091	109	263	242	105	85	480	556
RTOR Reduction (vph)	0	0	126	0	10	0	0	0	41	0	0	71
Lane Group Flow (vph)	249	1057	107	58	1190	0	263	242	64	85	480	485
Confl. Peds. (#/hr)			2				3			2		1
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	3	8		7	4		1	6	7	5	2	3
Permitted Phases	8		8	4					6			2
Actuated Green, G (s)	59.2	33.1	33.1	59.2	33.1		14.6	25.1	51.2	14.1	24.6	50.7
Effective Green, g (s)	59.2	33.1	33.1	59.2	33.1		14.6	25.1	51.2	14.1	24.6	50.7
Actuated g/C Ratio	0.49	0.27	0.27	0.49	0.27		0.12	0.21	0.42	0.12	0.20	0.42
Clearance Time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	421	1469	405	421	1447		393	775	701	380	1091	696
v/s Ratio Prot	0.13	0.20		0.03	0.23		0.08	0.06	0.02	0.03	0.09	0.15
v/s Ratio Perm	0.16		0.07	0.04					0.02			0.17
v/c Ratio	0.59	0.72	0.27	0.14	0.82		0.67	0.31	0.09	0.22	0.44	0.70
Uniform Delay, d1	36.1	39.6	34.2	30.0	41.0		50.7	40.4	20.8	48.3	42.0	28.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	1.4	0.1	0.1	3.7		3.3	1.1	0.0	0.1	1.3	2.5
Delay (s)	37.6	41.0	34.4	30.0	44.7		54.0	41.5	20.8	48.4	43.3	31.1
Level of Service	D	D	C	C	D		D	D	C	D	D	C
Approach Delay (s)		39.4			44.0			43.3			37.6	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.6	Sum of lost time (s)	22.2
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		

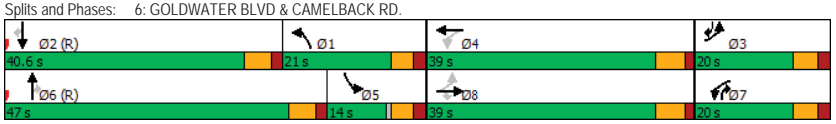
Description: Last Update: Sept 2017
c Critical Lane Group

Existing PM
6: GOLDWATER BLVD & CAMELBACK RD. Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBTL	SBL	NBT	WBL	EBTL
Lead/Lag	Lag	Lead			Lag	Lead		
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Ped	None	C-Min	None	Ped
Maximum Split (s)	21	40.6	20	39	14	47	20	39
Maximum Split (%)	17.4%	33.7%	16.6%	32.3%	11.6%	39.0%	16.6%	32.3%
Minimum Split (s)	11	40.6	11	31	11	35.6	11	33
Yellow Time (s)	3.3	4	3.6	4.4	3.3	4	3.6	4.4
All-Red Time (s)	2	1.6	2	1.3	2	1.6	2	1.3
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	1	2	2	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		7		7		7
Flash Dont Walk (s)		27		24		23		26
Dual Entry	No	Yes	No	Yes	No	Yes	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	88.6	48	28	109.6	95	48	28	109.6
End Time (s)	109.6	88.6	48	28	109.6	95	48	28
Yield/Force Off (s)	104.3	83	42.4	22.3	104.3	89.4	42.4	22.3
Yield/Force Off 170(s)	104.3	56	42.4	118.9	104.3	66.4	42.4	116.9
Local Start Time (s)	40.6	0	100.6	61.6	47	0	100.6	61.6
Local Yield (s)	56.3	35	115	94.9	56.3	41.4	115	94.9
Local Yield 170(s)	56.3	8	115	70.9	56.3	18.4	115	68.9

Intersection Summary

Cycle Length	120.6
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 48 (40%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green	



Existing PM

7: CAMELBACK RD. & SCOTTSDALE RD

Southbridge Expansion

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	188	582	249	99	593	175	282	867	96	331	653	197
Future Volume (vph)	188	582	249	99	593	175	282	867	96	331	653	197
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.91		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3252	3725	1482	1676	3579		3252	5260		3252	3725	1466
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3252	3725	1482	1676	3579		3252	5260		3252	3725	1466
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.86	0.86	0.88	0.88	0.88	0.95	0.95	0.95
Adj. Flow (vph)	204	633	271	115	690	203	320	985	109	348	687	207
RTOR Reduction (vph)	0	0	74	0	23	0	0	10	0	0	0	147
Lane Group Flow (vph)	204	633	197	115	870	0	320	1084	0	348	687	60
Confl. Peds. (#/hr)			8			12			10			8
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8	1	7	4		1	6		5	2	
Permitted Phases			8									2
Actuated Green, G (s)	11.5	26.1	46.6	18.0	32.6		20.5	38.3		16.7	34.7	34.7
Effective Green, g (s)	11.5	26.1	46.6	18.0	32.6		20.5	38.3		16.7	34.7	34.7
Actuated g/C Ratio	0.10	0.22	0.39	0.15	0.27		0.17	0.32		0.14	0.29	0.29
Clearance Time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	310	806	634	250	968		553	1671		450	1072	422
v/s Ratio Prot	c0.06	0.17	0.05	0.07	c0.24		0.10	c0.21		c0.11	0.18	
v/s Ratio Perm			0.08									0.04
v/c Ratio	0.66	0.79	0.31	0.46	0.90		0.58	0.65		0.77	0.64	0.14
Uniform Delay, d1	52.6	44.6	25.8	46.8	42.4		46.0	35.3		50.1	37.5	31.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.8	4.7	0.1	0.5	10.7		0.9	2.0		7.4	2.9	0.7
Delay (s)	56.4	49.2	25.9	47.3	53.0		46.9	37.3		57.5	40.4	32.5
Level of Service	E	D	C	D	D		D	D		E	D	C
Approach Delay (s)		44.8			52.4			39.5				43.9
Approach LOS		D			D			D				D

Intersection Summary			
HCM 2000 Control Delay	44.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.5	Sum of lost time (s)	21.4
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			

c Critical Lane Group

Existing PM

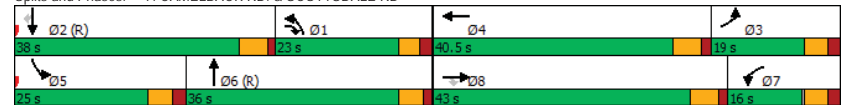
7: CAMELBACK RD. & SCOTTSDALE RD

Southbridge Expansion

Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBT	SBL	NBT	WBL	EBT
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	23	38	19	40.5	25	36	16	43
Maximum Split (%)	19.1%	31.5%	15.8%	33.6%	20.7%	29.9%	13.3%	35.7%
Minimum Split (s)	10	32.4	11	40.5	11	33	11	34.5
Yellow Time (s)	3	4.4	3.3	4	3.6	3.6	3.3	4
All-Red Time (s)	2	1	2	1.5	2	1.4	2	1.5
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		23		31		24		25
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	78	40	21	101	40	65	23.5	101
End Time (s)	101	78	40	21	65	101	40	23.5
Yield/Force Off (s)	96	72.6	34.7	15.5	59.4	96	34.7	18
Yield/Force Off 170(s)	96	49.6	34.7	105	59.4	72	34.7	113.5
Local Start Time (s)	38	0	101.5	61	0	25	104	61
Local Yield (s)	56	32.6	115.2	96	19.4	56	115.2	98.5
Local Yield 170(s)	56	9.6	115.2	65	19.4	32	115.2	73.5
Intersection Summary								
Cycle Length	120.5							
Control Type	Actuated-Coordinated							
Natural Cycle	100							
Offset: 40 (33%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green								

Splits and Phases: 7: CAMELBACK RD. & SCOTTSDALE RD



Existing PM Southbridge Expansion
 8: SCOTTSDALE RD & Stetson Dr/DRINKWATER BLVD HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔		↔	↔	
Traffic Volume (vph)	79	27	24	91	38	448	11	728	25	233	653	99
Future Volume (vph)	79	27	24	91	38	448	11	728	25	233	653	99
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		5.2		5.2	5.2	5.0	5.1	5.1		5.0	5.1	
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frbp, ped/bikes		1.00		1.00	1.00	0.96	1.00	1.00		1.00	0.98	
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97		1.00	1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected		0.97		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1848		1676	1961	1444	1676	3703		3252	3590	
Flt Permitted		0.79		0.65	1.00	1.00	0.35	1.00		0.24	1.00	
Satd. Flow (perm)		1497		1144	1961	1444	617	3703		820	3590	
Peak-hour factor, PHF	0.84	0.84	0.84	0.80	0.80	0.80	0.85	0.85	0.85	0.94	0.94	0.94
Adj. Flow (vph)	94	32	29	114	48	560	13	856	29	248	695	105
RTOR Reduction (vph)	0	0	0	0	0	50	0	2	0	0	8	0
Lane Group Flow (vph)	0	155	0	114	48	510	13	883	0	248	792	0
Confl. Peds. (#/hr)			7			35			18			30
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		8		4	5		6		5	2		
Permitted Phases	8		4		4	6		2				
Actuated Green, G (s)		27.6		27.6	27.6	37.6	67.1	67.1		82.1	82.1	
Effective Green, g (s)		27.6		27.6	27.6	37.6	67.1	67.1		82.1	82.1	
Actuated g/C Ratio		0.23		0.23	0.23	0.31	0.56	0.56		0.68	0.68	
Clearance Time (s)		5.2		5.2	5.2	5.0	5.1	5.1		5.0	5.1	
Vehicle Extension (s)		2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		344		263	451	452	345	2070		763	2456	
v/s Ratio Prot				0.02	c0.09		c0.24			0.03	0.22	
v/s Ratio Perm		0.10		0.10		0.26	0.02			0.20		
v/c Ratio		0.45		0.43	0.11	1.13	0.04	0.43		0.33	0.32	
Uniform Delay, d1		39.7		39.5	36.5	41.2	11.9	15.3		8.3	7.7	
Progression Factor		1.00		1.09	1.14	0.96	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3		0.4	0.0	82.0	0.2	0.6		0.1	0.3	
Delay (s)		40.0		43.6	41.7	121.4	12.1	16.0		8.4	8.0	
Level of Service		D		D	D	F	B	B		A	A	
Approach Delay (s)		40.0			103.8			15.9			8.1	
Approach LOS		D			F			B			A	

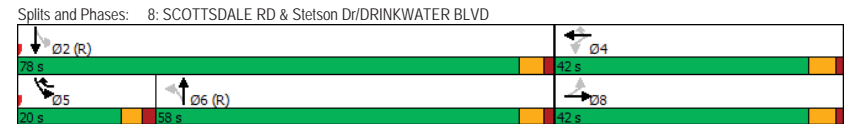
Intersection Summary			
HCM 2000 Control Delay	36.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		

Description: Last Update: Sept 2017
 c Critical Lane Group

Existing PM Southbridge Expansion
 8: SCOTTSDALE RD & Stetson Dr/DRINKWATER BLVD Timing Report, Sorted By Phase

Phase Number	2	4	5	6	8
Movement	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag		Lead	Lag		
Lead-Lag Optimize					
Recall Mode	C-Min	None	None	C-Min	None
Maximum Split (s)	78	42	20	58	42
Maximum Split (%)	65.0%	35.0%	16.7%	48.3%	35.0%
Minimum Split (s)	21.1	37.2	15	38.1	33.2
Yellow Time (s)	3.6	4	3	3.6	4
All-Red Time (s)	1.5	1.2	2	1.5	1.2
Minimum Initial (s)	10	7	10	10	7
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	9	9		9	7
Flash Dont Walk (s)	7	23		24	21
Dual Entry	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	44	2	44	64	2
End Time (s)	2	44	64	2	44
Yield/Force Off (s)	116.9	38.8	59	116.9	38.8
Yield/Force Off 170(s)	109.9	15.8	59	92.9	17.8
Local Start Time (s)	0	78	0	20	78
Local Yield (s)	72.9	114.8	15	72.9	114.8
Local Yield 170(s)	65.9	91.8	15	48.9	93.8

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 44 (37%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



Existing PM Southbridge Expansion
 9: GOLDWATER BLVD /GOLDWATER BLVD #2 & 5TH AVE HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	26	14	18	61	40	86	9	587	58	49	632	63
Future Volume (vph)	26	14	18	61	40	86	9	587	58	49	632	63
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2	5.2	4.0	4.0	4.0	5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.91	1.00	0.91
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	1.00	0.99	1.00	0.99
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1676	1961	1478	1676	1961	1472	1676	3672	1676	5268	1676	5268
Flt Permitted	0.73	1.00	1.00	0.75	1.00	1.00	0.33	1.00	0.35	1.00	0.35	1.00
Satd. Flow (perm)	1286	1961	1478	1319	1961	1472	585	3672	612	5268	612	5268
Peak-hour factor, PHF	0.80	0.92	0.80	0.92	0.92	0.92	0.81	0.81	0.92	0.92	0.85	0.85
Adj. Flow (vph)	32	15	22	66	43	93	11	725	63	53	744	74
RTOR Reduction (vph)	0	0	20	0	0	82	0	3	0	0	6	0
Lane Group Flow (vph)	33	15	3	66	43	11	11	785	0	53	812	0
Confl. Peds. (#/hr)			2			3			3			2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4		4	6			2		
Actuated Green, G (s)	13.3	13.3	13.3	14.5	14.5	14.5	96.3	96.3	96.3	96.3	96.3	96.3
Effective Green, g (s)	13.3	13.3	13.3	14.5	14.5	14.5	96.3	96.3	96.3	96.3	96.3	96.3
Actuated g/C Ratio	0.11	0.11	0.11	0.12	0.12	0.12	0.80	0.80	0.80	0.80	0.80	0.80
Clearance Time (s)	5.2	5.2	5.2	4.0	4.0	4.0	5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	142	217	163	159	236	177	469	2946	491	4227	491	4227
v/s Ratio Prot		0.01			0.02			c0.21				0.15
v/s Ratio Perm	0.03		0.00	c0.05		0.01	0.02		0.09			
v/c Ratio	0.23	0.07	0.02	0.42	0.18	0.06	0.02	0.27	0.11	0.19	0.11	0.19
Uniform Delay, d1	48.7	47.8	47.5	48.8	47.4	46.7	2.4	3.0	2.6	2.8	2.6	2.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	2.21	1.83	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.0	0.0	1.8	0.4	0.2	0.1	0.2	0.4	0.1	0.4	0.1
Delay (s)	49.0	47.9	47.5	50.6	47.8	46.9	5.4	5.7	3.0	2.9	3.0	2.9
Level of Service	D	D	D	D	D	D	A	A	A	A	A	A
Approach Delay (s)		48.3			48.3			5.7			2.9	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.4
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

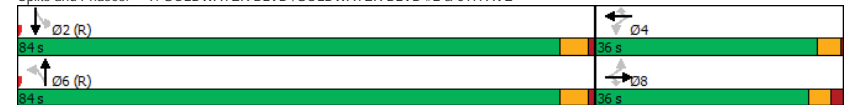
Description: Last Update: Sept 2017
 c Critical Lane Group

Existing PM Southbridge Expansion
 9: GOLDWATER BLVD /GOLDWATER BLVD #2 & 5TH AVE Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	84	36	84	36
Maximum Split (%)	70.0%	30.0%	70.0%	30.0%
Minimum Split (s)	16	20	16	34.2
Yellow Time (s)	4	3.5	4	3.3
All-Red Time (s)	1.2	0.5	1.2	1.9
Minimum Initial (s)	10	4	10	7
Vehicle Extension (s)	2	3	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	8
Flash Dont Walk (s)	14	11	11	21
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	110	74	110	74
End Time (s)	74	110	74	110
Yield/Force Off (s)	68.8	106	68.8	104.8
Yield/Force Off 170(s)	54.8	95	57.8	83.8
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.8	116	78.8	114.8
Local Yield 170(s)	64.8	105	67.8	93.8

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 110 (92%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	

Splits and Phases: 9: GOLDWATER BLVD /GOLDWATER BLVD #2 & 5TH AVE



Existing PM
10: Marshall Way & 5th Ave

Southbridge Expansion
HCM 6th Roundabout

Intersection			
Intersection Delay, s/veh	3.4		
Intersection LOS	A		
Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	86	144	63
Demand Flow Rate, veh/h	87	147	64
Vehicles Circulating, veh/h	11	20	67
Vehicles Exiting, veh/h	156	111	31
Ped Vol Crossing Leg, #/h	0	2	3
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.2	3.6	3.2
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	87	147	64
Cap Entry Lane, veh/h	1364	1352	1289
Entry HV Adj Factor	0.985	0.982	0.984
Flow Entry, veh/h	86	144	63
Cap Entry, veh/h	1344	1327	1268
V/C Ratio	0.064	0.109	0.050
Control Delay, s/veh	3.2	3.6	3.2
LOS	A	A	A
95th %tile Queue, veh	0	0	0

Existing PM
10: Marshall Way & 5th Ave

Southbridge Expansion
HCM 6th AWSC

Intersection						
Intersection Delay, s/veh	7.7					
Intersection LOS	A					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	61	18	10	122	18	40
Future Vol, veh/h	61	18	10	122	18	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	66	20	11	133	20	43
Number of Lanes	1	0	0	1	1	0
Approach	EB	WB	NB			
Opposing Approach	WB	EB				
Opposing Lanes	1	1	0			
Conflicting Approach Left		NB	EB			
Conflicting Lanes Left	0	1	1			
Conflicting Approach Right	NB		WB			
Conflicting Lanes Right	1	0	1			
HCM Control Delay	7.5	8	7.4			
HCM LOS	A	A	A			
Lane	NBLn1	EBLn1	WBLn1	NBLn1		
Vol Left, %	31%	0%	8%			
Vol Thru, %	0%	77%	92%			
Vol Right, %	69%	23%	0%			
Sign Control	Stop	Stop	Stop			
Traffic Vol by Lane	58	79	132			
LT Vol	18	0	10			
Through Vol	0	61	122			
RT Vol	40	18	0			
Lane Flow Rate	63	86	143			
Geometry Grp	1	1	1			
Degree of Util (X)	0.071	0.096	0.164			
Departure Headway (Hd)	4.078	4.017	4.125			
Convergence, Y/N	Yes	Yes	Yes			
Cap	884	884	865			
Service Time	2.078	2.079	2.172			
HCM Lane V/C Ratio	0.071	0.097	0.165			
HCM Control Delay	7.4	7.5	8			
HCM Lane LOS	A	A	A			
HCM 95th-tile Q	0.2	0.3	0.6			

Existing PM
11: 5th Ave & Stetson Dr

Southbridge Expansion
HCM 6th AWSC

Intersection						
Intersection Delay, s/veh	7.9					
Intersection LOS	A					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↖		↗	↗
Traffic Vol, veh/h	58	53	44	35	44	79
Future Vol, veh/h	58	53	44	35	44	79
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	63	58	48	38	48	86
Number of Lanes	0	1	1	0	1	0
Approach	EB	WB		SB		
Opposing Approach	WB	EB				
Opposing Lanes	1	1		0		
Conflicting Approach Left	SB			WB		
Conflicting Lanes Left	1	0		1		
Conflicting Approach Right		SB		EB		
Conflicting Lanes Right	0	1		1		
HCM Control Delay	8.2	7.5		7.8		
HCM LOS	A	A		A		
Lane	EBLn1	WBLn1	SBLn1			
Vol Left, %	52%	0%	36%			
Vol Thru, %	48%	56%	0%			
Vol Right, %	0%	44%	64%			
Sign Control	Stop	Stop	Stop			
Traffic Vol by Lane	111	79	123			
LT Vol	58	0	44			
Through Vol	53	44	0			
RT Vol	0	35	79			
Lane Flow Rate	121	86	134			
Geometry Grp	1	1	1			
Degree of Util (X)	0.145	0.095	0.151			
Departure Headway (Hd)	4.341	3.997	4.078			
Convergence, Y/N	Yes	Yes	Yes			
Cap	816	880	885			
Service Time	2.422	2.095	2.078			
HCM Lane V/C Ratio	0.148	0.098	0.151			
HCM Control Delay	8.2	7.5	7.8			
HCM Lane LOS	A	A	A			
HCM 95th-tile Q	0.5	0.3	0.5			

Existing PM
12: Craftsman Ct & 5th Ave

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Vol, veh/h	82	14	16	59	16	24
Future Vol, veh/h	82	14	16	59	16	24
Conflicting Peds, #/hr	0	14	0	0	0	6
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	89	15	17	64	17	26
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	118	0	209	117
Stage 1	-	-	-	-	111	-
Stage 2	-	-	-	-	98	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1470	-	779	935
Stage 1	-	-	-	-	914	-
Stage 2	-	-	-	-	926	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1453	-	760	919
Mov Cap-2 Maneuver	-	-	-	-	760	-
Stage 1	-	-	-	-	892	-
Stage 2	-	-	-	-	926	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	1.6		9.5		
HCM LOS				A		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	848	-	-	1453	-	
HCM Lane V/C Ratio	0.051	-	-	0.012	-	
HCM Control Delay (s)	9.5	-	-	7.5	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

Existing PM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (vph)	51	23	90	59	21	20	58	690	15	35	678	83
Future Volume (vph)	51	23	90	59	21	20	58	690	15	35	678	83
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		4.0		4.0	4.0		5.0	4.8		5.0	4.8	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.99		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.93		1.00	0.93		1.00	1.00		1.00	0.98	
Flt Protected		0.98		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1765		1676	1799		1676	3711		1676	3645	
Flt Permitted		0.90		0.63	1.00		0.24	1.00		0.28	1.00	
Satd. Flow (perm)		1609		1104	1799		429	3711		486	3645	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	25	98	64	23	22	63	750	16	38	737	90
RTOR Reduction (vph)	0	25	0	0	17	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	153	0	64	28	0	63	765	0	38	823	0
Confl. Peds. (#/hr)			11			8			12			21
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			4		2	1		2	1	
Permitted Phases	4			4			1			1		
Actuated Green, G (s)		13.0		13.0	13.0		29.0	21.5		29.0	21.5	
Effective Green, g (s)		13.0		13.0	13.0		29.0	21.5		29.0	21.5	
Actuated g/C Ratio		0.23		0.23	0.23		0.52	0.39		0.52	0.39	
Clearance Time (s)		4.0		4.0	4.0		5.0	4.8		5.0	4.8	
Vehicle Extension (s)		3.0		3.0	3.0		1.0	0.2		1.0	0.2	
Lane Grp Cap (vph)		374		257	419		390	1429		412	1404	
v/s Ratio Prot				0.02			c0.02	0.21		0.01	c0.23	
v/s Ratio Perm		c0.10		0.06			0.06			0.04		
v/c Ratio		0.41		0.25	0.07		0.16	0.54		0.09	0.59	
Uniform Delay, d1		18.1		17.4	16.7		7.1	13.3		6.8	13.6	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7		0.5	0.1		0.1	0.2		0.0	0.4	
Delay (s)		18.9		17.9	16.7		7.1	13.5		6.9	14.0	
Level of Service		B		B	B		A	B		A	B	
Approach Delay (s)		18.9		17.4			13.0			13.7		
Approach LOS		B		B			B			B		

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	55.8	Sum of lost time (s)	13.8
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Existing PM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	4
Movement	NBSB	NBSBL	EBWB
Lead/Lag	Lag	Lead	
Lead-Lag Optimize			
Recall Mode	Ped	None	None
Maximum Split (s)	68	68	58
Maximum Split (%)	35.1%	35.1%	29.9%
Minimum Split (s)	30	30	20
Yellow Time (s)	3.2	3.2	3.5
All-Red Time (s)	1.6	1.8	0.5
Minimum Initial (s)	10	10	4
Vehicle Extension (s)	0.2	1	3
Minimum Gap (s)	0.2	0.2	1
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)	10		5
Flash Dont Walk (s)	10		11
Dual Entry	No	No	Yes
Inhibit Max	No	No	Yes
Start Time (s)	68	0	136
End Time (s)	136	68	0
Yield/Force Off (s)	131.2	63	190
Yield/Force Off 170(s)	121.2	63	179
Local Start Time (s)	68	0	136
Local Yield (s)	131.2	63	190
Local Yield 170(s)	121.2	63	179

Intersection Summary	
Cycle Length	194
Control Type	Semi Act-Uncoord
Natural Cycle	80

Splits and Phases: 13: SCOTTSDALE RD & 5TH AVE.



Existing PM Southbridge Expansion
 14: DRINKWATER BLVD/DRINKWATER BLVD & 5TH AVE./STETSON DR Intersection Capacity Analysis

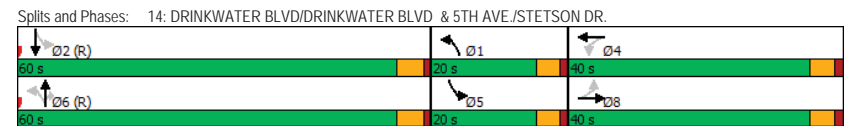
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	21	39	37	104	71	91	47	479	74	41	246	28
Future Volume (vph)	21	39	37	104	71	91	47	479	74	41	246	28
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.95	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.93		1.00	0.92		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	1804		1676	1775		1676	3725	1424	1676	3661	
Flt Permitted	0.43	1.00		0.68	1.00		0.55	1.00	1.00	0.45	1.00	
Satd. Flow (perm)	762	1804		1206	1775		979	3725	1424	800	3661	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.95	0.95	0.95	0.84	0.84	0.84
Adj. Flow (vph)	26	49	46	130	89	114	49	504	78	49	293	33
RTOR Reduction (vph)	0	32	0	0	44	0	0	0	27	0	5	0
Lane Group Flow (vph)	26	63	0	130	159	0	49	504	51	49	321	0
Confl. Peds. (#/hr)			4				7		10			6
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	23.2	23.2		23.2	23.2		82.2	78.2	78.2	82.2	78.2	
Effective Green, g (s)	23.2	23.2		23.2	23.2		82.2	78.2	78.2	82.2	78.2	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.69	0.65	0.65	0.69	0.65	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	0.2	0.2	2.0	0.2	
Lane Grp Cap (vph)	147	348		233	343		693	2427	927	577	2385	
v/s Ratio Prot		0.03			0.09		0.00	c0.14		c0.00	0.09	
v/s Ratio Perm	0.03			c0.11			0.05		0.04	0.06		
v/c Ratio	0.18	0.18		0.56	0.46		0.07	0.21	0.05	0.08	0.13	
Uniform Delay, d1	40.4	40.5		43.8	42.9		6.3	8.4	7.5	7.1	8.0	
Progression Factor	1.00	1.00		1.00	1.00		1.54	1.27	2.94	0.86	0.87	
Incremental Delay, d2	0.2	0.1		1.6	0.4		0.0	0.2	0.1	0.0	0.1	
Delay (s)	40.6	40.5		45.4	43.3		9.7	10.9	22.3	6.2	7.1	
Level of Service	D	D		D	D		A	B	C	A	A	
Approach Delay (s)		40.6			44.1			12.2			6.9	
Approach LOS		D			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		

Description: Last Update: Sept 2017
 c Critical Lane Group

Existing PM Southbridge Expansion
 14: DRINKWATER BLVD/DRINKWATER BLVD & 5TH AVE./STETSON DR Report, Sorted By Phase

Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag						
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	20	60	40	20	60	40
Maximum Split (%)	16.7%	50.0%	33.3%	16.7%	50.0%	33.3%
Minimum Split (s)	11	16	36	11	16	35
Yellow Time (s)	3.3	4	3.5	3.3	4	3.5
All-Red Time (s)	1.3	1	1.5	1.3	1	1.5
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	8		7	7
Flash Dont Walk (s)		13	23		12	23
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	110	50	10	110	50	10
End Time (s)	10	110	50	10	110	50
Yield/Force Off (s)	5.4	105	45	5.4	105	45
Yield/Force Off 170(s)	5.4	92	22	5.4	93	22
Local Start Time (s)	60	0	80	60	0	80
Local Yield (s)	75.4	55	115	75.4	55	115
Local Yield 170(s)	75.4	42	92	75.4	43	92



Existing PM
15: GOLDWATER BLVD & 3rd Ave

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑↑		↔	↑↑↑
Traffic Vol, veh/h	29	78	583	14	17	698
Future Vol, veh/h	29	78	583	14	17	698
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	85	634	15	18	759
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	982	325	0	0	649	0
Stage 1	642	-	-	-	-	-
Stage 2	340	-	-	-	-	-
Critical Hdwy	6.29	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.67	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	279	671	-	-	933	-
Stage 1	472	-	-	-	-	-
Stage 2	656	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	274	671	-	-	933	-
Mov Cap-2 Maneuver	364	-	-	-	-	-
Stage 1	463	-	-	-	-	-
Stage 2	656	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	13.4	0	0.2			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	546	933	-	
HCM Lane V/C Ratio	-	-	0.213	0.02	-	
HCM Control Delay (s)	-	-	13.4	8.9	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.8	0.1	-	

Existing PM
16: 3rd Ave & Marshall Way

Southbridge Expansion
HCM 6th AWSC

Intersection												
Intersection Delay, s/veh	7.7											
Intersection LOS	A											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	3	33	9	33	81	5	9	36	21	5	18	10
Future Vol, veh/h	3	33	9	33	81	5	9	36	21	5	18	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	36	10	36	88	5	10	39	23	5	20	11
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	7.5			8			7.6			7.4		
HCM LOS	A			A			A			A		
Lane	NBLn1	EBLn1	WBLn1	SBLn1								
Vol Left, %	14%	7%	28%	15%								
Vol Thru, %	55%	73%	68%	55%								
Vol Right, %	32%	20%	4%	30%								
Sign Control	Stop	Stop	Stop	Stop								
Traffic Vol by Lane	66	45	119	33								
LT Vol	9	3	33	5								
Through Vol	36	33	81	18								
RT Vol	21	9	5	10								
Lane Flow Rate	72	49	129	36								
Geometry Grp	1	1	1	1								
Degree of Util (X)	0.084	0.056	0.151	0.042								
Departure Headway (Hd)	4.208	4.115	4.189	4.258								
Convergence, Y/N	Yes	Yes	Yes	Yes								
Cap	857	856	847	845								
Service Time	2.209	2.206	2.259	2.26								
HCM Lane V/C Ratio	0.084	0.057	0.152	0.043								
HCM Control Delay	7.6	7.5	8	7.4								
HCM Lane LOS	A	A	A	A								
HCM 95th-tile Q	0.3	0.2	0.5	0.1								


Existing PM
17: 3rd Ave & Craftsman Ct

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	24	54	87	16	20	23
Future Vol, veh/h	24	54	87	16	20	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	59	95	17	22	25
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	112	0	0	215	104	
Stage 1	-	-	-	104	-	
Stage 2	-	-	-	111	-	
Critical Hdwy	4.12	-	-	6.42	6.22	
Critical Hdwy Stg 1	-	-	-	5.42	-	
Critical Hdwy Stg 2	-	-	-	5.42	-	
Follow-up Hdwy	2.218	-	-	3.518	3.318	
Pot Cap-1 Maneuver	1478	-	-	773	951	
Stage 1	-	-	-	920	-	
Stage 2	-	-	-	914	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	1478	-	-	759	951	
Mov Cap-2 Maneuver	-	-	-	759	-	
Stage 1	-	-	-	903	-	
Stage 2	-	-	-	914	-	
Approach	EB	WB	SB			
HCM Control Delay, s	2.3	0	9.5			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBR
Capacity (veh/h)	1478	-	-	-	851	
HCM Lane V/C Ratio	0.018	-	-	-	0.055	
HCM Control Delay (s)	7.5	0	-	-	9.5	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	

Existing PM
18: SCOTTSDALE RD & 3RD AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	↔	
Traffic Volume (vph)	54	25	98	61	51	183	58	547	26	32	731	49	
Future Volume (vph)	54	25	98	61	51	183	58	547	26	32	731	49	
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800	
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97	
Ftbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.88		1.00	0.88		1.00	0.99		1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1676	1703		1676	1706		1676	3695		1676	3725	1462	
Flt Permitted	0.51	1.00		0.67	1.00		0.35	1.00		0.42	1.00	1.00	
Satd. Flow (perm)	894	1703		1185	1706		611	3695		734	3725	1462	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	59	27	107	66	55	199	63	595	28	35	795	53	
RTOR Reduction (vph)	0	89	0	0	159	0	0	3	0	0	0	19	
Lane Group Flow (vph)	59	45	0	66	95	0	63	620	0	35	795	34	
Conf. Peds. (#/hr)			8			11			15			7	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm	
Protected Phases		3			3			1			1		
Permitted Phases	3			3			1			1		1	
Actuated Green, G (s)	7.9	7.9		7.9	7.9		30.1	30.1		30.1	30.1	30.1	
Effective Green, g (s)	7.9	7.9		7.9	7.9		30.1	30.1		30.1	30.1	30.1	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.63	0.63		0.63	0.63	0.63	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		0.2	0.2		0.2	0.2	0.2	
Lane Grp Cap (vph)	147	280		195	280		383	2317		460	2335	916	
v/s Ratio Prot		0.03			0.06			0.17			c0.21		
v/s Ratio Perm	c0.07			0.06			0.10			0.05		0.02	
v/c Ratio	0.40	0.16		0.34	0.34		0.16	0.27		0.08	0.34	0.04	
Uniform Delay, d1	17.9	17.2		17.7	17.7		3.7	4.0		3.5	4.2	3.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.7	0.1		0.4	0.3		0.1	0.0		0.0	0.0	0.0	
Delay (s)	18.6	17.3		18.1	18.0		3.8	4.0		3.5	4.3	3.4	
Level of Service	B	B		B	B		A	A		A	A	A	
Approach Delay (s)		17.7			18.0			4.0			4.2		
Approach LOS		B			B			A			A		
Intersection Summary													
HCM 2000 Control Delay	7.5		HCM 2000 Level of Service					A					
HCM 2000 Volume to Capacity ratio	0.35												
Actuated Cycle Length (s)	48.0				Sum of lost time (s)				10.0				
Intersection Capacity Utilization	71.2%		ICU Level of Service					C					
Analysis Period (min)	15												
c Critical Lane Group													

Existing PM
18: SCOTTSDALE RD & 3RD AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

	1	3
Phase Number	1	3
Movement	NBSB	EBWB
Lead/Lag		
Lead-Lag Optimize		
Recall Mode	Ped	None
Maximum Split (s)	36.9	31.1
Maximum Split (%)	54.3%	45.7%
Minimum Split (s)	35	31.1
Yellow Time (s)	3.2	3
All-Red Time (s)	1.8	2
Minimum Initial (s)	10	6
Vehicle Extension (s)	0.2	2
Minimum Gap (s)	1	2
Time Before Reduce (s)	0	0
Time To Reduce (s)	0	0
Walk Time (s)	18	5
Flash Dont Walk (s)	12	20
Dual Entry	No	No
Inhibit Max	No	No
Start Time (s)	0	36.9
End Time (s)	36.9	0
Yield/Force Off (s)	31.9	63
Yield/Force Off 170(s)	19.9	43
Local Start Time (s)	0	36.9
Local Yield (s)	31.9	63
Local Yield 170(s)	19.9	43

Intersection Summary	
Cycle Length	68
Control Type	Semi Act-Uncoord
Natural Cycle	70

Splits and Phases: 18: SCOTTSDALE RD & 3RD AVE.



Existing PM
19: DRINKWATER BLVD /DRINKWATER BLVD & 3RD AVE. HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	38	14	84	61	15	47	85	515	107	59	450	32
Future Volume (vph)	38	14	84	61	15	47	85	515	107	59	450	32
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99			0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87			0.95		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1689			1802		1676	5195		1676	3725	1454
Flt Permitted	0.59	1.00			0.69		0.46	1.00		0.37	1.00	1.00
Satd. Flow (perm)	1035	1689			1271		818	5195		661	3725	1454
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.89	0.89	0.89	0.88	0.88	0.88
Adj. Flow (vph)	44	16	97	71	17	55	96	579	120	67	511	36
RTOR Reduction (vph)	0	0	0	0	25	0	0	13	0	0	0	8
Lane Group Flow (vph)	44	113	0	0	118	0	96	686	0	67	511	28
Confl. Peds. (#/hr)			1			5			1			3
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		8			4			6			2	2
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	16.5	16.5			16.5		93.4	93.4		93.4	93.4	93.4
Effective Green, g (s)	16.5	16.5			16.5		93.4	93.4		93.4	93.4	93.4
Actuated g/C Ratio	0.14	0.14			0.14		0.78	0.78		0.78	0.78	0.78
Clearance Time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Vehicle Extension (s)	2.0	2.0			2.0		0.2	0.2		2.0	2.0	2.0
Lane Grp Cap (vph)	142	232			174		636	4043		514	2899	1131
v/s Ratio Prot		0.07						0.13			c0.14	
v/s Ratio Perm	0.04				c0.09		0.12			0.10		0.02
v/c Ratio	0.31	0.49			0.68		0.15	0.17		0.13	0.18	0.02
Uniform Delay, d1	46.6	47.8			49.2		3.3	3.4		3.3	3.4	3.0
Progression Factor	1.00	1.00			1.00		2.11	2.63		0.86	0.85	0.72
Incremental Delay, d2	0.5	0.6			8.0		0.4	0.1		0.5	0.1	0.0
Delay (s)	47.1	48.4			57.2		7.5	9.0		3.3	3.1	2.2
Level of Service	D	D			E		A	A		A	A	A
Approach Delay (s)		48.0			57.2			8.8			3.0	
Approach LOS		D			E			A			A	

Intersection Summary	
HCM 2000 Control Delay	14.4
HCM 2000 Volume to Capacity ratio	0.25
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	59.4%
Analysis Period (min)	15
Sum of lost time (s)	10.1
ICU Level of Service	B

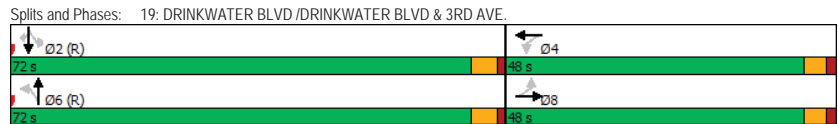
Description: Last Update: Sept 2017
c Critical Lane Group

Existing PM
19: DRINKWATER BLVD /DRINKWATER BLVD & 3RD AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

	↓	←	↑	→
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	72	48	72	48
Maximum Split (%)	60.0%	40.0%	60.0%	40.0%
Minimum Split (s)	22.2	38.9	32.2	30.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	0.2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	9	7	7
Flash Dont Walk (s)	10	25	20	19
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	40	112	40	112
End Time (s)	112	40	112	40
Yield/Force Off (s)	106.8	35.1	106.8	35.1
Yield/Force Off 170(s)	96.8	10.1	86.8	16.1
Local Start Time (s)	0	72	0	72
Local Yield (s)	66.8	115.1	66.8	115.1
Local Yield 170(s)	56.8	90.1	46.8	96.1

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 40 (33%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



Existing PM
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↖	→	↘	↙	←	↖	↘	↙	↗	↘	↙	↗	↘	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↖	↖↖↖	↖	↖	↖↖↖	↖	↖	↖↖↖	↖	↖	↖↖↖	↖	↖↖↖	↖
Traffic Volume (vph)	228	712	19	91	643	164	67	468	103	118	393	171		
Future Volume (vph)	228	712	19	91	643	164	67	468	103	118	393	171		
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800		
Total Lost time (s)	5.6	5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5			
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95			
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.99	1.00	0.99			
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95			
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			
Satd. Flow (prot)	1676	5353	1472	1676	5353	1462	1676	3725	1480	1676	3537			
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			
Satd. Flow (perm)	1676	5353	1472	1676	5353	1462	1676	3725	1480	1676	3537			
Peak-hour factor, PHF	0.95	0.95	0.95	0.85	0.85	0.85	0.85	0.85	0.85	0.94	0.94			0.94
Adj. Flow (vph)	240	749	20	107	756	193	79	551	121	126	418			182
RTOR Reduction (vph)	0	0	11	0	0	76	0	0	0	0	41			0
Lane Group Flow (vph)	240	749	9	107	756	117	79	551	121	126	559			0
Confl. Peds. (#/hr)			5			6			6		5			
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA			
Protected Phases	5 10	2		1	6	7	3	8	1	7	4			
Permitted Phases			2			6			8					
Actuated Green, G (s)	23.2	59.1	59.1	9.5	39.9	52.2	9.6	25.1	34.6	12.3	28.1			
Effective Green, g (s)	23.2	59.1	59.1	9.5	39.9	52.2	9.6	25.1	34.6	12.3	28.1			
Actuated g/C Ratio	0.18	0.46	0.46	0.07	0.31	0.41	0.08	0.20	0.27	0.10	0.22			
Clearance Time (s)		5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5			
Vehicle Extension (s)		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0			
Lane Grp Cap (vph)	304	2477	681	124	1672	597	125	732	462	161	778			
v/s Ratio Prot	c0.14	0.14		0.06	c0.14	0.02	0.05	0.15	0.02	c0.08	c0.16			
v/s Ratio Perm			0.01			0.06			0.06					
v/c Ratio	0.79	0.30	0.01	0.86	0.45	0.20	0.63	0.75	0.26	0.78	0.72			
Uniform Delay, d1	49.9	21.4	18.5	58.5	35.1	24.3	57.3	48.4	36.5	56.4	46.1			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	11.8	0.3	0.0	41.0	0.9	0.1	7.4	3.9	0.1	20.0	2.7			
Delay (s)	61.8	21.7	18.6	99.5	36.0	24.3	64.8	52.3	36.6	76.4	48.8			
Level of Service	E	C	B	F	D	C	E	D	D	E	D			
Approach Delay (s)		31.2			40.3			51.1			53.6			
Approach LOS		C			D			D			D			

Intersection Summary	
HCM 2000 Control Delay	42.7
HCM 2000 Volume to Capacity ratio	0.66
Actuated Cycle Length (s)	127.7
Intersection Capacity Utilization	77.2%
Analysis Period (min)	15
Description: Last Update: Nov 2017	
c Critical Lane Group	

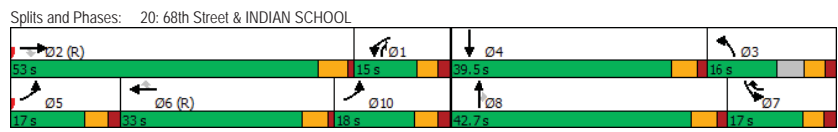
Existing PM
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	↔		↔		↔		↔		↔	
Phase Number	1	2	3	4	5	6	7	8	10	
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT	EBL	
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead		
Lead-Lag Optimize										
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None	
Maximum Split (s)	15	53	16	39.5	17	33	17	42.7	18	
Maximum Split (%)	11.7%	41.5%	12.5%	30.9%	13.3%	25.8%	13.3%	33.4%	14.1%	
Minimum Split (s)	11	32.4	11	39.5	11	33	11	42.7	11	
Yellow Time (s)	3.3	4.4	3.3	4	3.6	4	3.3	4	3.6	
All-Red Time (s)	2	1	1.9	1.5	2	1	2	1.7	2	
Minimum Initial (s)	5	10	5	7	5	10	5	7	5	
Vehicle Extension (s)	2	2	2	2	2	2	2	2	2	
Minimum Gap (s)	1	1	1	1	1	1	1	1	1	
Time Before Reduce (s)	0	0	0	0	0	0	0	0	0	
Time To Reduce (s)	0	0	0	0	0	0	0	0	0	
Walk Time (s)		4		4		4		4		
Flash Dont Walk (s)		23		30		24		33		
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes	Yes	
Inhibit Max	No	No	No	No	No	No	No	No	No	
Start Time (s)	73	20	127.5	88	20	37	3	88	70	
End Time (s)	88	73	20	127.5	37	70	20	3	88	
Yield/Force Off (s)	82.7	67.6	14.8	122	31.4	65	14.7	125	82.4	
Yield/Force Off 170(s)	82.7	44.6	14.8	92	31.4	41	14.7	92	82.4	
Local Start Time (s)	53	0	107.5	68	0	17	110.7	68	50	
Local Yield (s)	62.7	47.6	122.5	102	11.4	45	122.4	105	62.4	
Local Yield 170(s)	62.7	24.6	122.5	72	11.4	21	122.4	72	62.4	

Intersection Summary

Cycle Length	127.7
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 20 (16%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	



Existing PM
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↔		↔		↔		↔		↔		↔		↔	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↔↔	↔↔	↔	↔↔	↔↔		↔	↔↔		↔	↔↔			
Traffic Volume (vph)	202	655	57	62	579	53	86	330	41	72	504	152		
Future Volume (vph)	202	655	57	62	579	53	86	330	41	72	504	152		
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800		
Total Lost time (s)	5.3	5.0	3.0	5.3	5.0		5.3	5.3		5.3	5.3			
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		1.00	0.95		1.00	0.91			
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00			
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.98		1.00	0.97			
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00			
Satd. Flow (prot)	3317	3725	1510	3317	3685		1710	3671		1710	5173			
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00			
Satd. Flow (perm)	3317	3725	1510	3317	3685		1710	3671		1710	5173			
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.90	0.90	0.90	0.89	0.89	0.89		
Adj. Flow (vph)	220	712	62	69	643	59	96	367	46	81	566	171		
RTOR Reduction (vph)	0	0	33	0	5	0	0	10	0	0	54	0		
Lane Group Flow (vph)	220	712	29	69	697	0	96	403	0	81	683	0		
Confl. Peds. (#/hr)			1									3		
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%		
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA			
Protected Phases	5	2		1	6		3	8		7	4			
Permitted Phases			2											
Actuated Green, G (s)	12.9	54.4	54.4	9.0	50.5		11.5	22.9		12.8	24.2			
Effective Green, g (s)	12.9	54.4	56.4	9.0	50.5		11.5	22.9		12.8	24.2			
Actuated g/C Ratio	0.11	0.45	0.47	0.08	0.42		0.10	0.19		0.11	0.20			
Clearance Time (s)	5.3	5.0	5.0	5.3	5.0		5.3	5.3		5.3	5.3			
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0		2.0	1.0		2.0	1.0			
Lane Grp Cap (vph)	356	1688	709	248	1550		163	700		182	1043			
v/s Ratio Prot	c0.07	0.19		0.02	c0.19		c0.06	0.11		0.05	c0.13			
v/s Ratio Perm			0.02											
v/c Ratio	0.62	0.42	0.04	0.28	0.45		0.59	0.58		0.45	0.65			
Uniform Delay, d1	51.2	22.2	17.2	52.4	24.8		52.0	44.1		50.3	44.1			
Progression Factor	1.00	1.00	1.00	1.03	0.82		1.00	1.00		1.07	1.00			
Incremental Delay, d2	2.2	0.8	0.1	0.2	0.9		3.5	0.7		0.6	1.1			
Delay (s)	53.4	22.9	17.3	54.0	21.2		55.5	44.9		54.2	45.0			
Level of Service	D	C	B	D	C		E	D		D	D			
Approach Delay (s)		29.3			24.2			46.9			45.9			
Approach LOS		C			C			D			D			

Intersection Summary

HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

Existing PM
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	90	30	90	30
Maximum Split (%)	75.0%	25.0%	75.0%	25.0%
Minimum Split (s)	16	20	16	12
Yellow Time (s)	4	3.5	4	3.3
All-Red Time (s)	1.2	0.5	1.2	1.4
Minimum Initial (s)	10	4	10	7
Vehicle Extension (s)	0.2	3	0.2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	8
Flash Dont Walk (s)	8	11	7	17
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	70	40	70	40
End Time (s)	40	70	40	70
Yield/Force Off (s)	34.8	66	34.8	65.3
Yield/Force Off 170(s)	26.8	55	27.8	48.3
Local Start Time (s)	0	90	0	90
Local Yield (s)	84.8	116	84.8	115.3
Local Yield 170(s)	76.8	105	77.8	98.3
Intersection Summary				
Cycle Length	120			
Control Type	Actuated-Coordinated			
Natural Cycle	40			
Offset: 70 (58%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green				

Splits and Phases: 22: MARSHALL WY. & INDIAN SCHOOL



Existing PM
23: SCOTTSDALE RD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	614	100	151	622	154	53	405	104	180	588	130
Future Volume (vph)	98	614	100	151	622	154	53	405	104	180	588	130
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	3635		1676	3602		1676	3599		1676	3725	1475
Flt Permitted	0.22	1.00		0.27	1.00		0.15	1.00		0.22	1.00	1.00
Satd. Flow (perm)	395	3635		479	3602		263	3599		380	3725	1475
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	103	646	105	166	684	169	59	450	116	200	653	144
RTOR Reduction (vph)	0	9	0	0	14	0	0	22	0	0	0	100
Lane Group Flow (vph)	103	742	0	166	839	0	59	544	0	200	653	44
Confl. Peds. (#/hr)			9			5			4			
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	63.2	53.1		63.2	53.1		36.9	26.8		36.9	26.8	36.9
Effective Green, g (s)	63.2	53.1		63.2	53.1		36.9	26.8		36.9	26.8	36.9
Actuated g/C Ratio	0.53	0.44		0.53	0.44		0.31	0.22		0.31	0.22	0.31
Clearance Time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	315	1608		353	1593		199	803		225	831	516
v/s Ratio Prol	0.03	0.20		c0.04	c0.23		0.02	0.15		c0.07	0.18	0.01
v/s Ratio Perm	0.14			0.21			0.07			c0.20		0.02
v/c Ratio	0.33	0.46		0.47	0.53		0.30	0.68		0.89	0.79	0.09
Uniform Delay, d1	27.7	23.4		28.0	24.3		45.6	42.6		46.3	43.9	29.6
Progression Factor	1.61	1.21		1.62	1.62		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.9		0.3	1.2		0.3	1.8		31.0	4.6	0.0
Delay (s)	45.0	29.4		45.6	40.4		45.9	44.4		77.3	48.4	29.6
Level of Service	D	C		D	D		D	D		E	D	C
Approach Delay (s)	31.3			41.3			44.6			51.5		
Approach LOS	C			D			D			D		

Intersection Summary			
HCM 2000 Control Delay	42.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

Existing PM
23: SCOTTSDALE RD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

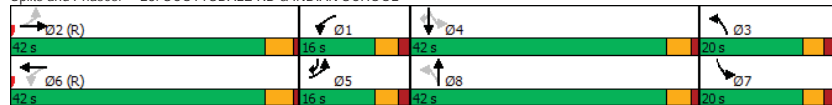


Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	16	42	20	42	16	42	20	42
Maximum Split (%)	13.3%	35.0%	16.7%	35.0%	13.3%	35.0%	16.7%	35.0%
Minimum Split (s)	11	30	10	32.8	11	33	10	34.8
Yellow Time (s)	3.3	4	3	3.6	3.3	4	3	3.6
All-Red Time (s)	1.8	1	2	1.2	1.8	1	2	1.2
Minimum Initial (s)	5	10	5	10	5	10	5	10
Vehicle Extension (s)	2	1	2	2	2	1	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		8		8
Flash Dont Walk (s)		18		21		20		22
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	42	0	100	58	42	0	100	58
End Time (s)	58	42	0	100	58	42	0	100
Yield/Force Off (s)	52.9	37	115	95.2	52.9	37	115	95.2
Yield/Force Off 170(s)	52.9	19	115	74.2	52.9	17	115	73.2
Local Start Time (s)	42	0	100	58	42	0	100	58
Local Yield (s)	52.9	37	115	95.2	52.9	37	115	95.2
Local Yield 170(s)	52.9	19	115	74.2	52.9	17	115	73.2

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green, Master Intersection	

Splits and Phases: 23: SCOTTSDALE RD & INDIAN SCHOOL



Existing PM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	↑
Traffic Volume (vph)	877	53	82	937	54	91
Future Volume (vph)	877	53	82	937	54	91
Ideal Flow (vphpl)	2000	1800	1800	2000	1800	1800
Total Lost time (s)	5.2		5.2	5.2	4.8	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frbp, ped/bikes	1.00		1.00	1.00	0.99	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.92	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	3687		1676	3725	1567	
Flt Permitted	1.00		0.27	1.00	0.98	
Satd. Flow (perm)	3687		479	3725	1567	
Peak-hour factor, PHF	0.95	0.95	0.89	0.89	0.88	0.88
Adj. Flow (vph)	923	56	92	1053	61	103
RTOR Reduction (vph)	3	0	0	0	57	0
Lane Group Flow (vph)	976	0	92	1053	107	0
Confl. Peds. (#/hr)		3				6
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	90.5		90.5	90.5	19.5	
Effective Green, g (s)	90.5		90.5	90.5	19.5	
Actuated g/C Ratio	0.75		0.75	0.75	0.16	
Clearance Time (s)	5.2		5.2	5.2	4.8	
Vehicle Extension (s)	0.2		0.2	0.2	2.0	
Lane Grp Cap (vph)	2780		361	2809	254	
v/s Ratio Prot	0.26			c0.28	c0.07	
v/s Ratio Perm			0.19			
v/c Ratio	0.35		0.25	0.37	0.42	
Uniform Delay, d1	4.9		4.5	5.1	45.2	
Progression Factor	2.36		0.60	0.63	1.00	
Incremental Delay, d2	0.3		1.6	0.4	0.4	
Delay (s)	11.9		4.3	3.5	45.6	
Level of Service	B		A	A	D	
Approach Delay (s)	11.9			3.6	45.6	
Approach LOS	B			A	D	

Intersection Summary

HCM 2000 Control Delay	10.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

Description: Last Update: Nov 2017

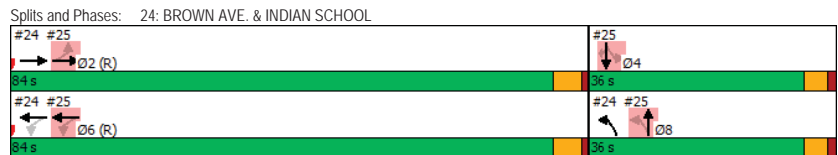
c Critical Lane Group

Existing PM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	→	↓	←	↖
Phase Number	2	4	6	8
Node Number	24	25	24	24
Movement	EBT	SBTL	WBTL	NBL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	84	36	84	36
Maximum Split (%)	70.0%	30.0%	70.0%	30.0%
Minimum Split (s)	23.2	12	27.2	35.8
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.5	1.2	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	0.2	2	0.2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	11		15	24
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	98	62	98	62
End Time (s)	62	98	62	98
Yield/Force Off (s)	56.8	93.2	56.8	93.2
Yield/Force Off 170(s)	45.8	93.2	41.8	69.2
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.8	115.2	78.8	115.2
Local Yield 170(s)	67.8	115.2	63.8	91.2

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 98 (82%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	



Existing PM
25: BUCKBOARD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↖	→	↘	↙	←	↖	↗	↘	↙	↖	↗	↘	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SEB	SEB
Lane Configurations	↖	↖↗		↖	↖↗		↖↗	↖↗		↖↗	↖↗	↖↗	↖↗
Traffic Volume (vph)	32	921	7	58	930	24	9	4	43	107	3	74	74
Future Volume (vph)	32	921	7	58	930	24	9	4	43	107	3	74	74
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800
Total Lost time (s)	5.2	5.2		5.2	5.2			4.8				4.8	4.8
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00				1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.98				1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00				1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.90				1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99				0.95	1.00
Satd. Flow (prot)	1676	3720		1676	3708			1709				1870	1500
Flt Permitted	0.24	1.00		0.27	1.00			0.95				0.70	1.00
Satd. Flow (perm)	428	3720		480	3708			1639				1377	1500
Peak-hour factor, PHF	0.95	0.95	0.95	0.89	0.89	0.89	0.88	0.88	0.88	0.90	0.90	0.90	0.90
Adj. Flow (vph)	34	969	7	65	1045	27	10	5	49	119	3	82	82
RTOR Reduction (vph)	0	0	0	0	1	0	0	41	0	0	0	69	69
Lane Group Flow (vph)	34	976	0	65	1071	0	0	23	0	0	122	13	13
Confl. Peds. (#/hr)			9			8			13				
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm	Perm
Protected Phases		2			6			8			4		4
Permitted Phases	2			6			8			4			4
Actuated Green, G (s)	90.5	90.5		90.5	90.5			19.5			19.5	19.5	19.5
Effective Green, g (s)	90.5	90.5		90.5	90.5			19.5			19.5	19.5	19.5
Actuated g/C Ratio	0.75	0.75		0.75	0.75			0.16			0.16	0.16	0.16
Clearance Time (s)	5.2	5.2		5.2	5.2			4.8			4.8	4.8	4.8
Vehicle Extension (s)	0.2	0.2		0.2	0.2			2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	322	2805		362	2796			266			223	243	243
v/s Ratio Prot		0.26			0.29								
v/s Ratio Perm	0.08			0.14				0.01				0.09	0.01
v/c Ratio	0.11	0.35		0.18	0.38			0.09				0.55	0.05
Uniform Delay, d1	3.9	4.9		4.2	5.1			42.7				46.2	42.5
Progression Factor	0.36	0.38		1.92	2.31			1.00				1.00	1.00
Incremental Delay, d2	0.6	0.3		0.9	0.3			0.1				1.5	0.0
Delay (s)	2.1	2.2		8.9	12.1			42.7				47.7	42.5
Level of Service	A	A		A	B			D				D	D
Approach Delay (s)		2.2			11.9			42.7				45.6	
Approach LOS		A			B			D				D	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

Existing PM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

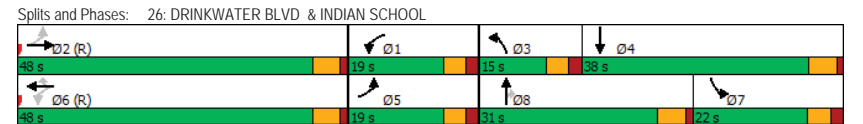
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	78	1006	55	267	797	200	79	441	392	296	246	53
Future Volume (vph)	78	1006	55	267	797	200	79	441	392	296	246	53
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.1	5.3	5.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1710	3697		1710	3725	1510	1710	3725	1505	3317	3629	
Flt Permitted	0.15	1.00		0.09	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	275	3697		168	3725	1510	1710	3725	1505	3317	3629	
Peak-hour factor, PHF	0.94	0.94	0.94	0.89	0.89	0.89	0.90	0.90	0.90	0.80	0.80	0.80
Adj. Flow (vph)	83	1070	59	300	896	225	88	490	436	370	308	66
RTOR Reduction (vph)	0	3	0	0	0	106	0	0	173	0	15	0
Lane Group Flow (vph)	83	1126	0	300	896	119	88	490	263	370	359	0
Confl. Peds. (#/hr)			2			1			4			3
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6			8			
Actuated Green, G (s)	56.5	42.8		56.5	42.8	42.8	8.9	25.9	25.9	16.7	33.7	
Effective Green, g (s)	56.5	42.8		56.5	42.8	42.8	8.9	25.9	25.9	16.7	33.7	
Actuated g/C Ratio	0.47	0.36		0.47	0.36	0.36	0.07	0.22	0.22	0.14	0.28	
Clearance Time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.1	5.3	5.1	
Vehicle Extension (s)	2.0	0.2		2.0	0.2	0.2	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	293	1318		255	1328	538	126	803	324	461	1019	
v/s Ratio Prot	0.03	0.30		c0.13	0.24		0.05	0.13		c0.11	0.10	
v/s Ratio Perm	0.10			c0.42		0.08			c0.17			
v/c Ratio	0.28	0.85		1.18	0.67	0.22	0.70	0.61	0.81	0.80	0.35	
Uniform Delay, d1	35.8	35.7		47.2	32.7	27.0	54.2	42.5	44.7	50.1	34.4	
Progression Factor	1.15	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.04	
Incremental Delay, d2	0.2	7.0		112.6	2.8	1.0	12.8	3.4	19.4	9.1	1.0	
Delay (s)	41.5	42.8		159.8	35.5	27.9	67.0	45.9	64.1	59.7	36.9	
Level of Service	D	D		F	D	C	E	D	E	E	D	
Approach Delay (s)		42.7			60.5			55.6			48.2	
Approach LOS		D			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	52.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9
Intersection Capacity Utilization	95.9%	ICU Level of Service	F
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

Existing PM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBT	EBL	WBTL	SBL	NBT
Lead/Lag			Lead	Lag			Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	Max	None	C-Max	None	Max
Maximum Split (s)	19	48	15	38	19	48	22	31
Maximum Split (%)	15.8%	40.0%	12.5%	31.7%	15.8%	40.0%	18.3%	25.8%
Minimum Split (s)	11	16	11	13	11	16	11	13
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1.2	2	1.1	2	1.2	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	0.2	2	2	2	0.2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		9		7		11
Flash Dont Walk (s)		21		20		19		20
Dual Entry	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	18	90	37	52	18	90	68	37
End Time (s)	37	18	52	90	37	18	90	68
Yield/Force Off (s)	31.7	12.8	46.7	84.9	31.7	12.8	84.7	62.9
Yield/Force Off 170(s)	31.7	111.8	46.7	64.9	31.7	113.8	84.7	42.9
Local Start Time (s)	48	0	67	82	48	0	98	67
Local Yield (s)	61.7	42.8	76.7	114.9	61.7	42.8	114.7	92.9
Local Yield 170(s)	61.7	21.8	76.7	94.9	61.7	23.8	114.7	72.9
Intersection Summary								
Cycle Length	120							
Control Type	Actuated-Coordinated							
Natural Cycle	60							
Offset: 90 (75%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green								




Existing PM
27: 70th St & GOLDWATER BLVD

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑	↑	↑
Traffic Vol, veh/h	670	152	29	288	67	13
Future Vol, veh/h	670	152	29	288	67	13
Conflicting Peds, #/hr	0	8	0	0	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	70	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	728	165	32	313	73	14
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	901	0	1040	457
Stage 1	-	-	-	-	819	-
Stage 2	-	-	-	-	221	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	437	-	259	471
Stage 1	-	-	-	-	319	-
Stage 2	-	-	-	-	765	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	434	-	238	467
Mov Cap-2 Maneuver	-	-	-	-	238	-
Stage 1	-	-	-	-	293	-
Stage 2	-	-	-	-	765	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	1.3	24.5			
HCM LOS			C			
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	238	467	-	-	434	-
HCM Lane V/C Ratio	0.306	0.03	-	-	0.073	-
HCM Control Delay (s)	26.7	12.9	-	-	13.9	-
HCM Lane LOS	D	B	-	-	B	-
HCM 95th %tile Q(veh)	1.2	0.1	-	-	0.2	-

Existing PM
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis



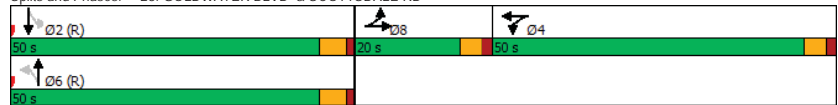
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕	↕
Traffic Volume (vph)	17	14	21	580	23	13	23	281	4	21	591	17
Future Volume (vph)	17	14	21	580	23	13	23	281	4	21	591	17
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.9			4.9			5.2			5.2		
Lane Util. Factor	1.00			0.95			1.00			0.95		
Frbp, ped/bikes	0.99			1.00			1.00			1.00		
Flpb, ped/bikes	1.00			1.00			1.00			1.00		
Frt	0.95			1.00			0.99			1.00		
Flt Protected	0.98			0.95			0.96			0.95		
Satd. Flow (prot)	1803			1593			1771			1676		
Flt Permitted	0.98			0.95			0.96			0.38		
Satd. Flow (perm)	1803			1593			1771			671		
Peak-hour factor, PHF	0.80	0.80	0.80	0.88	0.88	0.88	0.84	0.84	0.84	0.95	0.95	0.95
Adj. Flow (vph)	21	18	26	659	26	15	27	335	5	22	622	18
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	65	0	349	350	0	27	340	0	22	638	0
Conf. Peds. (#/hr)	4			4			4			3		
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4		6	6		2	2	
Permitted Phases							6			2		
Actuated Green, G (s)	7.7			31.3			66.0			66.0		
Effective Green, g (s)	7.7			31.3			66.0			66.0		
Actuated g/C Ratio	0.06			0.26			0.55			0.55		
Clearance Time (s)	4.9			4.9			5.2			5.2		
Vehicle Extension (s)	2.0			2.0			2.0			2.0		
Lane Grp Cap (vph)	115			415			461			369		
v/s Ratio Prot	c0.04			c0.22			0.20			0.09		
v/s Ratio Perm							0.04			0.02		
v/c Ratio	0.57			0.84			0.76			0.07		
Uniform Delay, d1	54.5			42.0			40.9			12.7		
Progression Factor	1.00			1.00			1.00			1.00		
Incremental Delay, d2	3.8			13.7			6.3			0.4		
Delay (s)	58.3			55.7			47.1			13.0		
Level of Service	E			E			D			B		
Approach Delay (s)	58.3			51.4			13.5			13.9		
Approach LOS	E			D			B			B		
Intersection Summary												
HCM 2000 Control Delay	30.1			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.43											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			15.0					
Intersection Capacity Utilization	52.2%			ICU Level of Service			A					
Analysis Period (min)	15											
Description: Last Update: Sept 2017												
c Critical Lane Group												

Existing PM
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

	↓	↘	↑	↗
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	50	50	50	20
Maximum Split (%)	41.7%	41.7%	41.7%	16.7%
Minimum Split (s)	16	13	16	13
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	88	38	88	18
End Time (s)	18	88	18	38
Yield/Force Off (s)	12.8	83.1	12.8	33.1
Yield/Force Off 170(s)	12.8	83.1	12.8	33.1
Local Start Time (s)	0	70	0	50
Local Yield (s)	44.8	115.1	44.8	65.1
Local Yield 170(s)	44.8	115.1	44.8	65.1
Intersection Summary				
Cycle Length	120			
Control Type	Actuated-Coordinated			
Natural Cycle	50			
Offset: 88 (73%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				

Splits and Phases: 28: GOLDWATER BLVD & SCOTTSDALE RD



Existing PM
29: OSBORN RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↘	→	↗	↙	←	↖	↘	↙	↗	↖	↘	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗	↗	↗	↗	↗	↗	↗
Traffic Volume (vph)	24	200	68	169	306	117	121	642	56	122	1055	27
Future Volume (vph)	24	200	68	169	306	117	121	642	56	122	1055	27
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3560		1676	3552		1676	3725	1467	1676	5329	
Flt Permitted	0.19	1.00		0.43	1.00		0.16	1.00	1.00	0.28	1.00	
Satd. Flow (perm)	343	3560		758	3552		276	3725	1467	500	5329	
Peak-hour factor, PHF	0.83	0.83	0.83	0.80	0.80	0.80	0.84	0.84	0.84	0.88	0.88	0.88
Adj. Flow (vph)	29	241	82	211	382	146	144	764	67	139	1199	31
RTOR Reduction (vph)	0	32	0	0	37	0	0	0	35	0	2	0
Lane Group Flow (vph)	29	291	0	211	492	0	144	764	32	139	1228	0
Confl. Peds. (#/hr)			13			7			8			10
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	30.4	22.3		30.4	22.3		68.2	57.5	57.5	68.6	57.9	
Effective Green, g (s)	30.4	22.3		30.4	22.3		68.2	57.5	57.5	68.6	57.9	
Actuated g/C Ratio	0.25	0.19		0.25	0.19		0.57	0.48	0.48	0.57	0.48	
Clearance Time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.0	
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	1.0	1.0	2.0	1.0	
Lane Grp Cap (vph)	176	661		253	660		281	1784	702	390	2571	
v/s Ratio Prot	0.01	0.08		c0.06	0.14		c0.05	0.21		0.03	0.23	
v/s Ratio Perm	0.03			c0.15			c0.24		0.02	0.17		
v/c Ratio	0.16	0.44		0.83	0.74		0.51	0.43	0.05	0.36	0.48	
Uniform Delay, d1	45.3	43.3		44.8	46.2		30.6	20.5	16.6	21.8	20.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.2		19.6	4.0		0.7	0.8	0.1	0.2	0.6	
Delay (s)	45.5	43.5		64.5	50.2		31.2	21.2	16.8	22.0	21.5	
Level of Service	D	D		E	D		C	C	B	C	C	
Approach Delay (s)		43.7			54.2			22.4			21.6	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay	31.1		HCM 2000 Level of Service		C							
HCM 2000 Volume to Capacity ratio	0.61											
Actuated Cycle Length (s)	120.0		Sum of lost time (s)		21.4							
Intersection Capacity Utilization	73.4%		ICU Level of Service		D							
Analysis Period (min)	15											
Description: Last Update: Sept 2017												
c Critical Lane Group												

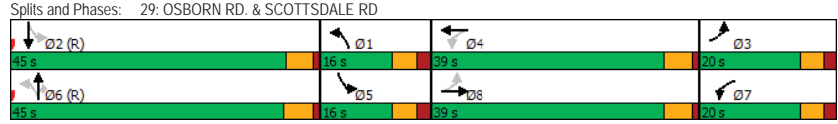
Existing PM
29: OSBORN RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase



Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	EBL	WBTL	SBL	NBTL	WBL	EBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	16	45	20	39	16	45	20	39
Maximum Split (%)	13.3%	37.5%	16.7%	32.5%	13.3%	37.5%	16.7%	32.5%
Minimum Split (s)	11	31	11	38.1	11	34.4	11	37.1
Yellow Time (s)	3.6	4	3.3	4	3.6	4.4	3.3	4
All-Red Time (s)	2	1	2	1.1	2	1	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	1	2	1	2	1	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		9		10		11
Flash Dont Walk (s)		18		24		19		21
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	5	80	60	21	5	80	60	21
End Time (s)	21	5	80	60	21	5	80	60
Yield/Force Off (s)	15.4	0	74.7	54.9	15.4	119.6	74.7	54.9
Yield/Force Off 170(s)	15.4	102	74.7	30.9	15.4	100.6	74.7	33.9
Local Start Time (s)	45	0	100	61	45	0	100	61
Local Yield (s)	55.4	40	114.7	94.9	55.4	39.6	114.7	94.9
Local Yield 170(s)	55.4	22	114.7	70.9	55.4	20.6	114.7	73.9

Intersection Summary
 Cycle Length 120
 Control Type Actuated-Coordinated
 Natural Cycle 95
 Offset: 80 (67%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green



APPENDIX D

CRASH ANALYSIS

Intersection	Total	2018	2017	2016	2015	Injury	Fatality	Angle	Left Turn	Rear End	Head On	Sideswipe	Other	Angle	Left Turn	Rear End	Head On	Sideswipe	Other	DUI	Pedestrian	Bicycle	Estimated Crashes per Million Entering Vehicles	Predictive Crashes with Addition of Site	Predictive Crashes of Site Traffic
SCOTTSDALE RD & CHAPARRAL RD	98	16	30	29	23	10	1	20	19	44	3	11	1	20%	19%	45%	3%	11%	1%	7	1	1	1.276	1.277	0.001
SCOTTSDALE RD & RANCHO VISTA	20	1	9	5	5	2	0	3	5	9	1	2	0	15%	25%	45%	5%	10%	0%	1	0	0	0.383	0.384	0.000
SCOTTSDALE RD & GRANADA RD	5	0	2	1	2	1	0	0	0	3	2	0	0	0%	0%	60%	40%	0%	0%	1	0	0	0.096	0.096	0.000
GOLDWATER BL & FASHION SQUARE DR	22	3	8	7	4	3	0	8	7	3	0	4	0	36%	32%	14%	0%	18%	0%	0	0	1	0.724	0.725	0.000
68 ST & CAMELBACK RD	60	16	10	16	18	8	0	18	12	22	0	5	3	30%	20%	37%	0%	8%	5%	2	1	1	0.844	0.845	0.001
GOLDWATER BL & CAMELBACK RD	76	14	16	26	20	16	0	25	8	29	1	10	3	33%	11%	38%	1%	13%	4%	1	1	1	1.069	1.070	0.001
SCOTTSDALE RD & CAMELBACK RD	88	14	33	19	22	10	0	21	2	41	5	16	3	24%	2%	47%	6%	18%	3%	8	1	1	1.102	1.104	0.002
SCOTTSDALE RD & DRINKWATER BL	51	13	9	15	14	9	0	10	7	19	0	11	4	20%	14%	37%	0%	22%	8%	4	0	1	1.296	1.300	0.003
GOLDWATER BL & 5 AV	5	0	0	3	2	1	0	0	0	1	1	3	0	0%	0%	20%	20%	60%	0%	0	0	0	0.178	0.178	0.000
MARSHALL WY & 5 AV	1	0	0	1	0	0	0	0	0	0	0	0	1	0%	0%	0%	0%	0%	###	0	0	0	0.213	0.213	0.000
STETSON DR & 5 AV	2	0	1	1	0	1	0	1	0	0	0	0	1	50%	0%	0%	0%	0%	50%	1	1	0	0.409	0.410	0.001
CRAFTSMAN CT & 5 AV	2	0	1	0	1	0	0	0	0	0	0	0	2	0%	0%	0%	0%	0%	###	0	0	0	0.631	0.631	0.000
SCOTTSDALE RD & 5 AV	25	4	4	5	12	3	0	8	1	6	0	5	5	32%	4%	24%	0%	20%	20%	4	1	1	0.912	0.913	0.002
DRINKWATER BL & 5 AV	1	0	1	0	0	1	0	1	0	0	0	0	0	###	0%	0%	0%	0%	0%	0	0	0	0.049	0.049	0.000
GOLDWATER BL & 3 AV	5	0	0	3	2	0	0	2	0	1	0	1	1	40%	0%	20%	0%	20%	20%	0	0	0	0.202	0.202	0.000
MARSHALL WY & 3 AV	1	0	0	1	0	0	0	0	0	1	0	0	0	0%	0%	###	0%	0%	0%	0	0	0	0.233	0.233	0.000
CRAFTSMAN CT & 3 AV	2	0	1	1	0	0	0	1	0	0	0	0	1	50%	0%	0%	0%	0%	50%	0	0	0	0.646	0.646	0.000
SCOTTSDALE RD & 3 AV	27	6	5	11	5	7	0	9	3	8	1	2	4	33%	11%	30%	4%	7%	15%	2	2	4	0.946	0.947	0.002
DRINKWATER BL & 3 AV	6	0	2	3	1	0	0	0	0	1	1	3	1	0%	0%	17%	17%	50%	17%	3	0	0	0.257	0.258	0.000
68 ST & INDIAN SCHOOL RD	42	14	10	11	7	1	0	10	1	14	0	15	2	24%	2%	33%	0%	36%	5%	1	0	0	0.654	0.655	0.001
GOLDWATER BL & INDIAN SCHOOL RD	43	11	8	12	12	4	0	8	5	21	1	8	0	19%	12%	49%	2%	19%	0%	3	0	0	0.769	0.770	0.001
MARSHALL WY & INDIAN SCHOOL RD	13	2	4	4	3	3	0	6	1	3	0	1	2	46%	8%	23%	0%	8%	15%	0	1	0	0.420	0.420	0.000
SCOTTSDALE RD & INDIAN SCHOOL RD	80	17	14	27	22	7	0	12	8	40	5	10	5	15%	10%	50%	6%	13%	6%	8	1	3	1.387	1.390	0.002
BROWN AV & INDIAN SCHOOL RD	18	4	3	5	6	3	0	1	1	12	1	0	3	6%	6%	67%	6%	0%	17%	2	1	1	0.471	0.471	0.001
BUCKBOARD TR & INDIAN SCHOOL RD	12	1	3	5	3	0	0	1	0	7	0	2	2	8%	0%	58%	0%	17%	17%	0	0	0	0.290	0.290	0.000
DRINKWATER BL & INDIAN SCHOOL RD	47	6	12	15	14	6	0	14	6	20	2	2	3	30%	13%	43%	4%	4%	6%	5	1	1	0.789	0.790	0.001
70 ST & GOLDWATER BL	3	0	2	0	1	0	0	0	0	0	0	3	0	0%	0%	0%	0%	###	0%	1	0	1	0.149	0.149	0.000
GOLDWATER BL & SCOTTSDALE RD	30	4	10	11	5	1	0	4	3	13	1	7	2	13%	10%	43%	3%	23%	7%	9	0	0	1.191	1.192	0.000
SCOTTSDALE RD & OSBORN RD	54	9	13	16	16	7	0	15	10	14	2	9	4	28%	19%	26%	4%	17%	7%	1	1	0	1.016	1.017	0.001
Totals	839	155	211	253	220	104	1	198	99	332	27	130	53	6.72	2.2	9.2	1.2	4.9	4.7	64	13	17			

Intersection ID	Control	Figure ADT	Estimate ADT	ADT	Site Daily	
1	Signal	52600	59,550	52600	1030	-12%
2	Signal		35,743	35743	1024	
3	Signal		35,571	35571	1024	
4	Signal		20,800	20800	84	
5	Signal	48700	50,557	48700	1379	-4%
6	Signal	48700	49,600	48700	1374	-2%
7	Signal	54700	52,386	54700	1918	4%
8	Signal		26,950	26950	2665	
9	Signal		19,286	19286	2077	
10	Stop-Roundabout		3,214	3214	1916	
11	All-way Stop		3,350	3350	2316	
12	1-way Stop		2,171	2171	523	
13	Signal		18,786	18786	1970	
14	Signal		13,864	13864	343	
15	1-way Stop		16,936	16936	1148	
16	All-way Stop		2,936	2936	127	
17	1-way Stop		2,121	2121	31	
18	Signal		19,557	19557	1612	
19	Signal		15,964	15964	343	
20	Signal	44000	40,014	44000	1515	10%
21	Signal	38300	35,179	38300	1412	9%
22	Signal		21,193	21193	406	
23	Signal	39500	36,936	39500	1771	7%
24	Signal		26,200	26200	1131	
25	Signal		28,379	28379	1131	
26	Signal	40800	46,536	40800	1474	-12%
27	1-way Stop		13,800	13800	351	
28	Signal		17,250	17250	351	
29	Signal	36400	33,493	36400	772	9%

Roadway	Total	2018	2017	2016	2015	Injury	Fatality	Angle	Left Turn	Rear End	Head On	Sideswipe	Other	DUI	Pedestrian	Bicycle
68 St	22	3	5	6	8	7	0	1	2	10	0	5	4	3	0	0
Brown Av	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
Buckboard Tr	3	1	1	0	1	0	0	0	0	1	0	2	0	0	0	0
Craftsman Ct	2	1	0	0	1	1	0	0	0	1	0	0	1	0	0	0
Drinkwater Bl	13	2	5	2	4	1	0	2	0	8	0	2	1	1	0	0
Goldwater Bl	22	1	6	8	7	4	0	4	0	9	1	3	5	0	1	0
Marshall Wy	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Scottsdale Rd	140	17	42	44	37	13	0	17	6	77	3	23	13	11	4	0
Totals	204	26	60	60	58	26	0	25	8	106	5	35	24	15	5	0

408 52 120 120 116

52 0

50 16 212 10 70 48

30 10 0

APPENDIX E

TRIP GENERATION

Southbridge Existing Trip Generation

Proposed

CIVTECH INC.

April 2019

Methodology Overview

This form facilitates trip generation estimation using data within the Institute of Transportation Engineer's (ITE) *Trip Generation Manual*, 10th Edition and methodology described within ITE's *7 Generation Handbook*, 3rd Edition. These references will be referred to as *Manual and Handbook*, respectively. The *Manual* contains data collected by various transportation professionals for a wide range of different land uses, with each land use category represented by a land use code (LUC). Average rates and equations have been established that correlate the relationship between an independent variable that describes the development size and generated trips for each categorized LUC in various settings and time periods. The *Handbook* indicates an established methodology for how to use data contained within the *Manual* when to use the fitted curve instead of the average rate and when to adjustments to the volume of trips are appropriate and how to do so. The methodology steps are represented visually in boxes in Figure 3.1. This worksheet applies calculations for each box if applicable.

Box 1 - Define Study Site Land Use Type & Site Characteristics

The analyst is to pick an appropriate LUC(s) based on the subject's zoning/land use(s)/future land use(s). The size of the land use(s) is described in reference to an independent variable(s) specific to (each) the land use (example: 1,000 square feet of building area is relatively common).

Land Use Types and Size

Proposed Use	Amount Units	ITE LUC	ITE Land Use Name
Zone A			
Geisha-A-Go-Go	4.511 1,000 square feet	931	Quality Restaurant
Cowboy Ciao	6.142 1,000 square feet	931	Quality Restaurant
The Montauk	4.054 1,000 square feet	932	(Sit Down) Restaurant
Diego Pops	2.700 1,000 square feet	932	(Sit Down) Restaurant
Shopping Center	11.204 1,000 square feet	820	Shopping Center
Zone B			
HRW Builders	3.000 1,000 square feet	710	General Office Building
Apartments	6 Dwelling Units	220	Multifamily Housing (Low-Rise)
Shopping Center	8.800 1,000 square feet	820	Shopping Center
Zone C			
Shopping Center	30.618 1,000 square feet	820	Shopping Center

Box 2 - Define Site Context

Context assessment is to "simply determine whether the study sites is in a multimodal setting" and "could have persons accessing the site by walking, bicycling, or riding transit." This assessment is used in Box 4. The *Manual* separates data into 4 setting categories - **Rural**, **General Urban/Suburban**, **Dense Multi-Urban Use** and **Center City Core**. This worksheet uses the following abbreviations, respectively: **R**, **G**, **D**, and **C**. The *Manual* does not have data for all settings of all land use codes. See the table on the next page titled "Site Context and Time Periods" - if this table is not provided, the "General Urban/Suburban" setting is used by default.

Box 3 - Define Analysis Objectives Types of Trips & Time Period

This tool will focus on vehicular trips for a 24-hour period on a typical weekday as well as its AM peak hour and PM peak hour. Other time period(s) may be of interest.

Site Context and Time Periods - Actual Setting, Setting Data Available for LUC, Setting Used in Analyses

Proposed Use	Setting	ADT		AM Peak Hour		PM Peak Hour		(not used)	
		Available	Used	Available	Used	Available	Used		
Zone A									
Geisha-A-Go-Go	General Urban/Suburban	G	G	G	G	G	G		
Cowboy Ciao	General Urban/Suburban	G	G	G	G	G	G		
The Montauk	General Urban/Suburban	G	G	G	G	G	G		
Diego Pops	General Urban/Suburban	G	G	G	G	G	G		
Shopping Center	General Urban/Suburban	G	G	G	G D	G	G D		
Zone B									
HRW Builders	General Urban/Suburban	G	G	G	G D C	G	G D C		
Apartments	General Urban/Suburban	G	G	G	G	G	G		
Shopping Center	General Urban/Suburban	G	G	G	G D	G	G D		
Zone C									
Shopping Center	General Urban/Suburban	G	G	G	G D	G	G D		

If the desired setting is not available within the *Manual*, adjustments may be made in Boxes 6 through 8.

Box 4 - Is Study Site Multimodal?

Per the Handbook, "if the objective is to establish a local trip generation rate for a particular land use or study site, the simplified approach (Box 9) may be acceptable but the *Box 5 through 8* approach is required if the study site is located in an infill setting, contains a mix of uses on-site, or is near significant transit service."

Box 5/Box 9 - Estimate Baseline Trips/Estimate Vehicular Trips (Determine Equation)

Vehicle trips are estimated using rates/equations applicable to each LUC. When the appropriate graph has a fitted curve, the *Handbook* has a process (Figure 4.2) to determine when to use it versus using the weighted average rate or collecting local data. The methodology requires for engineering judgement in some circumstances and permits engineering judgement to override or make adjustments when appropriate to best project (example 1: study site is expected to operate differently than data in the applicable land use code - such as restaurant that is closed in the morning or in the evening; example 2: LUC data in a localized area fails to be represented by the typically selected fitted curve/weighted average rate - a small shop/LUC 820, AM peak hour is skewed by the high y-intercept).

Equation Type: Equation Used [Equated Rate] (Type Abbreviations: Weighted Average Rate ("WA"), Fitted Curve ("FC"), or Custom ("C"))

Proposed Use	ADT	AM Peak Hour	PM Peak Hour	(not used)
Zone A				
Geisha-A-Go-Go	WA: $T=X^{*}83.84$ [83.84]	C: $T=X^{*}$ [0.00]	WA: $T=X^{*}7.8$ [7.80]	
Cowboy Ciao	WA: $T=X^{*}83.84$ [83.84]	C: $T=X^{*}$ [0.00]	WA: $T=X^{*}7.8$ [7.80]	
The Montauk	WA: $T=X^{*}112.18$ [112.18]	WA: $T=X^{*}9.94$ [9.94]	WA: $T=X^{*}9.77$ [9.77]	
Diego Pops	WA: $T=X^{*}112.18$ [112.18]	WA: $T=X^{*}9.94$ [9.94]	WA: $T=X^{*}9.77$ [9.77]	
Shopping Center	WA: $T=X^{*}37.75$ [37.75]	WA: $T=X^{*}0.94$ [0.94]	WA: $T=X^{*}3.81$ [3.81]	
Zone B				
HRW Builders	FC: $LN(T)=0.97^{*}LN(X)+2.5$ [11.79]	WA: $T=X^{*}1.16$ [1.16]	FC: $LN(T)=0.95^{*}LN(X)+0.36$ [1.36]	
Apartments	WA: $T=X^{*}7.32$ [7.32]	FC: $LN(T)=0.95^{*}LN(X)-0.51$ [0.55]	FC: $LN(T)=0.89^{*}LN(X)-0.02$ [0.80]	
Shopping Center	WA: $T=X^{*}37.75$ [37.75]	WA: $T=X^{*}0.94$ [0.94]	WA: $T=X^{*}3.81$ [3.81]	
Zone C				
Shopping Center	WA: $T=X^{*}37.75$ [37.75]	WA: $T=X^{*}0.94$ [0.94]	WA: $T=X^{*}3.81$ [3.81]	

Southbridge Existing Trip Generation

Proposed

CIVTECH INC.

April 2019

Box 5/Box 9 - Estimate Baseline Trips/Estimate Vehicular Trips (Apply Equations and in/out Distributions)

Baseline Vehicular Trips

Proposed Use	ADT				AM Peak Hour				PM Peak Hour				(not used)
	% In	In	Out	Total	% In	In	Out	Total	% In	In	Out	Total	
Zone A													
Geisha-A-Go-Go	50%	189	189	378	80%	2	1	3	67%	23	12	35	
Cowboy Ciao	50%	257	257	514	80%	3	1	4	67%	32	16	48	
The Montauk	50%	227	227	454	55%	22	18	40	62%	25	15	40	
Diego Pops	50%	151	151	302	55%	15	12	27	62%	16	10	26	
Shopping Center	50%	211	211	422	62%	7	4	11	48%	21	22	43	
Zone B													
HRW Builders	50%	18	18	36	86%	3	0	3	16%	1	3	4	
Apartments	50%	22	22	44	23%	1	2	3	63%	3	2	5	
Shopping Center	50%	166	166	332	62%	5	3	8	48%	16	18	34	
Zone C													
Shopping Center	50%	578	578	1,156	62%	18	11	29	48%	56	61	117	
Totals		1,819	1,819	3,638		76	52	128		193	159	352	

If vehicle trip reductions are not applied for internal capture and alternative mode, vehicle trips may be separated into vehicle trip subsets (pass-by trips, diverted trips, truck trips, new passenger vehicle trips) as part of Box 10. If vehicle trip reductions are to be applied, continue to Box 6.

Box 6 - Convert Baseline Vehicle Trips to Person Trips

If no vehicle trip reductions are to be applied, this portion may be ignored. The *Handbook* states "There are not enough samples to derive precise percentages by mode...however, for all but c...the motor vehicle percentage of total person trips is at least 96 percent." and "[vehicle occupancy for] many of the most commonly analyzed land use codes are not [available]." This form assumes that the total baseline vehicle trips for all land use codes accounts 90% of total person trips. Unless otherwise specified, this form later reverses the conversion in Box 8.

Box 7 - Estimate Internal Person Trips, External Walk/Bike Trips, Transit Person Trips, External Person Trips (Internal Capture)

Internal capture occurs for mixed-use developments when a portion of the trips generated by the site are expected to have the both the origin and destination within the site. Internal capture is not dependent on mode choice. The table below presents the internal capture percentages and trips in units of vehicle trips. CivTech can provide trips in units of persons if requested.

Adjustments for Internal Trips

Proposed Use	ADT				AM Peak Hour				PM Peak Hour				(not used)
	Percent	In	Out	Total	Percent	In	Out	Total	Percent	In	Out	Total	
Zone A													
Geisha-A-Go-Go	12%	23	23	46	5%	0	0	0	18%	4	2	6	
Cowboy Ciao	12%	31	31	62	5%	0	0	0	18%	6	3	9	
The Montauk	12%	27	27	54	5%	1	1	2	18%	5	2	7	
Diego Pops	12%	18	18	36	5%	1	0	1	18%	3	2	5	
Shopping Center	12%	25	25	50	5%	0	1	1	18%	4	4	8	
Zone B													
HRW Builders	7%	1	1	2	0%	0	0	0	14%	0	1	1	
Apartments	7%	2	2	4	0%	0	0	0	14%	0	1	1	
Shopping Center	7%	12	12	24	0%	0	0	0	14%	2	3	5	
Zone C													
Shopping Center	0%	0	0	0	0%	0	0	0	0%	0	0	0	
Totals		139	139	278		2	2	4		24	18	42	

Box 8 - Convert Person Trips to Final Vehicle Trips

The vehicle occupancy and baseline alternate mode are now factored out from the external trips in vehicles, after any adjustments for internal capture and additional alternate mode from Box In Box 6, vehicle trips were considered to account for 90% of total person trips. Alternate mode trips in addition to the baseline, if any, are accounted for in Box 7. It is estimated that vehicle trip should be reduced by an additional 0% due to carpooling. The final external trips in vehicles is multiplied by 90% - 0% = 90% to produce the external vehicle trips.

External Vehicular Trips

Proposed Use	ADT			AM Peak Hour			PM Peak Hour			(not used)
	In	Out	Total	In	Out	Total	In	Out	Total	
Zone A										
Geisha-A-Go-Go	166	166	332	2	1	3	19	10	29	
Cowboy Ciao	226	226	452	3	1	4	26	13	39	
The Montauk	200	200	400	21	17	38	20	13	33	
Diego Pops	133	133	266	14	12	26	13	8	21	
Shopping Center	186	186	372	7	3	10	17	18	35	
Zone B										
HRW Builders	17	17	34	3	0	3	1	2	3	
Apartments	20	20	40	1	2	3	3	1	4	
Shopping Center	154	154	308	5	3	8	14	15	29	
Zone C										
Shopping Center	578	578	1,156	18	11	29	56	61	117	
Totals	1,680	1,680	3,360	74	50	124	169	141	310	

NCHRP 684 Internal Trip Capture Estimation Tool					
Project Name:	Southbridge Expansion	Organization:	CivTech Inc		
Project Location:	Scottsdale Rd & 5th Ave	Performed By:	Briallen Rees		
Scenario Description:	Zone A existing	Date:	4/15/2019		
Analysis Year:	2022/2032	Checked By:			
Analysis Period:	AM Street Peak Hour	Date:			

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				11	7	4
Restaurant				74	42	32
Cinema/Entertainment				0		
Residential				0		
Hotel				0		
All Other Land Uses ²				0		
				85	49	36

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail	0		1	0	0	0
Restaurant	0	1		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	85	49	36
Internal Capture Percentage	5%	4%	6%
External Vehicle-Trips ⁵	81	47	34
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	14%	25%
Restaurant	2%	3%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

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NCHRP 684 Internal Trip Capture Estimation Tool					
Project Name:	Southbridge Expansion	Organization:	CivTech Inc		
Project Location:	Scottsdale Rd & 5th Ave	Performed By:	Briallen Rees		
Scenario Description:	Zone A existing	Date:	4/15/2019		
Analysis Year:	2022/2032	Checked By:			
Analysis Period:	PM Street Peak Hour	Date:			

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				43	21	22
Restaurant				149	96	53
Cinema/Entertainment				0		
Residential				0		
Hotel				0		
All Other Land Uses ²				0		
				192	117	75

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail	0		6	0	0	0
Restaurant	0	11		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	192	117	75
Internal Capture Percentage	18%	15%	23%
External Vehicle-Trips ⁵	158	100	58
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	52%	27%
Restaurant	6%	21%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made.

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

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NCHRP 684 Internal Trip Capture Estimation Tool					
Project Name:	Southbridge Expansion	Organization:	CivTech Inc		
Project Location:	Scottsdale Rd & 5th Ave	Performed By:	Briallen Rees		
Scenario Description:	Zone B existing	Date:	4/15/2019		
Analysis Year:	2022/2032	Checked By:			
Analysis Period:	AM Street Peak Hour	Date:			

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				3	3	0
Retail				8	5	3
Restaurant				0		
Cinema/Entertainment				0		
Residential				3	1	2
Hotel				0		
All Other Land Uses ²				0		
				14	9	5

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail	0					
Restaurant	0	0				
Cinema/Entertainment	0	0	0			
Residential	0	0	0	0		
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	14	9	5
Internal Capture Percentage	0%	0%	0%
External Vehicle-Trips ⁵	14	9	5
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	0%	N/A
Retail	0%	0%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	0%	0%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Southbridge Expansion	Organization:	CivTech Inc
Project Location:	Scottsdale Rd & 5th Ave	Performed By:	Briallen Rees
Scenario Description:	Zone B existing	Date:	4/15/2019
Analysis Year:	2022/2032	Checked By:	
Analysis Period:	PM Street Peak Hour	Date:	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				4	1	3
Retail				34	16	18
Restaurant				0		
Cinema/Entertainment				0		
Residential				5	3	2
Hotel				0		
All Other Land Uses ²				0		
				43	20	23

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1	0	0	0	0
Retail	0		0	0	1	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	43	20	23
Internal Capture Percentage	14%	15%	13%
External Vehicle-Trips ⁵	37	17	20
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	0%	33%
Retail	13%	6%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	33%	50%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made.

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Methodology Overview

This form facilitates trip generation estimation using data within the Institute of Transportation Engineer's (ITE) *Trip Generation Manual*, 10th Edition and methodology described within ITE's *Trip Generation Handbook*, 3rd Edition. These references will be referred to as *Manual and Handbook*, respectively. The *Manual* contains data collected by various transportation professionals for a wide range of different land uses, with each land use category represented by a land use code (LUC). Average rates and equations have been established that correlate the relationship between an independent variable that describes the development size and generated trips for each categorized LUC in various settings and time periods. The *Handbook* indicates an established methodology for how to use data contained within the *Manual* when to use the fitted curve instead of the average rate and when to adjustments to the volume of trips are appropriate and how to do so. The methodology steps are represented visually in boxes in Figure 3.1. This worksheet applies calculations for each box if applicable.

Box 1 - Define Study Site Land Use Type & Site Characteristics

The analyst is to pick an appropriate LUC(s) based on the subject's zoning/land use(s)/future land use(s). The size of the land use(s) is described in reference to an independent variable(s) specific to (each) the land use (example: 1,000 square feet of building area is relatively common).

Land Use Types and Size

Proposed Use	Amount Units	ITE LUC	ITE Land Use Name
Zone A			
Apartments	184 Dwelling Units	221	Multifamily Housing (Mid-Rise)
Hotel	200 Rooms	310	Hotel
General Office Building	119,040 1,000 square feet	710	General Office Building
Commercial Area and Art Gallery	35,520 1,000 square feet	820	Shopping Center
Zone B			
Apartments	21 Dwelling Units	220	Multifamily Housing (Low-Rise)
Shopping Center	15,590 1,000 square feet	820	Shopping Center
Zone C			
Apartments	194 Dwelling Units	222	Multifamily Housing (High-Rise)
Shopping Center	27,700 1,000 square feet	820	Shopping Center
Zone D			
Apartments	171 Dwelling Units	221	Multifamily Housing (Mid-Rise)
Shopping Center	10,427 1,000 square feet	820	Shopping Center

Box 2 - Define Site Context

Context assessment is to "simply determine whether the study sites is in a multimodal setting" and "could have persons accessing the site by walking, bicycling, or riding transit." This assessment is used in Box 4. The *Manual* separates data into 4 setting categories - **Rural**, **General Urban/Suburban**, **Dense Multi-Urban Use** and **Center City Core**. This worksheet uses the following abbreviations, respectively: **R**, **G**, **D**, and **C**. The *Manual* does not have data for all settings of all land use codes. See the table on the next page titled "Site Context and Time Periods" - if this table is not provided, the "General Urban/Suburban" setting is used by default.

Box 3 - Define Analysis Objectives Types of Trips & Time Period

This tool will focus on vehicular trips for a 24-hour period on a typical weekday as well as its AM peak hour and PM peak hour. Other time period(s) may be of interest.

Site Context and Time Periods - Actual Setting, Setting Data Available for LUC, Setting Used in Analyses

Proposed Use	Setting	ADT		AM Peak Hour		PM Peak Hour		(not used)
		Available	Used	Available	Used	Available	Used	
Zone A								
Apartments	General Urban/Suburban	G	G D	G	G D	G	G D	G
Hotel	General Urban/Suburban	G	G C	G	G D C	G	G C	G
General Office Building	General Urban/Suburban	G	G	G	G D C	G	G D C	G
Commercial Area and Art Gallery	General Urban/Suburban	G	G	G	G D	G	G D	G
Zone B								
Apartments	General Urban/Suburban	G	G	G	G	G	G	G
Shopping Center	General Urban/Suburban	G	G	G	G D	G	G D	G
Zone C								
Apartments	General Urban/Suburban	G	G D C	G	G D C	G	G D C	G
Shopping Center	General Urban/Suburban	G	G	G	G D	G	G D	G
Zone D								
Apartments	General Urban/Suburban	G	G D	G	G D	G	G D	G
Shopping Center	General Urban/Suburban	G	G	G	G D	G	G D	G

If the desired setting is not available within the *Manual*, adjustments may be made in Boxes 6 through 8.

Box 4 - Is Study Site Multimodal?

Per the Handbook, "if the objective is to establish a local trip generation rate for a particular land use or study site, the simplified approach (Box 9) may be acceptable but the *Box 5 through 8* approach is required if the study site is located in an infill setting, contains a mix of uses on-site, or is near significant transit service."

Box 5/Box 9 - Estimate Baseline Trips/Estimate Vehicular Trips (Determine Equation)

Vehicle trips are estimated using rates/equations applicable to each LUC. When the appropriate graph has a fitted curve, the *Handbook* has a process (Figure 4.2) to determine when to use it versus using the weighted average rate or collecting local data. The methodology requires for engineering judgement in some circumstances and permits engineering judgement to override or make adjustments when appropriate to best project (example 1: study site is expected to operate differently than data in the applicable land use code - such as restaurant that is closed in the morning or in the evening; example 2: LUC data in a localized area fails to be represented by the typically selected fitted curve/weighted average rate - a small shop/LUC 820, AM peak hour is skewed by the high y-intercept).

Equation Type: Equation Used [Equated Rate] (Type Abbreviations: Weighted Average Rate ("WA"), Fitted Curve ("FC"), or Custom ("C"))

Proposed Use	ADT	AM Peak Hour	PM Peak Hour	(not used)
Zone A				
Apartments	FC: T=5.45*X-1.75 [5.44]	FC: LN(T)=0.98*LN(X)-0.98 [0.34]	FC: LN(T)=0.96*LN(X)-0.63 [0.43]	
Hotel	FC: T=11.29*X-426.97 [9.16]	FC: T=0.5*X-5.34 [0.47]	FC: T=0.75*X-26.02 [0.62]	
General Office Building	FC: LN(T)=0.97*LN(X)+2.5 [10.56]	FC: T=0.94*X+26.49 [1.16]	FC: LN(T)=0.95*LN(X)+0.36 [1.13]	
Commercial Area and Art Gallery	WA: T=X*37.75 [37.75]	WA: T=X*0.94 [0.94]	WA: T=X*3.81 [3.81]	
Zone B				
Apartments	FC: T=7.56*X-40.86 [5.61]	FC: LN(T)=0.95*LN(X)-0.51 [0.52]	FC: LN(T)=0.89*LN(X)-0.02 [0.70]	
Shopping Center	WA: T=X*37.75 [37.75]	WA: T=X*0.94 [0.94]	WA: T=X*3.81 [3.81]	
Zone C				
Apartments	FC: T=3.94*X+211.81 [5.02]	FC: T=0.28*X+12.86 [0.35]	FC: T=0.34*X+8.56 [0.38]	
Shopping Center	WA: T=X*37.75 [37.75]	WA: T=X*0.94 [0.94]	WA: T=X*3.81 [3.81]	
Zone D				
Apartments	FC: T=5.45*X-1.75 [5.44]	FC: LN(T)=0.98*LN(X)-0.98 [0.34]	FC: LN(T)=0.96*LN(X)-0.63 [0.43]	
Shopping Center	WA: T=X*37.75 [37.75]	WA: T=X*0.94 [0.94]	WA: T=X*3.81 [3.81]	

Southbridge Expansion

Proposed

CIVTECH INC.

April 2019

Box 5/Box 9 - Estimate Baseline Trips/Estimate Vehicular Trips (Apply Equations and in/out Distributions)

Baseline Vehicular Trips

Proposed Use	ADT				AM Peak Hour				PM Peak Hour				(not used)
	% In	In	Out	Total	% In	In	Out	Total	% In	In	Out	Total	
Zone A													
Apartments	50%	501	501	1,002	26%	16	46	62	61%	49	31	80	
Hotel	50%	916	916	1,832	59%	56	39	95	51%	63	61	124	
General Office Building	50%	628	628	1,256	86%	119	19	138	16%	21	113	134	
Commercial Area and Art Gallery	50%	670	670	1,340	62%	20	13	33	48%	65	70	135	
Zone B													
Apartments	50%	59	59	118	23%	3	8	11	63%	9	6	15	
Shopping Center	50%	294	294	588	62%	9	6	15	48%	28	31	59	
Zone C													
Apartments	50%	494	494	988	24%	16	52	68	61%	46	30	76	
Shopping Center	50%	523	523	1,046	62%	16	10	26	48%	51	55	106	
Zone D													
Apartments	50%	465	465	930	26%	15	43	58	61%	45	29	74	
Shopping Center	50%	197	197	394	62%	6	4	10	48%	19	21	40	
Totals		4,747	4,747	9,494		276	240	516		396	447	843	

If vehicle trip reductions are not applied for internal capture and alternative mode, vehicle trips may be separated into vehicle trip subsets (pass-by trips, diverted trips, truck trips, new passenger vehicle trips) as part of Box 10. If vehicle trip reductions are to be applied, continue to Box 6.

Box 6 - Convert Baseline Vehicle Trips to Person Trips

If no vehicle trip reductions are to be applied, this portion may be ignored. The Handbook states "There are not enough samples to derive precise percentages by mode...however, for all but one, ...the motor vehicle percentage of total person trips is at least 96 percent." and "[vehicle occupancy for] many of the most commonly analyzed land use codes are not [available]." This form assumes that the total baseline vehicle trips for all land use codes accounts for 90% of total person trips. Unless otherwise specified, this form later reverses the conversion in Box 8.

Box 7 - Estimate Internal Person Trips, External Walk/Bike Trips, Transit Person Trips, External Person Trips (Internal Capture)

Internal capture occurs for mixed-use developments when a portion of the trips generated by the site are expected to have the both the origin and destination within the site. Internal capture is not dependent on mode choice. The table below presents the internal capture percentages and trips in units of vehicle trips. CivTech can provide trips in units of persons if requested.

Adjustments for Internal Trips

Proposed Use	Percent	ADT			AM Peak Hour			PM Peak Hour			(not used)		
		In	Out	Total	Percent	In	Out	Total	Percent	In		Out	Total
Zone A													
Apartments	13%	65	65	130	9%	1	5	6	17%	8	6	14	
Hotel	13%	119	119	238	9%	5	4	9	17%	11	10	21	
General Office Building	13%	82	82	164	9%	11	1	12	17%	4	19	23	
Commercial Area and Art Gallery	13%	87	87	174	9%	2	1	3	17%	11	12	23	
Zone B													
Apartments	10%	6	6	12	0%	0	0	0	19%	2	1	3	
Shopping Center	10%	29	29	58	0%	0	0	0	19%	5	6	11	
Zone C													
Apartments	11%	54	54	108	2%	0	1	1	21%	10	6	16	
Shopping Center	11%	58	58	116	2%	0	1	1	21%	11	11	22	
Zone D													
Apartments	6%	28	28	56	0%	0	0	0	12%	5	4	9	
Shopping Center	6%	12	12	24	0%	0	0	0	12%	2	3	5	
Totals		540	540	1,080		19	13	32		69	78	147	

Box 8 - Convert Person Trips to Final Vehicle Trips

The vehicle occupancy and baseline alternate mode are now factored out from the external trips in vehicles, after any adjustments for internal capture and additional alternate mode from Box 7. In Box 6, vehicle trips were considered to account for 90% of total person trips. Alternate mode trips in addition to the baseline, if any, are accounted for in Box 7. It is estimated that vehicle trips should be reduced by an additional 0% due to carpooling. The final external trips in vehicles is multiplied by 90% - 0% = 90% to produce the external vehicle trips.

External Vehicular Trips

Proposed Use	ADT			AM Peak Hour			PM Peak Hour			(not used)
	In	Out	Total	In	Out	Total	In	Out	Total	
Zone A										
Apartments	436	436	872	15	41	56	41	25	66	
Hotel	797	797	1,594	51	35	86	52	51	103	
General Office Building	546	546	1,092	108	18	126	17	94	111	
Commercial Area and Art Gallery	583	583	1,166	18	12	30	54	58	112	
Zone B										
Apartments	53	53	106	3	8	11	7	5	12	
Shopping Center	265	265	530	9	6	15	23	25	48	
Zone C										
Apartments	440	440	880	16	51	67	36	24	60	
Shopping Center	465	465	930	16	9	25	40	44	84	
Zone D										
Apartments	437	437	874	15	43	58	40	25	65	
Shopping Center	185	185	370	6	4	10	17	18	35	
Totals	4,207	4,207	8,414	257	227	484	327	369	696	

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Southbridge Expansion	Organization:	CivTech Inc
Project Location:	Scottsdale Rd & 5th Ave	Performed By:	Briallen Rees
Scenario Description:	Zone A	Date:	4/15/2019
Analysis Year:	2022/2032	Checked By:	
Analysis Period:	AM Street Peak Hour	Date:	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				138	119	19
Retail				33	20	13
Restaurant				0		
Cinema/Entertainment				0		
Residential				62	16	46
Hotel				95	56	39
All Other Land Uses ²				0		
				328	211	117

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		5	0	0	0	0
Retail	4		0	0	0	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	1	0	0	0		0
Hotel	4	1	0	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	328	211	117
Internal Capture Percentage	9%	7%	13%
External Vehicle-Trips ⁵	298	196	102
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	8%	26%
Retail	30%	31%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	0%	2%
Hotel	0%	13%

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Southbridge Expansion	Organization:	CivTech Inc
Project Location:	Scottsdale Rd & 5th Ave	Performed By:	Briallen Rees
Scenario Description:	Zone A	Date:	4/15/2019
Analysis Year:	2022/2032	Checked By:	
Analysis Period:	PM Street Peak Hour	Date:	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				134	21	113
Retail				135	65	70
Restaurant				0		
Cinema/Entertainment				0		
Residential				80	49	31
Hotel				124	63	61
All Other Land Uses ²				0		
				473	198	275

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		5	0	0	2	0
Retail	1		0	0	18	4
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	1	7	0	0		1
Hotel	0	1	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	473	198	275
Internal Capture Percentage	17%	20%	15%
External Vehicle-Trips ⁵	393	158	235
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	10%	6%
Retail	20%	33%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	41%	29%
Hotel	8%	2%

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made.

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Southbridge Expansion	Organization:	CivTech Inc
Project Location:	Scottsdale Rd & 5th Ave	Performed By:	Briallen Rees
Scenario Description:	Zone B	Date:	4/15/2019
Analysis Year:	2022/2032	Checked By:	
Analysis Period:	AM Street Peak Hour	Date:	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				15	9	6
Restaurant				0		
Cinema/Entertainment				0		
Residential				11	3	8
Hotel				0		
All Other Land Uses ²				0		
				26	12	14

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail	0					
Restaurant	0	0				
Cinema/Entertainment	0	0	0			
Residential	0	0	0	0		
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	26	12	14
Internal Capture Percentage	0%	0%	0%
External Vehicle-Trips ⁵	26	12	14
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	0%	0%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	0%	0%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

NCHRP 684 Internal Trip Capture Estimation Tool					
Project Name:	Southbridge Expansion	Organization:	CivTech Inc		
Project Location:	Scottsdale Rd & 5th Ave	Performed By:	Briallen Rees		
Scenario Description:	Zone B	Date:	4/15/2019		
Analysis Year:	2022/2032	Checked By:			
Analysis Period:	PM Street Peak Hour	Date:			

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				59	28	31
Restaurant				0		
Cinema/Entertainment				0		
Residential				15	9	6
Hotel				0		
All Other Land Uses ²				0		
				74	37	37

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail	0	0	0	0	4	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	3	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	74	37	37
Internal Capture Percentage	19%	19%	19%
External Vehicle-Trips ⁵	60	30	30
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	11%	13%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	44%	50%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made.

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Southbridge Expansion	Organization:	CivTech Inc
Project Location:	Scottsdale Rd & 5th Ave	Performed By:	Briallen Rees
Scenario Description:	Zone C	Date:	4/15/2019
Analysis Year:	2022/2032	Checked By:	
Analysis Period:	AM Street Peak Hour	Date:	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				26	16	10
Restaurant				0		
Cinema/Entertainment				0		
Residential				68	16	52
Hotel				0		
All Other Land Uses ²				0		
				94	32	62

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail	0					
Restaurant	0	0				
Cinema/Entertainment	0	0	0			
Residential	0	1	0			
Hotel	0	0	0			

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	94	32	62
Internal Capture Percentage	2%	3%	2%
External Vehicle-Trips ⁵	92	31	61
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	6%	0%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	0%	2%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Southbridge Expansion	Organization:	CivTech Inc
Project Location:	Scottsdale Rd & 5th Ave	Performed By:	Briallen Rees
Scenario Description:	Zone C	Date:	4/15/2019
Analysis Year:	2022/2032	Checked By:	
Analysis Period:	PM Street Peak Hour	Date:	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				106	51	55
Restaurant				0		
Cinema/Entertainment				0		
Residential				76	46	30
Hotel				0		
All Other Land Uses ²				0		
				182	97	85

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail	0	0	0	0	14	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	5	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	182	97	85
Internal Capture Percentage	21%	20%	22%
External Vehicle-Trips ⁵	144	78	66
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	10%	25%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	30%	17%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made.

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Southbridge Expansion	Organization:	CivTech Inc
Project Location:	Scottsdale Rd & 5th Ave	Performed By:	Briallen Rees
Scenario Description:	Zone D	Date:	4/15/2019
Analysis Year:	2022/2032	Checked By:	
Analysis Period:	AM Street Peak Hour	Date:	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				10	6	4
Restaurant				0		
Cinema/Entertainment				0		
Residential				58	15	43
Hotel				0		
All Other Land Uses ²				0		
				68	21	47

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail	0					
Restaurant	0	0				
Cinema/Entertainment	0	0	0			
Residential	0	0	0	0		
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	68	21	47
Internal Capture Percentage	0%	0%	0%
External Vehicle-Trips ⁵	68	21	47
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	0%	0%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	0%	0%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Southbridge Expansion	Organization:	CivTech Inc
Project Location:	Scottsdale Rd & 5th Ave	Performed By:	Briallen Rees
Scenario Description:	Zone D	Date:	4/15/2019
Analysis Year:	2022/2032	Checked By:	
Analysis Period:	PM Street Peak Hour	Date:	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				40	19	21
Restaurant				0		
Cinema/Entertainment				0		
Residential				74	45	29
Hotel				0		
All Other Land Uses ²				0		
				114	64	50

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	5	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	2	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	114	64	50
Internal Capture Percentage	12%	11%	14%
External Vehicle-Trips ⁵	100	57	43
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	11%	24%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	11%	7%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made.

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

APPENDIX F

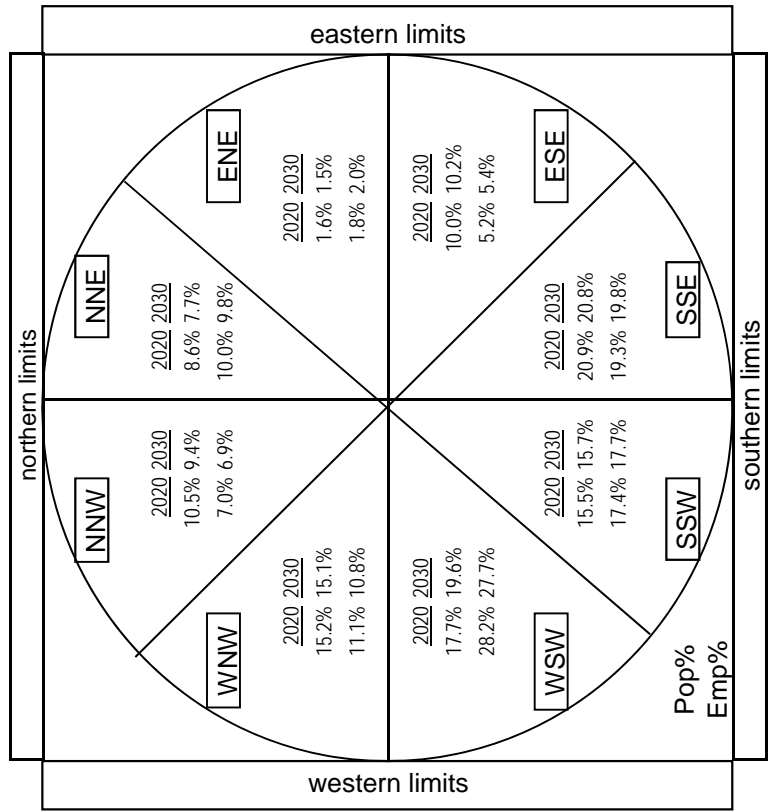
TRIP DISTRIBUTION

Quadrant	2020			2030		
	Population	Percent	Employment	Population	Percent	Employment
North Northwest	115,089	10.5%	62,427	119,990	9.4%	66,399
North Northeast	93,800	8.6%	89,548	97,723	7.7%	95,000
North	208,889	19.1%	151,975	217,713	17.1%	161,399
East Northeast	17,934	1.6%	15,997	19,402	1.5%	19,086
East Southeast	109,806	10.0%	46,569	129,891	10.2%	52,156
East	127,741	11.6%	62,566	149,292	11.7%	71,242
South Southeast	228,821	20.9%	171,964	263,989	20.8%	190,717
South Southwest	169,610	15.5%	155,420	199,168	15.7%	170,519
South	398,431	36.4%	327,384	463,158	36.5%	361,235
West Southwest	194,473	17.7%	251,309	248,796	19.6%	267,117
West Northwest	166,141	15.2%	98,778	191,734	15.1%	104,505
West	360,614	32.9%	350,086	440,530	34.7%	371,622
Totals	1,095,674	100.0%	892,011	1,270,693	100.0%	965,498

Radii

Population radius: 10 miles
 Employment radius: 10 miles

Select Analysis Year (2020, 2030, 2040, 2050)
 2020



APPENDIX G

BACKGROUND TRAFFIC CALCULATIONS

Location of counts: Goldwater Blvd btw Camelback and Indian School

Source(s): <https://www.scottsdaleaz.gov/transportation/studies-reports/traffic-volume>

	Year	Volume	Avg Growth Rate to 2014	Expansion Factor to 2014
Beginning	2014	17,800		
End	2016	18,400	1.7%	0.967

Growth Rate Used 1.7%
 Per-Year Multiplier 1.017

Year	Expansion Factor(s)	
2018	1.000	
2019	1.017	
2020	1.034	
2021	1.052	
2022	1.070	<- Expansion factor to opening
2023	1.088	
2024	1.106	
2025	1.125	
2026	1.144	
2027	1.164	
2028	1.184	
2029	1.204	
2030	1.224	
2031	1.245	
2032	1.266	<- Expansion factor to 10 years after opening
2033	1.288	
2034	1.310	
2035	1.332	
2036	1.354	
2037	1.378	
2038	1.401	

APPENDIX H

2022 PEAK HOUR TRAFFIC ANALYSIS

2022 Background AM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	58	107	40	469	187	273	15	1037	180	159	1346	82
Future Volume (vph)	58	107	40	469	187	273	15	1037	180	159	1346	82
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4	5.6	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	0.95	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.97	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1676	1945	1478	3252	1945	1478	1676	5200	1676	3711	1458	1458
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.06	1.00	0.13	1.00	1.00	1.00
Satd. Flow (perm)	1676	1945	1478	3252	1945	1478	103	5200	222	3711	1458	1458
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.89	0.89	0.89	0.88	0.88	0.88
Adj. Flow (vph)	61	113	42	515	205	300	17	1165	202	181	1530	93
RTOR Reduction (vph)	0	0	0	0	0	244	0	14	0	0	0	48
Lane Group Flow (vph)	61	113	42	515	205	56	17	1353	0	181	1530	45
Confl. Peds. (#/hr)			2			2			2			2
Bus Blockages (#/hr)	0	2	0	0	2	0	0	2	0	0	2	0
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	Perm
Protected Phases	8	8		4	4		1	6	5	2		
Permitted Phases			8			4	6		2			2
Actuated Green, G (s)	15.3	15.3	15.3	26.5	26.5	26.5	77.2	68.8	77.2	68.8	68.8	68.8
Effective Green, g (s)	15.3	15.3	15.3	26.5	26.5	26.5	77.2	68.8	77.2	68.8	68.8	68.8
Actuated g/C Ratio	0.11	0.11	0.11	0.19	0.19	0.19	0.55	0.49	0.55	0.49	0.49	0.49
Clearance Time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4	5.6	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.2	2.0	0.2	0.2	0.2
Lane Grp Cap (vph)	181	210	160	609	364	277	149	2531	207	1806	709	709
v/s Ratio Prot	0.04	c0.06		c0.16	0.11		0.01	0.26	c0.05	0.41		
v/s Ratio Perm			0.03			0.04	0.06		c0.43		0.03	
v/c Ratio	0.34	0.54	0.26	0.85	0.56	0.20	0.11	0.53	0.87	0.85	0.06	0.06
Uniform Delay, d1	58.3	59.7	57.8	55.4	52.1	48.5	50.7	25.1	41.9	31.7	19.2	19.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	1.3	0.3	10.1	1.2	0.1	0.1	0.8	30.2	5.1	0.2	0.2
Delay (s)	58.7	61.0	58.1	65.5	53.3	48.6	50.8	26.0	72.1	36.8	19.4	19.4
Level of Service	E	E	E	E	D	D	D	C	E	D	B	B
Approach Delay (s)		59.8			58.1			26.3		39.4		
Approach LOS		E			E			C		D		

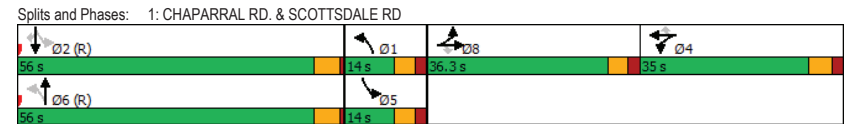
Intersection Summary			
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	141.3	Sum of lost time (s)	22.3
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Feb 2018			
c Critical Lane Group			

2022 Background AM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag			Lag			Lead
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	14	56	35	14	56	36.3
Maximum Split (%)	9.9%	39.6%	24.8%	9.9%	39.6%	25.7%
Minimum Split (s)	11	16	35	11	16	36.3
Yellow Time (s)	3.6	4.4	4	3.6	4.4	3.3
All-Red Time (s)	2	1	2	2	1	2
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	9
Flash Dont Walk (s)		10	22		14	22
Dual Entry	No	Yes	No	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	106	50	15	106	50	120
End Time (s)	120	106	50	120	106	15
Yield/Force Off (s)	114.4	100.6	44	114.4	100.6	9.7
Yield/Force Off 170(s)	114.4	90.6	22	114.4	86.6	129
Local Start Time (s)	56	0	106.3	56	0	70
Local Yield (s)	64.4	50.6	135.3	64.4	50.6	101
Local Yield 170(s)	64.4	40.6	113.3	64.4	36.6	79

Intersection Summary	
Cycle Length	141.3
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 50 (35%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Background AM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	89	2	40	32	5	18	107	1040	30	14	707	22
Future Volume (vph)	89	2	40	32	5	18	107	1040	30	14	707	22
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1	5.1	5.6	5.6	5.6	5.6	5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00	0.91
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.96	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1961	1480	1880	1500	1676	5326	1676	5323	1676	5323	1676
Flt Permitted	0.73	1.00	1.00	0.78	1.00	0.34	1.00	0.22	1.00	0.22	1.00	1.00
Satd. Flow (perm)	1288	1961	1480	1520	1500	605	5326	383	5323	383	5323	1676
Peak-hour factor, PHF	0.84	0.84	0.84	0.88	0.88	0.88	0.90	0.90	0.90	0.93	0.93	0.93
Adj. Flow (vph)	106	2	48	36	6	20	119	1156	33	15	760	24
RTOR Reduction (vph)	0	0	41	0	0	17	0	1	0	0	2	0
Lane Group Flow (vph)	106	2	7	0	42	3	119	1188	0	15	782	0
Confl. Peds. (#/hr)			1						3			4
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4		4	6		2		2	
Actuated Green, G (s)	17.6	17.6	17.6		17.6	17.6	96.8	96.8	96.8	96.8		96.8
Effective Green, g (s)	17.6	17.6	17.6		17.6	17.6	96.8	96.8	96.8	96.8		96.8
Actuated g/C Ratio	0.14	0.14	0.14		0.14	0.14	0.77	0.77	0.77	0.77		0.77
Clearance Time (s)	5.1	5.1	5.1		5.1	5.1	5.6	5.6	5.6	5.6		5.6
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0		2.0
Lane Grp Cap (vph)	181	275	208		213	211	468	4121	296	4118		4118
v/s Ratio Prot		0.00						0.22		0.15		
v/s Ratio Perm	c0.08		0.00		0.03	0.00	0.20		0.04			
v/c Ratio	0.59	0.01	0.03		0.20	0.01	0.25	0.29	0.05	0.19		
Uniform Delay, d1	50.3	46.2	46.4		47.5	46.3	4.0	4.1	3.3	3.8		
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	3.1	0.0	0.0		0.2	0.0	1.3	0.2	0.3	0.1		
Delay (s)	53.4	46.2	46.4		47.7	46.3	5.3	4.3	3.7	3.9		
Level of Service	D	D	D		D	D	A	A	A	A		
Approach Delay (s)		51.2			47.2			4.4		3.9		
Approach LOS		D			D			A		A		

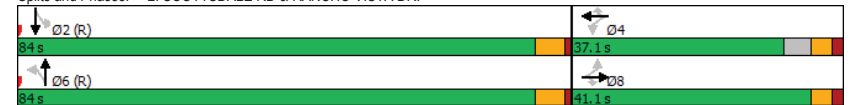
Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	125.1	Sum of lost time (s)	10.7
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Background AM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	84	37.1	84	41.1
Maximum Split (%)	67.1%	29.7%	67.1%	32.9%
Minimum Split (s)	16	37.1	16	41.1
Yellow Time (s)	4.4	3.3	4.4	3.3
All-Red Time (s)	1.2	1.8	1.2	1.8
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	11
Flash Dont Walk (s)	18	25	13	25
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	93	51.9	93	51.9
End Time (s)	51.9	93	51.9	93
Yield/Force Off (s)	46.3	87.9	46.3	87.9
Yield/Force Off 170(s)	28.3	62.9	33.3	62.9
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.4	120	78.4	120
Local Yield 170(s)	60.4	95	65.4	95
Intersection Summary				
Cycle Length	125.1			
Control Type	Actuated-Coordinated			
Natural Cycle	65			
Offset: 93 (74%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				

Splits and Phases: 2: SCOTTSDALE RD & RANCHO VISTA DR.



2022 Background AM Southbridge Expansion
 3: HIGHLAND AVE/Granada Ave & SCOTTSDALE RD HCM Signalized Intersection Capacity Analysis

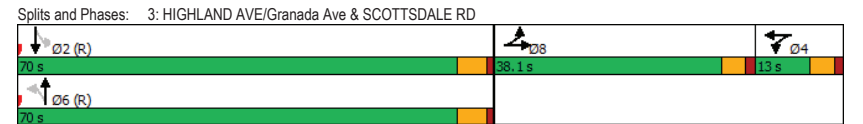
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (vph)	350	18	24	10	4	16	24	817	22	35	702	52
Future Volume (vph)	350	18	24	10	4	16	24	817	22	35	702	52
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.88		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3252	1780		1676	1725		1676	5328		1676	5292	
Flt Permitted	0.95	1.00		0.95	1.00		0.32	1.00		0.27	1.00	
Satd. Flow (perm)	3252	1780		1676	1725		572	5328		482	5292	
Peak-hour factor, PHF	0.91	0.91	0.91	0.81	0.81	0.81	0.88	0.88	0.88	0.93	0.93	0.93
Adj. Flow (vph)	385	20	26	12	5	20	27	928	25	38	755	56
RTOR Reduction (vph)	0	22	0	0	19	0	0	2	0	0	5	0
Lane Group Flow (vph)	385	24	0	12	6	0	27	951	0	38	806	0
Confl. Peds. (#/hr)			2						4			2
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6			2	
Permitted Phases							6			2		
Actuated Green, G (s)	20.6	20.6		4.2	4.2		80.4	80.4		80.4	80.4	
Effective Green, g (s)	20.6	20.6		4.2	4.2		80.4	80.4		80.4	80.4	
Actuated g/C Ratio	0.17	0.17		0.03	0.03		0.66	0.66		0.66	0.66	
Clearance Time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	553	302		58	59		379	3537		320	3513	
v/s Ratio Prot	c0.12	0.01		c0.01	0.00			c0.18			0.15	
v/s Ratio Perm							0.05			0.08		
v/c Ratio	0.70	0.08		0.21	0.10		0.07	0.27		0.12	0.23	
Uniform Delay, d1	47.3	42.3		56.8	56.6		7.2	8.3		7.4	8.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	0.0		0.6	0.3		0.4	0.2		0.8	0.2	
Delay (s)	50.4	42.3		57.5	56.9		7.5	8.5		8.2	8.2	
Level of Service	D	D		E	E		A	A		A	A	
Approach Delay (s)		49.5			57.1			8.5			8.2	
Approach LOS		D			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	15.9
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Background AM Southbridge Expansion
 3: HIGHLAND AVE/Granada Ave & SCOTTSDALE RD Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	70	13	70	38.1
Maximum Split (%)	57.8%	10.7%	57.8%	31.5%
Minimum Split (s)	30.7	13	28.7	38.1
Yellow Time (s)	4.4	3.6	4.4	3.6
All-Red Time (s)	1.3	1.5	1.3	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	1	2	1	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8		7	9
Flash Dont Walk (s)	17		16	24
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	42	29	42	112
End Time (s)	112	42	112	29
Yield/Force Off (s)	106.3	36.9	106.3	23.9
Yield/Force Off 170(s)	89.3	36.9	90.3	121
Local Start Time (s)	0	108.1	0	70
Local Yield (s)	64.3	116	64.3	103
Local Yield 170(s)	47.3	116	48.3	79

Intersection Summary	
Cycle Length	121.1
Control Type	Actuated-Coordinated
Natural Cycle	85
Offset: 42 (35%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Background AM
4: Fashion Square Drive

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

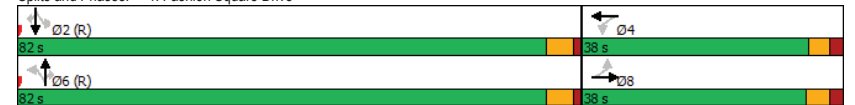
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	5	0	13	4	0	0	4	440	13	22	951	37
Future Volume (vph)	5	0	13	4	0	0	4	440	13	22	951	37
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		5.5		5.2			5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor		1.00		1.00			1.00	0.95	1.00	1.00	0.91	1.00
Frbp, ped/bikes		1.00		1.00			1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00			1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.90		1.00			1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99		0.95			0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1743		1676			1676	3725	1465	1676	5353	1466
Flt Permitted		0.91		1.00			0.26	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)		1607		1765			467	3725	1465	845	5353	1466
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	0	14	4	0	0	4	478	14	24	1034	40
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	2	0	0	5
Lane Group Flow (vph)	0	0	0	4	0	0	4	478	12	24	1034	35
Confl. Peds. (#/hr)							1		1			1
Turn Type	Perm	NA		Perm			Perm	NA	Perm	Perm	NA	Perm
Protected Phases		8		4			6		6		2	2
Permitted Phases	8		4			6		6	2			2
Actuated Green, G (s)		2.9		3.2			106.4	106.4	106.4	106.4	106.4	106.4
Effective Green, g (s)		2.9		3.2			106.4	106.4	106.4	106.4	106.4	106.4
Actuated g/C Ratio		0.02		0.03			0.89	0.89	0.89	0.89	0.89	0.89
Clearance Time (s)		5.5		5.2			5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)		3.0		3.0			3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		38		47			414	3302	1298	749	4746	1299
v/s Ratio Prot								0.13			c0.19	
v/s Ratio Perm		0.00		c0.00			0.01		0.01	0.03		0.02
v/c Ratio		0.01		0.09			0.01	0.14	0.01	0.03	0.22	0.03
Uniform Delay, d1		57.2		57.0			0.8	0.9	0.8	0.8	1.0	0.8
Progression Factor		1.00		1.00			1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.1		0.8			0.0	0.1	0.0	0.1	0.1	0.0
Delay (s)		57.3		57.8			0.8	1.0	0.8	0.9	1.1	0.8
Level of Service		E		E			A	A	A	A	A	A
Approach Delay (s)		57.3			57.8			1.0			1.0	
Approach LOS		E			E			A			A	
Intersection Summary												
HCM 2000 Control Delay		1.8					HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio		0.21										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)		10.7			
Intersection Capacity Utilization		41.6%					ICU Level of Service		A			
Analysis Period (min)		15										
c Critical Lane Group												

2022 Background AM
4: Fashion Square Drive

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	82	38	82	38
Maximum Split (%)	68.3%	31.7%	68.3%	31.7%
Minimum Split (s)	16	21.2	16	21.5
Yellow Time (s)	4	3	4	3.3
All-Red Time (s)	1.2	2.2	1.2	2.2
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	5
Flash Dont Walk (s)	16	11	10	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	82	0	82
End Time (s)	82	0	82	0
Yield/Force Off (s)	76.8	114.8	76.8	114.5
Yield/Force Off 170(s)	60.8	103.8	66.8	103.5
Local Start Time (s)	0	82	0	82
Local Yield (s)	76.8	114.8	76.8	114.5
Local Yield 170(s)	60.8	103.8	66.8	103.5
Intersection Summary				
Cycle Length	120			
Control Type	Actuated-Coordinated			
Natural Cycle	40			
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				

Split and Phases: 4: Fashion Square Drive



2022 Background AM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↑	↑↑↑		↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	79	1118	95	157	1021	48	200	343	156	51	213	54
Future Volume (vph)	79	1118	95	157	1021	48	200	343	156	51	213	54
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5285		1676	5313		1676	1961	1479	1676	1961	1477
Flt Permitted	0.18	1.00		0.14	1.00		0.49	1.00	1.00	0.22	1.00	1.00
Satd. Flow (perm)	325	5285		256	5313		866	1961	1479	396	1961	1477
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	86	1215	103	171	1110	52	217	373	170	55	232	59
RTOR Reduction (vph)	0	9	0	0	4	0	0	0	106	0	0	46
Lane Group Flow (vph)	86	1309	0	171	1158	0	217	373	64	55	232	13
Confl. Peds. (#/hr)			1			5			2			3
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	3		4	3		2	1		2	1	
Permitted Phases	3			3			1		1	1		1
Actuated Green, G (s)	54.1	50.1		54.1	50.1		27.4	23.4	23.4	27.4	23.4	23.4
Effective Green, g (s)	54.1	50.1		54.1	50.1		27.4	23.4	23.4	27.4	23.4	23.4
Actuated g/C Ratio	0.53	0.49		0.53	0.49		0.27	0.23	0.23	0.27	0.23	0.23
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	224	2583		190	2596		263	447	337	155	447	337
v/s Ratio Prot	0.01	0.25		c0.04	0.22		c0.03	c0.19		0.01	0.12	
v/s Ratio Perm	0.19			c0.44			0.19		0.04	0.08		0.01
v/c Ratio	0.38	0.51		0.90	0.45		0.83	0.83	0.19	0.35	0.52	0.04
Uniform Delay, d1	21.2	17.8		30.1	17.1		38.5	37.7	31.9	40.8	34.6	30.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1		37.9	0.0		17.8	12.1	0.1	0.5	0.4	0.0
Delay (s)	21.6	17.9		68.0	17.2		56.3	49.8	32.0	41.3	35.0	30.8
Level of Service	C	B		E	B		E	D	C	D	D	C
Approach Delay (s)	18.1			23.7			47.7			35.3		
Approach LOS	B			C			D			D		

Intersection Summary			
HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	102.5	Sum of lost time (s)	21.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		
c	Critical Lane Group		

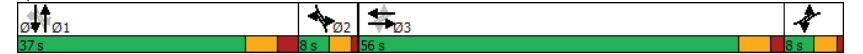
2022 Background AM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4
Movement	NBSB	NBSBL	EBWB	EBWBL
Lead/Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize				
Recall Mode	None	None	Ped	None
Maximum Split (s)	37	8	56	8
Maximum Split (%)	33.9%	7.3%	51.4%	7.3%
Minimum Split (s)	37	8	56	8
Yellow Time (s)	4.2	3	4.2	3
All-Red Time (s)	2.8	1	1.8	1
Minimum Initial (s)	8	4	10	4
Vehicle Extension (s)	2	1	1	1
Minimum Gap (s)	3	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		33	
Flash Dont Walk (s)	23		17	
Dual Entry	No	No	No	No
Inhibit Max	No	Yes	No	Yes
Start Time (s)	0	37	45	101
End Time (s)	37	45	101	0
Yield/Force Off (s)	30	41	95	105
Yield/Force Off 170(s)	7	41	78	105
Local Start Time (s)	72	0	8	64
Local Yield (s)	102	4	58	68
Local Yield 170(s)	79	4	41	68

Intersection Summary	
Cycle Length	109
Control Type	Actuated-Uncoordinated
Natural Cycle	110

Splits and Phases: 5: 68th Street & CAMELBACK RD.



2022 Background AM
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗↗↗	↘	↘	↗↗↗	↘	↘	↗↗↗	↘	↘	↗↗↗	↘
Traffic Volume (vph)	199	893	163	54	700	42	124	242	36	15	358	520
Future Volume (vph)	199	893	163	54	700	42	124	242	36	15	358	520
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	0.97	0.91	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5353	1479	1676	5304		3252	3725	1485	3252	5353	1490
Flt Permitted	0.25	1.00	1.00	0.19	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	432	5353	1479	334	5304		3252	3725	1485	3252	5353	1490
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	229	1026	187	64	824	49	141	275	41	17	398	578
RTOR Reduction (vph)	0	0	79	0	5	0	0	0	25	0	0	48
Lane Group Flow (vph)	229	1026	108	64	868	0	141	275	16	17	398	530
Confl. Peds. (#/hr)			2			2			5			3
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	3	8		7	4		1	6	7	5	2	3
Permitted Phases	8		8	4					6			2
Actuated Green, G (s)	69.0	47.5	47.5	69.0	47.5		12.2	25.3	46.8	5.1	18.2	39.7
Effective Green, g (s)	69.0	47.5	47.5	69.0	47.5		12.2	25.3	46.8	5.1	18.2	39.7
Actuated g/C Ratio	0.57	0.39	0.39	0.57	0.39		0.10	0.21	0.38	0.04	0.15	0.33
Clearance Time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Vehicle Extension (s)	2.0	0.2	0.2	2.0	0.2		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	465	2091	577	426	2071		326	775	639	136	801	555
v/s Ratio Prot	0.09	0.19		0.03	0.16		c0.04	0.07	0.00	0.01	0.07	c0.17
v/s Ratio Perm	c0.19		0.07	0.06					0.01			0.19
v/c Ratio	0.49	0.49	0.19	0.15	0.42		0.43	0.35	0.02	0.12	0.50	0.95
Uniform Delay, d1	26.1	27.9	24.4	21.0	27.0		51.4	41.2	23.2	56.1	47.5	40.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	0.1	0.1	0.1		0.3	1.3	0.0	0.2	2.2	26.7
Delay (s)	26.4	28.0	24.4	21.1	27.0		51.8	42.4	23.2	56.3	49.7	66.8
Level of Service	C	C	C	C	C		D	D	C	E	D	E
Approach Delay (s)		27.3			26.6			43.6			59.8	
Approach LOS		C			C			D			E	

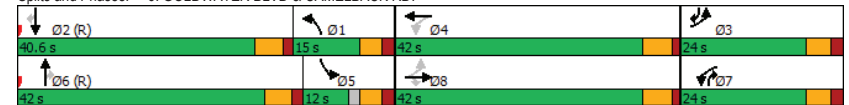
Intersection Summary			
HCM 2000 Control Delay	37.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	121.6	Sum of lost time (s)	22.2
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Last Update: Sept 16/2019			
c Critical Lane Group			

2022 Background AM
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBTL	SBL	NBT	WBL	EBTL
Lead/Lag	Lag	Lead			Lag	Lead		
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Ped	None	C-Min	None	Ped
Maximum Split (s)	15	40.6	24	42	12	42	24	42
Maximum Split (%)	12.3%	33.4%	19.7%	34.5%	9.9%	34.5%	19.7%	34.5%
Minimum Split (s)	11	40.6	11	31	11	35.6	11	33
Yellow Time (s)	3.3	4	3.6	4.4	3.3	4	3.6	4.4
All-Red Time (s)	2	1.6	2	1.3	2	1.6	2	1.3
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	0.2	2	2	2	0.2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		7		7		7
Flash Dont Walk (s)		27		24		23		26
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	40.6	0	97.6	55.6	42	0	97.6	55.6
End Time (s)	55.6	40.6	0	97.6	55.6	42	0	97.6
Yield/Force Off (s)	50.3	35	116	91.9	50.3	36.4	116	91.9
Yield/Force Off 170(s)	50.3	8	116	67.9	50.3	13.4	116	65.9
Local Start Time (s)	40.6	0	97.6	55.6	42	0	97.6	55.6
Local Yield (s)	50.3	35	116	91.9	50.3	36.4	116	91.9
Local Yield 170(s)	50.3	8	116	67.9	50.3	13.4	116	65.9
Intersection Summary								
Cycle Length	121.6							
Control Type	Actuated-Coordinated							
Natural Cycle	100							
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green								

Splits and Phases: 6: GOLDWATER BLVD & CAMELBACK RD.



2022 Background AM
7: SCOTTSDALE RD & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	128	683	181	71	607	129	195	678	45	141	611	111
Future Volume (vph)	128	683	181	71	607	129	195	678	45	141	611	111
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.91		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3252	3725	1479	1676	3609		3252	5292		3252	3725	1451
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3252	3725	1479	1676	3609		3252	5292		3252	3725	1451
Peak-hour factor, PHF	0.81	0.81	0.81	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	158	843	223	77	660	140	212	737	49	148	643	117
RTOR Reduction (vph)	0	0	61	0	16	0	0	6	0	0	0	75
Lane Group Flow (vph)	158	843	162	77	784	0	212	780	0	148	643	42
Confl. Peds. (#/hr)			6			18			16			16
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8	1	7	4		1	6		5	2	
Permitted Phases			8									2
Actuated Green, G (s)	11.7	34.2	46.5	9.3	31.8		12.3	41.7		13.4	43.0	43.0
Effective Green, g (s)	11.7	34.2	46.5	9.3	31.8		12.3	41.7		13.4	43.0	43.0
Actuated g/C Ratio	0.10	0.29	0.39	0.08	0.27		0.10	0.35		0.11	0.36	0.36
Clearance Time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	317	1061	634	129	956		333	1838		363	1334	519
v/s Ratio Prot	c0.05	c0.23	0.03	0.05	0.22		c0.07	0.15		0.05	c0.17	
v/s Ratio Perm			0.08									0.03
v/c Ratio	0.50	0.79	0.26	0.60	0.82		0.64	0.42		0.41	0.48	0.08
Uniform Delay, d1	51.4	39.7	25.0	53.5	41.4		51.7	30.0		49.6	29.9	25.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.02	1.11		1.00	1.00	1.00
Incremental Delay, d2	0.5	3.9	0.1	4.9	5.3		2.9	0.7		0.3	1.2	0.3
Delay (s)	51.8	43.6	25.1	58.4	46.7		55.4	33.9		49.9	31.1	25.7
Level of Service	D	D	C	E	D		E	C		D	C	C
Approach Delay (s)		41.3			47.7			38.5			33.5	
Approach LOS		D			D			D			C	

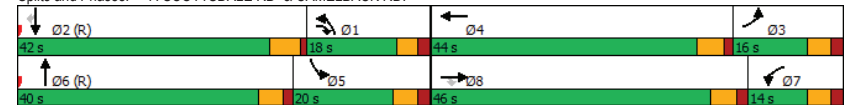
Intersection Summary			
HCM 2000 Control Delay	40.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.4
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Background AM
7: SCOTTSDALE RD & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBT	SBL	NBT	WBL	EBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	18	42	16	44	20	40	14	46
Maximum Split (%)	15.0%	35.0%	13.3%	36.7%	16.7%	33.3%	11.7%	38.3%
Minimum Split (s)	10	32.4	11	40.5	11	33	11	34.5
Yellow Time (s)	3	4.4	3.3	4	3.6	3.6	3.3	4
All-Red Time (s)	2	1	2	1.5	2	1.4	2	1.5
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		23		31		24		25
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	10	88	72	28	8	88	74	28
End Time (s)	28	10	88	72	28	8	88	74
Yield/Force Off (s)	23	4.6	82.7	66.5	22.4	3	82.7	68.5
Yield/Force Off 170(s)	23	101.6	82.7	35.5	22.4	99	82.7	43.5
Local Start Time (s)	42	0	104	60	40	0	106	60
Local Yield (s)	55	36.6	114.7	98.5	54.4	35	114.7	100.5
Local Yield 170(s)	55	13.6	114.7	67.5	54.4	11	114.7	75.5
Intersection Summary								
Cycle Length	120							
Control Type	Actuated-Coordinated							
Natural Cycle	100							
Offset: 88 (73%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green								

Splits and Phases: 7: SCOTTSDALE RD & CAMELBACK RD.



2022 Background AM Southbridge Expansion
 8: Stetson Dr/DRINKWATER BLVD & SCOTTSDALE RD HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	22	12	6	14	35	312	0	403	15	214	428	74
Future Volume (vph)	22	12	6	14	35	312	0	403	15	214	428	74
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		5.2		5.2	5.2	5.0		5.1		5.0	5.1	
Lane Util. Factor		1.00		1.00	1.00	1.00		0.95		0.97	0.95	
Frbp, ped/bikes		1.00		1.00	1.00	0.96		1.00		1.00	0.99	
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frt		0.98		1.00	1.00	0.85		0.99		1.00	0.98	
Flt Protected		0.97		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1862		1676	1961	1441		3701		3252	3597	
Flt Permitted		0.85		0.77	1.00	1.00		1.00		0.44	1.00	
Satd. Flow (perm)		1631		1356	1961	1441		3701		1498	3597	
Peak-hour factor, PHF	0.80	0.80	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	28	15	8	16	39	347	0	448	17	225	451	78
RTOR Reduction (vph)	0	0	0	0	0	189	0	2	0	0	10	0
Lane Group Flow (vph)	0	51	0	16	39	159	0	463	0	225	519	0
Confl. Peds. (#/hr)			8			35			14			18
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		8			4	5		6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)		25.6		25.6	25.6	33.0		71.7		84.1	84.1	
Effective Green, g (s)		25.6		25.6	25.6	33.0		71.7		84.1	84.1	
Actuated g/C Ratio		0.21		0.21	0.21	0.28		0.60		0.70	0.70	
Clearance Time (s)		5.2		5.2	5.2	5.0		5.1		5.0	5.1	
Vehicle Extension (s)		2.0		2.0	2.0	2.0		2.0		2.0	2.0	
Lane Grp Cap (vph)		347		289	418	396		2211		1158	2520	
v/s Ratio Prot				0.02	0.02	c0.02		0.13		0.01	c0.14	
v/s Ratio Perm		0.03		0.01		0.09				0.12		
v/c Ratio		0.15		0.06	0.09	0.40		0.21		0.19	0.21	
Uniform Delay, d1		38.3		37.6	37.9	35.4		11.1		6.0	6.3	
Progression Factor		1.00		0.96	0.98	2.63		1.00		0.52	0.56	
Incremental Delay, d2		0.1		0.0	0.0	0.2		0.2		0.0	0.2	
Delay (s)		38.4		36.0	37.0	93.5		11.3		3.1	3.7	
Level of Service		D		D	D	F		B		A	A	
Approach Delay (s)		38.4			85.7			11.3			3.5	
Approach LOS		D			F			B			A	

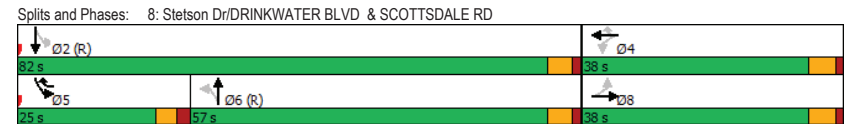
Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

Description: Last Update: Sept 2017
 c Critical Lane Group

2022 Background AM Southbridge Expansion
 8: Stetson Dr/DRINKWATER BLVD & SCOTTSDALE RD Timing Report, Sorted By Phase

Phase Number	2	4	5	6	8
Movement	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag		Lead	Lag		
Lead-Lag Optimize					
Recall Mode	C-Max	None	None	C-Max	None
Maximum Split (s)	82	38	25	57	38
Maximum Split (%)	68.3%	31.7%	20.8%	47.5%	31.7%
Minimum Split (s)	21.1	37.2	10	38.1	33.2
Yellow Time (s)	3.6	4	3	3.6	4
All-Red Time (s)	1.5	1.2	2	1.5	1.2
Minimum Initial (s)	10	7	5	10	7
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	9	9		9	7
Flash Dont Walk (s)	7	23		24	21
Dual Entry	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	93	55	93	118	55
End Time (s)	55	93	118	55	93
Yield/Force Off (s)	49.9	87.8	113	49.9	87.8
Yield/Force Off 170(s)	42.9	64.8	113	25.9	66.8
Local Start Time (s)	0	82	0	25	82
Local Yield (s)	76.9	114.8	20	76.9	114.8
Local Yield 170(s)	69.9	91.8	20	52.9	93.8

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 93 (78%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Background AM
9: GOLDWATER BLVD & 5TH AVE

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	15	0	6	14	13	13	13	448	81	74	551	88
Future Volume (vph)	15	0	6	14	13	13	13	448	81	74	551	88
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2		5.2	4.0	4.0	4.0	5.2	5.2		5.2	5.2	
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00	0.95	0.95		1.00	0.91	
Frpb, ped/bikes	1.00		0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95		1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676		1478	1676	1961	1475	1676	3627		1676	5222	
Flt Permitted	0.75		1.00	0.76	1.00	1.00	0.37	1.00		0.43	1.00	
Satd. Flow (perm)	1321		1478	1336	1961	1475	653	3627		761	5222	
Peak-hour factor, PHF	0.80	0.92	0.80	0.92	0.92	0.92	0.90	0.90	0.92	0.92	0.90	0.90
Adj. Flow (vph)	19	0	8	15	14	14	14	498	88	80	612	98
RTOR Reduction (vph)	0	0	7	0	0	13	0	6	0	0	10	0
Lane Group Flow (vph)	19	0	1	15	14	1	14	580	0	80	700	0
Confl. Peds. (#/hr)			2			2			2			3
Turn Type	Perm		Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		8			4			6				2
Permitted Phases	8		8	4		4	6			2		
Actuated Green, G (s)	11.5		11.5	12.7	12.7	12.7	98.1	98.1		98.1	98.1	
Effective Green, g (s)	11.5		11.5	12.7	12.7	12.7	98.1	98.1		98.1	98.1	
Actuated g/C Ratio	0.10		0.10	0.11	0.11	0.11	0.82	0.82		0.82	0.82	
Clearance Time (s)	5.2		5.2	4.0	4.0	4.0	5.2	5.2		5.2	5.2	
Vehicle Extension (s)	2.0		2.0	3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	126		141	141	207	156	533	2965		622	4268	
v/s Ratio Prot				0.01			c0.16				0.13	
v/s Ratio Perm	c0.01		0.00	0.01		0.00	0.02			0.11		
v/c Ratio	0.15		0.01	0.11	0.07	0.01	0.03	0.20		0.13	0.16	
Uniform Delay, d1	49.8		49.1	48.5	48.3	48.0	2.0	2.4		2.2	2.3	
Progression Factor	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2		0.0	0.3	0.1	0.0	0.1	0.1		0.4	0.1	
Delay (s)	50.0		49.1	48.9	48.5	48.0	2.1	2.5		2.7	2.4	
Level of Service	D		D	D	D	D	A	A		A	A	
Approach Delay (s)		49.7				48.5		2.5			2.4	
Approach LOS		D				D		A			A	

Intersection Summary			
HCM 2000 Control Delay	4.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.4
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		

Description: Last Update: Sept 2017

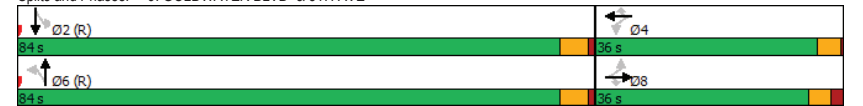
c Critical Lane Group

2022 Background AM
9: GOLDWATER BLVD & 5TH AVE

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	Min
Maximum Split (s)	84	36	84	36
Maximum Split (%)	70.0%	30.0%	70.0%	30.0%
Minimum Split (s)	16	20	16	34.2
Yellow Time (s)	4	3.5	4	3.3
All-Red Time (s)	1.2	0.5	1.2	1.9
Minimum Initial (s)	10	4	10	7
Vehicle Extension (s)	2	3	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	8
Flash Dont Walk (s)	14	11	11	21
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	20	104	20	104
End Time (s)	104	20	104	20
Yield/Force Off (s)	98.8	16	98.8	14.8
Yield/Force Off 170(s)	84.8	5	87.8	14.8
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.8	116	78.8	114.8
Local Yield 170(s)	64.8	105	67.8	114.8
Intersection Summary				
Cycle Length	120			
Control Type	Actuated-Coordinated			
Natural Cycle	55			
Offset: 20 (17%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				

Splits and Phases: 9: GOLDWATER BLVD & 5TH AVE



Intersection			
Intersection Delay, s/veh	3.3		
Intersection LOS	A		
Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	133	75	47
Demand Flow Rate, veh/h	136	76	48
Vehicles Circulating, veh/h	18	7	99
Vehicles Exiting, veh/h	65	140	55
Ped Vol Crossing Leg, #/h	0	1	5
Ped Cap Adj	1.000	1.000	0.999
Approach Delay, s/veh	3.5	3.1	3.3
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	136	76	48
Cap Entry Lane, veh/h	1355	1370	1247
Entry HV Adj Factor	0.978	0.985	0.979
Flow Entry, veh/h	133	75	47
Cap Entry, veh/h	1325	1349	1221
V/C Ratio	0.100	0.055	0.039
Control Delay, s/veh	3.5	3.1	3.3
LOS	A	A	A
95th %tile Queue, veh	0	0	0

Intersection						
Intersection Delay, s/veh	7.5					
Intersection LOS	A					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	89	33	17	52	6	37
Future Vol, veh/h	89	33	17	52	6	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	97	36	18	57	7	40
Number of Lanes	1	0	0	1	1	0
Approach	EB	WB	NB			
Opposing Approach	WB	EB				
Opposing Lanes	1	1	0			
Conflicting Approach Left		NB	EB			
Conflicting Lanes Left	0	1	1			
Conflicting Approach Right	NB		WB			
Conflicting Lanes Right	1	0	1			
HCM Control Delay	7.6	7.6	7.1			
HCM LOS	A	A	A			
Lane	NBLn1	EBLn1	WBLn1	NBLn1		
Vol Left, %	14%	0%	25%			
Vol Thru, %	0%	73%	75%			
Vol Right, %	86%	27%	0%			
Sign Control	Stop	Stop	Stop			
Traffic Vol by Lane	43	122	69			
LT Vol	6	0	17			
Through Vol	0	89	52			
RT Vol	37	33	0			
Lane Flow Rate	47	133	75			
Geometry Grp	1	1	1			
Degree of Util (X)	0.049	0.144	0.087			
Departure Headway (Hd)	3.8	3.911	4.167			
Convergence, Y/N	Yes	Yes	Yes			
Cap	927	915	858			
Service Time	1.887	1.942	2.203			
HCM Lane V/C Ratio	0.051	0.145	0.087			
HCM Control Delay	7.1	7.6	7.6			
HCM Lane LOS	A	A	A			
HCM 95th-tile Q	0.2	0.5	0.3			

Intersection						
Intersection Delay, s/veh	7.5					
Intersection LOS	A					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	59	56	26	34	5	30
Future Vol, veh/h	59	56	26	34	5	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	64	61	28	37	5	33
Number of Lanes	0	1	1	0	1	0
Approach	EB	WB	SB			
Opposing Approach	WB	EB				
Opposing Lanes	1	1	0			
Conflicting Approach Left	SB		WB			
Conflicting Lanes Left	1	0	1			
Conflicting Approach Right		SB	EB			
Conflicting Lanes Right	0	1	1			
HCM Control Delay	7.9	7.1	7			
HCM LOS	A	A	A			
Lane	EBLn1	WBLn1	SBLn1			
Vol Left, %	51%	0%	14%			
Vol Thru, %	49%	43%	0%			
Vol Right, %	0%	57%	86%			
Sign Control	Stop	Stop	Stop			
Traffic Vol by Lane	115	60	35			
LT Vol	59	0	5			
Through Vol	56	26	0			
RT Vol	0	34	30			
Lane Flow Rate	125	65	38			
Geometry Grp	1	1	1			
Degree of Util (X)	0.144	0.068	0.04			
Departure Headway (Hd)	4.153	3.755	3.773			
Convergence, Y/N	Yes	Yes	Yes			
Cap	865	950	935			
Service Time	2.173	1.795	1.854			
HCM Lane V/C Ratio	0.145	0.068	0.041			
HCM Control Delay	7.9	7.1	7			
HCM Lane LOS	A	A	A			
HCM 95th-tile Q	0.5	0.2	0.1			

Intersection						
Int Delay, s/veh	1.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	56	3	18	61	1	1
Future Vol, veh/h	56	3	18	61	1	1
Conflicting Peds, #/hr	0	2	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	61	3	20	66	1	1
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	66	0	171	66
Stage 1	-	-	-	-	65	-
Stage 2	-	-	-	-	106	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1536	-	819	998
Stage 1	-	-	-	-	958	-
Stage 2	-	-	-	-	918	-
Platoon blocked, %	-	-	-			
Mov Cap-1 Maneuver	-	-	1533	-	806	996
Mov Cap-2 Maneuver	-	-	-	-	806	-
Stage 1	-	-	-	-	943	-
Stage 2	-	-	-	-	918	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	1.7	9.1			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	891	-	-	1533	-	
HCM Lane V/C Ratio	0.002	-	-	0.013	-	
HCM Control Delay (s)	9.1	-	-	7.4	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

2022 Background AM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (vph)	14	15	15	15	10	10	29	432	19	17	423	27
Future Volume (vph)	14	15	15	15	10	10	29	432	19	17	423	27
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		6.0		6.0	6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.95		1.00	0.93		1.00	0.99		1.00	0.99	
Flt Protected		0.98		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1831		1676	1795		1676	3698		1676	3685	
Flt Permitted		0.88		0.74	1.00		0.47	1.00		0.47	1.00	
Satd. Flow (perm)		1646		1307	1795		836	3698		834	3685	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	16	16	16	11	11	32	470	21	18	460	29
RTOR Reduction (vph)	0	11	0	0	10	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	36	0	16	12	0	32	490	0	18	487	0
Confl. Peds. (#/hr)			6			14			4			12
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		3			3		2	1		2	1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		5.4		5.4	5.4		31.1	27.5		31.1	27.5	
Effective Green, g (s)		5.4		5.4	5.4		31.1	27.5		31.1	27.5	
Actuated g/C Ratio		0.10		0.10	0.10		0.59	0.52		0.59	0.52	
Clearance Time (s)		6.0		6.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0		3.0	3.0		1.0	0.2		1.0	0.2	
Lane Grp Cap (vph)		169		134	184		552	1937		551	1930	
v/s Ratio Prot				0.01			c0.00	c0.13		0.00	0.13	
v/s Ratio Perm		c0.02		0.01			0.03			0.02		
v/c Ratio		0.21		0.12	0.07		0.06	0.25		0.03	0.25	
Uniform Delay, d1		21.6		21.4	21.3		4.4	6.9		4.4	6.9	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6		0.4	0.2		0.0	0.0		0.0	0.0	
Delay (s)		22.2		21.8	21.4		4.5	6.9		4.4	6.9	
Level of Service		C		C	C		A	A		A	A	
Approach Delay (s)		22.2			21.6			6.7			6.8	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	52.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		
c	Critical Lane Group		

2022 Background AM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3
Movement	NBSB	NBSBL	EBWB
Lead/Lag	Lag	Lead	
Lead-Lag Optimize			
Recall Mode	Ped	None	None
Maximum Split (s)	74	74	46
Maximum Split (%)	38.1%	38.1%	23.7%
Minimum Split (s)	30	30	30
Yellow Time (s)	3.2	3.2	3.1
All-Red Time (s)	1.8	1.8	2.9
Minimum Initial (s)	10	10	6
Vehicle Extension (s)	0.2	1	3
Minimum Gap (s)	0.2	0.2	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)	10		9
Flash Dont Walk (s)	10		15
Dual Entry	No	No	No
Inhibit Max	No	No	No
Start Time (s)	74	0	148
End Time (s)	148	74	0
Yield/Force Off (s)	143	69	188
Yield/Force Off 170(s)	133	69	173
Local Start Time (s)	74	0	148
Local Yield (s)	143	69	188
Local Yield 170(s)	133	69	173

Intersection Summary		
Cycle Length		194
Control Type	Actuated-Uncoordinated	
Natural Cycle		90

Splits and Phases: 13: SCOTTSDALE RD & 5TH AVE.



2022 Background AM Southbridge Expansion
 14: 5TH AVE./STETSON DR. & DRINKWATER BLVD HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	43	1	16	10	44	32	314	167	62	192	5
Traffic Volume (vph)	5	43	1	16	10	44	32	314	167	62	192	5
Future Volume (vph)	5	43	1	16	10	44	32	314	167	62	192	5
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.88		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	1955		1676	1693		1676	3725	1456	1676	3707	
Flt Permitted	0.72	1.00		0.72	1.00		0.61	1.00	1.00	0.54	1.00	
Satd. Flow (perm)	1267	1955		1273	1693		1082	3725	1456	946	3707	
Peak-hour factor, PHF	0.80	0.80	0.80	0.90	0.90	0.90	0.87	0.87	0.87	0.89	0.89	0.89
Adj. Flow (vph)	6	54	1	18	11	49	37	361	192	70	216	6
RTOR Reduction (vph)	0	1	0	0	41	0	0	0	62	0	1	0
Lane Group Flow (vph)	6	54	0	18	19	0	37	361	130	70	221	0
Conf. Peds. (#/hr)			1			7			3			4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	20.0	20.0		20.0	20.0		85.4	81.3	81.3	85.4	81.3	
Effective Green, g (s)	20.0	20.0		20.0	20.0		85.4	81.3	81.3	85.4	81.3	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.71	0.68	0.68	0.71	0.68	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	0.2	0.2	2.0	0.2	
Lane Grp Cap (vph)	211	325		212	282		790	2523	986	698	2511	
v/s Ratio Prot		c0.03			0.01		0.00	c0.10		c0.00	0.06	
v/s Ratio Perm	0.00			0.01			0.03		0.09	0.07		
v/c Ratio	0.03	0.17		0.08	0.07		0.05	0.14	0.13	0.10	0.09	
Uniform Delay, d1	41.9	42.9		42.3	42.1		5.2	6.9	6.9	5.4	6.6	
Progression Factor	1.00	1.00		1.00	1.00		0.85	0.85	0.58	0.53	0.48	
Incremental Delay, d2	0.0	0.1		0.1	0.0		0.0	0.1	0.3	0.0	0.1	
Delay (s)	41.9	42.9		42.3	42.2		4.4	6.0	4.3	2.9	3.2	
Level of Service	D	D		D	D		A	A	A	A	A	
Approach Delay (s)		42.8			42.2			5.3			3.2	
Approach LOS		D			D			A			A	

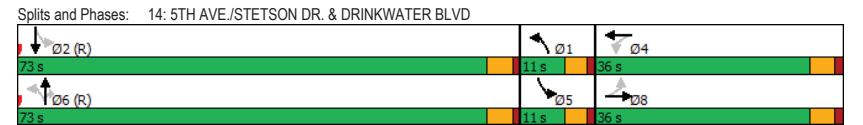
Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

Description: Last Update: Sept 2017
 c Critical Lane Group

2022 Background AM Southbridge Expansion
 14: 5TH AVE./STETSON DR. & DRINKWATER BLVD Timing Report, Sorted By Phase

Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag						
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	11	73	36	11	73	36
Maximum Split (%)	9.2%	60.8%	30.0%	9.2%	60.8%	30.0%
Minimum Split (s)	11	16	36	11	16	35
Yellow Time (s)	3.3	4	3.5	3.3	4	3.5
All-Red Time (s)	1.3	1	1.5	1.3	1	1.5
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	8		7	7
Flash Dont Walk (s)		13	23		12	23
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	3	50	14	3	50	14
End Time (s)	14	3	50	14	3	50
Yield/Force Off (s)	9.4	118	45	9.4	118	45
Yield/Force Off 170(s)	9.4	105	22	9.4	106	22
Local Start Time (s)	73	0	84	73	0	84
Local Yield (s)	79.4	68	115	79.4	68	115
Local Yield 170(s)	79.4	55	92	79.4	56	92


Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 50 (42%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕		↔	↕
Traffic Vol, veh/h	5	16	523	24	32	551
Future Vol, veh/h	5	16	523	24	32	551
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	17	568	26	35	599
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	891	297	0	0	594	0
Stage 1	581	-	-	-	-	-
Stage 2	310	-	-	-	-	-
Critical Hdwy	6.29	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.67	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	315	699	-	-	978	-
Stage 1	507	-	-	-	-	-
Stage 2	680	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	304	699	-	-	978	-
Mov Cap-2 Maneuver	387	-	-	-	-	-
Stage 1	489	-	-	-	-	-
Stage 2	680	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	11.4	0	0.5			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	586	978	-	-
HCM Lane V/C Ratio	-	-	0.039	0.036	-	-
HCM Control Delay (s)	-	-	11.4	8.8	-	-
HCM Lane LOS	-	-	B	A	-	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-	-

Intersection												
Intersection Delay, s/veh	7.5											
Intersection LOS	A											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	42	6	10	15	6	18	48	34	3	20	7
Future Vol, veh/h	9	42	6	10	15	6	18	48	34	3	20	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	46	7	11	16	7	20	52	37	3	22	8
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB	WB	NB	SB								
Opposing Approach	WB	EB	SB	NB								
Opposing Lanes	1	1	1	1								
Conflicting Approach Left	SB	NB	EB	WB								
Conflicting Lanes Left	1	1	1	1								
Conflicting Approach Right	NB	SB	WB	EB								
Conflicting Lanes Right	1	1	1	1								
HCM Control Delay	7.6	7.4	7.6	7.3								
HCM LOS	A	A	A	A								
Lane	NBLn1	EBLn1	WBLn1	SBLn1								
Vol Left, %	18%	16%	32%	10%								
Vol Thru, %	48%	74%	48%	67%								
Vol Right, %	34%	11%	19%	23%								
Sign Control	Stop	Stop	Stop	Stop								
Traffic Vol by Lane	100	57	31	30								
LT Vol	18	9	10	3								
Through Vol	48	42	15	20								
RT Vol	34	6	6	7								
Lane Flow Rate	109	62	34	33								
Geometry Grp	1	1	1	1								
Degree of Util (X)	0.119	0.072	0.039	0.037								
Departure Headway (Hd)	3.956	4.174	4.176	4.064								
Convergence, Y/N	Yes	Yes	Yes	Yes								
Cap	899	850	847	871								
Service Time	2.014	2.24	2.25	2.134								
HCM Lane V/C Ratio	0.121	0.073	0.04	0.038								
HCM Control Delay	7.6	7.6	7.4	7.3								
HCM Lane LOS	A	A	A	A								
HCM 95th-tile Q	0.4	0.2	0.1	0.1								

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	11	52	32	11	16	2
Future Vol, veh/h	11	52	32	11	16	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	57	35	12	17	2
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	47	0	0	122	41	
Stage 1	-	-	-	41	-	
Stage 2	-	-	-	81	-	
Critical Hdwy	4.12	-	-	6.42	6.22	
Critical Hdwy Stg 1	-	-	-	5.42	-	
Critical Hdwy Stg 2	-	-	-	5.42	-	
Follow-up Hdwy	2.218	-	-	3.518	3.318	
Pot Cap-1 Maneuver	1560	-	-	873	1030	
Stage 1	-	-	-	981	-	
Stage 2	-	-	-	942	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	1560	-	-	866	1030	
Mov Cap-2 Maneuver	-	-	-	866	-	
Stage 1	-	-	-	973	-	
Stage 2	-	-	-	942	-	
Approach	EB	WB	SB			
HCM Control Delay, s	1.3	0	9.2			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBR
Capacity (veh/h)	1560	-	-	-	882	
HCM Lane V/C Ratio	0.008	-	-	-	0.022	
HCM Control Delay (s)	7.3	0	-	-	9.2	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↕	↕		↕	↕		↕	↕		↕	↕	↕	
Traffic Volume (vph)	3	17	10	22	5	55	63	424	28	65	363	19	
Future Volume (vph)	3	17	10	22	5	55	63	424	28	65	363	19	
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800	
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.98	
Ftbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.94		1.00	0.86		1.00	0.99		1.00	1.00	0.85	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1676	1837		1676	1666		1676	3685		1676	3725	1464	
Fit Permitted	1.00	1.00		1.00	1.00		0.52	1.00		0.47	1.00	1.00	
Satd. Flow (perm)	1765	1837		1765	1666		916	3685		834	3725	1464	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	3	18	11	24	5	60	68	461	30	71	395	21	
RTOR Reduction (vph)	0	10	0	0	55	0	0	4	0	0	0	6	
Lane Group Flow (vph)	3	19	0	24	10	0	68	487	0	71	395	15	
Conf. Peds. (#/hr)			7			4			8			5	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm	
Protected Phases		3			3			1			1		
Permitted Phases	3			3			1			1		1	
Actuated Green, G (s)	3.9	3.9		3.9	3.9		35.8	35.8		35.8	35.8	35.8	
Effective Green, g (s)	3.9	3.9		3.9	3.9		35.8	35.8		35.8	35.8	35.8	
Actuated g/C Ratio	0.08	0.08		0.08	0.08		0.72	0.72		0.72	0.72	0.72	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		0.2	0.2		0.2	0.2	0.2	
Lane Grp Cap (vph)	138	144		138	130		659	2654		600	2683	1054	
v/s Ratio Prot		0.01			0.01			c0.13			0.11		
v/s Ratio Perm	0.00			c0.01			0.07			0.09		0.01	
v/c Ratio	0.02	0.13		0.17	0.07		0.10	0.18		0.12	0.15	0.01	
Uniform Delay, d1	21.1	21.3		21.4	21.2		2.1	2.2		2.1	2.2	2.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.0	0.2		0.2	0.1		0.0	0.0		0.0	0.0	0.0	
Delay (s)	21.2	21.5		21.6	21.3		2.1	2.3		2.2	2.2	2.0	
Level of Service	C	C		C	C		A	A		A	A	A	
Approach Delay (s)		21.4			21.4			2.2				2.2	
Approach LOS		C			C			A				A	
Intersection Summary													
HCM 2000 Control Delay	4.2		HCM 2000 Level of Service					A					
HCM 2000 Volume to Capacity ratio	0.18												
Actuated Cycle Length (s)	49.7				Sum of lost time (s)				10.0				
Intersection Capacity Utilization	55.0%		ICU Level of Service					A					
Analysis Period (min)	15												
c Critical Lane Group													

2022 Background AM
18: SCOTTSDALE RD & 3RD AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	3
Movement	NBSB	EBWB
Lead/Lag		
Lead-Lag Optimize		
Recall Mode	Ped	None
Maximum Split (s)	36	32
Maximum Split (%)	52.9%	47.1%
Minimum Split (s)	36	32
Yellow Time (s)	3.2	3
All-Red Time (s)	1.8	2
Minimum Initial (s)	10	6
Vehicle Extension (s)	0.2	2
Minimum Gap (s)	1	2
Time Before Reduce (s)	0	0
Time To Reduce (s)	0	0
Walk Time (s)	18	6
Flash Dont Walk (s)	12	15
Dual Entry	No	No
Inhibit Max	No	No
Start Time (s)	0	36
End Time (s)	36	0
Yield/Force Off (s)	31	63
Yield/Force Off 170(s)	19	48
Local Start Time (s)	0	36
Local Yield (s)	31	63
Local Yield 170(s)	19	48

Intersection Summary	
Cycle Length	68
Control Type	Actuated-Uncoordinated
Natural Cycle	70

Splits and Phases: 18: SCOTTSDALE RD & 3RD AVE.



2022 Background AM
19: DRINKWATER BLVD & 3RD AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	7	1	19	64	10	63	92	482	25	19	166	19
Future Volume (vph)	7	1	19	64	10	63	92	482	25	19	166	19
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00			0.99		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86			0.94		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1678			1785		1676	5306		1676	3725	1444
Flt Permitted	0.56	1.00			0.84		0.62	1.00		0.41	1.00	1.00
Satd. Flow (perm)	985	1678			1530		1100	5306		723	3725	1444
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.83	0.83	0.83	0.81	0.81	0.81
Adj. Flow (vph)	9	1	24	74	11	72	111	581	30	23	205	23
RTOR Reduction (vph)	0	0	0	0	30	0	0	3	0	0	0	5
Lane Group Flow (vph)	9	25	0	0	127	0	111	608	0	23	205	18
Confl. Peds. (#/hr)						2			4			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	16.7	16.7			16.7		93.2	93.2		93.2	93.2	93.2
Effective Green, g (s)	16.7	16.7			16.7		93.2	93.2		93.2	93.2	93.2
Actuated g/C Ratio	0.14	0.14			0.14		0.78	0.78		0.78	0.78	0.78
Clearance Time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	137	233			212		854	4120		561	2893	1121
v/s Ratio Prot		0.01						c0.11			0.06	
v/s Ratio Perm	0.01				c0.08		0.10			0.03		0.01
v/c Ratio	0.07	0.11			0.60		0.13	0.15		0.04	0.07	0.02
Uniform Delay, d1	44.9	45.1			48.5		3.3	3.4		3.1	3.2	3.0
Progression Factor	1.00	1.00			1.00		1.00	1.00		0.34	0.33	0.12
Incremental Delay, d2	0.1	0.1			3.0		0.3	0.1		0.1	0.0	0.0
Delay (s)	44.9	45.2			51.5		3.6	3.5		1.2	1.1	0.4
Level of Service	D	D			D		A	A		A	A	A
Approach Delay (s)		45.1			51.5			3.5			1.0	
Approach LOS		D			D			A			A	

Intersection Summary	
HCM 2000 Control Delay	10.7
HCM 2000 Volume to Capacity ratio	0.22
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	58.8%
Analysis Period (min)	15
Description: Last Update: Sept 2017	
c Critical Lane Group	

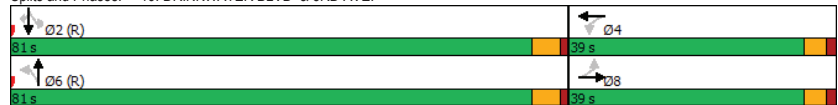
2022 Background AM
19: DRINKWATER BLVD & 3RD AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

	2	4	6	8
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	Min	C-Min	None
Maximum Split (s)	81	39	81	39
Maximum Split (%)	67.5%	32.5%	67.5%	32.5%
Minimum Split (s)	22.2	38.9	16	30.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	9	7	7
Flash Dont Walk (s)	10	25	20	19
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	62	23	62	23
End Time (s)	23	62	23	62
Yield/Force Off (s)	17.8	57.1	17.8	57.1
Yield/Force Off 170(s)	7.8	57.1	117.8	38.1
Local Start Time (s)	0	81	0	81
Local Yield (s)	75.8	115.1	75.8	115.1
Local Yield 170(s)	65.8	115.1	55.8	96.1

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 62 (52%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	

Splits and Phases: 19: DRINKWATER BLVD & 3RD AVE.



2022 Background AM
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔↔	↔	↔	↔↔	↔
Traffic Volume (vph)	167	679	6	28	653	94	41	508	86	117	319	166
Future Volume (vph)	167	679	6	28	653	94	41	508	86	117	319	166
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	5353	1474	1676	5353	1470	1676	3725	1477	1676	3516	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	5353	1474	1676	5353	1470	1676	3725	1477	1676	3516	
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.86	0.86	0.86	0.84	0.84	0.84
Adj. Flow (vph)	188	763	7	31	726	104	48	591	100	139	380	198
RTOR Reduction (vph)	0	0	4	0	0	60	0	0	0	0	61	0
Lane Group Flow (vph)	188	763	3	31	726	44	48	591	100	139	517	0
Conf. Peds. (#/hr)			4			4			7			3
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5 9	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	19.4	54.5	54.5	5.7	36.9	52.2	13.9	25.5	31.2	15.3	27.2	
Effective Green, g (s)	19.4	54.5	54.5	5.7	36.9	52.2	13.9	25.5	31.2	15.3	27.2	
Actuated g/C Ratio	0.16	0.44	0.44	0.05	0.30	0.43	0.11	0.21	0.25	0.12	0.22	
Clearance Time (s)		5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5	
Vehicle Extension (s)		1.0	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	264	2377	654	77	1609	625	189	774	439	208	779	
v/s Ratio Prot	c0.11	0.14		0.02	c0.14	0.01	0.03	c0.16	0.01	c0.08	0.15	
v/s Ratio Perm			0.00			0.02			0.06			
v/c Ratio	0.71	0.32	0.00	0.40	0.45	0.07	0.25	0.76	0.23	0.67	0.66	
Uniform Delay, d1	49.0	22.1	19.0	56.8	34.7	20.9	49.7	45.8	36.2	51.3	43.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.3	0.4	0.0	1.3	0.9	0.0	0.3	4.1	0.1	6.2	1.7	
Delay (s)	56.3	22.5	19.0	58.1	35.6	20.9	49.9	49.8	36.3	57.4	45.2	
Level of Service	E	C	B	E	D	C	D	D	D	E	D	
Approach Delay (s)		29.1			34.7			48.0			47.6	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	38.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	122.7	Sum of lost time (s)	25.6
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Background AM
20: 68th Street & INDIAN SCHOOL

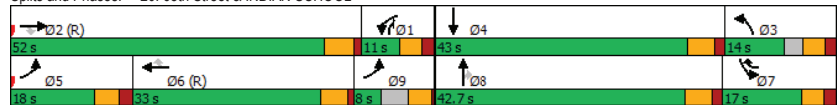
Southbridge Expansion
Timing Report, Sorted By Phase

	1	2	3	4	5	6	7	8	9
Phase Number	1	2	3	4	5	6	7	8	9
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT	EBL
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	
Lead-Lag Optimize									
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None
Maximum Split (s)	11	52	14	43	18	33	17	42.7	8
Maximum Split (%)	9.0%	42.4%	11.4%	35.0%	14.7%	26.9%	13.9%	34.8%	6.5%
Minimum Split (s)	11	32.4	11	39.5	11	33	11	42.7	8
Yellow Time (s)	3.3	4.4	3.3	4	3.6	4	3.3	4	3.5
All-Red Time (s)	2	1	1.9	1.5	2	1	2	1.7	0.5
Minimum Initial (s)	5	10	5	7	5	10	5	7	4
Vehicle Extension (s)	2	1	2	2	2	1	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4	
Flash Dont Walk (s)		23		30		24		33	
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	64	12	118	75	12	30	117.7	75	63
End Time (s)	75	64	12	118	30	63	12	117.7	75
Yield/Force Off (s)	69.7	58.6	6.8	112.5	24.4	58	6.7	112	71
Yield/Force Off 170(s)	69.7	35.6	6.8	82.5	24.4	34	6.7	79	71
Local Start Time (s)	52	0	106	63	0	18	105.7	63	51
Local Yield (s)	57.7	46.6	117.5	100.5	12.4	46	117.4	100	59
Local Yield 170(s)	57.7	23.6	117.5	70.5	12.4	22	117.4	67	59

Intersection Summary

Cycle Length	122.7
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 12 (10%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	

Splits and Phases: 20: 68th Street & INDIAN SCHOOL



2022 Background AM
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	171	640	73	58	564	34	68	357	14	34	433	77
Future Volume (vph)	171	640	73	58	564	34	68	357	14	34	433	77
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	1000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.0	3.0	5.3	5.0		5.3	5.3		5.3	5.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		1.00	0.95		1.00	0.91	
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3317	3725	1510	3317	3695		1710	1854		1710	5236	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3317	3725	1510	3317	3695		1710	1854		1710	5236	
Peak-hour factor, PHF	0.87	0.87	0.87	0.89	0.89	0.89	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	197	736	84	65	634	38	83	435	17	41	528	94
RTOR Reduction (vph)	0	0	45	0	3	0	0	2	0	0	25	0
Lane Group Flow (vph)	197	736	39	65	669	0	83	450	0	41	597	0
Conf. Peds. (#/hr)			1				1					2
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	12.9	56.3	56.3	7.3	50.7		18.8	34.8		7.0	23.0	
Effective Green, g (s)	12.9	56.3	58.3	7.3	50.7		18.8	34.8		7.0	23.0	
Actuated g/C Ratio	0.10	0.45	0.46	0.06	0.40		0.15	0.28		0.06	0.18	
Clearance Time (s)	5.3	5.0	5.0	5.3	5.0		5.3	5.3		5.3	5.3	
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0		2.0	1.0		2.0	1.0	
Lane Grp Cap (vph)	338	1660	697	191	1483		254	510		94	953	
v/s Ratio Prot	c0.06	c0.20		0.02	0.18		c0.05	c0.24		0.02	0.11	
v/s Ratio Perm			0.03									
v/c Ratio	0.58	0.44	0.06	0.34	0.45		0.33	0.88		0.44	0.63	
Uniform Delay, d1	54.1	24.2	18.8	57.2	27.6		48.1	43.8		57.7	47.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.9	0.2	0.4	1.0		0.3	15.9		1.2	0.9	
Delay (s)	55.8	25.0	18.9	57.6	28.6		48.4	59.7		58.9	48.6	
Level of Service	E	C	B	E	C		D	E		E	D	
Approach Delay (s)		30.5			31.2			57.9			49.3	
Approach LOS		C			C			E			D	

Intersection Summary

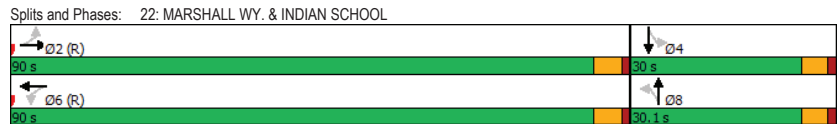
HCM 2000 Control Delay	39.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	126.3	Sum of lost time (s)	20.9
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Background AM
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	←	↓	→	↑
Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	90	30	90	30.1
Maximum Split (%)	74.9%	25.0%	74.9%	25.1%
Minimum Split (s)	16	29.1	16	30.1
Yellow Time (s)	4	3.6	4	3.6
All-Red Time (s)	1.2	1.5	1.2	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	8
Flash Dont Walk (s)	8	17	7	17
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	118	87.9	118	87.9
End Time (s)	87.9	118	87.9	118
Yield/Force Off (s)	82.7	112.9	82.7	112.9
Yield/Force Off 170(s)	74.7	95.9	75.7	95.9
Local Start Time (s)	0	90	0	90
Local Yield (s)	84.8	115	84.8	115
Local Yield 170(s)	76.8	98	77.8	98

Intersection Summary	
Cycle Length	120.1
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 118 (98%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green	



2022 Background AM
23: INDIAN SCHOOL & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	←	→	↙	↘	←	↙	↘	↑	↙	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↕	↕	↔
Traffic Volume (vph)	87	524	52	4	738	92	57	334	70	67	265	51
Future Volume (vph)	87	524	52	4	738	92	57	334	70	67	265	51
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	3668		1676	3648		1676	3613		1676	3725	1454
Flt Permitted	0.24	1.00		0.37	1.00		0.47	1.00		0.28	1.00	1.00
Satd. Flow (perm)	421	3668		659	3648		826	3613		495	3725	1454
Peak-hour factor, PHF	0.94	0.94	0.94	0.91	0.91	0.91	0.83	0.83	0.83	0.86	0.86	0.86
Adj. Flow (vph)	93	557	55	4	811	101	69	402	84	78	308	59
RTOR Reduction (vph)	0	5	0	0	6	0	0	16	0	0	0	43
Lane Group Flow (vph)	93	607	0	4	906	0	69	470	0	78	308	16
Confl. Peds. (#/hr)			8			21			11			20
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	69.9	64.3		69.9	64.3		30.2	26.2		30.2	26.2	31.8
Effective Green, g (s)	69.9	64.3		69.9	64.3		30.2	26.2		30.2	26.2	31.8
Actuated g/C Ratio	0.58	0.54		0.58	0.54		0.25	0.22		0.25	0.22	0.27
Clearance Time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	303	1965		431	1954		236	788		163	813	447
v/s Ratio Prot	c0.01	0.17		0.00	c0.25		0.01	c0.13		c0.02	0.08	0.00
v/s Ratio Perm	0.16			0.00			0.06			0.10		0.01
v/c Ratio	0.31	0.31		0.01	0.46		0.29	0.60		0.48	0.38	0.03
Uniform Delay, d1	21.4	15.5		13.7	17.2		39.8	42.2		46.4	40.0	32.7
Progression Factor	1.00	1.00		0.98	1.10		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.4		0.0	0.8		0.3	0.8		0.8	0.1	0.0
Delay (s)	21.6	15.9		13.5	19.7		40.0	43.0		47.2	40.1	32.7
Level of Service	C	B		B	B		D	D		D	D	C
Approach Delay (s)	16.7			19.7			42.6			40.4		
Approach LOS	B			B			D			D		

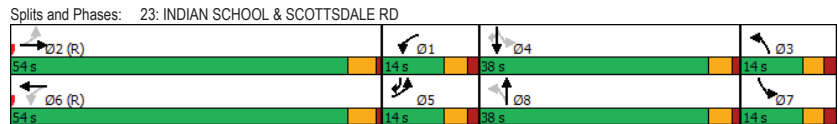
Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Background AM
23: INDIAN SCHOOL & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

	1	2	3	4	5	6	7	8
Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	14	54	14	38	14	54	14	38
Maximum Split (%)	11.7%	45.0%	11.7%	31.7%	11.7%	45.0%	11.7%	31.7%
Minimum Split (s)	11	30	10	32.8	11	33	10	34.8
Yellow Time (s)	3.3	4	3	3.6	3.3	4	3	3.6
All-Red Time (s)	1.8	1	2	1.2	1.8	1	2	1.2
Minimum Initial (s)	5	10	5	10	5	10	5	10
Vehicle Extension (s)	2	1	2	2	2	1	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		8		8
Flash Dont Walk (s)		18		21		20		22
Dual Entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	54	0	106	68	54	0	106	68
End Time (s)	68	54	0	106	68	54	0	106
Yield/Force Off (s)	62.9	49	115	101.2	62.9	49	115	101.2
Yield/Force Off 170(s)	62.9	31	115	80.2	62.9	29	115	79.2
Local Start Time (s)	54	0	106	68	54	0	106	68
Local Yield (s)	62.9	49	115	101.2	62.9	49	115	101.2
Local Yield 170(s)	62.9	31	115	80.2	62.9	29	115	79.2

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green	



2022 Background AM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	↑
Traffic Volume (vph)	836	21	22	964	1	14
Future Volume (vph)	836	21	22	964	1	14
Ideal Flow (vphpl)	2000	1800	1800	2000	1800	1800
Total Lost time (s)	5.2		5.2	5.2	5.1	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frbp, ped/bikes	1.00		1.00	1.00	0.98	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.87	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3709		1676	3725	1509	
Flt Permitted	1.00		0.30	1.00	1.00	
Satd. Flow (perm)	3709		525	3725	1509	
Peak-hour factor, PHF	0.92	0.92	0.93	0.93	0.80	0.80
Adj. Flow (vph)	909	23	24	1037	1	18
RTOR Reduction (vph)	1	0	0	0	16	0
Lane Group Flow (vph)	931	0	24	1037	3	0
Conf. Peds. (#/hr)		4				5
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	98.4		98.4	98.4	11.3	
Effective Green, g (s)	98.4		98.4	98.4	11.3	
Actuated g/C Ratio	0.82		0.82	0.82	0.09	
Clearance Time (s)	5.2		5.2	5.2	5.1	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	3041		430	3054	142	
v/s Ratio Prot	0.25			0.28	0.00	
v/s Ratio Perm			0.05			
v/c Ratio	0.31		0.06	0.34	0.02	
Uniform Delay, d1	2.6		2.0	2.7	49.3	
Progression Factor	0.62		0.34	0.28	1.00	
Incremental Delay, d2	0.3		0.2	0.3	0.0	
Delay (s)	1.9		0.9	1.0	49.3	
Level of Service	A		A	A	D	
Approach Delay (s)	1.9			1.0	49.3	
Approach LOS	A			A	D	

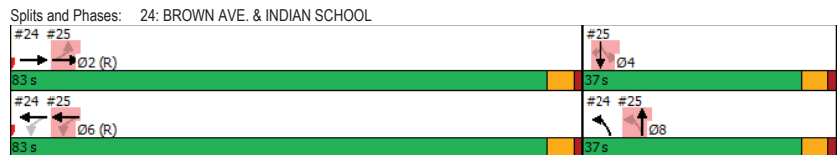
Intersection Summary			
HCM 2000 Control Delay	1.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.3
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Background AM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	→	↓	←	↖
Phase Number	2	4	6	8
Node Number	24	25	24	24
Movement	EBT	SBTL	WBTL	NBL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	83	37	83	37
Maximum Split (%)	69.2%	30.8%	69.2%	30.8%
Minimum Split (s)	23.2	12.1	27.2	36.1
Yellow Time (s)	4	3.6	4	3.6
All-Red Time (s)	1.2	1.5	1.2	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	11		15	24
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	106	69	106	69
End Time (s)	69	106	69	106
Yield/Force Off (s)	63.8	100.9	63.8	100.9
Yield/Force Off 170(s)	52.8	100.9	48.8	76.9
Local Start Time (s)	0	83	0	83
Local Yield (s)	77.8	114.9	77.8	114.9
Local Yield 170(s)	66.8	114.9	62.8	90.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 106 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	



2022 Background AM
25: BUCKBOARD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↖	→	↘	↙	←	↖	↗	↘	↙	↓	↖	↗
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖↗	↖↗		↖	↖	↖
Traffic Volume (vph)	116	729	10	42	934	135	2	1	16	39	0	49
Future Volume (vph)	116	729	10	42	934	135	2	1	16	39	0	49
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2			5.1			5.1	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98			0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1676	3717		1676	3639			1729			1863	1500
Flt Permitted	0.24	1.00		0.34	1.00			0.97			0.74	1.00
Satd. Flow (perm)	416	3717		594	3639			1682			1454	1500
Peak-hour factor, PHF	0.90	0.90	0.90	0.94	0.94	0.94	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	129	810	11	45	994	144	2	1	20	49	0	61
RTOR Reduction (vph)	0	0	0	0	5	0	0	18	0	0	0	55
Lane Group Flow (vph)	129	821	0	45	1133	0	0	6	0	0	49	6
Conf. Peds. (#/hr)			3			5						
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	4
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	98.4	98.4		98.4	98.4			11.3			11.3	11.3
Effective Green, g (s)	98.4	98.4		98.4	98.4			11.3			11.3	11.3
Actuated g/C Ratio	0.82	0.82		0.82	0.82			0.09			0.09	0.09
Clearance Time (s)	5.2	5.2		5.2	5.2			5.1			5.1	5.1
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	2.0
Lane Grp Cap (vph)	341	3047		487	2983			158			136	141
v/s Ratio Prot		0.22			0.31							
v/s Ratio Perm	0.31			0.08				0.00			0.03	0.00
v/c Ratio	0.38	0.27		0.09	0.38			0.04			0.36	0.04
Uniform Delay, d1	2.8	2.5		2.1	2.8			49.4			51.0	49.4
Progression Factor	0.34	0.16		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	3.1	0.2		0.4	0.4			0.0			0.6	0.0
Delay (s)	4.0	0.6		2.5	3.2			49.4			51.6	49.5
Level of Service	A	A		A	A			D			D	D
Approach Delay (s)		1.1			3.2			49.4			50.4	
Approach LOS		A			A			D			D	

Intersection Summary	
HCM 2000 Control Delay	5.1
HCM 2000 Volume to Capacity ratio	0.38
Actuated Cycle Length (s)	120.0
Sum of lost time (s)	10.3
Intersection Capacity Utilization	58.9%
ICU Level of Service	B
Analysis Period (min)	15
Description: Last Update: Sept 2017	
c Critical Lane Group	

2022 Background AM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

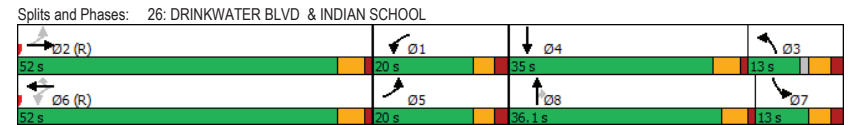
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	86	567	34	308	1081	195	60	363	177	81	139	17
Future Volume (vph)	86	567	34	308	1081	195	60	363	177	81	139	17
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.1	5.3	5.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1710	3694		1710	3725	1503	1710	3725	1498	3317	3664	
Flt Permitted	0.14	1.00		0.31	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	246	3694		565	3725	1503	1710	3725	1498	3317	3664	
Peak-hour factor, PHF	0.85	0.85	0.85	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	101	667	40	331	1162	210	67	403	197	90	154	19
RTOR Reduction (vph)	0	3	0	0	0	58	0	0	166	0	9	0
Lane Group Flow (vph)	101	704	0	331	1162	152	67	403	31	90	164	0
Confl. Peds. (#/hr)			4			4			8			6
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6			8			
Actuated Green, G (s)	72.6	59.9		72.6	59.9	59.9	14.4	19.3	19.3	8.3	13.2	
Effective Green, g (s)	72.6	59.9		72.6	59.9	59.9	14.4	19.3	19.3	8.3	13.2	
Actuated g/C Ratio	0.60	0.49		0.60	0.49	0.49	0.12	0.16	0.16	0.07	0.11	
Clearance Time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.1	5.3	5.1	
Vehicle Extension (s)	2.0	0.2		2.0	0.2	0.2	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	301	1827		458	1842	743	203	593	238	227	399	
v/s Ratio Prot	0.04	0.19		c0.08	0.31		c0.04	c0.11		0.03	0.04	
v/s Ratio Perm	0.17			c0.36		0.10			0.02			
v/c Ratio	0.34	0.39		0.72	0.63	0.21	0.33	0.68	0.13	0.40	0.41	
Uniform Delay, d1	30.0	19.1		26.8	22.5	17.2	48.9	48.0	43.7	54.0	50.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.6		4.7	1.7	0.6	0.3	2.4	0.1	0.4	0.3	
Delay (s)	30.2	19.7		31.5	24.1	17.8	49.3	50.4	43.8	54.4	50.6	
Level of Service	C	B		C	C	B	D	D	D	D	D	
Approach Delay (s)		21.0			24.8			48.4			51.9	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	20.9
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Background AM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBT	EBL	WBTL	SBL	NBT
Lead/Lag			Lag	Lead			Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	20	52	13	35	20	52	13	36.1
Maximum Split (%)	16.5%	42.9%	10.7%	28.9%	16.5%	42.9%	10.7%	29.8%
Minimum Split (s)	11	33.2	11	34.1	11	31.2	11	36.1
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1.2	2	1.1	2	1.2	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	0.2	2	2	2	0.2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		9		7		11
Flash Dont Walk (s)		21		20		19		20
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	36.9	106	91.9	56.9	36.9	106	93	56.9
End Time (s)	56.9	36.9	106	91.9	56.9	36.9	106	93
Yield/Force Off (s)	51.6	31.7	100.7	86.8	51.6	31.7	100.7	87.9
Yield/Force Off 170(s)	51.6	10.7	100.7	86.8	51.6	12.7	100.7	87.9
Local Start Time (s)	52	0	107	72	52	0	108.1	72
Local Yield (s)	66.7	46.8	115.8	101.9	66.7	46.8	115.8	103
Local Yield 170(s)	66.7	25.8	115.8	101.9	66.7	27.8	115.8	103
Intersection Summary								
Cycle Length	121.1							
Control Type	Actuated-Coordinated							
Natural Cycle	115							
Offset: 106 (88%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green								




2022 Background AM
27: 70th St & GOLDWATER BLVD

Southbridge Expansion
HCM 6th WSC

Intersection						
Int Delay, s/veh	2.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑	↑	↑
Traffic Vol, veh/h	381	54	10	291	102	26
Future Vol, veh/h	381	54	10	291	102	26
Conflicting Peds, #/hr	0	4	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	70	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	414	59	11	316	111	28
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	477	0	628	242
Stage 1	-	-	-	-	448	-
Stage 2	-	-	-	-	180	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	694	-	443	646
Stage 1	-	-	-	-	535	-
Stage 2	-	-	-	-	802	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	692	-	435	643
Mov Cap-2 Maneuver	-	-	-	-	435	-
Stage 1	-	-	-	-	525	-
Stage 2	-	-	-	-	802	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.3	15			
HCM LOS			C			
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	435	643	-	-	692	-
HCM Lane V/C Ratio	0.255	0.044	-	-	0.016	-
HCM Control Delay (s)	16.1	10.9	-	-	10.3	-
HCM Lane LOS	C	B	-	-	B	-
HCM 95th %tile Q(veh)	1	0.1	-	-	0	-

2022 Background AM
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis



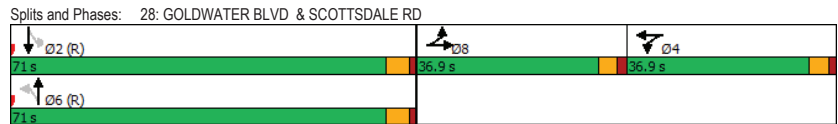
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑		↑	↑		↑	↑		↑	↑	↑	
Traffic Volume (vph)	4	6	6	228	12	17	54	263	1	36	347	18	
Future Volume (vph)	4	6	6	228	12	17	54	263	1	36	347	18	
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800	
Total Lost time (s)		4.9		4.9	4.9		5.2	5.2		5.2	5.2		
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95		1.00	0.91		
Frbp, ped/bikes		0.99		1.00	1.00		1.00	1.00		1.00	1.00		
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frt		0.95		1.00	0.98		1.00	1.00		1.00	0.99		
Fit Protected		0.99		0.95	0.96		0.95	1.00		0.95	1.00		
Satd. Flow (prot)		1828		1593	1753		1676	3723		1676	5305		
Fit Permitted		0.99		0.95	0.96		0.50	1.00		0.56	1.00		
Satd. Flow (perm)		1828		1593	1753		878	3723		983	5305		
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.82	0.82	0.82	0.87	0.87	0.87	
Adj. Flow (vph)	5	8	8	262	14	20	66	321	1	41	399	21	
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	2	0	
Lane Group Flow (vph)	0	21	0	149	143	0	66	322	0	41	418	0	
Conf. Peds. (#/hr)			2			3			7			2	
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA		
Protected Phases	8	8		4	4		6	6		2	2		
Permitted Phases							6			2			
Actuated Green, G (s)		9.2		19.4	19.4		101.2	101.2		101.2	101.2		
Effective Green, g (s)		9.2		19.4	19.4		101.2	101.2		101.2	101.2		
Actuated g/C Ratio		0.06		0.13	0.13		0.70	0.70		0.70	0.70		
Clearance Time (s)		4.9		4.9	4.9		5.2	5.2		5.2	5.2		
Vehicle Extension (s)		2.0		2.0	2.0		2.0	2.0		2.0	2.0		
Lane Grp Cap (vph)		116		213	234		613	2601		687	3707		
v/s Ratio Prot		c0.01		c0.09	0.08			c0.09			0.08		
v/s Ratio Perm							0.08			0.04			
v/c Ratio		0.18		0.70	0.61		0.11	0.12		0.06	0.11		
Uniform Delay, d1		64.2		59.9	59.1		7.1	7.2		6.8	7.1		
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2		0.3		7.8	3.1		0.4	0.1		0.2	0.1		
Delay (s)		64.5		67.8	62.2		7.5	7.3		7.0	7.2		
Level of Service		E		E	E		A	A		A	A		
Approach Delay (s)		64.5		65.0			7.3			7.2			
Approach LOS		E		E			A			A			
Intersection Summary													
HCM 2000 Control Delay	22.9		HCM 2000 Level of Service					C					
HCM 2000 Volume to Capacity ratio	0.21												
Actuated Cycle Length (s)	144.8			Sum of lost time (s)				15.0					
Intersection Capacity Utilization	54.2%		ICU Level of Service					A					
Analysis Period (min)	15												
Description: Last Update: Sept 2017													
c Critical Lane Group													

2022 Background AM
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

	↓	↘	↑	↗
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	71	36.9	71	36.9
Maximum Split (%)	49.0%	25.5%	49.0%	25.5%
Minimum Split (s)	23.2	36.9	27.2	36.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	8	8	9
Flash Dont Walk (s)	11	24	14	23
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	24	131.9	24	95
End Time (s)	95	24	95	131.9
Yield/Force Off (s)	89.8	19.1	89.8	127
Yield/Force Off 170(s)	78.8	139.9	75.8	104
Local Start Time (s)	0	107.9	0	71
Local Yield (s)	65.8	139.9	65.8	103
Local Yield 170(s)	54.8	115.9	51.8	80

Intersection Summary	
Cycle Length	144.8
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 24 (17%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Background AM
29: SCOTTSDALE RD & OSBORN RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↖	→	↘	↙	←	↗	↖	↗	↘	↙	↖	↗	↘	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗	↖	↖↗	↖	↖↗		
Traffic Volume (vph)	48	163	81	82	152	86	60	763	103	81	508	18		
Future Volume (vph)	48	163	81	82	152	86	60	763	103	81	508	18		
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800		
Total Lost time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.4			
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.91			
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	1.00			
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.95		1.00	0.95		1.00	1.00	0.85	1.00	0.99			
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00			
Satd. Flow (prot)	1676	3519		1676	3499		1676	3725	1473	1676	5320			
Flt Permitted	0.41	1.00		0.40	1.00		0.42	1.00	1.00	0.29	1.00			
Satd. Flow (perm)	730	3519		710	3499		742	3725	1473	507	5320			
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.92	0.92	0.92		
Adj. Flow (vph)	60	204	101	102	190	108	66	838	113	88	552	20		
RTOR Reduction (vph)	0	60	0	0	78	0	0	0	46	0	2	0		
Lane Group Flow (vph)	60	245	0	103	220	0	66	838	67	88	570	0		
Conf. Peds. (#/hr)			6			6			5			9		
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA			
Protected Phases	3	8		7	4		1	6	6	5	2			
Permitted Phases	8			4			6		6	2				
Actuated Green, G (s)	22.2	17.2		22.2	17.2		76.5	71.4	71.4	76.5	71.4			
Effective Green, g (s)	22.2	17.2		22.2	17.2		76.5	71.4	71.4	76.5	71.4			
Actuated g/C Ratio	0.18	0.14		0.18	0.14		0.64	0.59	0.59	0.64	0.59			
Clearance Time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.4			
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	1.0	1.0	2.0	1.0			
Lane Grp Cap (vph)	174	503		171	501		512	2214	875	372	3162			
v/s Ratio Prot	0.01	0.07		c0.03	0.06		0.01	c0.22		c0.01	0.11			
v/s Ratio Perm	0.05			c0.09			0.08		0.05	0.14				
v/c Ratio	0.34	0.49		0.60	0.44		0.13	0.38	0.08	0.24	0.18			
Uniform Delay, d1	46.6	47.4		49.1	47.0		9.1	12.7	10.3	14.3	11.1			
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	0.4	0.3		4.1	0.2		0.0	0.5	0.2	0.1	0.1			
Delay (s)	47.1	47.7		53.2	47.3		9.1	13.2	10.5	14.4	11.2			
Level of Service	D	D		D	D		A	B	B	B	B			
Approach Delay (s)		47.6			48.8			12.7			11.6			
Approach LOS		D			D			B			B			

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	21.4
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			

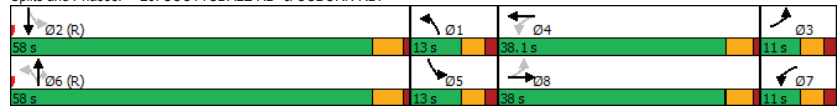
c Critical Lane Group

2022 Background AM
29: SCOTTSDALE RD & OSBORN RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	EBL	WBTL	SBL	NBTL	WBL	EBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	13	58	11	38.1	13	58	11	38
Maximum Split (%)	10.8%	48.3%	9.2%	31.7%	10.8%	48.3%	9.2%	31.6%
Minimum Split (s)	11	31.4	11	38.1	11	34.4	11	37.1
Yellow Time (s)	3.6	4.4	3.3	4	3.6	4.4	3.3	4
All-Red Time (s)	2	1	2	1.1	2	1	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	1	2	1	2	1	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		9		10		11
Flash Dont Walk (s)		18		24		19		21
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	58	0	109.1	71	58	0	109.1	71
End Time (s)	71	58	0	109.1	71	58	0	109.1
Yield/Force Off (s)	65.4	52.6	114.8	104	65.4	52.6	114.8	104
Yield/Force Off 170(s)	65.4	34.6	114.8	80	65.4	33.6	114.8	83
Local Start Time (s)	58	0	109.1	71	58	0	109.1	71
Local Yield (s)	65.4	52.6	114.8	104	65.4	52.6	114.8	104
Local Yield 170(s)	65.4	34.6	114.8	80	65.4	33.6	114.8	83
Intersection Summary								
Cycle Length	120.1							
Control Type	Actuated-Coordinated							
Natural Cycle	95							
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green								

Splits and Phases: 29: SCOTTSDALE RD & OSBORN RD.



2022 Background PM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	107	148	61	389	172	226	47	1748	345	208	1821	60
Future Volume (vph)	107	148	61	389	172	226	47	1748	345	208	1821	60
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4		5.6	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91		1.00	0.95	1.00
Fr	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1945	1500	3252	1945	1500	1676	5207		1676	3711	1500
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.06	1.00		0.06	1.00	1.00
Satd. Flow (perm)	1676	1945	1500	3252	1945	1500	104	5207		104	3711	1500
Peak-hour factor, PHF	0.85	0.85	0.85	0.83	0.83	0.83	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	174	72	469	207	272	49	1840	363	219	1917	63
RTOR Reduction (vph)	0	0	0	0	0	225	0	17	0	0	0	34
Lane Group Flow (vph)	126	174	72	469	207	47	49	2186	0	219	1917	29
Bus Blockages (#/hr)	0	2	0	0	2	0	0	2	0	0	2	0
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases			8			4	6			2		2
Actuated Green, G (s)	18.9	18.9	18.9	25.1	25.1	25.1	79.0	67.6		79.0	67.6	67.6
Effective Green, g (s)	18.9	18.9	18.9	25.1	25.1	25.1	79.0	67.6		79.0	67.6	67.6
Actuated g/C Ratio	0.13	0.13	0.13	0.17	0.17	0.17	0.54	0.47		0.54	0.47	0.47
Clearance Time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4		5.6	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.2		2.0	0.2	0.2
Lane Grp Cap (vph)	218	252	195	561	335	259	179	2422		179	1726	697
v/s Ratio Prot	0.08	c0.09		c0.14	0.11		0.02	0.42		c0.10	0.52	
v/s Ratio Perm			0.05			0.03	0.13			c0.56		0.02
w/C Ratio	0.58	0.69	0.37	0.84	0.62	0.18	0.27	0.90		1.22	1.11	0.04
Uniform Delay, d1	59.4	60.4	57.8	58.1	55.7	51.3	59.7	35.8		60.9	38.9	21.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.3	6.4	0.4	10.0	2.4	0.1	0.3	6.1		140.1	58.7	0.1
Delay (s)	61.8	66.8	58.2	68.1	58.0	51.4	60.0	41.9		200.9	97.5	21.3
Level of Service	E	E	E	E	E	D	E	D		F	F	C
Approach Delay (s)	63.4			61.1				42.3			105.6	
Approach LOS	E			E				D			F	
Intersection Summary												
HCM 2000 Control Delay	70.9					HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio	1.06											
Actuated Cycle Length (s)	145.3					Sum of lost time (s)			22.3			
Intersection Capacity Utilization	89.7%					ICU Level of Service			E			
Analysis Period (min)	15											
Description: Last Update: April 2018												
c Critical Lane Group												

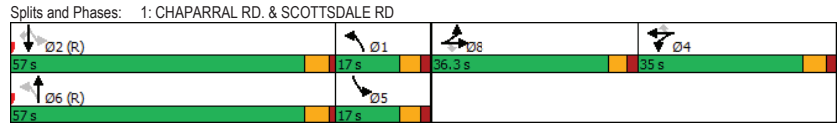
2022 Background PM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag	Lag	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	17	57	35	17	57	36.3
Maximum Split (%)	11.7%	39.2%	24.1%	11.7%	39.2%	25.0%
Minimum Split (s)	11	16	35	11	16	36.3
Yellow Time (s)	3.6	4.4	4	3.6	4.4	3.3
All-Red Time (s)	2	1	2	2	1	2
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	9
Flash Dont Walk (s)		10	22		14	22
Dual Entry	No	Yes	No	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	145	88	53	145	88	16.7
End Time (s)	16.7	145	88	16.7	145	53
Yield/Force Off (s)	11.1	139.6	82	11.1	139.6	47.7
Yield/Force Off 170(s)	11.1	129.6	60	11.1	125.6	25.7
Local Start Time (s)	57	0	110.3	57	0	74
Local Yield (s)	68.4	51.6	139.3	68.4	51.6	105
Local Yield 170(s)	68.4	41.6	117.3	68.4	37.6	83

Intersection Summary

Cycle Length	145.3
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 88 (61%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Background PM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↗	↔	↕	↗	↔	↕	↗	↔	↕	↗
Traffic Volume (vph)	151	17	184	17	4	21	43	2036	57	14	853	37
Future Volume (vph)	151	17	184	17	4	21	43	2036	57	14	853	37
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1	5.1	5.6	5.6	5.6	5.6	5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00	0.91
Frbp, ped/bikes	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ftpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	1.00	1.00	1.00	1.00	1.00	0.99	0.99
Flt Protected	0.95	1.00	1.00	0.96	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1676	1961	1500	1885	1480	1676	5327	1676	5327	1676	5314	5314
Flt Permitted	0.74	1.00	1.00	0.82	1.00	0.24	1.00	0.05	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1308	1961	1500	1616	1480	430	5327	86	5314	86	5314	5314
Peak-hour factor, PHF	0.81	0.81	0.81	0.86	0.86	0.86	0.90	0.90	0.90	0.83	0.83	0.83
Adj. Flow (vph)	186	21	227	20	5	24	48	2262	63	17	1028	45
RTOR Reduction (vph)	0	0	104	0	0	18	0	2	0	0	3	0
Lane Group Flow (vph)	186	21	123	0	25	6	48	2323	0	17	1070	0
Confl. Peds. (#/hr)						1			2			2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		8			4			6				2
Permitted Phases	8		8	4		4	6			2		
Actuated Green, G (s)	23.5	23.5	23.5		23.5	23.5	92.9	92.9		92.9	92.9	
Effective Green, g (s)	23.5	23.5	23.5		23.5	23.5	92.9	92.9		92.9	92.9	
Actuated g/C Ratio	0.18	0.18	0.18		0.18	0.18	0.73	0.73		0.73	0.73	
Clearance Time (s)	5.1	5.1	5.1		5.1	5.1	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	241	362	277		298	273	314	3893		62	3884	
v/s Ratio Prot		0.01					c0.44				0.20	
v/s Ratio Perm	c0.14		0.08		0.02	0.00	0.11			0.20		
v/c Ratio	0.77	0.06	0.45		0.08	0.02	0.15	0.60		0.27	0.28	
Uniform Delay, d1	49.3	42.7	46.0		42.9	42.4	5.2	8.2		5.8	5.8	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.0	0.0	0.4		0.0	0.0	1.0	0.7		10.6	0.2	
Delay (s)	62.3	42.7	46.4		42.9	42.4	6.2	8.8		16.4	5.9	
Level of Service	E	D	D		D	D	A	A		B	A	
Approach Delay (s)	53.0				42.7			8.8			6.1	
Approach LOS	D				D			A			A	

Intersection Summary

HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	127.1	Sum of lost time (s)	10.7
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

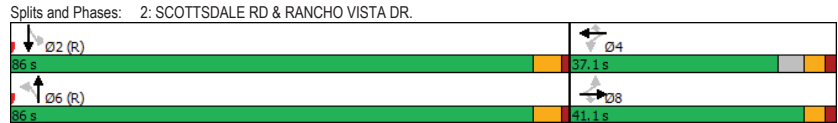
2022 Background PM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
Timing Report, Sorted By Phase

	2	4	6	8
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	86	37.1	86	41.1
Maximum Split (%)	67.7%	29.2%	67.7%	32.3%
Minimum Split (s)	16	37.1	16	41.1
Yellow Time (s)	4.4	3.3	4.4	3.3
All-Red Time (s)	1.2	1.8	1.2	1.8
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	11
Flash Dont Walk (s)	18	25	13	25
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	76	34.9	76	34.9
End Time (s)	34.9	76	34.9	76
Yield/Force Off (s)	29.3	70.9	29.3	70.9
Yield/Force Off 170(s)	11.3	45.9	16.3	45.9
Local Start Time (s)	0	86	0	86
Local Yield (s)	80.4	122	80.4	122
Local Yield 170(s)	62.4	97	67.4	97

Intersection Summary

Cycle Length	127.1
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 76 (60%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Background PM
3: SCOTTSDALE RD & HIGHLAND AVE/Granada Ave

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	678	18	49	27	18	37	44	1372	31	13	1066	86
Future Volume (vph)	678	18	49	27	18	37	44	1372	31	13	1066	86
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.90		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3252	1727		1676	1765		1676	5332		1676	5287	
Flt Permitted	0.95	1.00		0.95	1.00		0.15	1.00		0.11	1.00	
Satd. Flow (perm)	3252	1727		1676	1765		267	5332		191	5287	
Peak-hour factor, PHF	0.85	0.85	0.85	0.80	0.80	0.80	0.91	0.91	0.91	0.87	0.87	0.87
Adj. Flow (vph)	798	21	58	34	22	46	48	1508	34	15	1225	99
RTOR Reduction (vph)	0	42	0	0	19	0	0	2	0	0	7	0
Lane Group Flow (vph)	798	37	0	34	50	0	48	1540	0	15	1317	0
Conf. Peds. (#/hr)			2						2			2
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4		6	6		6	6	2
Permitted Phases							6			2		
Actuated Green, G (s)	32.6	32.6		6.8	6.8		64.8	64.8		64.8	64.8	
Effective Green, g (s)	32.6	32.6		6.8	6.8		64.8	64.8		64.8	64.8	
Actuated g/C Ratio	0.27	0.27		0.06	0.06		0.54	0.54		0.54	0.54	
Clearance Time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	882	468		94	99		144	2876		103	2852	
v/s Ratio Prot	c0.25	0.02		0.02	c0.03			c0.29			0.25	
v/s Ratio Perm							0.18			0.08		
v/c Ratio	0.90	0.08		0.36	0.51		0.33	0.54		0.15	0.46	
Uniform Delay, d1	42.3	32.6		54.6	55.0		15.5	17.9		13.8	17.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.3	0.0		0.9	1.5		6.1	0.7		3.0	0.5	
Delay (s)	54.6	32.6		55.4	56.5		21.6	18.6		16.8	17.5	
Level of Service	D	C		E	E		C	B		B	B	
Approach Delay (s)		52.6			56.1			18.7			17.5	
Approach LOS		D			E			B			B	

Intersection Summary

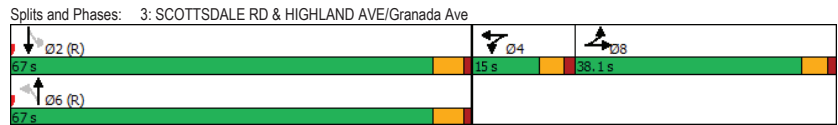
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	15.9
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Background PM
3: SCOTTSDALE RD & HIGHLAND AVE/Granada Ave

Southbridge Expansion
Timing Report, Sorted By Phase

	↓	↘	↑	↗
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lead		Lag
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	67	15	67	38.1
Maximum Split (%)	55.8%	12.5%	55.8%	31.7%
Minimum Split (s)	30.7	13	28.7	38.1
Yellow Time (s)	4.4	3.6	4.4	3.6
All-Red Time (s)	1.3	1.5	1.3	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	1	2	1	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8		7	9
Flash Dont Walk (s)	17		16	24
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	94	40.9	94	55.9
End Time (s)	40.9	55.9	40.9	94
Yield/Force Off (s)	35.2	50.8	35.2	88.9
Yield/Force Off 170(s)	18.2	50.8	19.2	64.9
Local Start Time (s)	0	67	0	82
Local Yield (s)	61.3	76.9	61.3	115
Local Yield 170(s)	44.3	76.9	45.3	91

Intersection Summary	
Cycle Length	120.1
Control Type	Actuated-Coordinated
Natural Cycle	85
Offset: 94 (78%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Background PM
4: Fashion Square Dr & Goldwater Blvd

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↖	→	↘	↙	←	↗	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	67	16	58	87	4	26	34	494	74	29	867	18
Future Volume (vph)	67	16	58	87	4	26	34	494	74	29	867	18
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		5.5		5.5	5.5		5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.91	1.00
Frbp, ped/bikes		0.99		1.00	0.98		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.94		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1796		1676	1676		1676	3725	1460	1676	5353	1466
Flt Permitted		0.83		0.57	1.00		0.29	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)		1530		998	1676		509	3725	1460	798	5353	1466
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	73	17	63	95	4	28	37	537	80	32	942	20
RTOR Reduction (vph)	0	25	0	0	24	0	0	0	17	0	0	4
Lane Group Flow (vph)	0	128	0	95	8	0	37	537	63	32	942	16
Conf. Peds. (#/hr)			2			3			2			1
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		8		4	4		6	6			2	
Permitted Phases	8			4			6		6	2		2
Actuated Green, G (s)		15.5		15.5	15.5		93.8	93.8	93.8	93.8	93.8	93.8
Effective Green, g (s)		15.5		15.5	15.5		93.8	93.8	93.8	93.8	93.8	93.8
Actuated g/C Ratio		0.13		0.13	0.13		0.78	0.78	0.78	0.78	0.78	0.78
Clearance Time (s)		5.5		5.5	5.5		5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		197		128	216		397	2911	1141	623	4184	1145
v/s Ratio Prot					0.00			0.14			c0.18	
v/s Ratio Perm		0.08		c0.10			0.07		0.04	0.04		0.01
v/c Ratio		0.65		0.74	0.04		0.09	0.18	0.05	0.05	0.23	0.01
Uniform Delay, d1		49.7		50.3	45.7		3.1	3.3	3.0	3.0	3.5	2.9
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		7.2		20.5	0.1		0.5	0.1	0.1	0.2	0.1	0.0
Delay (s)		56.8		70.8	45.8		3.6	3.5	3.1	3.1	3.6	2.9
Level of Service		E		E	D		A	A	A	A	A	A
Approach Delay (s)		56.8			64.5			3.4			3.6	
Approach LOS		E			E			A			A	

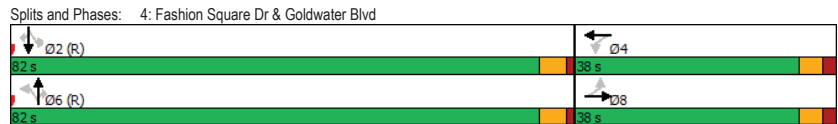
Intersection Summary	
HCM 2000 Control Delay	11.8
HCM 2000 Volume to Capacity ratio	0.30
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	53.2%
Analysis Period (min)	15
c Critical Lane Group	

2022 Background PM
4: Fashion Square Dr & Goldwater Blvd

Southbridge Expansion
Timing Report, Sorted By Phase

	2	4	6	8
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	82	38	82	38
Maximum Split (%)	68.3%	31.7%	68.3%	31.7%
Minimum Split (s)	16	21.5	16	21.5
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	2.2	1.2	2.2
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	5
Flash Dont Walk (s)	16	11	10	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	82	0	82
End Time (s)	82	0	82	0
Yield/Force Off (s)	76.8	114.5	76.8	114.5
Yield/Force Off 170(s)	60.8	103.5	66.8	103.5
Local Start Time (s)	0	82	0	82
Local Yield (s)	76.8	114.5	76.8	114.5
Local Yield 170(s)	60.8	103.5	66.8	103.5

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	40
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Background PM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	108	1098	193	212	1532	78	193	324	197	103	199	77
Future Volume (vph)	108	1098	193	212	1532	78	193	324	197	103	199	77
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5223		1676	5311		1676	1961	1461	1676	1961	1500
Flt Permitted	0.12	1.00		0.12	1.00		0.49	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	221	5223		221	5311		861	1961	1461	861	1961	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	1193	210	230	1665	85	210	352	214	112	216	84
RTOR Reduction (vph)	0	24	0	0	5	0	0	0	124	0	0	75
Lane Group Flow (vph)	117	1379	0	230	1745	0	210	352	90	112	216	9
Conf. Peds. (#/hr)			1			2			5			
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	3		4	3		2	1		2	1	
Permitted Phases	3			3			1		1	1		1
Actuated Green, G (s)	43.2	32.0		43.2	32.0		14.3	8.2	8.2	14.3	8.2	8.2
Effective Green, g (s)	43.2	32.0		43.2	32.0		14.3	8.2	8.2	14.3	8.2	8.2
Actuated g/C Ratio	0.55	0.41		0.55	0.41		0.18	0.10	0.10	0.18	0.10	0.10
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	329	2129		329	2164		220	204	152	220	204	156
v/s Ratio Prot	0.05	0.26		c0.10	c0.33		c0.07	c0.18		0.04	0.11	
v/s Ratio Perm	0.15			0.29			0.10		0.06	0.05		0.01
v/c Ratio	0.36	0.65		0.70	0.81		0.95	1.73	0.59	0.51	1.06	0.06
Uniform Delay, d1	23.7	18.7		22.0	20.5		32.2	35.1	33.5	31.6	35.1	31.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.5		5.2	2.2		47.2	346.3	3.7	0.7	79.4	0.1
Delay (s)	23.9	19.2		27.2	22.7		79.4	381.4	37.3	32.3	114.6	31.7
Level of Service	C	B		C	C		E	F	D	C	F	C
Approach Delay (s)		19.6			23.2			204.8			75.3	
Approach LOS		B			C			F			E	

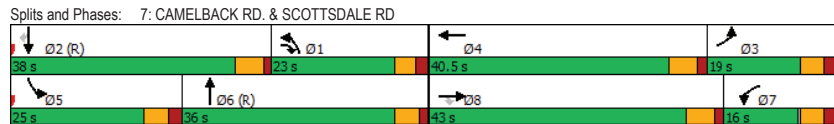
Intersection Summary	
HCM 2000 Control Delay	56.7
HCM 2000 Volume to Capacity ratio	0.93
Actuated Cycle Length (s)	78.5
Intersection Capacity Utilization	76.9%
Analysis Period (min)	15
c Critical Lane Group	

2022 Background PM
7: CAMELBACK RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

	1	2	3	4	5	6	7	8
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBT	SBL	NBT	WBL	EBT
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	23	38	19	40.5	25	36	16	43
Maximum Split (%)	19.1%	31.5%	15.8%	33.6%	20.7%	29.9%	13.3%	35.7%
Minimum Split (s)	10	32.4	11	40.5	11	33	11	34.5
Yellow Time (s)	3	4.4	3.3	4	3.6	3.6	3.3	4
All-Red Time (s)	2	1	2	1.5	2	1.4	2	1.5
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		23		31		24		25
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	78	40	21	101	40	65	23.5	101
End Time (s)	101	78	40	21	65	101	40	23.5
Yield/Force Off (s)	96	72.6	34.7	15.5	59.4	96	34.7	18
Yield/Force Off 170(s)	96	49.6	34.7	105	59.4	72	34.7	113.5
Local Start Time (s)	38	0	101.5	61	0	25	104	61
Local Yield (s)	56	32.6	115.2	96	19.4	56	115.2	98.5
Local Yield 170(s)	56	9.6	115.2	65	19.4	32	115.2	73.5

Intersection Summary	
Cycle Length	120.5
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 40 (33%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green	



2022 Background PM
8: SCOTTSDALE RD & Stetson Dr/DRINKWATER BLVD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	47	21	6	97	30	479	0	776	27	249	669	73
Future Volume (vph)	47	21	6	97	30	479	0	776	27	249	669	73
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		5.2		5.2	5.2	5.0		5.1		5.0	5.1	
Lane Util. Factor		1.00		1.00	1.00	1.00		0.95		0.97	0.95	
Frbp, ped/bikes		1.00		1.00	1.00	0.96		1.00		1.00	0.99	
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frt		0.99		1.00	1.00	0.85		0.99		1.00	0.99	
Flt Protected		0.97		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1877		1676	1961	1444		3703		3252	3623	
Flt Permitted		0.80		0.71	1.00	1.00		1.00		0.22	1.00	
Satd. Flow (perm)		1556		1253	1961	1444		3703		750	3623	
Peak-hour factor, PHF	0.84	0.84	0.84	0.80	0.80	0.80	0.85	0.85	0.85	0.94	0.94	0.94
Adj. Flow (vph)	56	25	7	121	38	599	0	913	32	265	712	78
RTOR Reduction (vph)	0	0	0	0	0	42	0	2	0	0	6	0
Lane Group Flow (vph)	0	88	0	121	38	557	0	943	0	265	784	0
Conf. Peds. (#/hr)			7			35			18			30
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		8			4	5		6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)		27.3		27.3	27.3	37.3		67.4		82.4	82.4	
Effective Green, g (s)		27.3		27.3	27.3	37.3		67.4		82.4	82.4	
Actuated g/C Ratio		0.23		0.23	0.23	0.31		0.56		0.69	0.69	
Clearance Time (s)		5.2		5.2	5.2	5.0		5.1		5.0	5.1	
Vehicle Extension (s)		2.0		2.0	2.0	2.0		2.0		2.0	2.0	
Lane Grp Cap (vph)		353		285	446	448		2079		723	2487	
v/s Ratio Prot					0.02	c0.10		c0.25		0.03	0.22	
v/s Ratio Perm		0.06		0.10		0.28				0.22		
v/c Ratio		0.25		0.42	0.09	1.24		0.45		0.37	0.32	
Uniform Delay, d1		38.0		39.6	36.5	41.4		15.5		8.6	7.5	
Progression Factor		1.00		1.09	1.16	0.92		1.00		1.00	1.00	
Incremental Delay, d2		0.1		0.4	0.0	126.9		0.7		0.1	0.3	
Delay (s)		38.1		43.4	42.3	165.0		16.2		8.8	7.9	
Level of Service		D		D	D	F		B		A	A	
Approach Delay (s)		38.1			139.4			16.2			8.1	
Approach LOS		D			F			B			A	

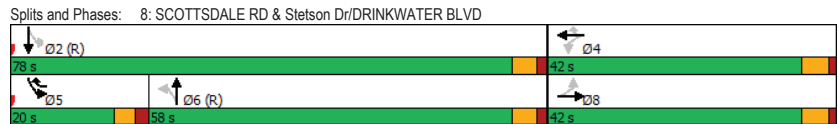
Intersection Summary			
HCM 2000 Control Delay	46.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Background PM
8: SCOTTSDALE RD & Stetson Dr/DRINKWATER BLVD

Southbridge Expansion
Timing Report, Sorted By Phase

	2	4	5	6	8
Phase Number	2	4	5	6	8
Movement	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag			Lead	Lag	
Lead-Lag Optimize					
Recall Mode	C-Min	None	None	C-Min	None
Maximum Split (s)	78	42	20	58	42
Maximum Split (%)	65.0%	35.0%	16.7%	48.3%	35.0%
Minimum Split (s)	21.1	37.2	15	38.1	33.2
Yellow Time (s)	3.6	4	3	3.6	4
All-Red Time (s)	1.5	1.2	2	1.5	1.2
Minimum Initial (s)	10	7	10	10	7
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	9	9		9	7
Flash Dont Walk (s)	7	23		24	21
Dual Entry	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	44	2	44	64	2
End Time (s)	2	44	64	2	44
Yield/Force Off (s)	116.9	38.8	59	116.9	38.8
Yield/Force Off 170(s)	109.9	15.8	59	92.9	17.8
Local Start Time (s)	0	78	0	20	78
Local Yield (s)	72.9	114.8	15	72.9	114.8
Local Yield 170(s)	65.9	91.8	15	48.9	93.8

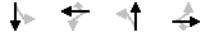
Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 44 (37%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Background PM
9: GOLDWATER BLVD /GOLDWATER BLVD #2 & 5TH AVE HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	28	0	19	42	30	72	10	628	37	41	676	67
Future Volume (vph)	28	0	19	42	30	72	10	628	37	41	676	67
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2	4.0	4.0	4.0	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.91	1.00	0.91	1.00
Frbp, ped/bikes	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	0.85	1.00	0.99	1.00	0.99	1.00	0.99	1.00
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1478	1676	1961	1472	1676	3693	1676	3693	1676	5268	5268
Flt Permitted	0.74	1.00	0.76	1.00	1.00	0.31	1.00	0.34	1.00	0.34	1.00	1.00
Satd. Flow (perm)	1298	1478	1336	1961	1472	552	3693	598	5268	598	5268	5268
Peak-hour factor, PHF	0.80	0.92	0.80	0.92	0.92	0.81	0.81	0.92	0.92	0.85	0.85	0.85
Adj. Flow (vph)	35	0	24	46	33	78	12	775	40	45	795	79
RTOR Reduction (vph)	0	0	22	0	0	70	0	2	0	0	5	0
Lane Group Flow (vph)	35	0	2	46	33	8	12	813	0	45	869	0
Conf. Peds. (#/hr)			2			3			3			2
Turn Type	Perm		Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4		4	6			2		
Actuated Green, G (s)	10.9		10.9	12.1	12.1	12.1	98.7	98.7		98.7	98.7	
Effective Green, g (s)	10.9		10.9	12.1	12.1	12.1	98.7	98.7		98.7	98.7	
Actuated g/C Ratio	0.09		0.09	0.10	0.10	0.10	0.82	0.82		0.82	0.82	
Clearance Time (s)	5.2		5.2	4.0	4.0	4.0	5.2	5.2		5.2	5.2	
Vehicle Extension (s)	2.0		2.0	3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	117		134	134	197	148	454	3037		491	4332	
v/s Ratio Prot					0.02		c0.22				0.16	
v/s Ratio Perm	0.03		0.00	c0.03		0.01	0.02			0.08		
v/c Ratio	0.30		0.02	0.34	0.17	0.05	0.03	0.27		0.09	0.20	
Uniform Delay, d1	51.0		49.7	50.2	49.3	48.8	1.9	2.4		2.0	2.3	
Progression Factor	1.00		1.00	1.00	1.00	1.00	2.25	2.16		1.00	1.00	
Incremental Delay, d2	0.5		0.0	1.5	0.4	0.2	0.1	0.2		0.4	0.1	
Delay (s)	51.5		49.7	51.8	49.7	48.9	4.5	5.5		2.4	2.4	
Level of Service	D		D	D	D	D	A	A		A	A	
Approach Delay (s)		50.8			49.9			5.4			2.4	
Approach LOS		D			D			A			A	

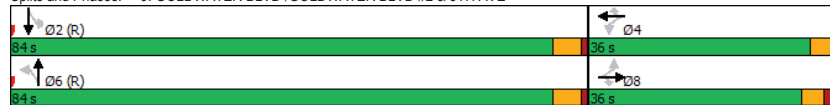
Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.4
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			



Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	84	36	84	36
Maximum Split (%)	70.0%	30.0%	70.0%	30.0%
Minimum Split (s)	16	20	16	34.2
Yellow Time (s)	4	3.5	4	3.3
All-Red Time (s)	1.2	0.5	1.2	1.9
Minimum Initial (s)	10	4	10	7
Vehicle Extension (s)	2	3	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	8
Flash Dont Walk (s)	14	11	11	21
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	110	74	110	74
End Time (s)	74	110	74	110
Yield/Force Off (s)	68.8	106	68.8	104.8
Yield/Force Off 170(s)	54.8	95	57.8	83.8
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.8	116	78.8	114.8
Local Yield 170(s)	64.8	105	67.8	93.8

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 110 (92%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	

Splits and Phases: 9: GOLDWATER BLVD /GOLDWATER BLVD #2 & 5TH AVE



Intersection			
Intersection Delay, s/veh	3.2		
Intersection LOS	A		
Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	51	111	58
Demand Flow Rate, veh/h	52	113	59
Vehicles Circulating, veh/h	7	15	31
Vehicles Exiting, veh/h	121	75	28
Ped Vol Crossing Leg, #/h	0	2	3
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.0	3.4	3.1
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	52	113	59
Cap Entry Lane, veh/h	1370	1359	1337
Entry HV Adj Factor	0.988	0.982	0.983
Flow Entry, veh/h	51	111	58
Cap Entry, veh/h	1354	1334	1314
V/C Ratio	0.038	0.083	0.044
Control Delay, s/veh	3.0	3.4	3.1
LOS	A	A	A
95th %tile Queue, veh	0	0	0

2022 Background PM
10: Marshall Way & 5th Ave

Southbridge Expansion
HCM 6th AWSC

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↖	↗
Traffic Vol, veh/h	28	19	6	96	14	40
Future Vol, veh/h	28	19	6	96	14	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	21	7	104	15	43
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.1	7.7	7.1
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	26%	0%	6%
Vol Thru, %	0%	60%	94%
Vol Right, %	74%	40%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	54	47	102
LT Vol	14	0	6
Through Vol	0	28	96
RT Vol	40	19	0
Lane Flow Rate	59	51	111
Geometry Grp	1	1	1
Degree of Util (X)	0.062	0.055	0.126
Departure Headway (Hd)	3.819	3.878	4.087
Convergence, Y/N	Yes	Yes	Yes
Cap	927	919	877
Service Time	1.889	1.921	2.115
HCM Lane V/C Ratio	0.064	0.055	0.127
HCM Control Delay	7.1	7.1	7.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	0.2	0.4

2022 Background PM
11: 5th Ave & Stetson Dr

Southbridge Expansion
HCM 6th AWSC

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↖		↗	↗
Traffic Vol, veh/h	21	57	42	26	39	51
Future Vol, veh/h	21	57	42	26	39	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	62	46	28	42	55
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left			WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.7	7.4	7.5
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	27%	0%	43%
Vol Thru, %	73%	62%	0%
Vol Right, %	0%	38%	57%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	78	68	90
LT Vol	21	0	39
Through Vol	57	42	0
RT Vol	0	26	51
Lane Flow Rate	85	74	98
Geometry Grp	1	1	1
Degree of Util (X)	0.099	0.081	0.107
Departure Headway (Hd)	4.217	3.941	3.952
Convergence, Y/N	Yes	Yes	Yes
Cap	844	901	896
Service Time	2.27	2.002	2.026
HCM Lane V/C Ratio	0.101	0.082	0.109
HCM Control Delay	7.7	7.4	7.5
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.3	0.3	0.4


2022 Background PM
12: Craftsman Ct & 5th Ave

Southbridge Expansion
HCM 6th WSC

Intersection						
Int Delay, s/veh	2.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Vol, veh/h	79	15	17	46	17	26
Future Vol, veh/h	79	15	17	46	17	26
Conflicting Peds, #/hr	0	14	0	0	0	6
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	86	16	18	50	18	28
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	116	0	194	114
Stage 1	-	-	-	-	108	-
Stage 2	-	-	-	-	86	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1473	-	795	939
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	937	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1456	-	775	923
Mov Cap-2 Maneuver	-	-	-	-	775	-
Stage 1	-	-	-	-	893	-
Stage 2	-	-	-	-	937	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	2	9.4			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	858	-	-	1456	-	
HCM Lane V/C Ratio	0.054	-	-	0.013	-	
HCM Control Delay (s)	9.4	-	-	7.5	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

2022 Background PM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔		↔	↔		↔	↔		↔	↔		
Traffic Volume (vph)	52	21	93	63	22	21	49	708	16	37	691	86	
Future Volume (vph)	52	21	93	63	22	21	49	708	16	37	691	86	
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800	
Total Lost time (s)	4.0			4.0			5.0			4.8			
Lane Util. Factor	1.00			1.00			1.00			0.95			
Frbp, ped/bikes	0.99			1.00			0.99			1.00			
Ftpb, ped/bikes	1.00			1.00			1.00			1.00			
Frt	0.92			1.00			0.93			1.00			
Fit Protected	0.98			0.95			1.00			0.95			
Satd. Flow (prot)	1762			1676			1799			1676			
Fit Permitted	0.89			0.62			1.00			0.24			
Satd. Flow (perm)	1601			1095			1799			416			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	57	23	101	68	24	23	53	770	17	40	751	93	
RTOR Reduction (vph)	0	25	0	0	18	0	0	1	0	0	4	0	
Lane Group Flow (vph)	0	156	0	68	29	0	53	786	0	40	840	0	
Confl. Peds. (#/hr)	11			8			12			21			
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA		
Protected Phases	4			4			2	1		2	1		
Permitted Phases	4			4			1			1			
Actuated Green, G (s)	13.1			13.1			29.2			21.8			
Effective Green, g (s)	13.1			13.1			29.2			21.8			
Actuated g/C Ratio	0.23			0.23			0.52			0.39			
Clearance Time (s)	4.0			4.0			5.0			4.8			
Vehicle Extension (s)	3.0			3.0			1.0			0.2			
Lane Grp Cap (vph)	373			255			382			1441			
v/s Ratio Prot	c0.10			0.06			c0.02			0.21			
v/s Ratio Perm	c0.10			0.06			0.05			0.04			
v/c Ratio	0.42			0.27			0.14			0.55			
Uniform Delay, d1	18.3			17.6			7.1			13.3			
Progression Factor	1.00			1.00			1.00			1.00			
Incremental Delay, d2	0.8			0.6			0.1			0.2			
Delay (s)	19.0			18.1			7.1			13.5			
Level of Service	B			B			A			B			
Approach Delay (s)	19.0			17.6			13.1			13.7			
Approach LOS	B			B			B			B			
Intersection Summary													
HCM 2000 Control Delay	14.2		HCM 2000 Level of Service					B					
HCM 2000 Volume to Capacity ratio	0.46												
Actuated Cycle Length (s)	56.1				Sum of lost time (s)				13.8				
Intersection Capacity Utilization	57.3%		ICU Level of Service					B					
Analysis Period (min)	15												
c Critical Lane Group													

2022 Background PM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

	1	2	4
Phase Number	1	2	4
Movement	NBSB	NBSBL	EBWB
Lead/Lag	Lag	Lead	
Lead-Lag Optimize			
Recall Mode	Ped	None	None
Maximum Split (s)	68	68	58
Maximum Split (%)	35.1%	35.1%	29.9%
Minimum Split (s)	30	30	20
Yellow Time (s)	3.2	3.2	3.5
All-Red Time (s)	1.6	1.8	0.5
Minimum Initial (s)	10	10	4
Vehicle Extension (s)	0.2	1	3
Minimum Gap (s)	0.2	0.2	1
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)	10		5
Flash Dont Walk (s)	10		11
Dual Entry	No	No	Yes
Inhibit Max	No	No	Yes
Start Time (s)	68	0	136
End Time (s)	136	68	0
Yield/Force Off (s)	131.2	63	190
Yield/Force Off 170(s)	121.2	63	179
Local Start Time (s)	68	0	136
Local Yield (s)	131.2	63	190
Local Yield 170(s)	121.2	63	179

Intersection Summary		
Cycle Length		194
Control Type	Semi Act-Uncoord	
Natural Cycle		80

Splits and Phases: 13: SCOTTSDALE RD & 5TH AVE.



2022 Background PM
14: DRINKWATER BLVD/DRINKWATER BLVD & 5TH AVE./STATION DR

Southbridge Expansion
Intersection Capacity Analysis

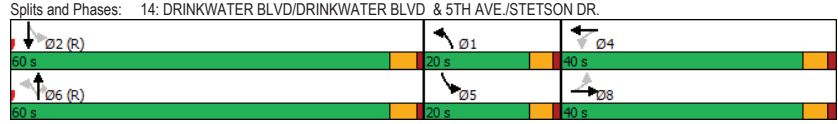
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	22	42	36	111	76	97	50	502	79	44	256	30
Future Volume (vph)	22	42	36	111	76	97	50	502	79	44	256	30
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.95	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.93		1.00	0.92		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	1812		1676	1776		1676	3725	1424	1676	3658	
Flt Permitted	0.41	1.00		0.68	1.00		0.55	1.00	1.00	0.44	1.00	
Satd. Flow (perm)	718	1812		1195	1776		965	3725	1424	777	3658	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.95	0.95	0.95	0.84	0.84	0.84
Adj. Flow (vph)	28	52	45	139	95	121	53	528	83	52	305	36
RTOR Reduction (vph)	0	29	0	0	43	0	0	0	29	0	5	0
Lane Group Flow (vph)	28	69	0	139	173	0	53	528	54	52	336	0
Confl. Peds. (#/hr)			4			7			10			6
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	23.5	23.5		23.5	23.5		81.9	77.9	77.9	81.9	77.9	
Effective Green, g (s)	23.5	23.5		23.5	23.5		81.9	77.9	77.9	81.9	77.9	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.68	0.65	0.65	0.68	0.65	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	0.2	0.2	2.0	0.2	
Lane Grp Cap (vph)	140	354		234	347		682	2418	924	560	2374	
v/s Ratio Prot		0.04			0.10		0.00	c0.14		c0.00	0.09	
v/s Ratio Perm	0.04			c0.12			0.05		0.04	0.06		
v/c Ratio	0.20	0.20		0.59	0.50		0.08	0.22	0.06	0.09	0.14	
Uniform Delay, d1	40.4	40.3		43.9	43.0		6.4	8.6	7.7	7.4	8.1	
Progression Factor	1.00	1.00		1.00	1.00		1.49	1.23	2.79	0.88	0.90	
Incremental Delay, d2	0.3	0.1		2.7	0.4		0.0	0.2	0.1	0.0	0.1	
Delay (s)	40.6	40.4		46.6	43.4		9.6	10.8	21.5	6.5	7.4	
Level of Service	D	D		D	D		A	B	C	A	A	
Approach Delay (s)		40.5			44.6			12.0			7.3	
Approach LOS		D			D			B			A	

Intersection Summary		
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.30	C
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	53.0%	ICU Level of Service
Analysis Period (min)	15	A
Description: Last Update: Sept 2017		
c Critical Lane Group		

Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag						
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	20	60	40	20	60	40
Maximum Split (%)	16.7%	50.0%	33.3%	16.7%	50.0%	33.3%
Minimum Split (s)	11	16	36	11	16	35
Yellow Time (s)	3.3	4	3.5	3.3	4	3.5
All-Red Time (s)	1.3	1	1.5	1.3	1	1.5
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	8		7	7
Flash Dont Walk (s)		13	23		12	23
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	110	50	10	110	50	10
End Time (s)	10	110	50	10	110	50
Yield/Force Off (s)	5.4	105	45	5.4	105	45
Yield/Force Off 170(s)	5.4	92	22	5.4	93	22
Local Start Time (s)	60	0	80	60	0	80
Local Yield (s)	75.4	55	115	75.4	55	115
Local Yield 170(s)	75.4	42	92	75.4	43	92

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 50 (42%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



Intersection

Int Delay, s/veh	1.2
Movement	WBL WBR NBT NBR SBL SBT
Lane Configurations	↔ ↕ ↕ ↕ ↕ ↕
Traffic Vol, veh/h	30 83 599 14 18 723
Future Vol, veh/h	30 83 599 14 18 723
Conflicting Peds, #/hr	0 0 0 0 0 0
Sign Control	Stop Stop Free Free Free Free
RT Channelized	- None - None - None
Storage Length	0 - - - 75 -
Veh in Median Storage, #	0 - 0 - - 0
Grade, %	0 - 0 - - 0
Peak Hour Factor	92 92 92 92 92 92
Heavy Vehicles, %	2 2 2 2 2 2
Mvmt Flow	33 90 651 15 20 786

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1013	333	0 0 666 0
Stage 1	659	-	- - - -
Stage 2	354	-	- - - -
Critical Hdwy	6.29	6.94	- - 4.14 -
Critical Hdwy Stg 1	5.84	-	- - - -
Critical Hdwy Stg 2	6.04	-	- - - -
Follow-up Hdwy	3.67	3.32	- - 2.22 -
Pot Cap-1 Maneuver	268	663	- - 919 -
Stage 1	462	-	- - - -
Stage 2	645	-	- - - -
Platoon blocked, %	-	-	- - - -
Mov Cap-1 Maneuver	262	663	- - 919 -
Mov Cap-2 Maneuver	353	-	- - - -
Stage 1	452	-	- - - -
Stage 2	645	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	13.7	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	538	919
HCM Lane V/C Ratio	-	-	0.228	0.021
HCM Control Delay (s)	-	-	13.7	9
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.9	0.1

2022 Background PM
16: 3rd Ave & Marshall Way

Southbridge Expansion
HCM 6th AWSC

Intersection												
Intersection Delay, s/veh	7.7											
Intersection LOS	A											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕			↕			↔	
Traffic Vol, veh/h	3	34	10	35	86	5	10	30	22	5	15	11
Future Vol, veh/h	3	34	10	35	86	5	10	30	22	5	15	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	37	11	38	93	5	11	33	24	5	16	12
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	8	7.6	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	16%	6%	28%	16%
Vol Thru, %	48%	72%	68%	48%
Vol Right, %	35%	21%	4%	35%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	62	47	126	31
LT Vol	10	3	35	5
Through Vol	30	34	86	15
RT Vol	22	10	5	11
Lane Flow Rate	67	51	137	34
Geometry Grp	1	1	1	1
Degree of Util (X)	0.079	0.058	0.159	0.04
Departure Headway (Hd)	4.208	4.101	4.18	4.244
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	857	860	849	848
Service Time	2.209	2.191	2.248	2.246
HCM Lane V/C Ratio	0.078	0.059	0.161	0.04
HCM Control Delay	7.6	7.4	8	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.2	0.6	0.1

2022 Background PM
17: 3rd Ave & Craftsman Ct

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.6					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	26	57	92	17	21	25
Future Vol, veh/h	26	57	92	17	21	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	62	100	18	23	27

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	118	0	227
Stage 1	-	-	109
Stage 2	-	-	118
Critical Hdwy	4.12	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.218	-	3.518
Pot Cap-1 Maneuver	1470	-	945
Stage 1	-	-	916
Stage 2	-	-	907
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1470	-	945
Mov Cap-2 Maneuver	-	-	746
Stage 1	-	-	898
Stage 2	-	-	907

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1470	-	-	-	842
HCM Lane V/C Ratio	0.019	-	-	-	0.059
HCM Control Delay (s)	7.5	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

2022 Background PM
18: SCOTTSDALE RD & 3RD AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	57	27	104	65	55	196	61	544	28	34	746	51
Future Volume (vph)	57	27	104	65	55	196	61	544	28	34	746	51
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.88		1.00	0.88		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1704		1676	1707		1676	3693		1676	3725	1462
Flt Permitted	0.49	1.00		0.67	1.00		0.34	1.00		0.42	1.00	1.00
Satd. Flow (perm)	861	1704		1176	1707		597	3693		735	3725	1462
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	62	29	113	71	60	213	66	591	30	37	811	55
RTOR Reduction (vph)	0	88	0	0	160	0	0	4	0	0	0	19
Lane Group Flow (vph)	62	54	0	71	113	0	66	617	0	37	811	36
Confl. Peds. (#/hr)			8			11			15			7
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		1
Actuated Green, G (s)	8.2	8.2		8.2	8.2		30.1	30.1		30.1	30.1	30.1
Effective Green, g (s)	8.2	8.2		8.2	8.2		30.1	30.1		30.1	30.1	30.1
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.62	0.62		0.62	0.62	0.62
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	146	289		199	289		372	2301		458	2321	911
v/s Ratio Prot		0.03			0.07			0.17			c0.22	
v/s Ratio Perm	c0.07			0.06			0.11			0.05		0.02
v/c Ratio	0.42	0.19		0.36	0.39		0.18	0.27		0.08	0.35	0.04
Uniform Delay, d1	17.9	17.2		17.7	17.8		3.9	4.1		3.6	4.4	3.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1		0.4	0.3		0.1	0.0		0.0	0.0	0.0
Delay (s)	18.7	17.3		18.1	18.1		3.9	4.1		3.6	4.4	3.5
Level of Service	B	B		B	B		A	A		A	A	A
Approach Delay (s)		17.7			18.1			4.1			4.3	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	48.3	Sum of lost time (s)	10.0
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		
c	Critical Lane Group		

2022 Background PM
18: SCOTTSDALE RD & 3RD AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	3
Movement	NBSB	EBWB
Lead/Lag		
Lead-Lag Optimize		
Recall Mode	Ped	None
Maximum Split (s)	36.9	31.1
Maximum Split (%)	54.3%	45.7%
Minimum Split (s)	35	31.1
Yellow Time (s)	3.2	3
All-Red Time (s)	1.8	2
Minimum Initial (s)	10	6
Vehicle Extension (s)	0.2	2
Minimum Gap (s)	1	2
Time Before Reduce (s)	0	0
Time To Reduce (s)	0	0
Walk Time (s)	18	5
Flash Dont Walk (s)	12	20
Dual Entry	No	No
Inhibit Max	No	No
Start Time (s)	0	36.9
End Time (s)	36.9	0
Yield/Force Off (s)	31.9	63
Yield/Force Off 170(s)	19.9	43
Local Start Time (s)	0	36.9
Local Yield (s)	31.9	63
Local Yield 170(s)	19.9	43

Intersection Summary	
Cycle Length	68
Control Type	Semi Act-Uncoord
Natural Cycle	70

Splits and Phases: 18: SCOTTSDALE RD & 3RD AVE.



2022 Background PM Southbridge Expansion
 19: DRINKWATER BLVD /DRINKWATER BLVD & 3RD AVE. HCM Signalized Intersection Capacity Analysis

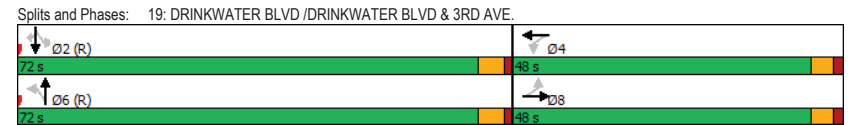
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	41	15	90	65	16	50	91	540	114	63	471	34
Future Volume (vph)	41	15	90	65	16	50	91	540	114	63	471	34
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99			0.99		1.00	1.00		1.00	1.00	0.97
Ftpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87			0.95		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1689			1804		1676	5193		1676	3725	1454
Flt Permitted	0.58	1.00			0.67		0.45	1.00		0.36	1.00	1.00
Satd. Flow (perm)	1022	1689			1240		799	5193		637	3725	1454
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.89	0.89	0.89	0.88	0.88	0.88
Adj. Flow (vph)	47	17	103	76	19	58	102	607	128	72	535	39
RTOR Reduction (vph)	0	0	0	0	25	0	0	14	0	0	0	9
Lane Group Flow (vph)	47	120	0	0	128	0	102	721	0	72	535	30
Confl. Peds. (#/hr)			1			5			1			3
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	17.2	17.2			17.2		92.7	92.7		92.7	92.7	92.7
Effective Green, g (s)	17.2	17.2			17.2		92.7	92.7		92.7	92.7	92.7
Actuated g/C Ratio	0.14	0.14			0.14		0.77	0.77		0.77	0.77	0.77
Clearance Time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Vehicle Extension (s)	2.0	2.0			2.0		0.2	0.2		2.0	2.0	2.0
Lane Grp Cap (vph)	146	242			177		617	4011		492	2877	1123
v/s Ratio Prot		0.07						0.14			c0.14	
v/s Ratio Perm	0.05				c0.10		0.13			0.11		0.02
v/c Ratio	0.32	0.50			0.72		0.17	0.18		0.15	0.19	0.03
Uniform Delay, d1	46.2	47.4			49.1		3.6	3.6		3.5	3.6	3.2
Progression Factor	1.00	1.00			1.00		2.21	2.71		0.86	0.86	0.76
Incremental Delay, d2	0.5	0.6			11.7		0.5	0.1		0.6	0.1	0.0
Delay (s)	46.6	48.0			60.8		8.4	9.9		3.6	3.3	2.5
Level of Service	D	D			E		A	A		A	A	A
Approach Delay (s)		47.6			60.8			9.7			3.2	
Approach LOS		D			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.1
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Background PM Southbridge Expansion
 19: DRINKWATER BLVD /DRINKWATER BLVD & 3RD AVE. Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	72	48	72	48
Maximum Split (%)	60.0%	40.0%	60.0%	40.0%
Minimum Split (s)	22.2	38.9	32.2	30.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	0.2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	9	7	7
Flash Dont Walk (s)	10	25	20	19
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	40	112	40	112
End Time (s)	112	40	112	40
Yield/Force Off (s)	106.8	35.1	106.8	35.1
Yield/Force Off 170(s)	96.8	10.1	86.8	16.1
Local Start Time (s)	0	72	0	72
Local Yield (s)	66.8	115.1	66.8	115.1
Local Yield 170(s)	56.8	90.1	46.8	96.1

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 40 (33%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Background PM
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕	↔↔	↔↔	↕↕	↔↔	↔↔	↕↕	↔↔	↔↔	↕↕	↔↔
Traffic Volume (vph)	200	696	61	66	609	52	92	349	44	68	534	153
Future Volume (vph)	200	696	61	66	609	52	92	349	44	68	534	153
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.0	3.0	5.3	5.0		5.3	5.3		5.3	5.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		1.00	0.95		1.00	0.91	
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3317	3725	1510	3317	3687		1710	3671		1710	5180	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3317	3725	1510	3317	3687		1710	3671		1710	5180	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.90	0.90	0.90	0.89	0.89	0.89
Adj. Flow (vph)	217	757	66	73	677	58	102	388	49	76	600	172
RTOR Reduction (vph)	0	0	35	0	5	0	0	10	0	0	51	0
Lane Group Flow (vph)	217	757	31	73	730	0	102	427	0	76	721	0
Confl. Peds. (#/hr)			1									3
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	12.6	53.5	53.5	8.6	49.5		11.8	23.9		13.1	25.2	
Effective Green, g (s)	12.6	53.5	55.5	8.6	49.5		11.8	23.9		13.1	25.2	
Actuated g/C Ratio	0.10	0.45	0.46	0.07	0.41		0.10	0.20		0.11	0.21	
Clearance Time (s)	5.3	5.0	5.0	5.3	5.0		5.3	5.3		5.3	5.3	
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0		2.0	1.0		2.0	1.0	
Lane Grp Cap (vph)	348	1660	698	237	1520		168	731		186	1087	
v/s Ratio Prot	c0.07	0.20		0.02	c0.20		c0.06	0.12		0.04	c0.14	
v/s Ratio Perm			0.02									
v/c Ratio	0.62	0.46	0.04	0.31	0.48		0.61	0.58		0.41	0.66	
Uniform Delay, d1	51.4	23.1	17.7	52.9	25.8		51.9	43.6		49.8	43.5	
Progression Factor	1.00	1.00	1.00	1.00	0.80		1.00	1.00		1.07	0.97	
Incremental Delay, d2	2.5	0.9	0.1	0.3	1.1		4.2	0.8		0.5	1.2	
Delay (s)	53.9	24.0	17.8	53.0	21.6		56.1	44.3		53.8	43.6	
Level of Service	D	C	B	D	C		E	D		D	D	
Approach Delay (s)		29.9			24.5			46.5			44.5	
Approach LOS		C			C			D			D	

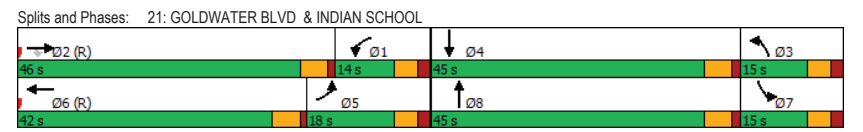
Intersection Summary			
HCM 2000 Control Delay	35.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

2022 Background PM
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	14	46	15	45	18	42	15	45
Maximum Split (%)	11.7%	38.3%	12.5%	37.5%	15.0%	35.0%	12.5%	37.5%
Minimum Split (s)	11	44	11	44.3	11	40	11	40.3
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1	2	1.3	2	1	2	1.3
Minimum Initial (s)	5	10	5	10	5	10	5	10
Vehicle Extension (s)	2	1	2	1	2	1	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		32		32		28		28
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	96	50	35	110	92	50	35	110
End Time (s)	110	96	50	35	110	92	50	35
Yield/Force Off (s)	104.7	91	44.7	29.7	104.7	87	44.7	29.7
Yield/Force Off 170(s)	104.7	59	44.7	29.7	104.7	59	44.7	29.7
Local Start Time (s)	46	0	105	60	42	0	105	60
Local Yield (s)	54.7	41	114.7	99.7	54.7	37	114.7	99.7
Local Yield 170(s)	54.7	9	114.7	99.7	54.7	9	114.7	99.7

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	115
Offset: 50 (42%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	



2022 Background PM
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	31	766	31	58	733	51	18	18	31	10	35	48
Future Volume (vph)	31	766	31	58	733	51	18	18	31	10	35	48
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2			4.7			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.94			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1676	3699		1676	3682			1799			1793	
Flt Permitted	0.31	1.00		0.31	1.00			0.80			0.97	
Satd. Flow (perm)	545	3699		553	3682			1466			1745	
Peak-hour factor, PHF	0.92	0.90	0.90	0.87	0.87	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	851	34	67	843	55	20	20	34	11	38	52
RTOR Reduction (vph)	0	1	0	0	2	0	0	29	0	0	37	0
Lane Group Flow (vph)	34	884	0	67	896	0	0	45	0	0	64	0
Confl. Peds. (#/hr)			4			5			5			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	98.3	98.3		98.3	98.3			11.8			12.5	
Effective Green, g (s)	98.3	98.3		98.3	98.3			11.8			12.5	
Actuated g/C Ratio	0.82	0.82		0.82	0.82			0.10			0.10	
Clearance Time (s)	5.2	5.2		5.2	5.2			4.7			4.0	
Vehicle Extension (s)	0.2	0.2		0.2	0.2			2.0			3.0	
Lane Grp Cap (vph)	446	3030		452	3016			144			181	
v/s Ratio Prot		0.24			0.24							
v/s Ratio Perm	0.06			0.12				0.03			0.04	
v/c Ratio	0.08	0.29		0.15	0.30			0.31			0.36	
Uniform Delay, d1	2.1	2.6		2.2	2.6			50.3			50.0	
Progression Factor	1.53	2.45		1.34	1.13			1.00			1.00	
Incremental Delay, d2	0.3	0.2		0.6	0.2			0.5			1.2	
Delay (s)	3.5	6.5		3.6	3.2			50.8			51.2	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		6.4			3.2			50.8			51.2	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.9
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Last Update: Nov 2017			

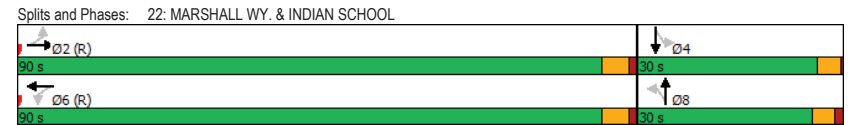
c Critical Lane Group

2022 Background PM
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	90	30	90	30
Maximum Split (%)	75.0%	25.0%	75.0%	25.0%
Minimum Split (s)	16	20	16	12
Yellow Time (s)	4	3.5	4	3.3
All-Red Time (s)	1.2	0.5	1.2	1.4
Minimum Initial (s)	10	4	10	7
Vehicle Extension (s)	0.2	3	0.2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	8
Flash Dont Walk (s)	8	11	7	17
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	70	40	70	40
End Time (s)	40	70	40	70
Yield/Force Off (s)	34.8	66	34.8	65.3
Yield/Force Off 170(s)	26.8	55	27.8	48.3
Local Start Time (s)	0	90	0	90
Local Yield (s)	84.8	116	84.8	115.3
Local Yield 170(s)	76.8	105	77.8	98.3

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	40
Offset: 70 (58%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green	



2022 Background PM
23: SCOTTSDALE RD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	100	645	106	162	654	142	56	417	111	178	617	128
Future Volume (vph)	100	645	106	162	654	142	56	417	111	178	617	128
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	3634		1676	3614		1676	3596		1676	3725	1475
Flt Permitted	0.21	1.00		0.25	1.00		0.15	1.00		0.21	1.00	1.00
Satd. Flow (perm)	366	3634		433	3614		257	3596		364	3725	1475
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	105	679	112	178	719	156	62	463	123	198	686	142
RTOR Reduction (vph)	0	9	0	0	13	0	0	22	0	0	0	96
Lane Group Flow (vph)	105	782	0	178	862	0	62	564	0	198	686	46
Confl. Peds. (#/hr)			9			5			4			9
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	62.4	51.4		62.4	51.4		37.7	27.5		37.7	27.5	38.5
Effective Green, g (s)	62.4	51.4		62.4	51.4		37.7	27.5		37.7	27.5	38.5
Actuated g/C Ratio	0.52	0.43		0.52	0.43		0.31	0.23		0.31	0.23	0.32
Clearance Time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	310	1556		339	1547		201	824		225	853	535
v/s Ratio Prot	0.03	0.22		c0.05	c0.24		0.03	0.16		c0.07	0.18	0.01
v/s Ratio Perm	0.15			0.22			0.07			c0.20		0.02
v/c Ratio	0.34	0.50		0.53	0.56		0.31	0.68		0.88	0.80	0.09
Uniform Delay, d1	29.6	25.0		31.3	25.8		45.9	42.3		46.2	43.7	28.5
Progression Factor	1.57	1.21		1.36	1.50		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	1.1		0.6	1.4		0.3	1.9		29.7	5.2	0.0
Delay (s)	46.7	31.3		43.3	39.9		46.2	44.2		75.9	48.9	28.5
Level of Service	D	C		D	D		D	D		E	D	C
Approach Delay (s)		33.1			40.5			44.4			51.3	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	42.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		

Description: Last Update: Sept 2017
c Critical Lane Group

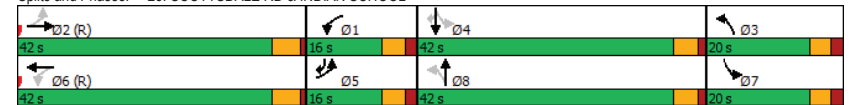
2022 Background PM
23: SCOTTSDALE RD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	16	42	20	42	16	42	20	42
Maximum Split (%)	13.3%	35.0%	16.7%	35.0%	13.3%	35.0%	16.7%	35.0%
Minimum Split (s)	11	30	10	32.8	11	33	10	34.8
Yellow Time (s)	3.3	4	3	3.6	3.3	4	3	3.6
All-Red Time (s)	1.8	1	2	1.2	1.8	1	2	1.2
Minimum Initial (s)	5	10	5	10	5	10	5	10
Vehicle Extension (s)	2	1	2	2	2	1	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		8		8
Flash Dont Walk (s)		18		21		20		22
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	42	0	100	58	42	0	100	58
End Time (s)	58	42	0	100	58	42	0	100
Yield/Force Off (s)	52.9	37	115	95.2	52.9	37	115	95.2
Yield/Force Off 170(s)	52.9	19	115	74.2	52.9	17	115	73.2
Local Start Time (s)	42	0	100	58	42	0	100	58
Local Yield (s)	52.9	37	115	95.2	52.9	37	115	95.2
Local Yield 170(s)	52.9	19	115	74.2	52.9	17	115	73.2

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green, Master Intersection	

Splits and Phases: 23: SCOTTSDALE RD & INDIAN SCHOOL



2022 Background PM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	912	57	88	968	58	97
Future Volume (vph)	912	57	88	968	58	97
Ideal Flow (vphpl)	2000	1800	1800	2000	1800	1800
Total Lost time (s)	5.2		5.2	5.2	4.8	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frbp, ped/bikes	1.00		1.00	1.00	0.99	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.92	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	3686		1676	3725	1567	
Flt Permitted	1.00		0.26	1.00	0.98	
Satd. Flow (perm)	3686		454	3725	1567	
Peak-hour factor, PHF	0.95	0.95	0.89	0.89	0.88	0.88
Adj. Flow (vph)	960	60	99	1088	66	110
RTOR Reduction (vph)	3	0	0	0	57	0
Lane Group Flow (vph)	1017		99	1088	119	0
Confl. Peds. (#/hr)		3				6
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	90.1		90.1	90.1	19.9	
Effective Green, g (s)	90.1		90.1	90.1	19.9	
Actuated g/C Ratio	0.75		0.75	0.75	0.17	
Clearance Time (s)	5.2		5.2	5.2	4.8	
Vehicle Extension (s)	0.2		0.2	0.2	2.0	
Lane Grp Cap (vph)	2767		340	2796	259	
v/s Ratio Prot	0.28			0.29	0.08	
v/s Ratio Perm			0.22			
v/c Ratio	0.37		0.29	0.39	0.46	
Uniform Delay, d1	5.1		4.8	5.3	45.2	
Progression Factor	2.42		0.59	0.61	1.00	
Incremental Delay, d2	0.3		2.0	0.4	0.5	
Delay (s)	12.8		4.9	3.6	45.7	
Level of Service	B		A	A	D	
Approach Delay (s)	12.8			3.7	45.7	
Approach LOS	B			A	D	

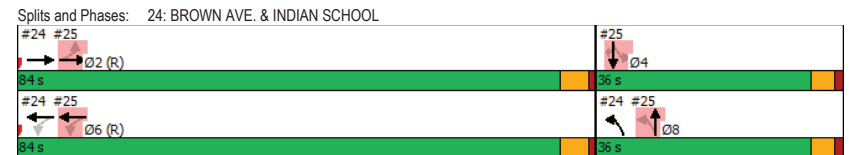
Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

2022 Background PM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Node Number	24	25	24	24
Movement	EBT	SBTL	WBTL	NBL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	84	36	84	36
Maximum Split (%)	70.0%	30.0%	70.0%	30.0%
Minimum Split (s)	23.2	12	27.2	35.8
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.5	1.2	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	0.2	2	0.2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	11		15	24
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	98	62	98	62
End Time (s)	62	98	62	98
Yield/Force Off (s)	56.8	93.2	56.8	93.2
Yield/Force Off 170(s)	45.8	93.2	41.8	69.2
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.8	115.2	78.8	115.2
Local Yield 170(s)	67.8	115.2	63.8	91.2

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 98 (82%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	



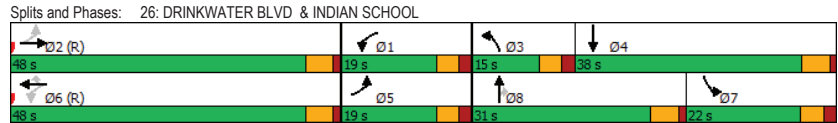
2022 Background PM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBT	EBL	WBTL	SBL	NBT
Lead/Lag			Lead	Lag			Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	Max	None	C-Max	None	Max
Maximum Split (s)	19	48	15	38	19	48	22	31
Maximum Split (%)	15.8%	40.0%	12.5%	31.7%	15.8%	40.0%	18.3%	25.8%
Minimum Split (s)	11	16	11	13	11	16	11	13
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1.2	2	1.1	2	1.2	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	0.2	2	2	2	0.2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		9		7		11
Flash Dont Walk (s)		21		20		19		20
Dual Entry	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	18	90	37	52	18	90	68	37
End Time (s)	37	18	52	90	37	18	90	68
Yield/Force Off (s)	31.7	12.8	46.7	84.9	31.7	12.8	84.7	62.9
Yield/Force Off 170(s)	31.7	111.8	46.7	64.9	31.7	113.8	84.7	42.9
Local Start Time (s)	48	0	67	82	48	0	98	67
Local Yield (s)	61.7	42.8	76.7	114.9	61.7	42.8	114.7	92.9
Local Yield 170(s)	61.7	21.8	76.7	94.9	61.7	23.8	114.7	72.9

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 90 (75%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green	



2022 Background PM
27: 70th St & GOLDWATER BLVD

Southbridge Expansion
HCM 6th TWSC

Intersection

Int Delay, s/veh	2.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑	↑↑	↑	↑
Traffic Vol, veh/h	712	163	31	304	72	14
Future Vol, veh/h	712	163	31	304	72	14
Conflicting Peds, #/hr	0	8	0	0	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	70	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	774	177	34	330	78	15

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	959
Stage 1	-	-	871
Stage 2	-	-	233
Critical Hdwy	-	5.34	6.29
Critical Hdwy Stg 1	-	-	6.64
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	-	3.12	3.67
Pot Cap-1 Maneuver	-	410	237
Stage 1	-	-	297
Stage 2	-	-	755
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	407	216
Mov Cap-2 Maneuver	-	-	216
Stage 1	-	-	270
Stage 2	-	-	755

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	28
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	216	447	-	-	407	-
HCM Lane V/C Ratio	0.362	0.034	-	-	0.083	-
HCM Control Delay (s)	30.8	13.3	-	-	14.6	-
HCM Lane LOS	D	B	-	-	B	-
HCM 95th %tile Q(veh)	1.6	0.1	-	-	0.3	-

2022 Background PM
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	18	15	22	621	25	10	25	301	4	17	632	18
Future Volume (vph)	18	15	22	621	25	10	25	301	4	17	632	18
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		4.9		4.9	4.9		5.2	5.2		5.2	5.2	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95		1.00	0.91	
Frbp, ped/bikes		0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.95		1.00	1.00		1.00	1.00		1.00	1.00	
Flt Protected		0.98		0.95	0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1803		1593	1774		1676	3717		1676	5327	
Flt Permitted		0.98		0.95	0.96		0.36	1.00		0.52	1.00	
Satd. Flow (perm)		1803		1593	1774		630	3717		923	5327	
Peak-hour factor, PHF	0.80	0.80	0.80	0.88	0.88	0.88	0.84	0.84	0.84	0.95	0.95	0.95
Adj. Flow (vph)	22	19	28	706	28	11	30	358	5	18	665	19
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	70	0	374	370	0	30	363	0	18	682	0
Confl. Peds. (#/hr)			4			4			4			3
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6			2	
Permitted Phases							6			2		
Actuated Green, G (s)		8.0		33.2	33.2		63.8	63.8		63.8	63.8	
Effective Green, g (s)		8.0		33.2	33.2		63.8	63.8		63.8	63.8	
Actuated g/C Ratio		0.07		0.28	0.28		0.53	0.53		0.53	0.53	
Clearance Time (s)		4.9		4.9	4.9		5.2	5.2		5.2	5.2	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		120		440	490		334	1976		490	2832	
v/s Ratio Prot		c0.04		c0.23	0.21			0.10			c0.13	
v/s Ratio Perm							0.05			0.02		
v/c Ratio		0.58		0.85	0.76		0.09	0.18		0.04	0.24	
Uniform Delay, d1		54.4		41.0	39.7		13.8	14.6		13.4	15.1	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.6		13.7	5.8		0.5	0.2		0.1	0.2	
Delay (s)		59.0		54.8	45.5		14.4	14.8		13.6	15.3	
Level of Service		E		D	D		B	B		B	B	
Approach Delay (s)		59.0			50.2			14.8			15.3	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		

Description: Last Update: Sept 2017

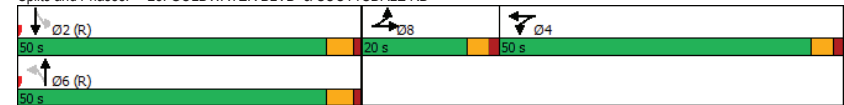
c Critical Lane Group

2022 Background PM
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	50	50	50	20
Maximum Split (%)	41.7%	41.7%	41.7%	16.7%
Minimum Split (s)	16	13	16	13
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	88	38	88	18
End Time (s)	18	88	18	38
Yield/Force Off (s)	12.8	83.1	12.8	33.1
Yield/Force Off 170(s)	12.8	83.1	12.8	33.1
Local Start Time (s)	0	70	0	50
Local Yield (s)	44.8	115.1	44.8	65.1
Local Yield 170(s)	44.8	115.1	44.8	65.1
Intersection Summary				
Cycle Length	120			
Control Type	Actuated-Coordinated			
Natural Cycle	50			
Offset: 88 (73%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				

Split and Phases: 28: GOLDWATER BLVD & SCOTTSDALE RD



2022 Background PM
29: OSBORN RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

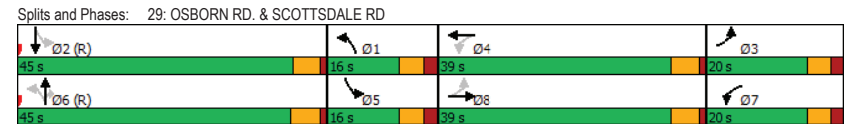
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	26	214	73	181	327	125	129	666	60	131	1111	29
Future Volume (vph)	26	214	73	181	327	125	129	666	60	131	1111	29
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3559		1676	3552		1676	3725	1467	1676	5329	
Flt Permitted	0.18	1.00		0.41	1.00		0.14	1.00	1.00	0.26	1.00	
Satd. Flow (perm)	311	3559		723	3552		241	3725	1467	466	5329	
Peak-hour factor, PHF	0.83	0.83	0.83	0.80	0.80	0.80	0.84	0.84	0.84	0.88	0.88	0.88
Adj. Flow (vph)	31	258	88	226	409	156	154	793	71	149	1262	33
RTOR Reduction (vph)	0	31	0	0	37	0	0	0	38	0	2	0
Lane Group Flow (vph)	31	315	0	226	528	0	154	793	33	149	1294	0
Conf. Peds. (#/hr)			13			7			8			10
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	32.5	23.4		32.5	23.4		66.1	55.8	55.8	66.5	56.2	
Effective Green, g (s)	32.5	23.4		32.5	23.4		66.1	55.8	55.8	66.5	56.2	
Actuated g/C Ratio	0.27	0.19		0.27	0.19		0.55	0.46	0.46	0.55	0.47	
Clearance Time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.0	
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	1.0	1.0	2.0	1.0	
Lane Grp Cap (vph)	187	694		268	692		255	1732	682	362	2495	
v/s Ratio Prot	0.01	0.09		c0.06	0.15		c0.05	0.21		0.04	0.24	
v/s Ratio Perm	0.03			c0.16			c0.28		0.02	0.19		
v/c Ratio	0.17	0.45		0.84	0.76		0.60	0.46	0.05	0.41	0.52	
Uniform Delay, d1	44.7	42.7		44.0	45.7		33.2	21.8	17.6	25.0	22.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.2		20.0	4.5		2.8	0.9	0.1	0.3	0.8	
Delay (s)	44.9	42.8		64.1	50.2		35.9	22.7	17.7	25.2	23.2	
Level of Service	D	D		E	D		D	C	B	C	C	
Approach Delay (s)		43.0			54.1			24.3			23.4	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.4
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Background PM
29: OSBORN RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	EBL	WBTL	SBL	NBTL	WBL	EBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	16	45	20	39	16	45	20	39
Maximum Split (%)	13.3%	37.5%	16.7%	32.5%	13.3%	37.5%	16.7%	32.5%
Minimum Split (s)	11	31	11	38.1	11	34.4	11	37.1
Yellow Time (s)	3.6	4	3.3	4	3.6	4.4	3.3	4
All-Red Time (s)	2	1	2	1.1	2	1	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	1	2	1	2	1	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		9		10		11
Flash Dont Walk (s)		18		24		19		21
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	5	80	60	21	5	80	60	21
End Time (s)	21	5	80	60	21	5	80	60
Yield/Force Off (s)	15.4	0	74.7	54.9	15.4	119.6	74.7	54.9
Yield/Force Off 170(s)	15.4	102	74.7	30.9	15.4	100.6	74.7	33.9
Local Start Time (s)	45	0	100	61	45	0	100	61
Local Yield (s)	55.4	40	114.7	94.9	55.4	39.6	114.7	94.9
Local Yield 170(s)	55.4	22	114.7	70.9	55.4	20.6	114.7	73.9
Intersection Summary								
Cycle Length	120							
Control Type	Actuated-Coordinated							
Natural Cycle	95							
Offset: 80 (67%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green								



2022 Total AM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

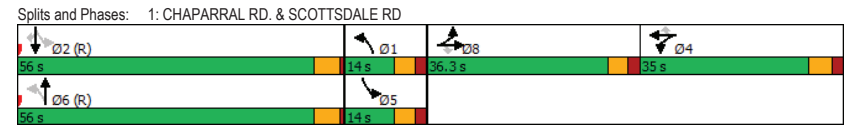
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	[Diagrammatic lane configurations]											
Traffic Volume (vph)	58	107	40	492	187	273	15	1052	197	159	1365	82
Future Volume (vph)	58	107	40	492	187	273	15	1052	197	159	1365	82
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4		5.6	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1945	1478	3252	1945	1478	1676	5191		1676	3711	1458
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.06	1.00		0.12	1.00	1.00
Satd. Flow (perm)	1676	1945	1478	3252	1945	1478	104	5191		205	3711	1458
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.89	0.89	0.89	0.88	0.88	0.88
Adj. Flow (vph)	61	113	42	541	205	300	17	1182	221	181	1551	93
RTOR Reduction (vph)	0	0	0	0	0	242	0	16	0	0	0	48
Lane Group Flow (vph)	61	113	42	541	205	58	17	1387	0	181	1551	45
Confl. Peds. (#/hr)			2			2				2		2
Bus Blockages (#/hr)	0	2	0	0	2	0	0	2	0	0	2	0
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases			8			4	6			2		2
Actuated Green, G (s)	15.3	15.3	15.3	27.5	27.5	27.5	76.2	67.8		76.2	67.8	67.8
Effective Green, g (s)	15.3	15.3	15.3	27.5	27.5	27.5	76.2	67.8		76.2	67.8	67.8
Actuated g/C Ratio	0.11	0.11	0.11	0.19	0.19	0.19	0.54	0.48		0.54	0.48	0.48
Clearance Time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4		5.6	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.2		2.0	0.2	0.2
Lane Grp Cap (vph)	181	210	160	632	378	287	149	2490		198	1780	699
v/s Ratio Prot	0.04	c0.06		c0.17	0.11		0.01	0.27		c0.05	0.42	
v/s Ratio Perm			0.03			0.04	0.05			c0.44		0.03
v/c Ratio	0.34	0.54	0.26	0.86	0.54	0.20	0.11	0.56		0.91	0.87	0.06
Uniform Delay, d1	58.3	59.7	57.8	55.0	51.2	47.7	53.1	26.1		43.4	32.9	19.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	1.3	0.3	10.6	0.9	0.1	0.1	0.9		39.9	6.2	0.2
Delay (s)	58.7	61.0	58.1	65.6	52.1	47.8	53.2	27.0		83.3	39.0	19.9
Level of Service	E	E	E	E	D	D	D	C		F	D	B
Approach Delay (s)		59.8			57.9			27.3			42.5	
Approach LOS		E			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	42.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	141.3	Sum of lost time (s)	22.3
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Feb 2018			
c Critical Lane Group			

2022 Total AM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag			Lag			Lead
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	14	56	35	14	56	36.3
Maximum Split (%)	9.9%	39.6%	24.8%	9.9%	39.6%	25.7%
Minimum Split (s)	11	16	35	11	16	36.3
Yellow Time (s)	3.6	4.4	4	3.6	4.4	3.3
All-Red Time (s)	2	1	2	2	1	2
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	9
Flash Dont Walk (s)		10	22		14	22
Dual Entry	No	Yes	No	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	106	50	15	106	50	120
End Time (s)	120	106	50	120	106	15
Yield/Force Off (s)	114.4	100.6	44	114.4	100.6	9.7
Yield/Force Off 170(s)	114.4	90.6	22	114.4	86.6	129
Local Start Time (s)	56	0	106.3	56	0	70
Local Yield (s)	64.4	50.6	135.3	64.4	50.6	101
Local Yield 170(s)	64.4	40.6	113.3	64.4	36.6	79
Intersection Summary						
Cycle Length	141.3					
Control Type	Actuated-Coordinated					
Natural Cycle	150					
Offset: 50 (35%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green						



2022 Total AM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗		↘	↑	↗	↖	↗	↖	↗	↘
Traffic Volume (vph)	89	2	40	32	5	18	107	1072	30	14	748	22
Future Volume (vph)	89	2	40	32	5	18	107	1072	30	14	748	22
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1	5.1		5.1	5.1	5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	1.00	0.99		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1961	1480		1880	1500	1676	5327		1676	5325	
Flt Permitted	0.73	1.00	1.00		0.78	1.00	0.33	1.00		0.21	1.00	
Satd. Flow (perm)	1288	1961	1480		1520	1500	578	5327		368	5325	
Peak-hour factor, PHF	0.84	0.84	0.84	0.88	0.88	0.88	0.90	0.90	0.90	0.93	0.93	0.93
Adj. Flow (vph)	106	2	48	36	6	20	119	1191	33	15	804	24
RTOR Reduction (vph)	0	0	41	0	0	17	0	1	0	0	2	0
Lane Group Flow (vph)	106	2	7	0	42	3	119	1223	0	15	826	0
Confl. Peds. (#/hr)			1						3			4
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4		4	6			2		
Actuated Green, G (s)	17.6	17.6	17.6		17.6	17.6	96.8	96.8		96.8	96.8	
Effective Green, g (s)	17.6	17.6	17.6		17.6	17.6	96.8	96.8		96.8	96.8	
Actuated g/C Ratio	0.14	0.14	0.14		0.14	0.14	0.77	0.77		0.77	0.77	
Clearance Time (s)	5.1	5.1	5.1		5.1	5.1	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	181	275	208		213	211	447	4121		284	4120	
v/s Ratio Prot		0.00						0.23			0.16	
v/s Ratio Perm	c0.08		0.00		0.03	0.00	0.21			0.04		
v/c Ratio	0.59	0.01	0.03		0.20	0.01	0.27	0.30		0.05	0.20	
Uniform Delay, d1	50.3	46.2	46.4		47.5	46.3	4.0	4.2		3.3	3.8	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	0.0	0.0		0.2	0.0	1.5	0.2		0.4	0.1	
Delay (s)	53.4	46.2	46.4		47.7	46.3	5.5	4.3		3.7	3.9	
Level of Service	D	D	D		D	D	A	A		A	A	
Approach Delay (s)		51.2			47.2			4.4			3.9	
Approach LOS		D			D			A			A	

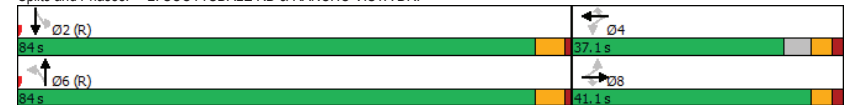
Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	125.1	Sum of lost time (s)	10.7
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Total AM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	84	37.1	84	41.1
Maximum Split (%)	67.1%	29.7%	67.1%	32.9%
Minimum Split (s)	16	37.1	16	41.1
Yellow Time (s)	4.4	3.3	4.4	3.3
All-Red Time (s)	1.2	1.8	1.2	1.8
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	11
Flash Dont Walk (s)	18	25	13	25
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	93	51.9	93	51.9
End Time (s)	51.9	93	51.9	93
Yield/Force Off (s)	46.3	87.9	46.3	87.9
Yield/Force Off 170(s)	28.3	62.9	33.3	62.9
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.4	120	78.4	120
Local Yield 170(s)	60.4	95	65.4	95
Intersection Summary				
Cycle Length	125.1			
Control Type	Actuated-Coordinated			
Natural Cycle	70			
Offset: 93 (74%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				

Signal Phases: 2: SCOTTSDALE RD & RANCHO VISTA DR.



2022 Total AM Southbridge Expansion
 3: HIGHLAND AVE/Granada Ave & SCOTTSDALE RD HCM Signalized Intersection Capacity Analysis

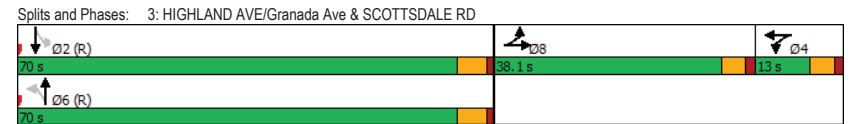
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	356	18	24	10	4	16	24	843	22	35	742	53
Future Volume (vph)	356	18	24	10	4	16	24	843	22	35	742	53
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.88		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3252	1780		1676	1725		1676	5328		1676	5294	
Flt Permitted	0.95	1.00		0.95	1.00		0.31	1.00		0.26	1.00	
Satd. Flow (perm)	3252	1780		1676	1725		542	5328		465	5294	
Peak-hour factor, PHF	0.91	0.91	0.91	0.81	0.81	0.81	0.88	0.88	0.88	0.93	0.93	0.93
Adj. Flow (vph)	391	20	26	12	5	20	27	958	25	38	798	57
RTOR Reduction (vph)	0	22	0	0	19	0	0	2	0	0	5	0
Lane Group Flow (vph)	391	24	0	12	6	0	27	981	0	38	850	0
Confl. Peds. (#/hr)			2						4			2
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6			2	
Permitted Phases							6			2		
Actuated Green, G (s)	20.8	20.8		4.2	4.2		80.2	80.2		80.2	80.2	
Effective Green, g (s)	20.8	20.8		4.2	4.2		80.2	80.2		80.2	80.2	
Actuated g/C Ratio	0.17	0.17		0.03	0.03		0.66	0.66		0.66	0.66	
Clearance Time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	558	305		58	59		358	3528		307	3506	
v/s Ratio Prot	c0.12	0.01		c0.01	0.00			c0.18			0.16	
v/s Ratio Perm							0.05			0.08		
v/c Ratio	0.70	0.08		0.21	0.10		0.08	0.28		0.12	0.24	
Uniform Delay, d1	47.2	42.1		56.8	56.6		7.3	8.5		7.5	8.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.2	0.0		0.6	0.3		0.4	0.2		0.8	0.2	
Delay (s)	50.5	42.2		57.5	56.9		7.7	8.7		8.3	8.4	
Level of Service	D	D		E	E		A	A		A	A	
Approach Delay (s)		49.6			57.1			8.6			8.4	
Approach LOS		D			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	15.9
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Total AM Southbridge Expansion
 3: HIGHLAND AVE/Granada Ave & SCOTTSDALE RD Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	70	13	70	38.1
Maximum Split (%)	57.8%	10.7%	57.8%	31.5%
Minimum Split (s)	30.7	13	28.7	38.1
Yellow Time (s)	4.4	3.6	4.4	3.6
All-Red Time (s)	1.3	1.5	1.3	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	1	2	1	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8		7	9
Flash Dont Walk (s)	17		16	24
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	42	29	42	112
End Time (s)	112	42	112	29
Yield/Force Off (s)	106.3	36.9	106.3	23.9
Yield/Force Off 170(s)	89.3	36.9	90.3	121
Local Start Time (s)	0	108.1	0	70
Local Yield (s)	64.3	116	64.3	103
Local Yield 170(s)	47.3	116	48.3	79

Intersection Summary	
Cycle Length	121.1
Control Type	Actuated-Coordinated
Natural Cycle	85
Offset: 42 (35%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Total AM
4: Fashion Square Drive

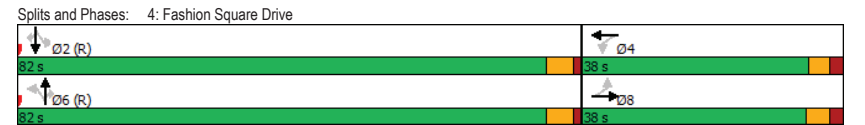
Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	5	0	13	4	0	0	4	446	13	22	953	37
Future Volume (vph)	5	0	13	4	0	0	4	446	13	22	953	37
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		5.5		5.2			5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor		1.00		1.00			1.00	0.95	1.00	1.00	0.91	1.00
Frbp, ped/bikes		1.00		1.00			1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00			1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.90		1.00			1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99		0.95			0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1743		1676			1676	3725	1465	1676	5353	1466
Flt Permitted		0.91		1.00			0.26	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)		1607		1765			466	3725	1465	839	5353	1466
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	0	14	4	0	0	4	485	14	24	1036	40
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	2	0	0	5
Lane Group Flow (vph)	0	0	0	4	0	0	4	485	12	24	1036	35
Confl. Peds. (#/hr)							1		1			1
Turn Type	Perm	NA		Perm			Perm	NA	Perm	Perm	NA	Perm
Protected Phases		8		4			6		6		2	2
Permitted Phases	8		4			6		6	2			2
Actuated Green, G (s)		2.9		3.2			106.4	106.4	106.4	106.4	106.4	106.4
Effective Green, g (s)		2.9		3.2			106.4	106.4	106.4	106.4	106.4	106.4
Actuated g/C Ratio		0.02		0.03			0.89	0.89	0.89	0.89	0.89	0.89
Clearance Time (s)		5.5		5.2			5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)		3.0		3.0			3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		38		47			413	3302	1298	743	4746	1299
v/s Ratio Prot				0.13				0.13			c0.19	
v/s Ratio Perm		0.00		c0.00			0.01		0.01	0.03		0.02
v/c Ratio		0.01		0.09			0.01	0.15	0.01	0.03	0.22	0.03
Uniform Delay, d1		57.2		57.0			0.8	0.9	0.8	0.8	1.0	0.8
Progression Factor		1.00		1.00			1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.1		0.8			0.0	0.1	0.0	0.1	0.1	0.0
Delay (s)		57.3		57.8			0.8	1.0	0.8	0.9	1.1	0.8
Level of Service		E		E			A	A	A	A	A	A
Approach Delay (s)		57.3			57.8			1.0			1.0	
Approach LOS		E			E			A			A	
Intersection Summary												
HCM 2000 Control Delay		1.8					HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio		0.21										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)		10.7			
Intersection Capacity Utilization		41.6%					ICU Level of Service		A			
Analysis Period (min)		15										
c Critical Lane Group												

2022 Total AM
4: Fashion Square Drive

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	82	38	82	38
Maximum Split (%)	68.3%	31.7%	68.3%	31.7%
Minimum Split (s)	16	21.2	16	21.5
Yellow Time (s)	4	3	4	3.3
All-Red Time (s)	1.2	2.2	1.2	2.2
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	5
Flash Dont Walk (s)	16	11	10	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	82	0	82
End Time (s)	82	0	82	0
Yield/Force Off (s)	76.8	114.8	76.8	114.5
Yield/Force Off 170(s)	60.8	103.8	66.8	103.5
Local Start Time (s)	0	82	0	82
Local Yield (s)	76.8	114.8	76.8	114.5
Local Yield 170(s)	60.8	103.8	66.8	103.5
Intersection Summary				
Cycle Length	120			
Control Type	Actuated-Coordinated			
Natural Cycle	40			
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				



2022 Total AM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	79	1165	99	159	1065	51	208	343	159	57	213	54
Future Volume (vph)	79	1165	99	159	1065	51	208	343	159	57	213	54
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5285		1676	5313		1676	1961	1479	1676	1961	1477
Flt Permitted	0.17	1.00		0.13	1.00		0.49	1.00	1.00	0.22	1.00	1.00
Satd. Flow (perm)	301	5285		233	5313		866	1961	1479	396	1961	1477
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	86	1266	108	173	1158	55	226	373	173	62	232	59
RTOR Reduction (vph)	0	9	0	0	5	0	0	0	103	0	0	46
Lane Group Flow (vph)	86	1365	0	173	1208	0	226	373	70	62	232	13
Confl. Peds. (#/hr)			1			5			2			3
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	3		4	3		2	1	2	1		1
Permitted Phases	3			3			1		1			1
Actuated Green, G (s)	54.1	50.1		54.1	50.1		27.4	23.4	23.4	27.4	23.4	23.4
Effective Green, g (s)	54.1	50.1		54.1	50.1		27.4	23.4	23.4	27.4	23.4	23.4
Actuated g/C Ratio	0.53	0.49		0.53	0.49		0.27	0.23	0.23	0.27	0.23	0.23
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	212	2583		179	2596		263	447	337	155	447	337
v/s Ratio Prot	0.02	0.26		c0.04	0.23		c0.03	0.19		0.02	0.12	
v/s Ratio Perm	0.20			c0.47			c0.20		0.05	0.09		0.01
v/c Ratio	0.41	0.53		0.97	0.47		0.86	0.83	0.21	0.40	0.52	0.04
Uniform Delay, d1	22.3	18.1		30.9	17.3		38.5	37.7	32.0	41.1	34.6	30.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.1		56.6	0.0		22.5	12.1	0.1	0.6	0.4	0.0
Delay (s)	22.7	18.2		87.5	17.4		61.0	49.8	32.2	41.7	35.0	30.8
Level of Service	C	B		F	B		E	D	C	D	D	C
Approach Delay (s)	18.4			26.1			49.1			35.5		
Approach LOS	B			C			D			D		

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	102.5	Sum of lost time (s)	21.0
Intersection Capacity Utilization	92.6%	ICU Level of Service	F
Analysis Period (min)	15		
c	Critical Lane Group		

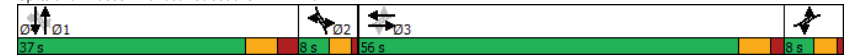
2022 Total AM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4
Movement	NBSB	NBSBL	EBWB	EBWBL
Lead/Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize				
Recall Mode	None	None	Ped	None
Maximum Split (s)	37	8	56	8
Maximum Split (%)	33.9%	7.3%	51.4%	7.3%
Minimum Split (s)	37	8	56	8
Yellow Time (s)	4.2	3	4.2	3
All-Red Time (s)	2.8	1	1.8	1
Minimum Initial (s)	8	4	10	4
Vehicle Extension (s)	2	1	1	1
Minimum Gap (s)	3	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		33	
Flash Dont Walk (s)	23		17	
Dual Entry	No	No	No	No
Inhibit Max	No	Yes	No	Yes
Start Time (s)	0	37	45	101
End Time (s)	37	45	101	0
Yield/Force Off (s)	30	41	95	105
Yield/Force Off 170(s)	7	41	78	105
Local Start Time (s)	72	0	8	64
Local Yield (s)	102	4	58	68
Local Yield 170(s)	79	4	41	68

Intersection Summary	
Cycle Length	109
Control Type	Actuated-Uncoordinated
Natural Cycle	110

Splits and Phases: 5: 68th Street & CAMELBACK RD.



2022 Total AM
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔↔	↔↔	↔	↔↔	↔↔↔	↔
Traffic Volume (vph)	199	934	178	54	730	42	143	248	37	15	360	520
Future Volume (vph)	199	934	178	54	730	42	143	248	37	15	360	520
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	0.97	0.91	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5353	1479	1676	5306		3252	3725	1486	3252	5353	1490
Flt Permitted	0.24	1.00	1.00	0.18	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	415	5353	1479	314	5306		3252	3725	1486	3252	5353	1490
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	229	1074	205	64	859	49	162	282	42	17	400	578
RTOR Reduction (vph)	0	0	81	0	4	0	0	0	26	0	0	50
Lane Group Flow (vph)	229	1074	124	64	904	0	163	282	16	17	400	528
Confl. Peds. (#/hr)			2			2			5			3
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	3	8		7	4		1	6	7	5	2	3
Permitted Phases	8		8	4					6			2
Actuated Green, G (s)	70.0	48.8	48.8	70.0	48.8		12.8	24.2	45.4	5.2	16.6	37.8
Effective Green, g (s)	70.0	48.8	48.8	70.0	48.8		12.8	24.2	45.4	5.2	16.6	37.8
Actuated g/C Ratio	0.58	0.40	0.40	0.58	0.40		0.11	0.20	0.37	0.04	0.14	0.31
Clearance Time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Vehicle Extension (s)	2.0	0.2	0.2	2.0	0.2		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	458	2148	593	418	2129		342	741	623	139	730	531
v/s Ratio Prot	0.09	c0.20		0.03	0.17		c0.05	0.08	0.00	0.01	0.07	c0.17
v/s Ratio Perm	0.20		0.08	0.06					0.01			0.18
v/c Ratio	0.50	0.50	0.21	0.15	0.42		0.48	0.38	0.03	0.12	0.55	1.00
Uniform Delay, d1	26.0	27.3	23.8	21.1	26.3		51.2	42.2	24.1	56.0	49.0	41.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	0.1	0.1	0.0		0.4	1.5	0.0	0.1	2.9	37.5
Delay (s)	26.3	27.3	23.8	21.1	26.3		51.6	43.7	24.1	56.1	51.9	79.3
Level of Service	C	C	C	C	C		D	D	C	E	D	E
Approach Delay (s)		26.7			26.0			44.7			67.9	
Approach LOS		C			C			D			E	

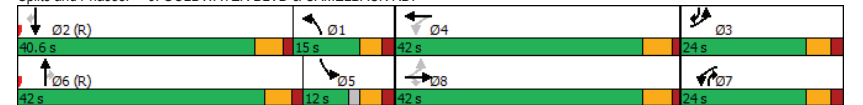
Intersection Summary			
HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	121.6	Sum of lost time (s)	22.2
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Total AM
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBTL	SBL	NBT	WBL	EBTL
Lead/Lag	Lag	Lead			Lag	Lead		
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Ped	None	C-Min	None	Ped
Maximum Split (s)	15	40.6	24	42	12	42	24	42
Maximum Split (%)	12.3%	33.4%	19.7%	34.5%	9.9%	34.5%	19.7%	34.5%
Minimum Split (s)	11	40.6	11	31	11	35.6	11	33
Yellow Time (s)	3.3	4	3.6	4.4	3.3	4	3.6	4.4
All-Red Time (s)	2	1.6	2	1.3	2	1.6	2	1.3
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	0.2	2	2	2	0.2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		7		7		7
Flash Dont Walk (s)		27		24		23		26
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	40.6	0	97.6	55.6	42	0	97.6	55.6
End Time (s)	55.6	40.6	0	97.6	55.6	42	0	97.6
Yield/Force Off (s)	50.3	35	116	91.9	50.3	36.4	116	91.9
Yield/Force Off 170(s)	50.3	8	116	67.9	50.3	13.4	116	65.9
Local Start Time (s)	40.6	0	97.6	55.6	42	0	97.6	55.6
Local Yield (s)	50.3	35	116	91.9	50.3	36.4	116	91.9
Local Yield 170(s)	50.3	8	116	67.9	50.3	13.4	116	65.9
Intersection Summary								
Cycle Length	121.6							
Control Type	Actuated-Coordinated							
Natural Cycle	100							
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green								

Splits and Phases: 6: GOLDWATER BLVD & CAMELBACK RD.



2022 Total AM
7: SCOTTSDALE RD & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

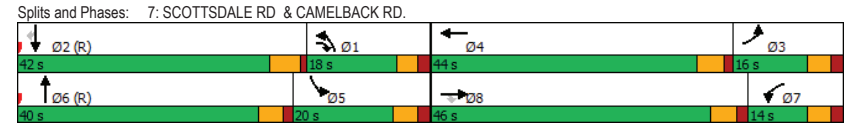
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	129	683	222	75	607	129	225	703	47	141	651	111
Future Volume (vph)	129	683	222	75	607	129	225	703	47	141	651	111
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.91		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3252	3725	1480	1676	3609		3252	5292		3252	3725	1451
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3252	3725	1480	1676	3609		3252	5292		3252	3725	1451
Peak-hour factor, PHF	0.81	0.81	0.81	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	159	843	274	82	660	140	245	764	51	148	685	117
RTOR Reduction (vph)	0	0	53	0	16	0	0	6	0	0	0	76
Lane Group Flow (vph)	159	843	221	82	784	0	245	809	0	148	685	41
Confl. Peds. (#/hr)			6			18			16			16
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8	1	7	4		1	6		5	2	
Permitted Phases			8									2
Actuated Green, G (s)	10.4	32.0	46.5	10.2	31.8		14.5	40.1		16.3	42.1	42.1
Effective Green, g (s)	10.4	32.0	46.5	10.2	31.8		14.5	40.1		16.3	42.1	42.1
Actuated g/C Ratio	0.09	0.27	0.39	0.08	0.27		0.12	0.33		0.14	0.35	0.35
Clearance Time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	281	993	635	142	956		392	1768		441	1306	509
v/s Ratio Prot	0.05	c0.23	0.04	c0.05	0.22		c0.08	0.15		0.05	c0.18	
v/s Ratio Perm			0.11									0.03
v/c Ratio	0.57	0.85	0.35	0.58	0.82		0.62	0.46		0.34	0.52	0.08
Uniform Delay, d1	52.6	41.7	26.0	52.8	41.4		50.2	31.4		46.9	31.0	26.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.97	1.07		1.00	1.00	1.00
Incremental Delay, d2	1.6	6.6	0.1	3.5	5.3		2.2	0.8		0.2	1.5	0.3
Delay (s)	54.2	48.3	26.1	56.3	46.7		50.9	34.4		47.1	32.5	26.3
Level of Service	D	D	C	E	D		D	C		D	C	C
Approach Delay (s)		44.3			47.6			38.3			34.0	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	41.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.4
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Total AM
7: SCOTTSDALE RD & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBT	SBL	NBT	WBL	EBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	18	42	16	44	20	40	14	46
Maximum Split (%)	15.0%	35.0%	13.3%	36.7%	16.7%	33.3%	11.7%	38.3%
Minimum Split (s)	10	32.4	11	40.5	11	33	11	34.5
Yellow Time (s)	3	4.4	3.3	4	3.6	3.6	3.3	4
All-Red Time (s)	2	1	2	1.5	2	1.4	2	1.5
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		23		31		24		25
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	10	88	72	28	8	88	74	28
End Time (s)	28	10	88	72	28	8	88	74
Yield/Force Off (s)	23	4.6	82.7	66.5	22.4	3	82.7	68.5
Yield/Force Off 170(s)	23	101.6	82.7	35.5	22.4	99	82.7	43.5
Local Start Time (s)	42	0	104	60	40	0	106	60
Local Yield (s)	55	36.6	114.7	98.5	54.4	35	114.7	100.5
Local Yield 170(s)	55	13.6	114.7	67.5	54.4	11	114.7	75.5
Intersection Summary								
Cycle Length	120							
Control Type	Actuated-Coordinated							
Natural Cycle	100							
Offset: 88 (73%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green								



2022 Total AM Southbridge Expansion
 8: Stetson Dr/DRINKWATER BLVD & SCOTTSDALE RD HCM Signalized Intersection Capacity Analysis

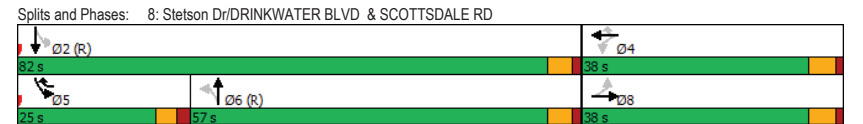
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	61	15	21	14	45	312	23	421	15	214	467	120
Future Volume (vph)	61	15	21	14	45	312	23	421	15	214	467	120
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2	5.0	5.1	5.1		5.0	5.1	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1768		1676	1961	1441	1676	3702		3252	3548	
Flt Permitted	0.72	1.00		0.73	1.00	1.00	0.42	1.00		0.43	1.00	
Satd. Flow (perm)	1278	1768		1284	1961	1441	737	3702		1461	3548	
Peak-hour factor, PHF	0.80	0.80	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	76	19	26	16	50	347	26	468	17	225	492	126
RTOR Reduction (vph)	0	0	0	0	0	178	0	2	0	0	16	0
Lane Group Flow (vph)	76	45	0	16	50	169	26	483	0	225	602	0
Confl. Peds. (#/hr)			8			35			14			18
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		8			4	5		6		5	2	
Permitted Phases	8			4		4		6			2	
Actuated Green, G (s)	25.6	25.6		25.6	25.6	33.0		71.7		84.1	84.1	
Effective Green, g (s)	25.6	25.6		25.6	25.6	33.0		71.7		84.1	84.1	
Actuated g/C Ratio	0.21	0.21		0.21	0.21	0.28		0.60		0.70	0.70	
Clearance Time (s)	5.2	5.2		5.2	5.2	5.0		5.1		5.0	5.1	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0		2.0	2.0	
Lane Grp Cap (vph)	272	377		273	418	396		2211		1134	2486	
v/s Ratio Prot		0.03			0.03	c0.03		0.13		0.01	c0.17	
v/s Ratio Perm	0.06			0.01		0.09		0.04		0.13		
v/c Ratio	0.28	0.12		0.06	0.12	0.43		0.06		0.20	0.24	
Uniform Delay, d1	39.5	38.1		37.6	38.1	35.7		10.1		6.1	6.5	
Progression Factor	1.00	1.00		0.95	0.98	2.42		1.00		0.43	0.43	
Incremental Delay, d2	0.2	0.1		0.0	0.0	0.3		0.3		0.0	0.2	
Delay (s)	39.7	38.2		35.9	37.3	86.9		11.4		2.6	3.0	
Level of Service	D	D		D	D	F		B		A	A	
Approach Delay (s)		39.1			78.9			11.4			2.9	
Approach LOS		D			E			B			A	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Total AM Southbridge Expansion
 8: Stetson Dr/DRINKWATER BLVD & SCOTTSDALE RD Timing Report, Sorted By Phase

Phase Number	2	4	5	6	8
Movement	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag		Lead	Lag		
Lead-Lag Optimize					
Recall Mode	C-Max	None	None	C-Max	None
Maximum Split (s)	82	38	25	57	38
Maximum Split (%)	68.3%	31.7%	20.8%	47.5%	31.7%
Minimum Split (s)	21.1	37.2	10	38.1	33.2
Yellow Time (s)	3.6	4	3	3.6	4
All-Red Time (s)	1.5	1.2	2	1.5	1.2
Minimum Initial (s)	10	7	5	10	7
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	9	9		9	7
Flash Dont Walk (s)	7	23		24	21
Dual Entry	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	93	55	93	118	55
End Time (s)	55	93	118	55	93
Yield/Force Off (s)	49.9	87.8	113	49.9	87.8
Yield/Force Off 170(s)	42.9	64.8	113	25.9	66.8
Local Start Time (s)	0	82	0	25	82
Local Yield (s)	76.9	114.8	20	76.9	114.8
Local Yield 170(s)	69.9	91.8	20	52.9	93.8

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 93 (78%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Total AM
9: GOLDWATER BLVD & 5TH AVE

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	24	12	15	36	26	31	17	448	98	87	551	92
Future Volume (vph)	24	12	15	36	26	31	17	448	98	87	551	92
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2	5.2	4.0	4.0	4.0	5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.91	1.00	0.91
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	1.00	0.98	1.00	0.98
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1676	1961	1478	1676	1961	1475	1676	3610	1676	5217	1676	5217
Flt Permitted	0.74	1.00	1.00	0.75	1.00	1.00	0.37	1.00	0.42	1.00	0.42	1.00
Satd. Flow (perm)	1304	1961	1478	1322	1961	1475	651	3610	747	5217	747	5217
Peak-hour factor, PHF	0.80	0.92	0.80	0.92	0.92	0.92	0.90	0.90	0.92	0.92	0.90	0.90
Adj. Flow (vph)	30	13	19	39	28	34	19	498	107	95	612	102
RTOR Reduction (vph)	0	0	17	0	0	30	0	8	0	0	10	0
Lane Group Flow (vph)	30	13	2	39	28	4	19	597	0	95	704	0
Confl. Peds. (#/hr)			2			2			2			3
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4		4	6		2		2	
Actuated Green, G (s)	12.0	12.0	12.0	13.2	13.2	13.2	97.6	97.6	97.6	97.6	97.6	97.6
Effective Green, g (s)	12.0	12.0	12.0	13.2	13.2	13.2	97.6	97.6	97.6	97.6	97.6	97.6
Actuated g/C Ratio	0.10	0.10	0.10	0.11	0.11	0.11	0.81	0.81	0.81	0.81	0.81	0.81
Clearance Time (s)	5.2	5.2	5.2	4.0	4.0	4.0	5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	130	196	147	145	215	162	529	2936	607	4243	607	4243
v/s Ratio Prot		0.01			0.01			c0.17				0.13
v/s Ratio Perm	0.02		0.00	c0.03		0.00	0.03		0.13			
v/c Ratio	0.23	0.07	0.01	0.27	0.13	0.02	0.04	0.20	0.16	0.17	0.16	0.17
Uniform Delay, d1	49.7	48.9	48.7	49.0	48.2	47.6	2.2	2.5	2.4	2.4	2.4	2.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	0.0	1.0	0.3	0.1	0.1	0.2	0.5	0.1	0.5	0.1
Delay (s)	50.1	49.0	48.7	50.0	48.5	47.7	2.3	2.7	2.9	2.5	2.9	2.5
Level of Service	D	D	D	D	D	D	A	A	A	A	A	A
Approach Delay (s)		49.4			48.8			2.6			2.6	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.4
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Last Update: Sept 2017			

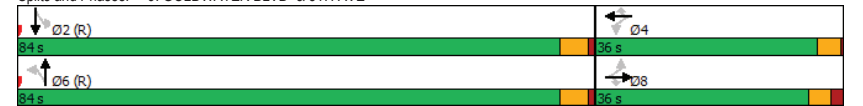
c Critical Lane Group

2022 Total AM
9: GOLDWATER BLVD & 5TH AVE

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	Min
Maximum Split (s)	84	36	84	36
Maximum Split (%)	70.0%	30.0%	70.0%	30.0%
Minimum Split (s)	16	20	16	34.2
Yellow Time (s)	4	3.5	4	3.3
All-Red Time (s)	1.2	0.5	1.2	1.9
Minimum Initial (s)	10	4	10	7
Vehicle Extension (s)	2	3	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	8
Flash Dont Walk (s)	14	11	11	21
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	20	104	20	104
End Time (s)	104	20	104	20
Yield/Force Off (s)	98.8	16	98.8	14.8
Yield/Force Off 170(s)	84.8	5	87.8	14.8
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.8	116	78.8	114.8
Local Yield 170(s)	64.8	105	67.8	114.8
Intersection Summary				
Cycle Length	120			
Control Type	Actuated-Coordinated			
Natural Cycle	60			
Offset: 20 (17%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				

Splits and Phases: 9: GOLDWATER BLVD & 5TH AVE



Intersection			
Intersection Delay, s/veh	3.5		
Intersection LOS	A		
Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	165	107	51
Demand Flow Rate, veh/h	169	109	52
Vehicles Circulating, veh/h	22	9	132
Vehicles Exiting, veh/h	96	175	59
Ped Vol Crossing Leg, #/h	0	1	5
Ped Cap Adj	1.000	1.000	0.999
Approach Delay, s/veh	3.7	3.3	3.4
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	169	109	52
Cap Entry Lane, veh/h	1349	1367	1206
Entry HV Adj Factor	0.979	0.984	0.981
Flow Entry, veh/h	165	107	51
Cap Entry, veh/h	1321	1346	1182
V/C Ratio	0.125	0.080	0.043
Control Delay, s/veh	3.7	3.3	3.4
LOS	A	A	A
95th %tile Queue, veh	0	0	0


Intersection						
Intersection Delay, s/veh	7.8					
Intersection LOS	A					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	119	33	20	78	8	39
Future Vol, veh/h	119	33	20	78	8	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	129	36	22	85	9	42
Number of Lanes	1	0	0	1	1	0
Approach	EB	WB	NB			
Opposing Approach	WB	EB				
Opposing Lanes	1	1	0			
Conflicting Approach Left		NB	EB			
Conflicting Lanes Left	0	1	1			
Conflicting Approach Right	NB		WB			
Conflicting Lanes Right	1	0	1			
HCM Control Delay	7.9	7.8	7.3			
HCM LOS	A	A	A			
Lane	NBLn1	EBLn1	WBLn1	NBLn1		
Vol Left, %	17%	0%	20%			
Vol Thru, %	0%	78%	80%			
Vol Right, %	83%	22%	0%			
Sign Control	Stop	Stop	Stop			
Traffic Vol by Lane	47	152	98			
LT Vol	8	0	20			
Through Vol	0	119	78			
RT Vol	39	33	0			
Lane Flow Rate	51	165	107			
Geometry Grp	1	1	1			
Degree of Util (X)	0.057	0.182	0.124			
Departure Headway (Hd)	4.05	3.973	4.189			
Convergence, Y/N	Yes	Yes	Yes			
Cap	889	897	850			
Service Time	2.05	2.022	2.243			
HCM Lane V/C Ratio	0.057	0.184	0.126			
HCM Control Delay	7.3	7.9	7.8			
HCM Lane LOS	A	A	A			
HCM 95th-tile Q	0.2	0.7	0.4			

Intersection						
Intersection Delay, s/veh	7.8					
Intersection LOS	A					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	89	58	30	37	12	55
Future Vol, veh/h	89	58	30	37	12	55
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	97	63	33	40	13	60
Number of Lanes	0	1	1	0	1	0
Approach	EB	WB		SB		
Opposing Approach	WB	EB				
Opposing Lanes	1	1		0		
Conflicting Approach Left	SB			WB		
Conflicting Lanes Left	1	0		1		
Conflicting Approach Right		SB		EB		
Conflicting Lanes Right	0	1		1		
HCM Control Delay	8.3	7.3		7.3		
HCM LOS	A	A		A		
Lane	EBLn1	WBLn1	SBLn1			
Vol Left, %	61%	0%	18%			
Vol Thru, %	39%	45%	0%			
Vol Right, %	0%	55%	82%			
Sign Control	Stop	Stop	Stop			
Traffic Vol by Lane	147	67	67			
LT Vol	89	0	12			
Through Vol	58	30	0			
RT Vol	0	37	55			
Lane Flow Rate	160	73	73			
Geometry Grp	1	1	1			
Degree of Util (X)	0.188	0.078	0.081			
Departure Headway (Hd)	4.239	3.852	3.985			
Convergence, Y/N	Yes	Yes	Yes			
Cap	844	918	905			
Service Time	2.283	1.924	1.985			
HCM Lane V/C Ratio	0.19	0.08	0.081			
HCM Control Delay	8.3	7.3	7.3			
HCM Lane LOS	A	A	A			
HCM 95th-tile Q	0.7	0.3	0.3			

Intersection						
Int Delay, s/veh	0.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	65	3	18	68	1	1
Future Vol, veh/h	65	3	18	68	1	1
Conflicting Peds, #/hr	0	2	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	71	3	20	74	1	1
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	76	0	189	76
Stage 1	-	-	-	-	75	-
Stage 2	-	-	-	-	114	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1523	-	800	985
Stage 1	-	-	-	-	948	-
Stage 2	-	-	-	-	911	-
Platoon blocked, %	-	-	-			
Mov Cap-1 Maneuver	-	-	1520	-	787	983
Mov Cap-2 Maneuver	-	-	-	-	787	-
Stage 1	-	-	-	-	933	-
Stage 2	-	-	-	-	911	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	1.5	9.1			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	874	-	-	1520	-	
HCM Lane V/C Ratio	0.002	-	-	0.013	-	
HCM Control Delay (s)	9.1	-	-	7.4	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

2022 Total AM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (vph)	30	17	40	15	14	10	83	469	19	22	455	31
Future Volume (vph)	30	17	40	15	14	10	83	469	19	22	455	31
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		6.0		6.0	6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frbp. ped/bikes		0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb. ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.94		1.00	0.94		1.00	0.99		1.00	0.99	
Flt Protected		0.98		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1795		1676	1820		1676	3700		1676	3681	
Flt Permitted		0.87		0.70	1.00		0.45	1.00		0.44	1.00	
Satd. Flow (perm)		1594		1228	1820		787	3700		785	3681	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	18	43	16	15	11	90	510	21	24	495	34
RTOR Reduction (vph)	0	18	0	0	10	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	76	0	16	16	0	90	530	0	24	527	0
Confl. Peds. (#/hr)			6			14			4			12
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		3			3		2	1		2	1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		6.5		6.5	6.5		31.8	24.2		31.8	24.2	
Effective Green, g (s)		6.5		6.5	6.5		31.8	24.2		31.8	24.2	
Actuated g/C Ratio		0.12		0.12	0.12		0.59	0.45		0.59	0.45	
Clearance Time (s)		6.0		6.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0		3.0	3.0		1.0	0.2		1.0	0.2	
Lane Grp Cap (vph)		190		146	217		585	1648		584	1640	
v/s Ratio Prot				0.01			c0.02	c0.14		0.01	0.14	
v/s Ratio Perm		c0.05		0.01			0.07			0.02		
v/c Ratio		0.40		0.11	0.08		0.15	0.32		0.04	0.32	
Uniform Delay, d1		22.1		21.3	21.2		4.9	9.7		4.7	9.7	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.4		0.3	0.1		0.0	0.0		0.0	0.0	
Delay (s)		23.5		21.7	21.4		5.0	9.8		4.7	9.8	
Level of Service		C		C	C		A	A		A	A	
Approach Delay (s)		23.5			21.5			9.1			9.6	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	54.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

2022 Total AM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
Timing Report, Sorted By Phase



Phase Number	1	2	3
Movement	NBSB	NBSBL	EBWB
Lead/Lag	Lag	Lead	
Lead-Lag Optimize			
Recall Mode	Ped	None	None
Maximum Split (s)	74	74	46
Maximum Split (%)	38.1%	38.1%	23.7%
Minimum Split (s)	30	30	30
Yellow Time (s)	3.2	3.2	3.1
All-Red Time (s)	1.8	1.8	2.9
Minimum Initial (s)	10	10	6
Vehicle Extension (s)	0.2	1	3
Minimum Gap (s)	0.2	0.2	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)	10		9
Flash Dont Walk (s)	10		15
Dual Entry	No	No	No
Inhibit Max	No	No	No
Start Time (s)	74	0	148
End Time (s)	148	74	0
Yield/Force Off (s)	143	69	188
Yield/Force Off 170(s)	133	69	173
Local Start Time (s)	74	0	148
Local Yield (s)	143	69	188
Local Yield 170(s)	133	69	173

Intersection Summary		
Cycle Length		194
Control Type	Actuated-Uncoordinated	
Natural Cycle	90	

Splits and Phases: 13: SCOTTSDALE RD & 5TH AVE.



2022 Total AM Southbridge Expansion
 14: 5TH AVE./STETSON DR. & DRINKWATER BLVD HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	43	8	16	10	44	36	324	167	62	195	5
Traffic Volume (vph)	5	43	8	16	10	44	36	324	167	62	195	5
Future Volume (vph)	5	43	8	16	10	44	36	324	167	62	195	5
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.88		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	1911		1676	1693		1676	3725	1456	1676	3707	
Flt Permitted	0.72	1.00		0.72	1.00		0.61	1.00	1.00	0.53	1.00	
Satd. Flow (perm)	1267	1911		1262	1693		1079	3725	1456	936	3707	
Peak-hour factor, PHF	0.80	0.80	0.80	0.90	0.90	0.90	0.87	0.87	0.87	0.89	0.89	0.89
Adj. Flow (vph)	6	54	10	18	11	49	41	372	192	70	219	6
RTOR Reduction (vph)	0	6	0	0	41	0	0	0	62	0	1	0
Lane Group Flow (vph)	6	58	0	18	19	0	41	372	130	70	224	0
Confl. Peds. (#/hr)			1			7			3			4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	20.0	20.0		20.0	20.0		85.4	81.3	81.3	85.4	81.3	
Effective Green, g (s)	20.0	20.0		20.0	20.0		85.4	81.3	81.3	85.4	81.3	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.71	0.68	0.68	0.71	0.68	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	0.2	0.2	2.0	0.2	
Lane Grp Cap (vph)	211	318		210	282		788	2523	986	691	2511	
v/s Ratio Prot		c0.03			0.01		0.00	c0.10		c0.00	0.06	
v/s Ratio Perm	0.00			0.01			0.04		0.09	0.07		
v/c Ratio	0.03	0.18		0.09	0.07		0.05	0.15	0.13	0.10	0.09	
Uniform Delay, d1	41.9	43.0		42.3	42.1		5.2	6.9	6.9	5.4	6.6	
Progression Factor	1.00	1.00		1.00	1.00		0.86	0.85	0.58	0.45	0.45	
Incremental Delay, d2	0.0	0.1		0.1	0.0		0.0	0.1	0.3	0.0	0.1	
Delay (s)	41.9	43.1		42.3	42.2		4.5	6.0	4.2	2.4	3.1	
Level of Service	D	D		D	D		A	A	A	A	A	
Approach Delay (s)		43.0			42.2			5.4			2.9	
Approach LOS		D			D			A			A	

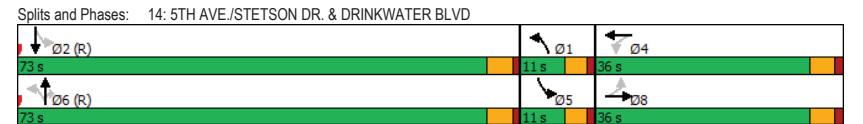
Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

Description: Last Update: Sept 2017
 c Critical Lane Group

2022 Total AM Southbridge Expansion
 14: 5TH AVE./STETSON DR. & DRINKWATER BLVD Timing Report, Sorted By Phase

Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag						
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	11	73	36	11	73	36
Maximum Split (%)	9.2%	60.8%	30.0%	9.2%	60.8%	30.0%
Minimum Split (s)	11	16	36	11	16	35
Yellow Time (s)	3.3	4	3.5	3.3	4	3.5
All-Red Time (s)	1.3	1	1.5	1.3	1	1.5
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	8		7	7
Flash Dont Walk (s)		13	23		12	23
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	3	50	14	3	50	14
End Time (s)	14	3	50	14	3	50
Yield/Force Off (s)	9.4	118	45	9.4	118	45
Yield/Force Off 170(s)	9.4	105	22	9.4	106	22
Local Start Time (s)	73	0	84	73	0	84
Local Yield (s)	79.4	68	115	79.4	68	115
Local Yield 170(s)	79.4	55	92	79.4	56	92


Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 50 (42%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑↑		↔	↑↑↑
Traffic Vol, veh/h	5	16	544	24	32	582
Future Vol, veh/h	5	16	544	24	32	582
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	17	591	26	35	633
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	927	309	0	0	617	0
Stage 1	604	-	-	-	-	-
Stage 2	323	-	-	-	-	-
Critical Hdwy	6.29	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.67	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	300	687	-	-	959	-
Stage 1	493	-	-	-	-	-
Stage 2	670	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	289	687	-	-	959	-
Mov Cap-2 Maneuver	374	-	-	-	-	-
Stage 1	475	-	-	-	-	-
Stage 2	670	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	11.5	0	0.5			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	573	959	-	-
HCM Lane V/C Ratio	-	-	0.04	0.036	-	-
HCM Control Delay (s)	-	-	11.5	8.9	-	-
HCM Lane LOS	-	-	B	A	-	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-	-

Intersection												
Intersection Delay, s/veh	7.5											
Intersection LOS	A											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	9	43	6	10	16	6	18	52	34	3	23	7
Future Vol, veh/h	9	43	6	10	16	6	18	52	34	3	23	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	47	7	11	17	7	20	57	37	3	25	8
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB	WB			NB			SB				
Opposing Approach	WB	EB			SB			NB				
Opposing Lanes	1	1			1			1				
Conflicting Approach Left	SB	NB			EB			WB				
Conflicting Lanes Left	1	1			1			1				
Conflicting Approach Right	NB	SB			WB			EB				
Conflicting Lanes Right	1	1			1			1				
HCM Control Delay	7.6	7.4			7.6			7.3				
HCM LOS	A			A			A					
Lane	NBLn1	EBLn1	WBLn1	SBLn1								
Vol Left, %	17%	16%	31%	9%								
Vol Thru, %	50%	74%	50%	70%								
Vol Right, %	33%	10%	19%	21%								
Sign Control	Stop	Stop	Stop	Stop								
Traffic Vol by Lane	104	58	32	33								
LT Vol	18	9	10	3								
Through Vol	52	43	16	23								
RT Vol	34	6	6	7								
Lane Flow Rate	113	63	35	36								
Geometry Grp	1	1	1	1								
Degree of Util (X)	0.125	0.073	0.04	0.041								
Departure Headway (Hd)	3.969	4.187	4.19	4.081								
Convergence, Y/N	Yes	Yes	Yes	Yes								
Cap	895	846	843	867								
Service Time	2.028	2.261	2.272	2.155								
HCM Lane V/C Ratio	0.126	0.074	0.042	0.042								
HCM Control Delay	7.6	7.6	7.4	7.3								
HCM Lane LOS	A	A	A	A								
HCM 95th-tile Q	0.4	0.2	0.1	0.1								

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	11	53	33	11	16	2
Future Vol, veh/h	11	53	33	11	16	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	58	36	12	17	2
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	48	0	0	124	42	
Stage 1	-	-	-	42	-	
Stage 2	-	-	-	82	-	
Critical Hdwy	4.12	-	-	6.42	6.22	
Critical Hdwy Stg 1	-	-	-	5.42	-	
Critical Hdwy Stg 2	-	-	-	5.42	-	
Follow-up Hdwy	2.218	-	-	3.518	3.318	
Pot Cap-1 Maneuver	1559	-	-	871	1029	
Stage 1	-	-	-	980	-	
Stage 2	-	-	-	941	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	1559	-	-	864	1029	
Mov Cap-2 Maneuver	-	-	-	864	-	
Stage 1	-	-	-	972	-	
Stage 2	-	-	-	941	-	
Approach	EB	WB	SB			
HCM Control Delay, s	1.3	0	9.2			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1559	-	-	-	880	
HCM Lane V/C Ratio	0.008	-	-	-	0.022	
HCM Control Delay (s)	7.3	0	-	-	9.2	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	4	17	11	22	5	55	64	514	28	65	420	20
Future Volume (vph)	4	17	11	22	5	55	64	514	28	65	420	20
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Ftbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.86		1.00	0.99		1.00	1.00	0.85
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1831		1676	1666		1676	3692		1676	3725	1464
Fit Permitted	1.00	1.00		1.00	1.00		0.49	1.00		0.43	1.00	1.00
Satd. Flow (perm)	1765	1831		1765	1666		862	3692		758	3725	1464
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	18	12	24	5	60	70	559	30	71	457	22
RTOR Reduction (vph)	0	11	0	0	55	0	0	3	0	0	0	6
Lane Group Flow (vph)	4	19	0	24	10	0	70	586	0	71	457	16
Conf. Peds. (#/hr)			7			4			8			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		1
Actuated Green, G (s)	3.9	3.9		3.9	3.9		35.8	35.8		35.8	35.8	35.8
Effective Green, g (s)	3.9	3.9		3.9	3.9		35.8	35.8		35.8	35.8	35.8
Actuated g/C Ratio	0.08	0.08		0.08	0.08		0.72	0.72		0.72	0.72	0.72
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	138	143		138	130		620	2659		546	2683	1054
v/s Ratio Prot		0.01			0.01			c0.16			0.12	
v/s Ratio Perm	0.00			c0.01			0.08			0.09		0.01
v/c Ratio	0.03	0.13		0.17	0.07		0.11	0.22		0.13	0.17	0.02
Uniform Delay, d1	21.2	21.3		21.4	21.2		2.1	2.3		2.1	2.2	2.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.0	0.2		0.2	0.1		0.0	0.0		0.0	0.0	0.0
Delay (s)	21.2	21.5		21.6	21.3		2.1	2.3		2.2	2.2	2.0
Level of Service	C	C		C	C		A	A		A	A	A
Approach Delay (s)		21.4			21.4			2.3				2.2
Approach LOS		C			C			A				A
Intersection Summary												
HCM 2000 Control Delay	4.0		HCM 2000 Level of Service		A							
HCM 2000 Volume to Capacity ratio	0.22											
Actuated Cycle Length (s)	49.7				Sum of lost time (s)				10.0			
Intersection Capacity Utilization	55.0%		ICU Level of Service		A							
Analysis Period (min)	15											
c Critical Lane Group												

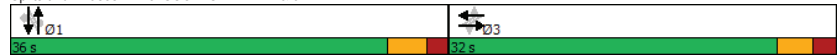
2022 Total AM
18: SCOTTSDALE RD & 3RD AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	3
Movement	NBSB	EBWB
Lead/Lag		
Lead-Lag Optimize		
Recall Mode	Ped	None
Maximum Split (s)	36	32
Maximum Split (%)	52.9%	47.1%
Minimum Split (s)	36	32
Yellow Time (s)	3.2	3
All-Red Time (s)	1.8	2
Minimum Initial (s)	10	6
Vehicle Extension (s)	0.2	2
Minimum Gap (s)	1	2
Time Before Reduce (s)	0	0
Time To Reduce (s)	0	0
Walk Time (s)	18	6
Flash Dont Walk (s)	12	15
Dual Entry	No	No
Inhibit Max	No	No
Start Time (s)	0	36
End Time (s)	36	0
Yield/Force Off (s)	31	63
Yield/Force Off 170(s)	19	48
Local Start Time (s)	0	36
Local Yield (s)	31	63
Local Yield 170(s)	19	48

Intersection Summary	
Cycle Length	68
Control Type	Actuated-Uncoordinated
Natural Cycle	70

Splits and Phases: 18: SCOTTSDALE RD & 3RD AVE.



2022 Total AM
19: DRINKWATER BLVD & 3RD AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	7	1	19	64	10	63	92	497	25	19	176	19
Future Volume (vph)	7	1	19	64	10	63	92	497	25	19	176	19
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00			0.99		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86			0.94		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1678			1785		1676	5307		1676	3725	1444
Flt Permitted	0.56	1.00			0.84		0.62	1.00		0.40	1.00	1.00
Satd. Flow (perm)	985	1678			1530		1087	5307		710	3725	1444
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.83	0.83	0.83	0.81	0.81	0.81
Adj. Flow (vph)	9	1	24	74	11	72	111	599	30	23	217	23
RTOR Reduction (vph)	0	0	0	0	30	0	0	3	0	0	0	5
Lane Group Flow (vph)	9	25	0	0	127	0	111	626	0	23	217	18
Confl. Peds. (#/hr)						2			4			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		8			4			6			2	2
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	16.7	16.7			16.7		93.2	93.2		93.2	93.2	93.2
Effective Green, g (s)	16.7	16.7			16.7		93.2	93.2		93.2	93.2	93.2
Actuated g/C Ratio	0.14	0.14			0.14		0.78	0.78		0.78	0.78	0.78
Clearance Time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	137	233			212		844	4121		551	2893	1121
v/s Ratio Prot		0.01						c0.12			0.06	
v/s Ratio Perm	0.01				c0.08		0.10			0.03		0.01
v/c Ratio	0.07	0.11			0.60		0.13	0.15		0.04	0.08	0.02
Uniform Delay, d1	44.9	45.1			48.5		3.3	3.4		3.1	3.2	3.0
Progression Factor	1.00	1.00			1.00		1.00	1.00		0.41	0.38	0.24
Incremental Delay, d2	0.1	0.1			3.0		0.3	0.1		0.1	0.1	0.0
Delay (s)	44.9	45.2			51.5		3.7	3.5		1.4	1.3	0.8
Level of Service	D	D			D		A	A		A	A	A
Approach Delay (s)		45.1			51.5			3.5			1.2	
Approach LOS		D			D			A			A	

Intersection Summary	
HCM 2000 Control Delay	10.5
HCM 2000 Volume to Capacity ratio	0.22
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	58.8%
Analysis Period (min)	15
Description: Last Update: Sept 2017	
c Critical Lane Group	

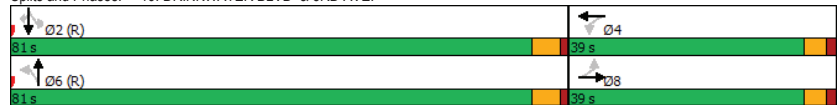
2022 Total AM
19: DRINKWATER BLVD & 3RD AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

	2	4	6	8
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	Min	C-Min	None
Maximum Split (s)	81	39	81	39
Maximum Split (%)	67.5%	32.5%	67.5%	32.5%
Minimum Split (s)	22.2	38.9	16	30.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	9	7	7
Flash Dont Walk (s)	10	25	20	19
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	62	23	62	23
End Time (s)	23	62	23	62
Yield/Force Off (s)	17.8	57.1	17.8	57.1
Yield/Force Off 170(s)	7.8	57.1	117.8	38.1
Local Start Time (s)	0	81	0	81
Local Yield (s)	75.8	115.1	75.8	115.1
Local Yield 170(s)	65.8	115.1	55.8	96.1

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 62 (52%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	

Splits and Phases: 19: DRINKWATER BLVD & 3RD AVE.



2022 Total AM
20: 68th Street & INDIAN SCHOOL


Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔↔	↔↔
Traffic Volume (vph)	167	718	6	44	691	103	41	511	103	121	321	166
Future Volume (vph)	167	718	6	44	691	103	41	511	103	121	321	166
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	5353	1474	1676	5353	1470	1676	3725	1477	1676	3516	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	5353	1474	1676	5353	1470	1676	3725	1477	1676	3516	
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.86	0.86	0.86	0.84	0.84	0.84
Adj. Flow (vph)	188	807	7	49	768	114	48	594	120	144	382	198
RTOR Reduction (vph)	0	0	4	0	0	66	0	0	0	0	61	0
Lane Group Flow (vph)	188	807	3	49	768	48	48	594	120	144	519	0
Conf. Peds. (#/hr)			4			4			7			3
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5 9	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	19.5	54.0	54.0	5.7	36.3	52.0	14.2	25.6	31.3	15.7	27.4	
Effective Green, g (s)	19.5	54.0	54.0	5.7	36.3	52.0	14.2	25.6	31.3	15.7	27.4	
Actuated g/C Ratio	0.16	0.44	0.44	0.05	0.30	0.42	0.12	0.21	0.26	0.13	0.22	
Clearance Time (s)		5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5	
Vehicle Extension (s)		1.0	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	266	2355	648	77	1583	622	193	777	440	214	785	
v/s Ratio Prot	c0.11	0.15		0.03	c0.14	0.01	0.03	c0.16	0.01	c0.09	0.15	
v/s Ratio Perm			0.00			0.02			0.07			
v/c Ratio	0.71	0.34	0.00	0.64	0.49	0.08	0.25	0.76	0.27	0.67	0.66	
Uniform Delay, d1	48.9	22.6	19.3	57.5	35.5	21.1	49.4	45.7	36.6	51.0	43.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.8	0.4	0.0	12.0	1.1	0.0	0.2	4.1	0.1	6.4	1.6	
Delay (s)	55.7	23.0	19.3	69.5	36.6	21.1	49.6	49.8	36.7	57.5	45.1	
Level of Service	E	C	B	E	D	C	D	D	D	E	D	
Approach Delay (s)		29.1			36.4			47.7			47.5	
Approach LOS		C			D			D			D	

Intersection Summary	
HCM 2000 Control Delay	39.2
HCM 2000 Volume to Capacity ratio	0.63
Actuated Cycle Length (s)	122.7
Intersection Capacity Utilization	75.2%
Analysis Period (min)	15
Description: Last Update: Sept 2017	
c Critical Lane Group	

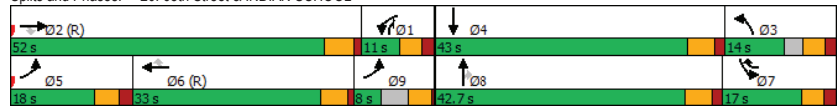
2022 Total AM
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase




Phase Number	1	2	3	4	5	6	7	8	9
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT	EBL
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	
Lead-Lag Optimize									
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None
Maximum Split (s)	11	52	14	43	18	33	17	42.7	8
Maximum Split (%)	9.0%	42.4%	11.4%	35.0%	14.7%	26.9%	13.9%	34.8%	6.5%
Minimum Split (s)	11	32.4	11	39.5	11	33	11	42.7	8
Yellow Time (s)	3.3	4.4	3.3	4	3.6	4	3.3	4	3.5
All-Red Time (s)	2	1	1.9	1.5	2	1	2	1.7	0.5
Minimum Initial (s)	5	10	5	7	5	10	5	7	4
Vehicle Extension (s)	2	1	2	2	2	1	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4	
Flash Dont Walk (s)		23		30		24		33	
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	64	12	118	75	12	30	117.7	75	63
End Time (s)	75	64	12	118	30	63	12	117.7	75
Yield/Force Off (s)	69.7	58.6	6.8	112.5	24.4	58	6.7	112	71
Yield/Force Off 170(s)	69.7	35.6	6.8	82.5	24.4	34	6.7	79	71
Local Start Time (s)	52	0	106	63	0	18	105.7	63	51
Local Yield (s)	57.7	46.6	117.5	100.5	12.4	46	117.4	100	59
Local Yield 170(s)	57.7	23.6	117.5	70.5	12.4	22	117.4	67	59
Intersection Summary									
Cycle Length	122.7								
Control Type	Actuated-Coordinated								
Natural Cycle	110								
Offset: 12 (10%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green									

Splits and Phases: 20: 68th Street & INDIAN SCHOOL



2022 Total AM
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕	↔↔	↔↔	↕↕	↔↔	↔↔	↕↕	↔↔	↔↔	↕↕	↔↔
Traffic Volume (vph)	186	673	77	58	586	38	70	360	14	44	441	90
Future Volume (vph)	186	673	77	58	586	38	70	360	14	44	441	90
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	1000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.0	3.0	5.3	5.0		5.3	5.3		5.3	5.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		1.00	0.95		1.00	0.91	
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3317	3725	1510	3317	3693		1710	1854		1710	5222	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3317	3725	1510	3317	3693		1710	1854		1710	5222	
Peak-hour factor, PHF	0.87	0.87	0.87	0.89	0.89	0.89	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	214	774	89	65	658	43	85	439	17	54	538	110
RTOR Reduction (vph)	0	0	48	0	4	0	0	2	0	0	30	0
Lane Group Flow (vph)	214	774	41	65	697	0	85	454	0	54	618	0
Conf. Peds. (#/hr)			1				1					2
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	13.5	55.6	55.6	7.6	49.7		18.6	34.6		7.6	23.6	
Effective Green, g (s)	13.5	55.6	57.6	7.6	49.7		18.6	34.6		7.6	23.6	
Actuated g/C Ratio	0.11	0.44	0.46	0.06	0.39		0.15	0.27		0.06	0.19	
Clearance Time (s)	5.3	5.0	5.0	5.3	5.0		5.3	5.3		5.3	5.3	
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0		2.0	1.0		2.0	1.0	
Lane Grp Cap (vph)	354	1639	688	199	1453		251	507		102	975	
v/s Ratio Prot	c0.06	c0.21		0.02	0.19		0.05	c0.24		c0.03	0.12	
v/s Ratio Perm			0.03									
v/c Ratio	0.60	0.47	0.06	0.33	0.48		0.34	0.90		0.53	0.63	
Uniform Delay, d1	53.9	25.0	19.2	56.9	28.6		48.3	44.1		57.6	47.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	1.0	0.2	0.4	1.1		0.3	17.7		2.3	1.0	
Delay (s)	55.8	26.0	19.4	57.2	29.8		48.6	61.8		59.9	48.4	
Level of Service	E	C	B	E	C		D	E		E	D	
Approach Delay (s)		31.4			32.1			59.7			49.2	
Approach LOS		C			C			E			D	
Intersection Summary												
HCM 2000 Control Delay	40.6						HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio	0.64											
Actuated Cycle Length (s)	126.3						Sum of lost time (s)			20.9		
Intersection Capacity Utilization	72.2%						ICU Level of Service			C		
Analysis Period (min)	15											
Description: Last Update: Sept 2017												
c Critical Lane Group												

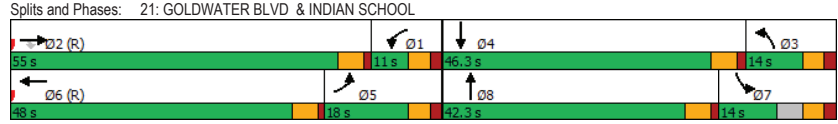
2022 Total AM
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	←		→		↙		↘		↖		↗		↑		↓	
Phase Number	1	2	3	4	5	6	7	8								
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT								
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead								
Lead-Lag Optimize																
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min								
Maximum Split (s)	11	55	14	46.3	18	48	14	42.3								
Maximum Split (%)	8.7%	43.5%	11.1%	36.7%	14.3%	38.0%	11.1%	33.5%								
Minimum Split (s)	11	37	11	46.3	11	35	11	42.3								
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4								
All-Red Time (s)	2	1	2	1.3	2	1	2	1.3								
Minimum Initial (s)	5	10	5	7	5	10	5	7								
Vehicle Extension (s)	2	1	2	1	2	1	2	1								
Minimum Gap (s)	1	1	1	1	1	1	1	1								
Time Before Reduce (s)	0	0	0	0	0	0	0	0								
Time To Reduce (s)	0	0	0	0	0	0	0	0								
Walk Time (s)		8		9		8		9								
Flash Dont Walk (s)		24		32		22		28								
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes								
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes								
Start Time (s)	75	20	6	86	68	20	2	86								
End Time (s)	86	75	20	6	86	68	20	2								
Yield/Force Off (s)	80.7	70	14.7	0.7	80.7	63	14.7	123								
Yield/Force Off 170(s)	80.7	46	14.7	0.7	80.7	41	14.7	123								
Local Start Time (s)	55	0	112.3	66	48	0	108.3	66								
Local Yield (s)	60.7	50	121	107	60.7	43	121	103								
Local Yield 170(s)	60.7	26	121	107	60.7	21	121	103								

Intersection Summary

Cycle Length	126.3
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 20 (16%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	



2022 Total AM
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	←		→		↙		↘		↖		↗		↑		↓	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations	↖	↖↗		↖	↖↗			↖↗			↖↗					
Traffic Volume (vph)	27	661	13	66	683	32	4	4	9	4	4	14				
Future Volume (vph)	27	661	13	66	683	32	4	4	9	4	4	14				
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800				
Total Lost time (s)	5.2	5.2		5.2	5.2			5.1			5.1					
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00					
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99					
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00					
Frt	1.00	1.00		1.00	0.99			0.93			0.91					
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99					
Satd. Flow (prot)	1676	3712		1676	3695			1790			1758					
Flt Permitted	0.32	1.00		0.38	1.00			0.92			0.94					
Satd. Flow (perm)	562	3712		669	3695			1659			1666					
Peak-hour factor, PHF	0.94	0.94	0.94	0.81	0.81	0.81	0.86	0.86	0.86	0.86	0.86	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	29	703	14	81	843	40	5	5	10	5	5	18				
RTOR Reduction (vph)	0	1	0	0	2	0	0	9	0	0	17	0				
Lane Group Flow (vph)	29	716	0	81	881	0	0	11	0	0	11	0				
Conf. Peds. (#/hr)			4			3			4			2				
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA					
Protected Phases		2			6			8			8					
Permitted Phases	2			6			8			4						
Actuated Green, G (s)	102.0	102.0		102.0	102.0			7.8			7.8					
Effective Green, g (s)	102.0	102.0		102.0	102.0			7.8			7.8					
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.06			0.06					
Clearance Time (s)	5.2	5.2		5.2	5.2			5.1			5.1					
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0					
Lane Grp Cap (vph)	477	3152		568	3138			107			108					
v/s Ratio Prot		0.19			0.24											
v/s Ratio Perm	0.05			0.12				0.01			0.01					
v/c Ratio	0.06	0.23		0.14	0.28			0.10			0.10					
Uniform Delay, d1	1.4	1.7		1.6	1.8			52.8			52.9					
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00					
Incremental Delay, d2	0.2	0.2		0.5	0.2			0.1			0.2					
Delay (s)	1.7	1.9		2.1	2.0			53.0			53.0					
Level of Service	A	A		A	A			D			D					
Approach Delay (s)		1.9			2.0			53.0			53.0					
Approach LOS		A			A			D			D					

Intersection Summary

HCM 2000 Control Delay	3.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	10.3
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

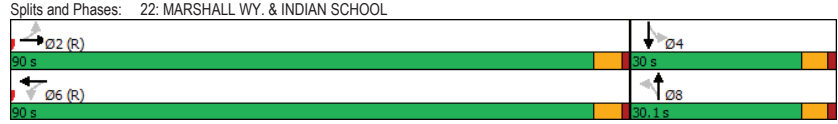
2022 Total AM
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	←	↓	→	↑
Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	90	30	90	30.1
Maximum Split (%)	74.9%	25.0%	74.9%	25.1%
Minimum Split (s)	16	29.1	16	30.1
Yellow Time (s)	4	3.6	4	3.6
All-Red Time (s)	1.2	1.5	1.2	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	8
Flash Dont Walk (s)	8	17	7	17
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	118	87.9	118	87.9
End Time (s)	87.9	118	87.9	118
Yield/Force Off (s)	82.7	112.9	82.7	112.9
Yield/Force Off 170(s)	74.7	95.9	75.7	95.9
Local Start Time (s)	0	90	0	90
Local Yield (s)	84.8	115	84.8	115
Local Yield 170(s)	76.8	98	77.8	98

Intersection Summary

Cycle Length	120.1
Control Type	Actuated-Coordinated
Natural Cycle	55
Offset: 118 (98%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green	



2022 Total AM
23: INDIAN SCHOOL & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	←	→	↙	↘	←	↙	↘	↑	↙	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↕	↕	↔
Traffic Volume (vph)	114	541	55	4	746	130	59	360	70	90	281	70
Future Volume (vph)	114	541	55	4	746	130	59	360	70	90	281	70
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frbp. ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb. ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	3666		1676	3622		1676	3620		1676	3725	1456
Flt Permitted	0.21	1.00		0.35	1.00		0.45	1.00		0.25	1.00	1.00
Satd. Flow (perm)	368	3666		624	3622		789	3620		446	3725	1456
Peak-hour factor, PHF	0.94	0.94	0.94	0.91	0.91	0.91	0.83	0.83	0.83	0.86	0.86	0.86
Adj. Flow (vph)	121	576	59	4	820	143	71	434	84	105	327	81
RTOR Reduction (vph)	0	5	0	0	10	0	0	14	0	0	0	58
Lane Group Flow (vph)	121	630	0	4	953	0	71	504	0	105	327	23
Confl. Peds. (#/hr)			8			21			11			20
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	68.2	60.8		68.2	60.8		31.9	26.4		31.9	26.4	33.8
Effective Green, g (s)	68.2	60.8		68.2	60.8		31.9	26.4		31.9	26.4	33.8
Actuated g/C Ratio	0.57	0.51		0.57	0.51		0.27	0.22		0.27	0.22	0.28
Clearance Time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	289	1857		419	1835		250	796		174	819	471
v/s Ratio Prot	c0.03	0.17		0.00	c0.26		0.01	c0.14		c0.03	0.09	0.00
v/s Ratio Perm	0.21			0.00			0.06			0.13		0.01
v/c Ratio	0.42	0.34		0.01	0.52		0.28	0.63		0.60	0.40	0.05
Uniform Delay, d1	26.5	17.6		15.2	19.8		39.0	42.4		47.8	40.0	31.4
Progression Factor	1.00	1.00		0.81	1.13		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	0.5		0.0	1.0		0.2	1.2		4.0	0.1	0.0
Delay (s)	26.9	18.1		12.3	23.3		39.3	43.6		51.8	40.1	31.4
Level of Service	C	B		B	C		D	D		D	D	C
Approach Delay (s)	19.5			23.3			43.1			41.1		
Approach LOS	B			C			D			D		

Intersection Summary

HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

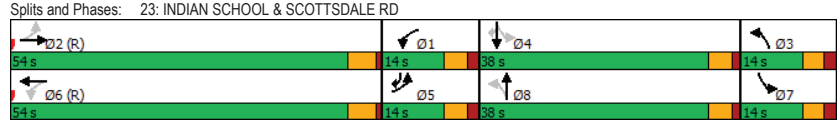
2022 Total AM
23: INDIAN SCHOOL & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	14	54	14	38	14	54	14	38
Maximum Split (%)	11.7%	45.0%	11.7%	31.7%	11.7%	45.0%	11.7%	31.7%
Minimum Split (s)	11	30	10	32.8	11	33	10	34.8
Yellow Time (s)	3.3	4	3	3.6	3.3	4	3	3.6
All-Red Time (s)	1.8	1	2	1.2	1.8	1	2	1.2
Minimum Initial (s)	5	10	5	10	5	10	5	10
Vehicle Extension (s)	2	1	2	2	2	1	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		8		8
Flash Dont Walk (s)		18		21		20		22
Dual Entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	54	0	106	68	54	0	106	68
End Time (s)	68	54	0	106	68	54	0	106
Yield/Force Off (s)	62.9	49	115	101.2	62.9	49	115	101.2
Yield/Force Off 170(s)	62.9	31	115	80.2	62.9	29	115	79.2
Local Start Time (s)	54	0	106	68	54	0	106	68
Local Yield (s)	62.9	49	115	101.2	62.9	49	115	101.2
Local Yield 170(s)	62.9	31	115	80.2	62.9	29	115	79.2

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green	



2022 Total AM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	↑
Traffic Volume (vph)	875	21	22	1010	1	14
Future Volume (vph)	875	21	22	1010	1	14
Ideal Flow (vphpl)	2000	1800	1800	2000	1800	1800
Total Lost time (s)	5.2		5.2	5.2	5.1	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frbp, ped/bikes	1.00		1.00	1.00	0.98	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.87	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3709		1676	3725	1509	
Flt Permitted	1.00		0.28	1.00	1.00	
Satd. Flow (perm)	3709		501	3725	1509	
Peak-hour factor, PHF	0.92	0.92	0.93	0.93	0.80	0.80
Adj. Flow (vph)	951	23	24	1086	1	18
RTOR Reduction (vph)	1	0	0	0	16	0
Lane Group Flow (vph)	973	0	24	1086	3	0
Conf. Peds. (#/hr)		4				5
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	98.4		98.4	98.4	11.3	
Effective Green, g (s)	98.4		98.4	98.4	11.3	
Actuated g/C Ratio	0.82		0.82	0.82	0.09	
Clearance Time (s)	5.2		5.2	5.2	5.1	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	3041		410	3054	142	
v/s Ratio Prot	0.26			c0.29	c0.00	
v/s Ratio Perm			0.05			
v/c Ratio	0.32		0.06	0.36	0.02	
Uniform Delay, d1	2.6		2.0	2.7	49.3	
Progression Factor	0.55		0.33	0.27	1.00	
Incremental Delay, d2	0.3		0.3	0.3	0.0	
Delay (s)	1.7		0.9	1.1	49.3	
Level of Service	A		A	A	D	
Approach Delay (s)	1.7			1.1	49.3	
Approach LOS	A			A	D	

Intersection Summary

HCM 2000 Control Delay	1.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.3
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Last Update: Sept 2017			

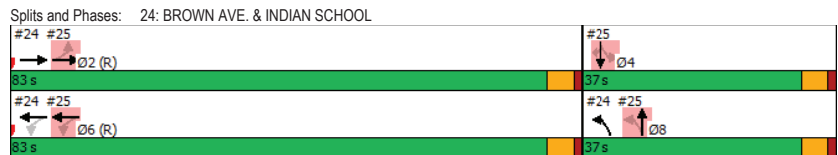
c Critical Lane Group

2022 Total AM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	→	↓	←	↖
Phase Number	2	4	6	8
Node Number	24	25	24	24
Movement	EBT	SBTL	WBTL	NBL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	83	37	83	37
Maximum Split (%)	69.2%	30.8%	69.2%	30.8%
Minimum Split (s)	23.2	12.1	27.2	36.1
Yellow Time (s)	4	3.6	4	3.6
All-Red Time (s)	1.2	1.5	1.2	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	11		15	24
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	106	69	106	69
End Time (s)	69	106	69	106
Yield/Force Off (s)	63.8	100.9	63.8	100.9
Yield/Force Off 170(s)	52.8	100.9	48.8	76.9
Local Start Time (s)	0	83	0	83
Local Yield (s)	77.8	114.9	77.8	114.9
Local Yield 170(s)	66.8	114.9	62.8	90.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 106 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	



2022 Total AM
25: BUCKBOARD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↖	→	↘	↙	←	↖	↘	↙	↗	↘	↙	↗
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖↗	↖↗		↖	↖	↖
Traffic Volume (vph)	116	768	10	42	980	135	2	1	16	39	0	49
Future Volume (vph)	116	768	10	42	980	135	2	1	16	39	0	49
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2			5.1			5.1	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98			0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1676	3717		1676	3643			1729			1863	1500
Flt Permitted	0.22	1.00		0.32	1.00			0.97			0.74	1.00
Satd. Flow (perm)	393	3717		566	3643			1682			1454	1500
Peak-hour factor, PHF	0.90	0.90	0.90	0.94	0.94	0.94	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	129	853	11	45	1043	144	2	1	20	49	0	61
RTOR Reduction (vph)	0	0	0	0	5	0	0	18	0	0	0	55
Lane Group Flow (vph)	129	864	0	45	1182	0	0	6	0	0	49	6
Conf. Peds. (#/hr)			3			5						
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	4
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	98.4	98.4		98.4	98.4			11.3			11.3	11.3
Effective Green, g (s)	98.4	98.4		98.4	98.4			11.3			11.3	11.3
Actuated g/C Ratio	0.82	0.82		0.82	0.82			0.09			0.09	0.09
Clearance Time (s)	5.2	5.2		5.2	5.2			5.1			5.1	5.1
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	2.0
Lane Grp Cap (vph)	322	3047		464	2987			158			136	141
v/s Ratio Prot		0.23			0.32							
v/s Ratio Perm	c0.33			0.08				0.00			c0.03	0.00
v/c Ratio	0.40	0.28		0.10	0.40			0.04			0.36	0.04
Uniform Delay, d1	2.9	2.5		2.1	2.9			49.4			51.0	49.4
Progression Factor	0.44	0.16		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	3.6	0.2		0.4	0.4			0.0			0.6	0.0
Delay (s)	4.8	0.6		2.5	3.3			49.4			51.6	49.5
Level of Service	A	A		A	A			D			D	D
Approach Delay (s)		1.2			3.2			49.4			50.4	
Approach LOS		A			A			D			D	

Intersection Summary	
HCM 2000 Control Delay	5.0
HCM 2000 Volume to Capacity ratio	0.40
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	60.1%
Analysis Period (min)	15
Description: Last Update: Sept 2017	
c Critical Lane Group	

2022 Total AM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

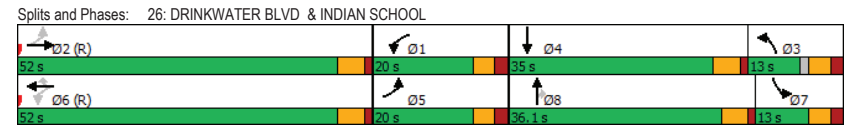
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	86	606	34	308	1127	210	60	363	177	91	139	17
Future Volume (vph)	86	606	34	308	1127	210	60	363	177	91	139	17
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.1	5.3	5.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1710	3696		1710	3725	1503	1710	3725	1498	3317	3664	
Flt Permitted	0.12	1.00		0.29	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	213	3696		521	3725	1503	1710	3725	1498	3317	3664	
Peak-hour factor, PHF	0.85	0.85	0.85	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	101	713	40	331	1212	226	67	403	197	101	154	19
RTOR Reduction (vph)	0	3	0	0	0	58	0	0	166	0	9	0
Lane Group Flow (vph)	101	750	0	331	1212	168	67	403	31	101	164	0
Confl. Peds. (#/hr)			4			4			8			6
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6			8			
Actuated Green, G (s)	72.4	59.0		72.4	59.0	59.0	14.6	19.3	19.3	8.5	13.2	
Effective Green, g (s)	72.4	59.0		72.4	59.0	59.0	14.6	19.3	19.3	8.5	13.2	
Actuated g/C Ratio	0.60	0.49		0.60	0.49	0.49	0.12	0.16	0.16	0.07	0.11	
Clearance Time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.1	5.3	5.1	
Vehicle Extension (s)	2.0	0.2		2.0	0.2	0.2	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	292	1800		443	1814	732	206	593	238	232	399	
v/s Ratio Prot	0.04	0.20		c0.08	0.33		0.04	c0.11		c0.03	0.04	
v/s Ratio Perm	0.17			c0.36		0.11			0.02			
v/c Ratio	0.35	0.42		0.75	0.67	0.23	0.33	0.68	0.13	0.44	0.41	
Uniform Delay, d1	32.8	20.0		27.6	23.6	17.9	48.7	48.0	43.7	54.0	50.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.7		5.9	2.0	0.7	0.3	2.4	0.1	0.5	0.3	
Delay (s)	33.0	20.7		33.5	25.6	18.6	49.1	50.4	43.8	54.5	50.6	
Level of Service	C	C		C	C	B	D	D	D	D	D	
Approach Delay (s)		22.2			26.2			48.3			52.0	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	20.9
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Total AM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBT	EBL	WBTL	SBL	NBT
Lead/Lag			Lag	Lead			Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	20	52	13	35	20	52	13	36.1
Maximum Split (%)	16.5%	42.9%	10.7%	28.9%	16.5%	42.9%	10.7%	29.8%
Minimum Split (s)	11	33.2	11	34.1	11	31.2	11	36.1
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1.2	2	1.1	2	1.2	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	0.2	2	2	2	0.2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		9		7		11
Flash Dont Walk (s)		21		20		19		20
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	36.9	106	91.9	56.9	36.9	106	93	56.9
End Time (s)	56.9	36.9	106	91.9	56.9	36.9	106	93
Yield/Force Off (s)	51.6	31.7	100.7	86.8	51.6	31.7	100.7	87.9
Yield/Force Off 170(s)	51.6	10.7	100.7	86.8	51.6	12.7	100.7	87.9
Local Start Time (s)	52	0	107	72	52	0	108.1	72
Local Yield (s)	66.7	46.8	115.8	101.9	66.7	46.8	115.8	103
Local Yield 170(s)	66.7	25.8	115.8	101.9	66.7	27.8	115.8	103
Intersection Summary								
Cycle Length	121.1							
Control Type	Actuated-Coordinated							
Natural Cycle	115							
Offset: 106 (88%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green								



2022 Total AM
27: 70th St & GOLDWATER BLVD

Southbridge Expansion
HCM 6th WSC

Intersection						
Int Delay, s/veh	2.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑	↑	↑
Traffic Vol, veh/h	393	54	10	295	102	26
Future Vol, veh/h	393	54	10	295	102	26
Conflicting Peds, #/hr	0	4	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	70	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	427	59	11	321	111	28
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	490	0	644	248
Stage 1	-	-	-	-	461	-
Stage 2	-	-	-	-	183	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	685	-	434	641
Stage 1	-	-	-	-	525	-
Stage 2	-	-	-	-	799	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	683	-	426	638
Mov Cap-2 Maneuver	-	-	-	-	426	-
Stage 1	-	-	-	-	515	-
Stage 2	-	-	-	-	799	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.3	15.3			
HCM LOS			C			
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	426	638	-	-	683	-
HCM Lane V/C Ratio	0.26	0.044	-	-	0.016	-
HCM Control Delay (s)	16.4	10.9	-	-	10.4	-
HCM Lane LOS	C	B	-	-	B	-
HCM 95th %tile Q(veh)	1	0.1	-	-	0	-

2022 Total AM
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

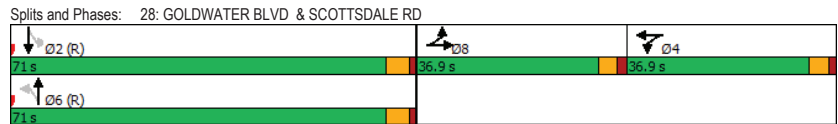
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	↔	
Traffic Volume (vph)	4	6	6	228	12	21	54	263	1	47	347	18	
Future Volume (vph)	4	6	6	228	12	21	54	263	1	47	347	18	
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800	
Total Lost time (s)		4.9		4.9	4.9		5.2	5.2		5.2	5.2		
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95		1.00	0.91		
Frbp, ped/bikes		0.99		1.00	1.00		1.00	1.00		1.00	1.00		
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frt		0.95		1.00	0.98		1.00	1.00		1.00	0.99		
Fit Protected		0.99		0.95	0.96		0.95	1.00		0.95	1.00		
Satd. Flow (prot)		1828		1593	1748		1676	3723		1676	5305		
Fit Permitted		0.99		0.95	0.96		0.50	1.00		0.56	1.00		
Satd. Flow (perm)		1828		1593	1748		878	3723		983	5305		
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.82	0.82	0.82	0.87	0.87	0.87	
Adj. Flow (vph)	5	8	8	262	14	24	66	321	1	54	399	21	
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	2	0	
Lane Group Flow (vph)	0	21	0	152	143	0	66	322	0	54	418	0	
Conf. Peds. (#/hr)			2			3			7			2	
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA		
Protected Phases	8	8		4	4		6	6		2	2		
Permitted Phases							6			2			
Actuated Green, G (s)		9.2		19.5	19.5		101.1	101.1		101.1	101.1		
Effective Green, g (s)		9.2		19.5	19.5		101.1	101.1		101.1	101.1		
Actuated g/C Ratio		0.06		0.13	0.13		0.70	0.70		0.70	0.70		
Clearance Time (s)		4.9		4.9	4.9		5.2	5.2		5.2	5.2		
Vehicle Extension (s)		2.0		2.0	2.0		2.0	2.0		2.0	2.0		
Lane Grp Cap (vph)		116		214	235		613	2599		686	3703		
v/s Ratio Prot		c0.01		c0.10	0.08			c0.09			0.08		
v/s Ratio Perm							0.08			0.05			
v/c Ratio		0.18		0.71	0.61		0.11	0.12		0.08	0.11		
Uniform Delay, d1		64.2		59.9	59.0		7.1	7.2		7.0	7.2		
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2		0.3		8.9	3.0		0.4	0.1		0.2	0.1		
Delay (s)		64.5		68.8	62.1		7.5	7.3		7.2	7.2		
Level of Service		E		E	E		A	A		A	A		
Approach Delay (s)		64.5		65.5			7.3			7.2			
Approach LOS		E		E			A			A			
Intersection Summary													
HCM 2000 Control Delay	23.1		HCM 2000 Level of Service					C					
HCM 2000 Volume to Capacity ratio	0.22												
Actuated Cycle Length (s)	144.8				Sum of lost time (s)				15.0				
Intersection Capacity Utilization	54.3%		ICU Level of Service					A					
Analysis Period (min)	15												
Description: Last Update: Sept 2017													
c Critical Lane Group													

2022 Total AM
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

	↓	↘	↑	↗
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	71	36.9	71	36.9
Maximum Split (%)	49.0%	25.5%	49.0%	25.5%
Minimum Split (s)	23.2	36.9	27.2	36.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	8	8	9
Flash Dont Walk (s)	11	24	14	23
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	24	131.9	24	95
End Time (s)	95	24	95	131.9
Yield/Force Off (s)	89.8	19.1	89.8	127
Yield/Force Off 170(s)	78.8	139.9	75.8	104
Local Start Time (s)	0	107.9	0	71
Local Yield (s)	65.8	139.9	65.8	103
Local Yield 170(s)	54.8	115.9	51.8	80

Intersection Summary	
Cycle Length	144.8
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 24 (17%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Total AM
29: SCOTTSDALE RD & OSBORN RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↖	→	↘	↙	←	↗	↖	↗	↘	↙	↖	↗
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗	↖	↖↗	↖↗	↖↗
Traffic Volume (vph)	48	163	81	82	152	86	60	795	103	81	538	18
Future Volume (vph)	48	163	81	82	152	86	60	795	103	81	538	18
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.95		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3519		1676	3499		1676	3725	1473	1676	5322	
Flt Permitted	0.41	1.00		0.40	1.00		0.40	1.00	1.00	0.27	1.00	
Satd. Flow (perm)	730	3519		710	3499		713	3725	1473	482	5322	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	60	204	101	102	190	108	66	874	113	88	585	20
RTOR Reduction (vph)	0	60	0	0	78	0	0	0	46	0	2	0
Lane Group Flow (vph)	60	245	0	103	220	0	66	874	67	88	603	0
Conf. Peds. (#/hr)			6			6			5			9
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	3	8		7	4		1	6	6	5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	22.2	17.2		22.2	17.2		76.5	71.4	71.4	76.5	71.4	
Effective Green, g (s)	22.2	17.2		22.2	17.2		76.5	71.4	71.4	76.5	71.4	
Actuated g/C Ratio	0.18	0.14		0.18	0.14		0.64	0.59	0.59	0.64	0.59	
Clearance Time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.4	
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	1.0	1.0	2.0	1.0	
Lane Grp Cap (vph)	174	503		171	501		495	2214	875	357	3163	
v/s Ratio Prot	0.01	0.07		c0.03	0.06		0.01	c0.23		c0.01	0.11	
v/s Ratio Perm	0.05			c0.09			0.08		0.05	0.15		
v/c Ratio	0.34	0.49		0.60	0.44		0.13	0.39	0.08	0.25	0.19	
Uniform Delay, d1	46.6	47.4		49.1	47.0		9.3	12.9	10.3	14.8	11.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.3		4.1	0.2		0.0	0.5	0.2	0.1	0.1	
Delay (s)	47.1	47.7		53.2	47.3		9.3	13.4	10.5	15.0	11.3	
Level of Service	D	D		D	D		A	B	B	B	B	
Approach Delay (s)		47.6			48.8			12.9			11.7	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	21.4
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			

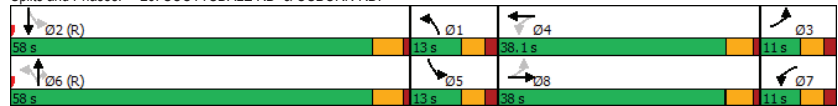
c Critical Lane Group

2022 Total AM
29: SCOTTSDALE RD & OSBORN RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	EBL	WBTL	SBL	NBTL	WBL	EBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	13	58	11	38.1	13	58	11	38
Maximum Split (%)	10.8%	48.3%	9.2%	31.7%	10.8%	48.3%	9.2%	31.6%
Minimum Split (s)	11	31.4	11	38.1	11	34.4	11	37.1
Yellow Time (s)	3.6	4.4	3.3	4	3.6	4.4	3.3	4
All-Red Time (s)	2	1	2	1.1	2	1	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	1	2	1	2	1	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		9		10		11
Flash Dont Walk (s)		18		24		19		21
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	58	0	109.1	71	58	0	109.1	71
End Time (s)	71	58	0	109.1	71	58	0	109.1
Yield/Force Off (s)	65.4	52.6	114.8	104	65.4	52.6	114.8	104
Yield/Force Off 170(s)	65.4	34.6	114.8	80	65.4	33.6	114.8	83
Local Start Time (s)	58	0	109.1	71	58	0	109.1	71
Local Yield (s)	65.4	52.6	114.8	104	65.4	52.6	114.8	104
Local Yield 170(s)	65.4	34.6	114.8	80	65.4	33.6	114.8	83

Splits and Phases: 29: SCOTTSDALE RD & OSBORN RD.



2022 Total AM
30: 6TH ST. & A1

Southbridge Expansion
HCM 6th TWSC

Intersection	1.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Int Delay, s/veh	1.7					
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	8	52	84	74	32	6
Future Vol, veh/h	8	52	84	74	32	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	57	91	80	35	7

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	171	0	206
Stage 1	-	-	131
Stage 2	-	-	75
Critical Hdwy	4.12	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.218	-	3.518
Pot Cap-1 Maneuver	1406	-	782
Stage 1	-	-	895
Stage 2	-	-	948
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1406	-	777
Mov Cap-2 Maneuver	-	-	777
Stage 1	-	-	889
Stage 2	-	-	948

Approach	EB	WB	SB
HCM Control Delay, s	1	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1406	-	-	-	796
HCM Lane V/C Ratio	0.006	-	-	-	0.052
HCM Control Delay (s)	7.6	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	8	34	61	29	26	7
Future Vol, veh/h	8	34	61	29	26	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	37	66	32	28	8

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	98	0	137
Stage 1	-	-	82
Stage 2	-	-	55
Critical Hdwy	4.12	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.218	-	3.318
Pot Cap-1 Maneuver	1495	-	856
Stage 1	-	-	941
Stage 2	-	-	968
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1495	-	851
Mov Cap-2 Maneuver	-	-	851
Stage 1	-	-	935
Stage 2	-	-	968

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1495	-	-	-	875
HCM Lane V/C Ratio	0.006	-	-	-	0.041
HCM Control Delay (s)	7.4	0	-	-	9.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	3.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕		↕
Traffic Vol, veh/h	51	6	76	111	0	46
Future Vol, veh/h	51	6	76	111	0	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	55	7	83	121	0	50

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	62	59
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	4.12	6.22
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	2.218	3.318
Pot Cap-1 Maneuver	-	1541	1007
Stage 1	-	-	0
Stage 2	-	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1541	1007
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1007	-	-	1541	-
HCM Lane V/C Ratio	0.05	-	-	0.054	-
HCM Control Delay (s)	8.8	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.2	-

2022 Total AM
33: Stetson Dr & C1

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↕	↕	
Traffic Vol, veh/h	3	25	12	137	53	3
Future Vol, veh/h	3	25	12	137	53	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	27	13	149	58	3

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	235	60	61
Stage 1	60	-	-
Stage 2	175	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	753	1005	1542
Stage 1	963	-	-
Stage 2	855	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	746	1005	1542
Mov Cap-2 Maneuver	746	-	-
Stage 1	954	-	-
Stage 2	855	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1542	-	969	-	-
HCM Lane V/C Ratio	0.008	-	0.031	-	-
HCM Control Delay (s)	7.4	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

2022 Total AM
34: 5th Ave & C2

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕			↕
Traffic Vol, veh/h	11	201	73	7	0	32
Future Vol, veh/h	11	201	73	7	0	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	218	79	8	0	35

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	87	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1509	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1509	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1509	-	-	-	976
HCM Lane V/C Ratio	0.008	-	-	-	0.036
HCM Control Delay (s)	7.4	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

2022 Total AM
35: 5TH AVE & D

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	13	34	130	8	18	29
Future Vol, veh/h	13	34	130	8	18	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	37	141	9	20	32

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	150	0	0	211	146
Stage 1	-	-	-	146	-
Stage 2	-	-	-	65	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	1431	-	-	777	901
Stage 1	-	-	-	881	-
Stage 2	-	-	-	958	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1431	-	-	769	901
Mov Cap-2 Maneuver	-	-	-	769	-
Stage 1	-	-	-	872	-
Stage 2	-	-	-	958	-

Approach	EB	WB	SB
HCM Control Delay, s	2.1	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1431	-	-	-	845
HCM Lane V/C Ratio	0.01	-	-	-	0.06
HCM Control Delay (s)	7.5	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

2022 Total AM
36: Vehicle Path & 6TH ST.

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	↕
Traffic Vol, veh/h	47	37	0	99	59	0
Future Vol, veh/h	47	37	0	99	59	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	51	40	0	108	64	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	91	0	179
Stage 1	-	-	-	-	71
Stage 2	-	-	-	-	108
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1504	-	811
Stage 1	-	-	-	-	952
Stage 2	-	-	-	-	916
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1504	-	811
Mov Cap-2 Maneuver	-	-	-	-	811
Stage 1	-	-	-	-	952
Stage 2	-	-	-	-	916

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	811	-	-	1504	-
HCM Lane V/C Ratio	0.079	-	-	-	-
HCM Control Delay (s)	9.8	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0	-

2022 Total AM
37: 5TH AVE. & Vehicle Path

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↖		↗	↗
Traffic Vol, veh/h	2	51	72	57	36	1
Future Vol, veh/h	2	51	72	57	36	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	55	78	62	39	1
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	140	0	0	168	109	
Stage 1	-	-	-	109	-	
Stage 2	-	-	-	59	-	
Critical Hdwy	4.12	-	-	6.42	6.22	
Critical Hdwy Stg 1	-	-	-	5.42	-	
Critical Hdwy Stg 2	-	-	-	5.42	-	
Follow-up Hdwy	2,218	-	-	3,518	3,318	
Pot Cap-1 Maneuver	1443	-	-	822	945	
Stage 1	-	-	-	916	-	
Stage 2	-	-	-	964	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	1443	-	-	821	945	
Mov Cap-2 Maneuver	-	-	-	821	-	
Stage 1	-	-	-	915	-	
Stage 2	-	-	-	964	-	
Approach	EB	WB	SB			
HCM Control Delay, s	0.3	0	9.6			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBR
Capacity (veh/h)	1443	-	-	-	824	
HCM Lane V/C Ratio	0.002	-	-	-	0.049	
HCM Control Delay (s)	7.5	0	-	-	9.6	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.2	

2022 Total AM Mitigated
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

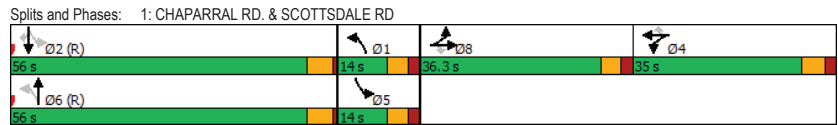
	↖	→	↗	↖	←	↖	↖	↖	↖	↖	↖	↖	↖	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	58	107	40	492	187	273	15	1052	197	159	1365	82		
Future Volume (vph)	58	107	40	492	187	273	15	1052	197	159	1365	82		
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800		
Total Lost time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4	5.6	5.4	5.4	5.4		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	0.95	1.00	1.00		
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.97		
Ftbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.85	1.00		
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95		
Satd. Flow (prot)	1676	1945	1478	3252	1945	1478	1676	5191	1676	3711	1458	1458		
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.06	1.00	0.12	1.00	1.00	1.00		
Satd. Flow (perm)	1676	1945	1478	3252	1945	1478	104	5191	205	3711	1458	1458		
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.89	0.89	0.89	0.88	0.88	0.88		
Adj. Flow (vph)	61	113	42	541	205	300	17	1182	221	181	1551	93		
RTOR Reduction (vph)	0	0	0	0	0	242	0	16	0	0	0	48		
Lane Group Flow (vph)	61	113	42	541	205	58	17	1387	0	181	1551	45		
Confl. Peds. (#/hr)			2			2			2			2		
Bus Blockages (#/hr)	0	2	0	0	2	0	0	2	0	0	2	0		
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	pm+pt	NA	Perm			
Protected Phases	8	8		4	4		1	6		5	2			
Permitted Phases			8			4	6		2		2			
Actuated Green, G (s)	15.3	15.3	15.3	27.5	27.5	27.5	76.2	67.8	76.2	67.8	67.8			
Effective Green, g (s)	15.3	15.3	15.3	27.5	27.5	27.5	76.2	67.8	76.2	67.8	67.8			
Actuated g/C Ratio	0.11	0.11	0.11	0.19	0.19	0.19	0.54	0.48	0.54	0.48	0.48			
Clearance Time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4	5.6	5.4	5.4			
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.2	2.0	0.2	0.2			
Lane Grp Cap (vph)	181	210	160	632	378	287	149	2490	198	1780	699			
v/s Ratio Prot	0.04	c0.06		c0.17	0.11		0.01	0.27	c0.05	0.42				
v/s Ratio Perm			0.03			0.04	0.05		c0.44		0.03			
v/c Ratio	0.34	0.54	0.26	0.86	0.54	0.20	0.11	0.56	0.91	0.87	0.06			
Uniform Delay, d1	58.3	59.7	57.8	55.0	51.2	47.7	53.1	26.1	43.4	32.9	19.7			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	0.4	1.3	0.3	10.6	0.9	0.1	0.1	0.9	39.9	6.2	0.2			
Delay (s)	58.7	61.0	58.1	65.6	52.1	47.8	53.2	27.0	83.3	39.0	19.9			
Level of Service	E	E	E	E	D	D	D	C	F	D	B			
Approach Delay (s)	59.8			57.9			27.3			42.5				
Approach LOS	E			E			C			D				
Intersection Summary														
HCM 2000 Control Delay	42.1			HCM 2000 Level of Service			D							
HCM 2000 Volume to Capacity ratio	0.85													
Actuated Cycle Length (s)	141.3			Sum of lost time (s)			22.3							
Intersection Capacity Utilization	80.5%			ICU Level of Service			D							
Analysis Period (min)	15													
Description: Last Update: Feb 2018														
c Critical Lane Group														

2022 Total AM Mitigated
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag			Lag			Lead
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	14	56	35	14	56	36.3
Maximum Split (%)	9.9%	39.6%	24.8%	9.9%	39.6%	25.7%
Minimum Split (s)	11	16	35	11	16	36.3
Yellow Time (s)	3.6	4.4	4	3.6	4.4	3.3
All-Red Time (s)	2	1	2	2	1	2
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	9
Flash Dont Walk (s)		10	22		14	22
Dual Entry	No	Yes	No	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	106	50	15	106	50	120
End Time (s)	120	106	50	120	106	15
Yield/Force Off (s)	114.4	100.6	44	114.4	100.6	9.7
Yield/Force Off 170(s)	114.4	90.6	22	114.4	86.6	129
Local Start Time (s)	56	0	106.3	56	0	70
Local Yield (s)	64.4	50.6	135.3	64.4	50.6	101
Local Yield 170(s)	64.4	40.6	113.3	64.4	36.6	79

Intersection Summary	
Cycle Length	141.3
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 50 (35%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Total AM Mitigated
3: HIGHLAND AVE/Granada Ave & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔		↔	↔		↔↔↔	↔↔↔		↔↔	↔↔	↔↔
Traffic Volume (vph)	356	18	24	10	4	16	24	843	22	35	742	53
Future Volume (vph)	356	18	24	10	4	16	24	843	22	35	742	53
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.88		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3252	1780		1676	1725		1676	5328		1676	5294	
Flt Permitted	0.95	1.00		0.95	1.00		0.31	1.00		0.26	1.00	
Satd. Flow (perm)	3252	1780		1676	1725		542	5328		465	5294	
Peak-hour factor, PHF	0.91	0.91	0.91	0.81	0.81	0.81	0.88	0.88	0.88	0.93	0.93	0.93
Adj. Flow (vph)	391	20	26	12	5	20	27	958	25	38	798	57
RTOR Reduction (vph)	0	22	0	0	19	0	0	2	0	0	5	0
Lane Group Flow (vph)	391	24	0	12	6	0	27	981	0	38	850	0
Confl. Peds. (#/hr)			2						4			2
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4		6	6		2	2	
Permitted Phases							6			2		
Actuated Green, G (s)	20.8	20.8		4.2	4.2		80.2	80.2		80.2	80.2	
Effective Green, g (s)	20.8	20.8		4.2	4.2		80.2	80.2		80.2	80.2	
Actuated g/C Ratio	0.17	0.17		0.03	0.03		0.66	0.66		0.66	0.66	
Clearance Time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	558	305		58	59		358	3528		307	3506	
v/s Ratio Prot	c0.12	0.01		c0.01	0.00			c0.18			0.16	
v/s Ratio Perm							0.05			0.08		
v/c Ratio	0.70	0.08		0.21	0.10		0.08	0.28		0.12	0.24	
Uniform Delay, d1	47.2	42.1		56.8	56.6		7.3	8.5		7.5	8.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.2	0.0		0.6	0.3		0.4	0.2		0.8	0.2	
Delay (s)	50.5	42.2		57.5	56.9		7.7	8.7		8.3	8.4	
Level of Service	D	D		E	E		A	A		A	A	
Approach Delay (s)		49.6			57.1			8.6			8.4	
Approach LOS		D			E			A			A	

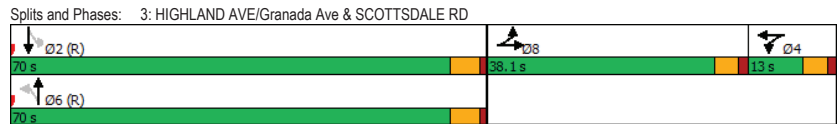
Intersection Summary	
HCM 2000 Control Delay	16.8
HCM 2000 Volume to Capacity ratio	0.36
Actuated Cycle Length (s)	121.1
Intersection Capacity Utilization	57.7%
Analysis Period (min)	15
Description: Last Update: Sept 2017	
c Critical Lane Group	

2022 Total AM Mitigated
3: HIGHLAND AVE/Granada Ave & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

	↓	↘	↑	↙
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	70	13	70	38.1
Maximum Split (%)	57.8%	10.7%	57.8%	31.5%
Minimum Split (s)	30.7	13	28.7	38.1
Yellow Time (s)	4.4	3.6	4.4	3.6
All-Red Time (s)	1.3	1.5	1.3	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	1	2	1	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8		7	9
Flash Dont Walk (s)	17		16	24
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	42	29	42	112
End Time (s)	112	42	112	29
Yield/Force Off (s)	106.3	36.9	106.3	23.9
Yield/Force Off 170(s)	89.3	36.9	90.3	121
Local Start Time (s)	0	108.1	0	70
Local Yield (s)	64.3	116	64.3	103
Local Yield 170(s)	47.3	116	48.3	79

Intersection Summary	
Cycle Length	121.1
Control Type	Actuated-Coordinated
Natural Cycle	85
Offset: 42 (35%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Total AM Mitigated
4: Fashion Square Drive

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↘	→	↙	↗	←	↖	↘	↗	↖	↙	↘	↗	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔		↔	↔		↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	5	0	13	4	0	0	4	446	13	22	953	37	
Future Volume (vph)	5	0	13	4	0	0	4	446	13	22	953	37	
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800	
Total Lost time (s)		5.5		5.2			5.2	5.2	5.2	5.2	5.2	5.2	
Lane Util. Factor		1.00		1.00			1.00	0.95	1.00	1.00	0.91	1.00	
Frbp, ped/bikes		1.00		1.00			1.00	1.00	0.98	1.00	1.00	0.98	
Flpb, ped/bikes		1.00		1.00			1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.90		1.00			1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.99		0.95			0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1743		1676			1676	3725	1465	1676	5353	1466	
Flt Permitted		0.91		0.75			0.26	1.00	1.00	0.48	1.00	1.00	
Satd. Flow (perm)		1607		1315			466	3725	1465	839	5353	1466	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	5	0	14	4	0	0	4	485	14	24	1036	40	
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	2	0	0	6	
Lane Group Flow (vph)	0	1	0	4	0	0	4	485	12	24	1036	34	
Conf. Peds. (#/hr)						1			1			1	
Turn Type	Perm	NA		Perm			Perm	NA	Perm	Perm	NA	Perm	
Protected Phases		8			4			6			2		
Permitted Phases	8		4				6		6	2		2	
Actuated Green, G (s)		7.1		7.4			102.2	102.2	102.2	102.2	102.2	102.2	
Effective Green, g (s)		7.1		7.4			102.2	102.2	102.2	102.2	102.2	102.2	
Actuated g/C Ratio		0.06		0.06			0.85	0.85	0.85	0.85	0.85	0.85	
Clearance Time (s)		5.5		5.2			5.2	5.2	5.2	5.2	5.2	5.2	
Vehicle Extension (s)		3.0		3.0			3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		95		81			396	3172	1247	714	4558	1248	
v/s Ratio Prot								0.13			c0.19		
v/s Ratio Perm		0.00		c0.00			0.01		0.01	0.03		0.02	
v/c Ratio		0.01		0.05			0.01	0.15	0.01	0.03	0.23	0.03	
Uniform Delay, d1		53.1		53.0			1.3	1.5	1.3	1.4	1.6	1.4	
Progression Factor		1.00		1.00			1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0		0.3			0.0	0.1	0.0	0.1	0.1	0.0	
Delay (s)		53.2		53.2			1.4	1.6	1.3	1.4	1.8	1.4	
Level of Service		D		D			A	A	A	A	A	A	
Approach Delay (s)		53.2			53.2			1.6			1.7		
Approach LOS		D			D			A			A		

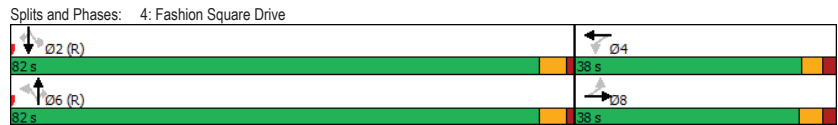
Intersection Summary	
HCM 2000 Control Delay	2.4
HCM 2000 Volume to Capacity ratio	0.22
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	41.6%
Analysis Period (min)	15
c Critical Lane Group	

2022 Total AM Mitigated
4: Fashion Square Drive

Southbridge Expansion
Timing Report, Sorted By Phase

	2	4	6	8
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	Min	C-Min	Min
Maximum Split (s)	82	38	82	38
Maximum Split (%)	68.3%	31.7%	68.3%	31.7%
Minimum Split (s)	16	21.2	16	21.5
Yellow Time (s)	4	3	4	3.3
All-Red Time (s)	1.2	2.2	1.2	2.2
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	5
Flash Dont Walk (s)	16	11	10	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	82	0	82
End Time (s)	82	0	82	0
Yield/Force Off (s)	76.8	114.8	76.8	114.5
Yield/Force Off 170(s)	60.8	114.8	66.8	114.5
Local Start Time (s)	0	82	0	82
Local Yield (s)	76.8	114.8	76.8	114.5
Local Yield 170(s)	60.8	114.8	66.8	114.5

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	40
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Total AM Mitigated
6: GOLDWATER BLVD & CAMELBACK RD.


Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔↔	↔↔	↔	↔↔	↔↔↔	↔
Traffic Volume (vph)	199	934	178	54	730	42	143	248	37	15	360	520
Future Volume (vph)	199	934	178	54	730	42	143	248	37	15	360	520
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	0.97	0.91	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5353	1479	1676	5306		3252	3725	1488	3252	5353	1489
Flt Permitted	0.23	1.00	1.00	0.18	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	414	5353	1479	312	5306		3252	3725	1488	3252	5353	1489
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.88	0.88	0.88	0.88	0.90	0.90
Adj. Flow (vph)	229	1074	205	64	859	49	162	282	42	17	400	578
RTOR Reduction (vph)	0	0	81	0	4	0	0	0	28	0	0	48
Lane Group Flow (vph)	229	1074	124	64	904	0	163	282	14	17	400	530
Conf. Peds. (#/hr)			2			2			5			3
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	3	8		7	4		1	6	7	5	2	3
Permitted Phases	8		8	4				6				2
Actuated Green, G (s)	70.4	48.6	48.6	70.4	48.6		9.6	18.5	40.3	10.5	19.4	41.2
Effective Green, g (s)	70.4	48.6	48.6	70.4	48.6		9.6	18.5	40.3	10.5	19.4	41.2
Actuated g/C Ratio	0.58	0.40	0.40	0.58	0.40		0.08	0.15	0.33	0.09	0.16	0.34
Clearance Time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Vehicle Extension (s)	2.0	0.2	0.2	2.0	0.2		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	465	2139	591	425	2120		256	566	561	280	854	573
v/s Ratio Prot	0.09	c0.20		0.03	0.17		c0.05	0.08	0.00	0.01	0.07	c0.17
v/s Ratio Perm	0.20		0.08	0.06				0.00				0.19
v/c Ratio	0.49	0.50	0.21	0.15	0.43		0.64	0.50	0.02	0.06	0.47	0.93
Uniform Delay, d1	25.7	27.4	23.9	20.8	26.4		54.3	47.3	27.4	51.0	46.4	38.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	0.1	0.1	0.1		3.8	3.1	0.0	0.0	1.8	20.7
Delay (s)	26.0	27.5	24.0	20.9	26.5		58.1	50.4	27.4	51.1	48.3	59.4
Level of Service	C	C	C	C	C		E	D	C	D	D	E
Approach Delay (s)	26.8			26.1			51.0				54.8	
Approach LOS	C			C			D				D	

Intersection Summary	
HCM 2000 Control Delay	36.6
HCM 2000 Volume to Capacity ratio	0.74
Actuated Cycle Length (s)	121.6
Intersection Capacity Utilization	89.4%
Analysis Period (min)	15
Description: Last Update: Sept 2017	
c Critical Lane Group	

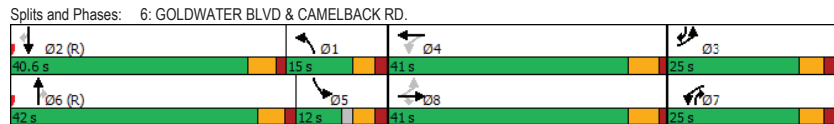
2022 Total AM Mitigated
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase




Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBTL	SBL	NBT	WBL	EBTL
Lead/Lag	Lag	Lead			Lag	Lead		
Lead-Lag Optimize								
Recall Mode	None	C-Min	Min	Ped	Min	C-Min	None	Ped
Maximum Split (s)	15	40.6	25	41	12	42	25	41
Maximum Split (%)	12.3%	33.4%	20.6%	33.7%	9.9%	34.5%	20.6%	33.7%
Minimum Split (s)	11	40.6	11	31	11	35.6	11	33
Yellow Time (s)	3.3	4	3.6	4.4	3.3	4	3.6	4.4
All-Red Time (s)	2	1.6	2	1.3	2	1.6	2	1.3
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	0.2	2	2	2	0.2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		7		7		7
Flash Dont Walk (s)		27		24		23		26
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	40.6	0	96.6	55.6	42	0	96.6	55.6
End Time (s)	55.6	40.6	0	96.6	55.6	42	0	96.6
Yield/Force Off (s)	50.3	35	116	90.9	50.3	36.4	116	90.9
Yield/Force Off 170(s)	50.3	8	116	66.9	50.3	13.4	116	64.9
Local Start Time (s)	40.6	0	96.6	55.6	42	0	96.6	55.6
Local Yield (s)	50.3	35	116	90.9	50.3	36.4	116	90.9
Local Yield 170(s)	50.3	8	116	66.9	50.3	13.4	116	64.9

Intersection Summary	
Cycle Length	121.6
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green	



2022 Total AM Mitigated
8: Stetson Dr/DRINKWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	61	15	21	14	45	312	23	421	15	214	467	120
Future Volume (vph)	61	15	21	14	45	312	23	421	15	214	467	120
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2	5.0	5.1	5.1		5.0	5.1	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1768		1676	1961	1441	1676	3702		3252	3548	
Flt Permitted	0.72	1.00		0.73	1.00	1.00	0.42	1.00		0.43	1.00	
Satd. Flow (perm)	1278	1768		1284	1961	1441	737	3702		1460	3548	
Peak-hour factor, PHF	0.80	0.80	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	76	19	26	16	50	347	26	468	17	225	492	126
RTOR Reduction (vph)	0	0	0	0	0	150	0	2	0	0	15	0
Lane Group Flow (vph)	76	45	0	16	50	197	26	483	0	225	603	0
Confl. Peds. (#/hr)			8			35			14			18
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		8			4	5		6		5	2	
Permitted Phases	8			4		4		6			2	
Actuated Green, G (s)	25.6	25.6		25.6	25.6	33.1	71.6	71.6		84.1	84.1	
Effective Green, g (s)	25.6	25.6		25.6	25.6	33.1	71.6	71.6		84.1	84.1	
Actuated g/C Ratio	0.21	0.21		0.21	0.21	0.28	0.60	0.60		0.70	0.70	
Clearance Time (s)	5.2	5.2		5.2	5.2	5.0	5.1	5.1		5.0	5.1	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	272	377		273	418	397	439	2208		1135	2486	
v/s Ratio Prot		0.03			0.03	c0.03		0.13		0.01	c0.17	
v/s Ratio Perm	0.06			0.01		0.11	0.04			0.13		
v/c Ratio	0.28	0.12		0.06	0.12	0.50	0.06	0.22		0.20	0.24	
Uniform Delay, d1	39.5	38.1		37.6	38.1	36.5	10.1	11.2		6.1	6.5	
Progression Factor	1.00	1.00		0.93	0.95	2.00	1.00	1.00		0.40	0.40	
Incremental Delay, d2	0.2	0.1		0.0	0.0	0.4	0.3	0.2		0.0	0.2	
Delay (s)	39.7	38.2		34.9	36.4	73.4	10.4	11.5		2.5	2.8	
Level of Service	D	D		C	D	E	B	B		A	A	
Approach Delay (s)		39.1			67.4			11.4			2.7	
Approach LOS		D			E			B			A	

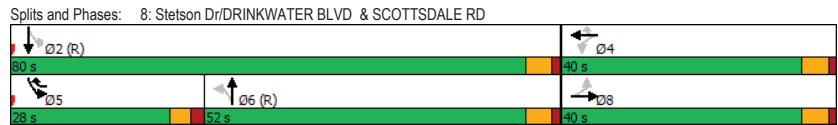
Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Total AM Mitigated
8: Stetson Dr/DRINKWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

	2	4	5	6	8
Phase Number	2	4	5	6	8
Movement	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag			Lead	Lag	
Lead-Lag Optimize					
Recall Mode	C-Max	None	None	C-Max	None
Maximum Split (s)	80	40	28	52	40
Maximum Split (%)	66.7%	33.3%	23.3%	43.3%	33.3%
Minimum Split (s)	21.1	37.2	10	38.1	33.2
Yellow Time (s)	3.6	4	3	3.6	4
All-Red Time (s)	1.5	1.2	2	1.5	1.2
Minimum Initial (s)	10	7	5	10	7
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	9	9		9	7
Flash Dont Walk (s)	7	23		24	21
Dual Entry	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	93	53	93	1	53
End Time (s)	53	93	1	53	93
Yield/Force Off (s)	47.9	87.8	116	47.9	87.8
Yield/Force Off 170(s)	40.9	64.8	116	23.9	66.8
Local Start Time (s)	0	80	0	28	80
Local Yield (s)	74.9	114.8	23	74.9	114.8
Local Yield 170(s)	67.9	91.8	23	50.9	93.8

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 93 (78%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Total AM Mitigated
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔↔	↔↔	↔↔	↔↔	↔↔	↔↔	↔↔	↔↔	↔↔	↔↔	↔↔
Traffic Volume (vph)	186	673	77	58	586	38	70	360	14	44	441	90
Future Volume (vph)	186	673	77	58	586	38	70	360	14	44	441	90
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	1000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.0	3.0	5.3	5.0		5.3	5.3		5.3	5.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		1.00	0.95		1.00	0.91	
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3317	3725	1510	3317	3693		1710	1854		1710	5222	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3317	3725	1510	3317	3693		1710	1854		1710	5222	
Peak-hour factor, PHF	0.87	0.87	0.87	0.89	0.89	0.89	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	214	774	89	65	658	43	85	439	17	54	538	110
RTOR Reduction (vph)	0	0	48	0	4	0	0	2	0	0	30	0
Lane Group Flow (vph)	214	774	41	65	697	0	85	454	0	54	618	0
Conf. Peds. (#/hr)			1			1						2
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	13.5	55.6	55.6	7.6	49.7		18.6	34.6		7.6	23.6	
Effective Green, g (s)	13.5	55.6	57.6	7.6	49.7		18.6	34.6		7.6	23.6	
Actuated g/C Ratio	0.11	0.44	0.46	0.06	0.39		0.15	0.27		0.06	0.19	
Clearance Time (s)	5.3	5.0	5.0	5.3	5.0		5.3	5.3		5.3	5.3	
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0		2.0	1.0		2.0	1.0	
Lane Grp Cap (vph)	354	1639	688	199	1453		251	507		102	975	
v/s Ratio Prot	c0.06	c0.21		0.02	0.19		0.05	c0.24		c0.03	0.12	
v/s Ratio Perm			0.03									
v/c Ratio	0.60	0.47	0.06	0.33	0.48		0.34	0.90		0.53	0.63	
Uniform Delay, d1	53.9	25.0	19.2	56.9	28.6		48.3	44.1		57.6	47.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	1.0	0.2	0.4	1.1		0.3	17.7		2.3	1.0	
Delay (s)	55.8	26.0	19.4	57.2	29.8		48.6	61.8		59.9	48.4	
Level of Service	E	C	B	E	C		D	E		E	D	
Approach Delay (s)		31.4			32.1			59.7			49.2	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	126.3	Sum of lost time (s)	20.9
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

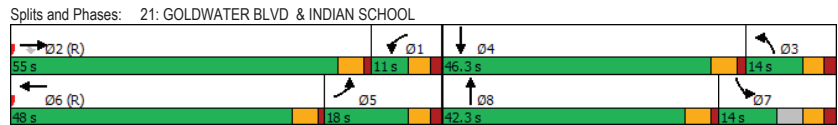
2022 Total AM Mitigated
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	←		→		↖		↗	
Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	11	55	14	46.3	18	48	14	42.3
Maximum Split (%)	8.7%	43.5%	11.1%	36.7%	14.3%	38.0%	11.1%	33.5%
Minimum Split (s)	11	37	11	46.3	11	35	11	42.3
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1	2	1.3	2	1	2	1.3
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	1	2	1	2	1	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		9		8		9
Flash Dont Walk (s)		24		32		22		28
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	75	20	6	86	68	20	2	86
End Time (s)	86	75	20	6	86	68	20	2
Yield/Force Off (s)	80.7	70	14.7	0.7	80.7	63	14.7	123
Yield/Force Off 170(s)	80.7	46	14.7	0.7	80.7	41	14.7	123
Local Start Time (s)	55	0	112.3	66	48	0	108.3	66
Local Yield (s)	60.7	50	121	107	60.7	43	121	103
Local Yield 170(s)	60.7	26	121	107	60.7	21	121	103

Intersection Summary

Cycle Length	126.3
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 20 (16%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	



2022 Total AM Mitigated
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	←		→		↖		↗					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖		↗	↖	↗	↖	↗		↖	↗	
Traffic Volume (vph)	4	6	6	228	12	21	54	263	1	47	347	18
Future Volume (vph)	4	6	6	228	12	21	54	263	1	47	347	18
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		4.9		4.9		4.9		5.2		5.2		5.2
Lane Util. Factor		1.00		0.95		0.95		1.00		0.95		1.00
Frbp, ped/bikes		0.99		1.00		1.00		1.00		1.00		1.00
Flpb, ped/bikes		1.00		1.00		1.00		1.00		1.00		1.00
Frt		0.95		1.00		0.98		1.00		1.00		1.00
Flt Protected		0.99		0.95		0.96		0.95		1.00		0.95
Satd. Flow (prot)		1828		1593		1748		1676		3723		1676
Flt Permitted		0.99		0.95		0.96		0.50		1.00		0.56
Satd. Flow (perm)		1828		1593		1748		878		3723		983
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.82	0.82	0.82	0.87	0.87	0.87
Adj. Flow (vph)	5	8	8	262	14	24	66	321	1	54	399	21
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	21	0	152	143	0	66	322	0	54	418	0
Conf. Peds. (#/hr)			2			3			7			2
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6		6		2
Permitted Phases							6					2
Actuated Green, G (s)		9.2		19.5	19.5		101.1	101.1		101.1		101.1
Effective Green, g (s)		9.2		19.5	19.5		101.1	101.1		101.1		101.1
Actuated g/C Ratio		0.06		0.13	0.13		0.70	0.70		0.70		0.70
Clearance Time (s)		4.9		4.9	4.9		5.2	5.2		5.2		5.2
Vehicle Extension (s)		2.0		2.0	2.0		2.0	2.0		2.0		2.0
Lane Grp Cap (vph)		116		214	235		613	2599		686		3703
v/s Ratio Prot		c0.01		c0.10	0.08			c0.09				0.08
v/s Ratio Perm							0.08			0.05		
v/c Ratio		0.18		0.71	0.61		0.11	0.12		0.08		0.11
Uniform Delay, d1		64.2		59.9	59.0		7.1	7.2		7.0		7.2
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2		0.3		8.9	3.0		0.4	0.1		0.2		0.1
Delay (s)		64.5		68.8	62.1		7.5	7.3		7.2		7.2
Level of Service		E		E	E		A	A		A		A
Approach Delay (s)		64.5			65.5			7.3				7.2
Approach LOS		E			E			A				A

Intersection Summary

HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	144.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

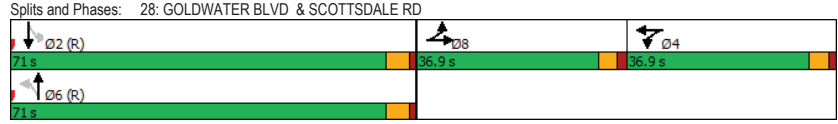
2022 Total AM Mitigated
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

	↓	↘	↑	↗
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	71	36.9	71	36.9
Maximum Split (%)	49.0%	25.5%	49.0%	25.5%
Minimum Split (s)	23.2	36.9	27.2	36.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	8	8	9
Flash Dont Walk (s)	11	24	14	23
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	24	131.9	24	95
End Time (s)	95	24	95	131.9
Yield/Force Off (s)	89.8	19.1	89.8	127
Yield/Force Off 170(s)	78.8	139.9	75.8	104
Local Start Time (s)	0	107.9	0	71
Local Yield (s)	65.8	139.9	65.8	103
Local Yield 170(s)	54.8	115.9	51.8	80

Intersection Summary

Cycle Length	144.8
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 24 (17%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Total AM Mitigated
29: SCOTTSDALE RD & OSBORN RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↖	→	↘	↙	←	↗	↖	↗	↘	↙	↖	↗	↘	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗	↖	↖↗	↖	↖↗		
Traffic Volume (vph)	48	163	81	82	152	86	60	795	103	81	538	18		
Future Volume (vph)	48	163	81	82	152	86	60	795	103	81	538	18		
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800		
Total Lost time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.4			
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.91			
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	1.00			
Ftpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.95		1.00	0.95		1.00	1.00	0.85	1.00	1.00			
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00			
Satd. Flow (prot)	1676	3519		1676	3499		1676	3725	1473	1676	5322			
Flt Permitted	0.41	1.00		0.40	1.00		0.40	1.00	1.00	0.27	1.00			
Satd. Flow (perm)	730	3519		710	3499		713	3725	1473	482	5322			
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.92	0.92			
Adj. Flow (vph)	60	204	101	102	190	108	66	874	113	88	585	20		
RTOR Reduction (vph)	0	60	0	0	78	0	0	0	46	0	2	0		
Lane Group Flow (vph)	60	245	0	103	220	0	66	874	67	88	603	0		
Conf. Peds. (#/hr)			6			6			5			9		
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA			
Protected Phases	3	8		7	4		1	6	6	5	2			
Permitted Phases	8			4			6		6	2				
Actuated Green, G (s)	22.2	17.2		22.2	17.2		76.5	71.4	71.4	76.5	71.4			
Effective Green, g (s)	22.2	17.2		22.2	17.2		76.5	71.4	71.4	76.5	71.4			
Actuated g/C Ratio	0.18	0.14		0.18	0.14		0.64	0.59	0.59	0.64	0.59			
Clearance Time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.4			
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	1.0	1.0	2.0	1.0			
Lane Grp Cap (vph)	174	503		171	501		495	2214	875	357	3163			
v/s Ratio Prot	0.01	0.07		c0.03	0.06		0.01	c0.23		c0.01	0.11			
v/s Ratio Perm	0.05			c0.09			0.08		0.05	0.15				
v/c Ratio	0.34	0.49		0.60	0.44		0.13	0.39	0.08	0.25	0.19			
Uniform Delay, d1	46.6	47.4		49.1	47.0		9.3	12.9	10.3	14.8	11.1			
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	0.4	0.3		4.1	0.2		0.0	0.5	0.2	0.1	0.1			
Delay (s)	47.1	47.7		53.2	47.3		9.3	13.4	10.5	15.0	11.3			
Level of Service	D	D		D	D		A	B	B	B	B			
Approach Delay (s)		47.6			48.8			12.9			11.7			
Approach LOS		D			D			B			B			

Intersection Summary

HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	21.4
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			

c Critical Lane Group

2022 Total PM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	107	148	61	415	172	226	47	1774	376	208	1843	60
Future Volume (vph)	107	148	61	415	172	226	47	1774	376	208	1843	60
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4	5.6	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	0.95	1.00	1.00
Fr	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	1.00	1.00	0.85	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1676	1945	1500	3252	1945	1500	1676	5199	1676	3711	1500	1500
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.06	1.00	0.06	1.00	1.00	1.00
Satd. Flow (perm)	1676	1945	1500	3252	1945	1500	106	5199	106	3711	1500	1500
Peak-hour factor, PHF	0.85	0.85	0.85	0.83	0.83	0.83	0.95	0.95	0.95	0.95	0.95	0.95
12h Flow (vph)	126	174	72	500	207	272	49	1867	396	219	1940	63
RTOR Reduction (vph)	0	0	0	0	0	223	0	19	0	0	0	34
Lane Group Flow (vph)	126	174	72	500	207	49	49	2244	0	219	1940	29
Bus Blockages (#/hr)	0	2	0	0	2	0	0	2	0	0	2	0
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	Perm
Protected Phases	8	8		4	4		1	6	5	2		
Permitted Phases			8			4	6		2		2	
Actuated Green, G (s)	18.9	18.9	18.9	26.3	26.3	26.3	77.8	66.4	77.8	66.4	66.4	66.4
Effective Green, g (s)	18.9	18.9	18.9	26.3	26.3	26.3	77.8	66.4	77.8	66.4	66.4	66.4
Actuated g/C Ratio	0.13	0.13	0.13	0.18	0.18	0.18	0.54	0.46	0.54	0.46	0.46	0.46
Clearance Time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4	5.6	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.2	0.2	2.0	0.2	0.2	0.2
Lane Grp Cap (vph)	218	252	195	588	352	271	179	2375	179	1695	685	685
v/s Ratio Prot	0.08	c0.09		c0.15	0.11		0.02	0.43	c0.10	0.52		
v/s Ratio Perm			0.05			0.03	0.12		c0.55		0.02	
v/c Ratio	0.58	0.69	0.37	0.85	0.59	0.18	0.27	0.94	1.22	1.14	0.04	0.04
Uniform Delay, d1	59.4	60.4	57.8	57.6	54.5	50.4	59.7	37.7	63.3	39.5	21.8	21.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	6.4	0.4	10.9	1.6	0.1	0.3	9.4	140.1	72.6	0.1	0.1
Delay (s)	61.8	66.8	58.2	68.5	56.2	50.5	60.0	47.1	203.4	112.0	22.0	22.0
Level of Service	E	E	E	E	E	D	E	D	F	F	C	C
Approach Delay (s)	63.4			60.9			47.4			118.5		
Approach LOS	E			E			D			F		

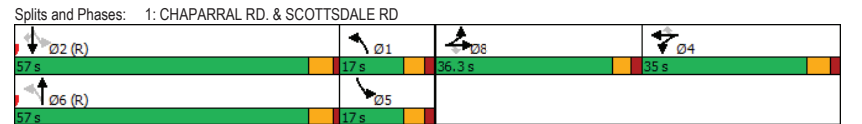
Intersection Summary			
HCM 2000 Control Delay	77.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	145.3	Sum of lost time (s)	22.3
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
Description: Last Update: April 2018			
c Critical Lane Group			

2022 Total PM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag	Lag	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	17	57	35	17	57	36.3
Maximum Split (%)	11.7%	39.2%	24.1%	11.7%	39.2%	25.0%
Minimum Split (s)	11	16	35	11	16	36.3
Yellow Time (s)	3.6	4.4	4	3.6	4.4	3.3
All-Red Time (s)	2	1	2	2	1	2
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	9
Flash Dont Walk (s)		10	22		14	22
Dual Entry	No	Yes	No	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	145	88	53	145	88	16.7
End Time (s)	16.7	145	88	16.7	145	53
Yield/Force Off (s)	11.1	139.6	82	11.1	139.6	47.7
Yield/Force Off 170(s)	11.1	129.6	60	11.1	125.6	25.7
Local Start Time (s)	57	0	110.3	57	0	74
Local Yield (s)	68.4	51.6	139.3	68.4	51.6	105
Local Yield 170(s)	68.4	41.6	117.3	68.4	37.6	83

Intersection Summary	
Cycle Length	145.3
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 88 (61%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Total PM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	151	17	184	17	4	21	43	2094	57	14	899	37
Future Volume (vph)	151	17	184	17	4	21	43	2094	57	14	899	37
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1	5.1	5.6	5.6	5.6	5.6	5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00	0.91
Frbp, ped/bikes	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	1.00	1.00	1.00	1.00	0.99	1.00	0.99
Flt Protected	0.95	1.00	1.00	0.96	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1961	1500	1885	1480	1676	5328	1676	5316	1676	5316	1676
Flt Permitted	0.74	1.00	1.00	0.82	1.00	0.23	1.00	0.04	1.00	0.04	1.00	1.00
Satd. Flow (perm)	1308	1961	1500	1616	1480	403	5328	78	5316	78	5316	1676
Peak-hour factor, PHF	0.81	0.81	0.81	0.86	0.86	0.86	0.90	0.90	0.90	0.83	0.83	0.83
Adj. Flow (vph)	186	21	227	20	5	24	48	2327	63	17	1083	45
RTOR Reduction (vph)	0	0	91	0	0	18	0	2	0	0	2	0
Lane Group Flow (vph)	186	21	136	0	25	6	48	2388	0	17	1126	0
Confl. Peds. (#/hr)						1			2			2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4		4	6		2			
Actuated Green, G (s)	23.5	23.5	23.5		23.5	23.5	92.9	92.9	92.9	92.9		
Effective Green, g (s)	23.5	23.5	23.5		23.5	23.5	92.9	92.9	92.9	92.9		
Actuated g/C Ratio	0.18	0.18	0.18		0.18	0.18	0.73	0.73	0.73	0.73		
Clearance Time (s)	5.1	5.1	5.1		5.1	5.1	5.6	5.6	5.6	5.6		
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0		
Lane Grp Cap (vph)	241	362	277		298	273	294	3894	57	3885		
v/s Ratio Prot		0.01					0.45			0.21		
v/s Ratio Perm	c0.14		0.09		0.02	0.00	0.12		0.22			
v/c Ratio	0.77	0.06	0.49		0.08	0.02	0.16	0.61	0.30	0.29		
Uniform Delay, d1	49.3	42.7	46.4		42.9	42.4	5.2	8.3	5.9	5.8		
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	13.0	0.0	0.5		0.0	0.0	1.2	0.7	12.9	0.2		
Delay (s)	62.3	42.7	46.9		42.9	42.4	6.4	9.1	18.8	6.0		
Level of Service	E	D	D		D	D	A	A	B	A		
Approach Delay (s)		53.3			42.7		9.0		6.2			
Approach LOS		D			D		A		A			

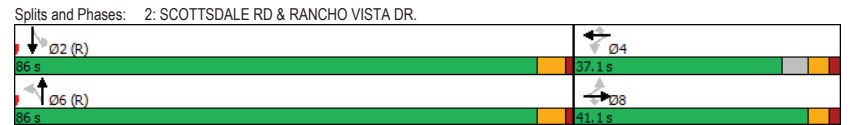
Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	127.1	Sum of lost time (s)	10.7
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Total PM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	86	37.1	86	41.1
Maximum Split (%)	67.7%	29.2%	67.7%	32.3%
Minimum Split (s)	16	37.1	16	41.1
Yellow Time (s)	4.4	3.3	4.4	3.3
All-Red Time (s)	1.2	1.8	1.2	1.8
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	11
Flash Dont Walk (s)	18	25	13	25
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	76	34.9	76	34.9
End Time (s)	34.9	76	34.9	76
Yield/Force Off (s)	29.3	70.9	29.3	70.9
Yield/Force Off 170(s)	11.3	45.9	16.3	45.9
Local Start Time (s)	0	86	0	86
Local Yield (s)	80.4	122	80.4	122
Local Yield 170(s)	62.4	97	67.4	97

Intersection Summary	
Cycle Length	127.1
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 76 (60%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Total PM Southbridge Expansion
 3: SCOTTSDALE RD & HIGHLAND AVE/Granada Ave HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	685	18	49	27	18	37	44	1423	31	13	1110	88
Future Volume (vph)	685	18	49	27	18	37	44	1423	31	13	1110	88
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.90		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3252	1727		1676	1765		1676	5333		1676	5288	
Flt Permitted	0.95	1.00		0.95	1.00		0.14	1.00		0.10	1.00	
Satd. Flow (perm)	3252	1727		1676	1765		246	5333		174	5288	
Peak-hour factor, PHF	0.85	0.85	0.85	0.80	0.80	0.80	0.91	0.91	0.91	0.87	0.87	0.87
Adj. Flow (vph)	806	21	58	34	22	46	48	1564	34	15	1276	101
RTOR Reduction (vph)	0	42	0	0	17	0	0	2	0	0	7	0
Lane Group Flow (vph)	806	37	0	34	52	0	48	1596	0	15	1370	0
Confl. Peds. (#/hr)			2						2			2
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6			2	
Permitted Phases							6			2		
Actuated Green, G (s)	32.5	32.5		6.9	6.9		64.8	64.8		64.8	64.8	
Effective Green, g (s)	32.5	32.5		6.9	6.9		64.8	64.8		64.8	64.8	
Actuated g/C Ratio	0.27	0.27		0.06	0.06		0.54	0.54		0.54	0.54	
Clearance Time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	880	467		96	101		132	2877		93	2853	
v/s Ratio Prot	c0.25	0.02		0.02	c0.03			c0.30			0.26	
v/s Ratio Perm							0.19			0.09		
v/c Ratio	0.92	0.08		0.35	0.52		0.36	0.55		0.16	0.48	
Uniform Delay, d1	42.5	32.6		54.5	55.0		15.8	18.2		13.9	17.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.7	0.0		0.8	1.8		7.6	0.8		3.7	0.6	
Delay (s)	56.2	32.7		55.3	56.8		23.4	18.9		17.6	17.8	
Level of Service	E	C		E	E		C	B		B	B	
Approach Delay (s)		54.1			56.3			19.1			17.8	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	15.9
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		

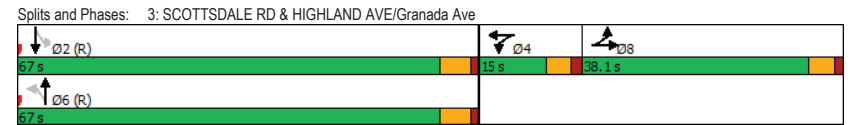
Description: Last Update: Sept 2017

c Critical Lane Group

2022 Total PM Southbridge Expansion
 3: SCOTTSDALE RD & HIGHLAND AVE/Granada Ave Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag	Lead		Lag	
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	67	15	67	38.1
Maximum Split (%)	55.8%	12.5%	55.8%	31.7%
Minimum Split (s)	30.7	13	28.7	38.1
Yellow Time (s)	4.4	3.6	4.4	3.6
All-Red Time (s)	1.3	1.5	1.3	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	1	2	1	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8		7	9
Flash Dont Walk (s)	17		16	24
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	94	40.9	94	55.9
End Time (s)	40.9	55.9	40.9	94
Yield/Force Off (s)	35.2	50.8	35.2	88.9
Yield/Force Off 170(s)	18.2	50.8	19.2	64.9
Local Start Time (s)	0	67	0	82
Local Yield (s)	61.3	76.9	61.3	115
Local Yield 170(s)	44.3	76.9	45.3	91

Intersection Summary	
Cycle Length	120.1
Control Type	Actuated-Coordinated
Natural Cycle	85
Offset: 94 (78%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Total PM
4: Fashion Square Dr & Goldwater Blvd

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

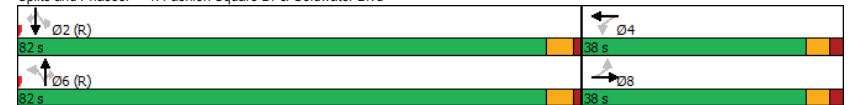
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	67	16	58	87	4	26	34	501	74	29	871	18
Future Volume (vph)	67	16	58	87	4	26	34	501	74	29	871	18
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		5.5		5.5	5.5		5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.91	1.00
Frbp, ped/bikes		0.99		1.00	0.98		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.94		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1796		1676	1676		1676	3725	1460	1676	5353	1466
Flt Permitted		0.83		0.57	1.00		0.29	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)		1530		998	1676		506	3725	1460	792	5353	1466
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	73	17	63	95	4	28	37	545	80	32	947	20
RTOR Reduction (vph)	0	25	0	0	24	0	0	0	17	0	0	4
Lane Group Flow (vph)	0	128	0	95	8	0	37	545	63	32	947	16
Confl. Peds. (#/hr)			2			3			2			1
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		8		4	4		6	6	2		2	2
Permitted Phases	8		4			6		6	2			2
Actuated Green, G (s)	15.5		15.5	15.5		93.8	93.8	93.8	93.8	93.8		93.8
Effective Green, g (s)	15.5		15.5	15.5		93.8	93.8	93.8	93.8	93.8		93.8
Actuated g/C Ratio	0.13		0.13	0.13		0.78	0.78	0.78	0.78	0.78		0.78
Clearance Time (s)	5.5		5.5	5.5		5.2	5.2	5.2	5.2	5.2		5.2
Vehicle Extension (s)	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	197		128	216		395	2911	1141	619	4184		1145
v/s Ratio Prot			0.00			0.15				c0.18		
v/s Ratio Perm	0.08		c0.10			0.07		0.04	0.04			0.01
v/c Ratio	0.65		0.74	0.04		0.09	0.19	0.05	0.05	0.23		0.01
Uniform Delay, d1	49.7		50.3	45.7		3.1	3.4	3.0	3.0	3.5		2.9
Progression Factor	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	7.2		20.5	0.1		0.5	0.1	0.1	0.2	0.1		0.0
Delay (s)	56.8		70.8	45.8		3.6	3.5	3.1	3.1	3.6		2.9
Level of Service	E		E	D		A	A	A	A	A		A
Approach Delay (s)	56.8			64.5			3.4			3.6		
Approach LOS	E			E			A			A		
Intersection Summary												
HCM 2000 Control Delay		11.7				HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio		0.30										
Actuated Cycle Length (s)		120.0				Sum of lost time (s)			10.7			
Intersection Capacity Utilization		53.2%				ICU Level of Service			A			
Analysis Period (min)		15										
c Critical Lane Group												

2022 Total PM
4: Fashion Square Dr & Goldwater Blvd

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	82	38	82	38
Maximum Split (%)	68.3%	31.7%	68.3%	31.7%
Minimum Split (s)	16	21.5	16	21.5
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	2.2	1.2	2.2
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	5
Flash Dont Walk (s)	16	11	10	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	82	0	82
End Time (s)	82	0	82	0
Yield/Force Off (s)	76.8	114.5	76.8	114.5
Yield/Force Off 170(s)	60.8	103.5	66.8	103.5
Local Start Time (s)	0	82	0	82
Local Yield (s)	76.8	114.5	76.8	114.5
Local Yield 170(s)	60.8	103.5	66.8	103.5
Intersection Summary				
Cycle Length	120			
Control Type	Actuated-Coordinated			
Natural Cycle	40			
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				

Split and Phases: 4: Fashion Square Dr & Goldwater Blvd



2022 Total PM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	108	1160	203	216	1603	85	201	325	200	109	199	77
Future Volume (vph)	108	1160	203	216	1603	85	201	325	200	109	199	77
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5223		1676	5309		1676	1961	1460	1676	1961	1500
Flt Permitted	0.11	1.00		0.11	1.00		0.49	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	202	5223		202	5309		861	1961	1460	861	1961	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	1261	221	235	1742	92	218	353	217	118	216	84
RTOR Reduction (vph)	0	23	0	0	5	0	0	0	126	0	0	76
Lane Group Flow (vph)	117	1459	0	235	1829	0	218	353	91	118	216	8
Confl. Peds. (#/hr)			1			2			5			
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	3		4	3		2	1	2	1	1	1
Permitted Phases	3			3			1		1			1
Actuated Green, G (s)	47.0	34.9		47.0	34.9		14.4	8.2	8.2	14.4	8.2	8.2
Effective Green, g (s)	47.0	34.9		47.0	34.9		14.4	8.2	8.2	14.4	8.2	8.2
Actuated g/C Ratio	0.57	0.42		0.57	0.42		0.17	0.10	0.10	0.17	0.10	0.10
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	331	2212		331	2248		211	195	145	211	195	149
v/s Ratio Prot	0.05	0.28		c0.10	c0.34		c0.08	c0.18		0.04	0.11	
v/s Ratio Perm	0.15			0.30			0.10		0.06	0.06		0.01
v/c Ratio	0.35	0.66		0.71	0.81		1.03	1.81	0.63	0.56	1.11	0.06
Uniform Delay, d1	24.7	19.0		23.0	20.9		34.5	37.1	35.6	33.5	37.1	33.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.5		5.6	2.2		70.9	384.2	6.0	1.8	96.3	0.1
Delay (s)	25.0	19.5		28.6	23.1		105.4	421.3	41.6	35.4	133.4	33.7
Level of Service	C	B		C	C		F	F	D	D	F	C
Approach Delay (s)	19.9			23.8			229.3				85.7	
Approach LOS	B			C			F				F	

Intersection Summary			
HCM 2000 Control Delay	61.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	82.4	Sum of lost time (s)	21.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c	Critical Lane Group		

2022 Total PM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4
Movement	NBSB	NBSBL	EBWB	EBWBL
Lead/Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	15	10	56	31
Maximum Split (%)	13.4%	8.9%	50.0%	27.7%
Minimum Split (s)	15	8	56	31
Yellow Time (s)	4.2	3	4.2	3
All-Red Time (s)	2.8	1	1.8	1
Minimum Initial (s)	8	4	10	4
Vehicle Extension (s)	2	1	1	1
Minimum Gap (s)	1	1	1	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	0		33	
Flash Dont Walk (s)	0		17	
Dual Entry	No	No	No	No
Inhibit Max	No	No	No	No
Start Time (s)	0	15	25	81
End Time (s)	15	25	81	0
Yield/Force Off (s)	8	21	75	108
Yield/Force Off 170(s)	8	21	58	108
Local Start Time (s)	97	0	10	66
Local Yield (s)	105	6	60	93
Local Yield 170(s)	105	6	43	93

Intersection Summary	
Cycle Length	112
Control Type	Actuated-Uncoordinated
Natural Cycle	120

Splits and Phases: 5: 68th Street & CAMELBACK RD.



2022 Total PM
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔↔	↔↔	↔	↔↔	↔↔↔	↔
Traffic Volume (vph)	245	1057	244	58	1115	107	277	246	106	80	456	523
Future Volume (vph)	245	1057	244	58	1115	107	277	246	106	80	456	523
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	0.97	0.91	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5353	1479	1676	5276		3252	3725	1491	3252	5353	1491
Flt Permitted	0.12	1.00	1.00	0.12	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	209	5353	1479	209	5276		3252	3725	1491	3252	5353	1491
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95	0.88	0.88	0.88
Adj. Flow (vph)	266	1149	265	63	1212	116	292	259	112	91	518	594
RTOR Reduction (vph)	0	0	125	0	9	0	0	0	44	0	0	72
Lane Group Flow (vph)	266	1149	140	63	1319	0	292	259	68	91	518	522
Confl. Peds. (#/hr)			2			3			2			1
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	3	8		7	4		1	6	7	5	2	3
Permitted Phases	8		8	4					6			2
Actuated Green, G (s)	60.4	33.8	33.8	60.4	33.8		14.3	20.6	47.2	17.4	23.7	50.3
Effective Green, g (s)	60.4	33.8	33.8	60.4	33.8		14.3	20.6	47.2	17.4	23.7	50.3
Actuated g/C Ratio	0.50	0.28	0.28	0.50	0.28		0.12	0.17	0.39	0.14	0.20	0.42
Clearance Time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	428	1500	414	428	1478		385	636	652	469	1051	691
v/s Ratio Prot	0.14	0.21		0.03	0.25		0.09	0.07	0.02	0.03	0.10	0.17
v/s Ratio Perm	0.17		0.10	0.04					0.02			0.18
v/c Ratio	0.62	0.77	0.34	0.15	0.89		0.76	0.41	0.10	0.19	0.49	0.76
Uniform Delay, d1	37.4	39.8	34.5	30.8	41.7		51.5	44.6	23.3	45.4	43.1	29.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	2.2	0.2	0.1	7.1		7.4	1.9	0.0	0.1	1.7	4.2
Delay (s)	39.4	41.9	34.7	30.8	48.7		58.9	46.5	23.3	45.5	44.8	34.1
Level of Service	D	D	C	C	D		E	D	C	D	D	C
Approach Delay (s)		40.4			47.9			48.0			39.6	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	43.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.6	Sum of lost time (s)	22.2
Intersection Capacity Utilization	96.2%	ICU Level of Service	F
Analysis Period (min)	15		

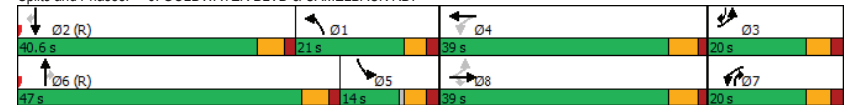
Description: Last Update: Sept 2017
c Critical Lane Group

2022 Total PM
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBTL	SBL	NBT	WBL	EBTL
Lead/Lag	Lag	Lead			Lag	Lead		
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Ped	None	C-Min	None	Ped
Maximum Split (s)	21	40.6	20	39	14	47	20	39
Maximum Split (%)	17.4%	33.7%	16.6%	32.3%	11.6%	39.0%	16.6%	32.3%
Minimum Split (s)	11	40.6	11	31	11	35.6	11	33
Yellow Time (s)	3.3	4	3.6	4.4	3.3	4	3.6	4.4
All-Red Time (s)	2	1.6	2	1.3	2	1.6	2	1.3
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	1	2	2	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		7		7		7
Flash Dont Walk (s)		27		24		23		26
Dual Entry	No	Yes	Yes	No	No	Yes	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	88.6	48	28	109.6	95	48	28	109.6
End Time (s)	109.6	88.6	48	28	109.6	95	48	28
Yield/Force Off (s)	104.3	83	42.4	22.3	104.3	89.4	42.4	22.3
Yield/Force Off 170(s)	104.3	56	42.4	118.9	104.3	66.4	42.4	116.9
Local Start Time (s)	40.6	0	100.6	61.6	47	0	100.6	61.6
Local Yield (s)	56.3	35	115	94.9	56.3	41.4	115	94.9
Local Yield 170(s)	56.3	8	115	70.9	56.3	18.4	115	68.9

Splits and Phases: 6: GOLDWATER BLVD & CAMELBACK RD.



2022 Total PM
7: CAMELBACK RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	201	622	284	107	635	187	342	958	106	354	710	212
Future Volume (vph)	201	622	284	107	635	187	342	958	106	354	710	212
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.91		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3252	3725	1482	1676	3579		3252	5260		3252	3725	1466
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3252	3725	1482	1676	3579		3252	5260		3252	3725	1466
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.86	0.86	0.88	0.88	0.88	0.95	0.95	0.95
Adj. Flow (vph)	218	676	309	124	738	217	389	1089	120	373	747	223
RTOR Reduction (vph)	0	0	72	0	23	0	0	10	0	0	0	157
Lane Group Flow (vph)	218	676	237	124	932	0	389	1199	0	373	747	66
Confl. Peds. (#/hr)	8			12			10			8		
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8	1	7	4		1	6		5	2	
Permitted Phases	8			7			6			2		
Actuated Green, G (s)	11.9	27.0	47.7	18.5	33.6		20.7	36.4		17.2	33.1	33.1
Effective Green, g (s)	11.9	27.0	47.7	18.5	33.6		20.7	36.4		17.2	33.1	33.1
Actuated g/C Ratio	0.10	0.22	0.40	0.15	0.28		0.17	0.30		0.14	0.27	0.27
Clearance Time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	321	834	648	257	997		558	1588		464	1023	402
v/s Ratio Prot	c0.07	0.18	0.06	0.07	c0.26		0.12	c0.23		0.11	c0.20	
v/s Ratio Perm	0.10									0.05		
v/c Ratio	0.68	0.81	0.36	0.48	0.93		0.70	0.75		0.80	0.73	0.17
Uniform Delay, d1	52.5	44.3	25.7	46.6	42.4		47.0	38.0		50.0	39.6	33.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.4	5.7	0.1	0.5	15.0		3.1	3.4		9.2	4.6	0.9
Delay (s)	56.9	50.0	25.8	47.1	57.3		50.0	41.4		59.2	44.2	34.1
Level of Service	E	D	C	D	E		D	D		E	D	C
Approach Delay (s)	45.1			56.2			43.5			46.7		
Approach LOS	D			E			D			D		

Intersection Summary			
HCM 2000 Control Delay	47.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.5	Sum of lost time (s)	21.4
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		

Description: Last Update: Sept 2017
c Critical Lane Group

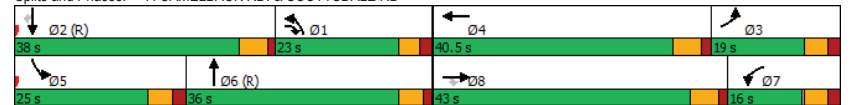
2022 Total PM
7: CAMELBACK RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBT	SBL	NBT	WBL	EBT
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	23	38	19	40.5	25	36	16	43
Maximum Split (%)	19.1%	31.5%	15.8%	33.6%	20.7%	29.9%	13.3%	35.7%
Minimum Split (s)	10	32.4	11	40.5	11	33	11	34.5
Yellow Time (s)	3	4.4	3.3	4	3.6	3.6	3.3	4
All-Red Time (s)	2	1	2	1.5	2	1.4	2	1.5
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)	4		4		4		4	
Flash Dont Walk (s)	23		31		24		25	
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	78	40	21	101	40	65	23.5	101
End Time (s)	101	78	40	21	65	101	40	23.5
Yield/Force Off (s)	96	72.6	34.7	15.5	59.4	96	34.7	18
Yield/Force Off 170(s)	96	49.6	34.7	105	59.4	72	34.7	113.5
Local Start Time (s)	38	0	101.5	61	0	25	104	61
Local Yield (s)	56	32.6	115.2	96	19.4	56	115.2	98.5
Local Yield 170(s)	56	9.6	115.2	65	19.4	32	115.2	73.5

Intersection Summary	
Cycle Length	120.5
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 40 (33%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green	

Splits and Phases: 7: CAMELBACK RD. & SCOTTSDALE RD



2022 Total PM Southbridge Expansion
 8: SCOTTSDALE RD & Stetson Dr/DRINKWATER BLVD HCM Signalized Intersection Capacity Analysis

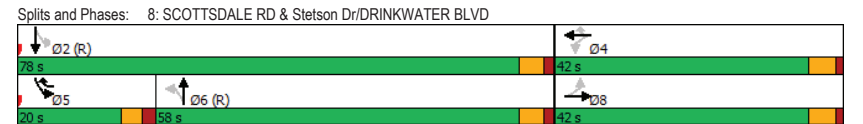
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	128	27	38	97	40	479	22	811	27	249	714	119
Future Volume (vph)	128	27	38	97	40	479	22	811	27	249	714	119
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2	5.0	5.1	5.1		5.0	5.1	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1767		1676	1961	1444	1676	3704		3252	3577	
Flt Permitted	0.72	1.00		0.71	1.00	1.00	0.32	1.00		0.20	1.00	
Satd. Flow (perm)	1278	1767		1247	1961	1444	566	3704		700	3577	
Peak-hour factor, PHF	0.84	0.84	0.84	0.80	0.80	0.80	0.85	0.85	0.85	0.94	0.94	0.94
Adj. Flow (vph)	152	32	45	121	50	599	26	954	32	265	760	127
RTOR Reduction (vph)	0	0	0	0	0	37	0	2	0	0	9	0
Lane Group Flow (vph)	152	77	0	121	50	562	26	984	0	265	878	0
Confl. Peds. (#/hr)			7			35			18			30
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		8			4	5		6		5	2	
Permitted Phases	8			4		4		6		2		
Actuated Green, G (s)	27.7	27.7		27.7	27.7	37.7		67.0		82.0	82.0	
Effective Green, g (s)	27.7	27.7		27.7	27.7	37.7		67.0		82.0	82.0	
Actuated g/C Ratio	0.23	0.23		0.23	0.23	0.31		0.56		0.68	0.68	
Clearance Time (s)	5.2	5.2		5.2	5.2	5.0		5.1		5.0	5.1	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0		2.0	2.0	
Lane Grp Cap (vph)	295	407		287	452	453		2068		691	2444	
v/s Ratio Prot		0.04			0.03	c0.10		c0.27		0.03	0.25	
v/s Ratio Perm	0.12			0.10		0.29		0.05		0.23		
v/c Ratio	0.52	0.19		0.42	0.11	1.24		0.08		0.38	0.36	
Uniform Delay, d1	40.3	37.1		39.3	36.4	41.1		12.3		9.1	8.0	
Progression Factor	1.00	1.00		1.06	1.10	0.85		1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.1		0.4	0.0	125.7		0.5		0.1	0.4	
Delay (s)	40.9	37.2		42.1	40.2	160.8		12.8		9.3	8.4	
Level of Service	D	D		D	D	F		B		A	A	
Approach Delay (s)		39.7			134.3			16.6			8.6	
Approach LOS		D			F			B			A	

Intersection Summary			
HCM 2000 Control Delay	44.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Total PM Southbridge Expansion
 8: SCOTTSDALE RD & Stetson Dr/DRINKWATER BLVD Timing Report, Sorted By Phase

Phase Number	2	4	5	6	8
Movement	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag		Lead	Lag		
Lead-Lag Optimize					
Recall Mode	C-Min	None	None	C-Min	None
Maximum Split (s)	78	42	20	58	42
Maximum Split (%)	65.0%	35.0%	16.7%	48.3%	35.0%
Minimum Split (s)	21.1	37.2	15	38.1	33.2
Yellow Time (s)	3.6	4	3	3.6	4
All-Red Time (s)	1.5	1.2	2	1.5	1.2
Minimum Initial (s)	10	7	10	10	7
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	9	9		9	7
Flash Dont Walk (s)	7	23		24	21
Dual Entry	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	44	2	44	64	2
End Time (s)	2	44	64	2	44
Yield/Force Off (s)	116.9	38.8	59	116.9	38.8
Yield/Force Off 170(s)	109.9	15.8	59	92.9	17.8
Local Start Time (s)	0	78	0	20	78
Local Yield (s)	72.9	114.8	15	72.9	114.8
Local Yield 170(s)	65.9	91.8	15	48.9	93.8

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 44 (37%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Total PM Southbridge Expansion
 9: GOLDWATER BLVD /GOLDWATER BLVD #2 & 5TH AVE HCM Signalized Intersection Capacity Analysis

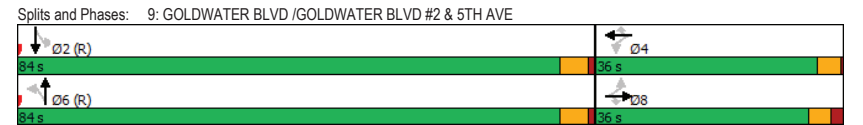
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	36	20	27	71	46	93	20	628	63	61	676	78
Future Volume (vph)	36	20	27	71	46	93	20	628	63	61	676	78
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2	5.2	4.0	4.0	4.0	5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.91	1.00	0.91
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	1.00	0.98	1.00	0.98
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1676	1961	1478	1676	1961	1472	1676	3672	1676	5256	1676	5256
Flt Permitted	0.72	1.00	1.00	0.74	1.00	1.00	0.31	1.00	0.33	1.00	0.33	1.00
Satd. Flow (perm)	1278	1961	1478	1311	1961	1472	543	3672	574	5256	574	5256
Peak-hour factor, PHF	0.80	0.92	0.80	0.92	0.92	0.92	0.81	0.81	0.92	0.92	0.85	0.85
Adj. Flow (vph)	45	22	34	77	50	101	25	775	68	66	795	92
RTOR Reduction (vph)	0	0	30	0	0	88	0	3	0	0	7	0
Lane Group Flow (vph)	45	22	4	77	50	13	25	840	0	66	880	0
Confl. Peds. (#/hr)			2			3			3			2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4		4	6		2			
Actuated Green, G (s)	13.9	13.9	13.9	15.1	15.1	15.1	95.7	95.7	95.7	95.7	95.7	95.7
Effective Green, g (s)	13.9	13.9	13.9	15.1	15.1	15.1	95.7	95.7	95.7	95.7	95.7	95.7
Actuated g/C Ratio	0.12	0.12	0.12	0.13	0.13	0.13	0.80	0.80	0.80	0.80	0.80	0.80
Clearance Time (s)	5.2	5.2	5.2	4.0	4.0	4.0	5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	148	227	171	164	246	185	433	2928	457	4191	457	4191
v/s Ratio Prot		0.01			0.03			0.23			0.17	
v/s Ratio Perm	0.04		0.00	0.06		0.01	0.05		0.11			
v/c Ratio	0.30	0.10	0.02	0.47	0.20	0.07	0.06	0.29	0.14	0.21	0.14	0.21
Uniform Delay, d1	48.6	47.4	47.0	48.7	47.1	46.2	2.6	3.2	2.8	3.0	2.8	3.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	2.21	2.11	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1	0.0	2.1	0.4	0.2	0.2	0.2	0.7	0.1	0.7	0.1
Delay (s)	49.0	47.5	47.1	50.8	47.5	46.4	6.0	7.0	3.4	3.1	3.4	3.1
Level of Service	D	D	D	D	D	D	A	A	A	A	A	A
Approach Delay (s)		48.0			48.1			6.9			3.1	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.4
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Total PM Southbridge Expansion
 9: GOLDWATER BLVD /GOLDWATER BLVD #2 & 5TH AVE Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	84	36	84	36
Maximum Split (%)	70.0%	30.0%	70.0%	30.0%
Minimum Split (s)	16	20	16	34.2
Yellow Time (s)	4	3.5	4	3.3
All-Red Time (s)	1.2	0.5	1.2	1.9
Minimum Initial (s)	10	4	10	7
Vehicle Extension (s)	2	3	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	8
Flash Dont Walk (s)	14	11	11	21
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	110	74	110	74
End Time (s)	74	110	74	110
Yield/Force Off (s)	68.8	106	68.8	104.8
Yield/Force Off 170(s)	54.8	95	57.8	83.8
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.8	116	78.8	114.8
Local Yield 170(s)	64.8	105	67.8	93.8

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 110 (92%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



Intersection			
Intersection Delay, s/veh	3.5		
Intersection LOS	A		
Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	94	160	69
Demand Flow Rate, veh/h	95	163	70
Vehicles Circulating, veh/h	10	21	74
Vehicles Exiting, veh/h	174	123	31
Ped Vol Crossing Leg, #/h	0	2	3
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.2	3.7	3.3
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	95	163	70
Cap Entry Lane, veh/h	1366	1351	1280
Entry HV Adj Factor	0.985	0.982	0.986
Flow Entry, veh/h	94	160	69
Cap Entry, veh/h	1345	1325	1261
V/C Ratio	0.070	0.121	0.055
Control Delay, s/veh	3.2	3.7	3.3
LOS	A	A	A
95th %tile Queue, veh	0	0	0

Intersection						
Intersection Delay, s/veh	7.8					
Intersection LOS	A					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	67	19	9	138	19	44
Future Vol, veh/h	67	19	9	138	19	44
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	73	21	10	150	21	48
Number of Lanes	1	0	0	1	1	0
Approach	EB	WB	NB			
Opposing Approach	WB	EB				
Opposing Lanes	1	1	0			
Conflicting Approach Left			NB	EB		
Conflicting Lanes Left	0		1	1		
Conflicting Approach Right	NB		WB			
Conflicting Lanes Right	1	0	1			
HCM Control Delay	7.6	8.1	7.5			
HCM LOS	A	A	A			
Lane	NBLn1	EBLn1	WBLn1	NBLn1		
Vol Left, %	30%	0%	6%			
Vol Thru, %	0%	78%	94%			
Vol Right, %	70%	22%	0%			
Sign Control	Stop	Stop	Stop			
Traffic Vol by Lane	63	86	147			
LT Vol	19	0	9			
Through Vol	0	67	138			
RT Vol	44	19	0			
Lane Flow Rate	68	93	160			
Geometry Grp	1	1	1			
Degree of Util (X)	0.078	0.105	0.184			
Departure Headway (Hd)	4.125	4.043	4.138			
Convergence, Y/N	Yes	Yes	Yes			
Cap	874	877	861			
Service Time	2.125	2.114	2.191			
HCM Lane V/C Ratio	0.078	0.106	0.186			
HCM Control Delay	7.5	7.6	8.1			
HCM Lane LOS	A	A	A			
HCM 95th-tile Q	0.3	0.4	0.7			

Intersection						
Intersection Delay, s/veh	8					
Intersection LOS	A					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	63	59	51	33	47	87
Future Vol, veh/h	63	59	51	33	47	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	68	64	55	36	51	95
Number of Lanes	0	1	1	0	1	0
Approach	EB	WB		SB		
Opposing Approach	WB	EB				
Opposing Lanes	1	1		0		
Conflicting Approach Left	SB			WB		
Conflicting Lanes Left	1	0		1		
Conflicting Approach Right		SB		EB		
Conflicting Lanes Right	0	1		1		
HCM Control Delay	8.3	7.7		7.9		
HCM LOS	A	A		A		
Lane	EBLn1	WBLn1	SBLn1			
Vol Left, %	52%	0%	35%			
Vol Thru, %	48%	61%	0%			
Vol Right, %	0%	39%	65%			
Sign Control	Stop	Stop	Stop			
Traffic Vol by Lane	122	84	134			
LT Vol	63	0	47			
Through Vol	59	51	0			
RT Vol	0	33	87			
Lane Flow Rate	133	91	146			
Geometry Grp	1	1	1			
Degree of Util (X)	0.161	0.106	0.167			
Departure Headway (Hd)	4.364	4.162	4.118			
Convergence, Y/N	Yes	Yes	Yes			
Cap	809	865	875			
Service Time	2.463	2.172	2.123			
HCM Lane V/C Ratio	0.164	0.105	0.167			
HCM Control Delay	8.3	7.7	7.9			
HCM Lane LOS	A	A	A			
HCM 95th-tile Q	0.6	0.4	0.6			

Intersection						
Int Delay, s/veh	2.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	88	15	17	61	17	26
Future Vol, veh/h	88	15	17	61	17	26
Conflicting Peds, #/hr	0	14	0	0	0	6
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	96	16	18	66	18	28
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	126	0	220	124
Stage 1	-	-	-	-	118	-
Stage 2	-	-	-	-	102	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1460	-	768	927
Stage 1	-	-	-	-	907	-
Stage 2	-	-	-	-	922	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1443	-	749	912
Mov Cap-2 Maneuver	-	-	-	-	749	-
Stage 1	-	-	-	-	884	-
Stage 2	-	-	-	-	922	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	1.6	9.5			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	840	-	-	1443	-	
HCM Lane V/C Ratio	0.056	-	-	0.013	-	
HCM Control Delay (s)	9.5	-	-	7.5	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

2022 Total PM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (vph)	84	24	145	63	26	21	105	743	16	49	760	93
Future Volume (vph)	84	24	145	63	26	21	105	743	16	49	760	93
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		4.0		4.0	4.0		5.0	4.8		5.0	4.8	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.98		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.92		1.00	0.93		1.00	1.00		1.00	0.98	
Flt Protected		0.98		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1753		1676	1810		1676	3711		1676	3642	
Flt Permitted		0.88		0.52	1.00		0.16	1.00		0.21	1.00	
Satd. Flow (perm)		1572		913	1810		286	3711		374	3642	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	91	26	158	68	28	23	114	808	17	53	826	101
RTOR Reduction (vph)	0	25	0	0	15	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	250	0	68	36	0	114	824	0	53	923	0
Confl. Peds. (#/hr)			11			8			12			21
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			4		2	1		2	1	
Permitted Phases	4			4			1			1		
Actuated Green, G (s)		20.5		20.5	20.5		35.5	25.0		35.5	25.0	
Effective Green, g (s)		20.5		20.5	20.5		35.5	25.0		35.5	25.0	
Actuated g/C Ratio		0.29		0.29	0.29		0.51	0.36		0.51	0.36	
Clearance Time (s)		4.0		4.0	4.0		5.0	4.8		5.0	4.8	
Vehicle Extension (s)		3.0		3.0	3.0		1.0	0.2		1.0	0.2	
Lane Grp Cap (vph)		461		268	531		354	1329		386	1304	
v/s Ratio Prot				0.02			c0.05	0.22		0.02	c0.25	
v/s Ratio Perm		c0.16		0.07			0.12			0.05		
v/c Ratio		0.54		0.25	0.07		0.32	0.62		0.14	0.71	
Uniform Delay, d1		20.7		18.8	17.8		10.3	18.5		9.4	19.3	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.3		0.5	0.1		0.2	0.7		0.1	1.5	
Delay (s)		22.0		19.3	17.8		10.5	19.1		9.5	20.7	
Level of Service		C		B	B		B	B		A	C	
Approach Delay (s)		22.0			18.7			18.1			20.1	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	69.8	Sum of lost time (s)	13.8
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		
c	Critical Lane Group		

2022 Total PM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	4
Movement	NBSB	NBSBL	EBWB
Lead/Lag	Lag	Lead	
Lead-Lag Optimize			
Recall Mode	Ped	None	None
Maximum Split (s)	68	68	58
Maximum Split (%)	35.1%	35.1%	29.9%
Minimum Split (s)	30	30	20
Yellow Time (s)	3.2	3.2	3.5
All-Red Time (s)	1.6	1.8	0.5
Minimum Initial (s)	10	10	4
Vehicle Extension (s)	0.2	1	3
Minimum Gap (s)	0.2	0.2	1
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)	10		5
Flash Dont Walk (s)	10		11
Dual Entry	No	No	Yes
Inhibit Max	No	No	Yes
Start Time (s)	68	0	136
End Time (s)	136	68	0
Yield/Force Off (s)	131.2	63	190
Yield/Force Off 170(s)	121.2	63	179
Local Start Time (s)	68	0	136
Local Yield (s)	131.2	63	190
Local Yield 170(s)	121.2	63	179

Intersection Summary			
Cycle Length	194		
Control Type	Semi Act-Uncoord		
Natural Cycle	80		

Splits and Phases: 13: SCOTTSDALE RD & 5TH AVE.



2022 Total PM Southbridge Expansion
 14: DRINKWATER BLVD/DRINKWATER BLVD & 5TH AVE./STETSON DR Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	22	42	50	111	76	97	54	512	79	44	262	30
Future Volume (vph)	22	42	50	111	76	97	54	512	79	44	262	30
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.95	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.92		1.00	0.92		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	1785		1676	1776		1676	3725	1424	1676	3659	
Flt Permitted	0.41	1.00		0.64	1.00		0.54	1.00	1.00	0.43	1.00	
Satd. Flow (perm)	722	1785		1121	1776		958	3725	1424	766	3659	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.95	0.95	0.95	0.84	0.84	0.84
Adj. Flow (vph)	28	52	62	139	95	121	57	539	83	52	312	36
RTOR Reduction (vph)	0	40	0	0	43	0	0	0	29	0	5	0
Lane Group Flow (vph)	28	76	0	139	173	0	57	539	54	52	343	0
Confl. Peds. (#/hr)			4			7			10			6
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	23.7	23.7		23.7	23.7		81.7	77.7	77.7	81.7	77.7	
Effective Green, g (s)	23.7	23.7		23.7	23.7		81.7	77.7	77.7	81.7	77.7	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.68	0.65	0.65	0.68	0.65	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	0.2	0.2	2.0	0.2	
Lane Grp Cap (vph)	142	352		221	350		676	2411	922	551	2369	
v/s Ratio Prot		0.04			0.10		0.00	c0.14		c0.00	0.09	
v/s Ratio Perm	0.04			c0.12			0.05		0.04	0.06		
v/c Ratio	0.20	0.22		0.63	0.49		0.08	0.22	0.06	0.09	0.14	
Uniform Delay, d1	40.2	40.4		44.1	42.8		6.5	8.7	7.7	7.6	8.2	
Progression Factor	1.00	1.00		1.00	1.00		1.47	1.20	2.73	0.89	0.90	
Incremental Delay, d2	0.2	0.1		4.0	0.4		0.0	0.2	0.1	0.0	0.1	
Delay (s)	40.5	40.5		48.1	43.2		9.6	10.7	21.3	6.7	7.6	
Level of Service	D	D		D	D		A	B	C	A	A	
Approach Delay (s)		40.5			45.1			11.9			7.4	
Approach LOS		D			D			B			A	

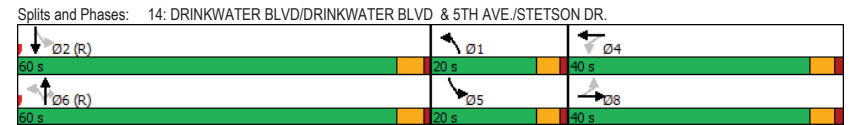
Intersection Summary			
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		

Description: Last Update: Sept 2017
 c Critical Lane Group

2022 Total PM Southbridge Expansion
 14: DRINKWATER BLVD/DRINKWATER BLVD & 5TH AVE./STETSON DR Report, Sorted By Phase

Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag						
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	20	60	40	20	60	40
Maximum Split (%)	16.7%	50.0%	33.3%	16.7%	50.0%	33.3%
Minimum Split (s)	11	16	36	11	16	35
Yellow Time (s)	3.3	4	3.5	3.3	4	3.5
All-Red Time (s)	1.3	1	1.5	1.3	1	1.5
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	8		7	7
Flash Dont Walk (s)		13	23		12	23
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	110	50	10	110	50	10
End Time (s)	10	110	50	10	110	50
Yield/Force Off (s)	5.4	105	45	5.4	105	45
Yield/Force Off 170(s)	5.4	92	22	5.4	93	22
Local Start Time (s)	60	0	80	60	0	80
Local Yield (s)	75.4	55	115	75.4	55	115
Local Yield 170(s)	75.4	42	92	75.4	43	92

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 50 (42%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Total PM
15: GOLDWATER BLVD & 3rd Ave

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↔
Traffic Vol, veh/h	31	83	635	15	18	760
Future Vol, veh/h	31	83	635	15	18	760
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	90	690	16	20	826
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1068	353	0	0	706	0
Stage 1	698	-	-	-	-	-
Stage 2	370	-	-	-	-	-
Critical Hdwy	6.29	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.67	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	249	643	-	-	888	-
Stage 1	442	-	-	-	-	-
Stage 2	633	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	243	643	-	-	888	-
Mov Cap-2 Maneuver	336	-	-	-	-	-
Stage 1	432	-	-	-	-	-
Stage 2	633	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	14.2	0	0.2			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	515	888	-	-
HCM Lane V/C Ratio	-	-	0.241	0.022	-	-
HCM Control Delay (s)	-	-	14.2	9.1	-	-
HCM Lane LOS	-	-	B	A	-	-
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-	-

2022 Total PM
16: 3rd Ave & Marshall Way

Southbridge Expansion
HCM 6th ATWC

Intersection												
Intersection Delay, s/veh	7.8											
Intersection LOS	A											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	36	10	35	87	5	10	38	22	5	18	11
Future Vol, veh/h	3	36	10	35	87	5	10	38	22	5	18	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	39	11	38	95	5	11	41	24	5	20	12
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB	WB	NB	SB								
Opposing Approach	WB	EB	SB	NB								
Opposing Lanes	1	1	1	1								
Conflicting Approach Left	SB	NB	EB	WB								
Conflicting Lanes Left	1	1	1	1								
Conflicting Approach Right	NB	SB	WB	EB								
Conflicting Lanes Right	1	1	1	1								
HCM Control Delay	7.5	8.1	7.7	7.5								
HCM LOS	A	A	A	A								
Lane	NBLn1	EBLn1	WBLn1	SBLn1								
Vol Left, %	14%	6%	28%	15%								
Vol Thru, %	54%	73%	69%	53%								
Vol Right, %	31%	20%	4%	32%								
Sign Control	Stop	Stop	Stop	Stop								
Traffic Vol by Lane	70	49	127	34								
LT Vol	10	3	35	5								
Through Vol	38	36	87	18								
RT Vol	22	10	5	11								
Lane Flow Rate	76	53	138	37								
Geometry Grp	1	1	1	1								
Degree of Util (X)	0.09	0.061	0.161	0.044								
Departure Headway (Hd)	4.242	4.128	4.203	4.279								
Convergence, Y/N	Yes	Yes	Yes	Yes								
Cap	850	853	843	841								
Service Time	2.243	2.227	2.28	2.281								
HCM Lane V/C Ratio	0.089	0.062	0.164	0.044								
HCM Control Delay	7.7	7.5	8.1	7.5								
HCM Lane LOS	A	A	A	A								
HCM 95th-tile Q	0.3	0.2	0.6	0.1								

2022 Total PM
17: 3rd Ave & Craftsman Ct

Southbridge Expansion
HCM 6th WSC

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	26	59	94	17	21	25
Future Vol, veh/h	26	59	94	17	21	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	64	102	18	23	27
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	120	0	0	231	111	
Stage 1	-	-	-	111	-	
Stage 2	-	-	-	120	-	
Critical Hdwy	4.12	-	-	6.42	6.22	
Critical Hdwy Stg 1	-	-	-	5.42	-	
Critical Hdwy Stg 2	-	-	-	5.42	-	
Follow-up Hdwy	2,218	-	-	3,518	3,318	
Pot Cap-1 Maneuver	1468	-	-	757	942	
Stage 1	-	-	-	914	-	
Stage 2	-	-	-	905	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	1468	-	-	742	942	
Mov Cap-2 Maneuver	-	-	-	742	-	
Stage 1	-	-	-	896	-	
Stage 2	-	-	-	905	-	
Approach	EB	WB	SB			
HCM Control Delay, s	2.3	0	9.6			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBR
Capacity (veh/h)	1468	-	-	-	839	
HCM Lane V/C Ratio	0.019	-	-	-	0.06	
HCM Control Delay (s)	7.5	0	-	-	9.6	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	

2022 Total PM
18: SCOTTSDALE RD & 3RD AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	59	27	106	65	55	196	63	634	28	34	865	52
Future Volume (vph)	59	27	106	65	55	196	63	634	28	34	865	52
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Ftbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.88		1.00	0.88		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1703		1676	1707		1676	3697		1676	3725	1462
Flt Permitted	0.45	1.00		0.67	1.00		0.28	1.00		0.38	1.00	1.00
Satd. Flow (perm)	792	1703		1174	1707		498	3697		666	3725	1462
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	29	115	71	60	213	68	689	30	37	940	57
RTOR Reduction (vph)	0	59	0	0	118	0	0	3	0	0	0	18
Lane Group Flow (vph)	64	85	0	71	155	0	68	716	0	37	940	39
Conf. Peds. (#/hr)	8			11			15			7		
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	3			3			1			1		
Permitted Phases	3			3			1			1		
Actuated Green, G (s)	9.0	9.0		9.0	9.0		30.1	30.1		30.1	30.1	30.1
Effective Green, g (s)	9.0	9.0		9.0	9.0		30.1	30.1		30.1	30.1	30.1
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.61	0.61		0.61	0.61	0.61
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	145	312		215	312		305	2266		408	2283	896
v/s Ratio Prot	0.05			c0.09			0.19			c0.25		
v/s Ratio Perm	0.08			0.06			0.14			0.06		0.03
v/c Ratio	0.44	0.27		0.33	0.50		0.22	0.32		0.09	0.41	0.04
Uniform Delay, d1	17.8	17.2		17.4	18.0		4.3	4.6		3.9	4.9	3.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	0.2		0.3	0.5		0.1	0.0		0.0	0.0	0.0
Delay (s)	18.6	17.4		17.8	18.5		4.4	4.6		3.9	5.0	3.8
Level of Service	B	B		B	B		A	A		A	A	A
Approach Delay (s)	17.8			18.3			4.6			4.9		
Approach LOS	B			B			A			A		
Intersection Summary												
HCM 2000 Control Delay	7.8			HCM 2000 Level of Service			A					
HCM 2000 Volume to Capacity ratio	0.43											
Actuated Cycle Length (s)	49.1			Sum of lost time (s)			10.0					
Intersection Capacity Utilization	71.9%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

2022 Total PM
18: SCOTTSDALE RD & 3RD AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

	1	3
Phase Number	1	3
Movement	NBSB	EBWB
Lead/Lag		
Lead-Lag Optimize		
Recall Mode	Ped	None
Maximum Split (s)	36.9	31.1
Maximum Split (%)	54.3%	45.7%
Minimum Split (s)	35	31.1
Yellow Time (s)	3.2	3
All-Red Time (s)	1.8	2
Minimum Initial (s)	10	6
Vehicle Extension (s)	0.2	2
Minimum Gap (s)	1	2
Time Before Reduce (s)	0	0
Time To Reduce (s)	0	0
Walk Time (s)	18	5
Flash Dont Walk (s)	12	20
Dual Entry	No	No
Inhibit Max	No	No
Start Time (s)	0	36.9
End Time (s)	36.9	0
Yield/Force Off (s)	31.9	63
Yield/Force Off 170(s)	19.9	43
Local Start Time (s)	0	36.9
Local Yield (s)	31.9	63
Local Yield 170(s)	19.9	43

Intersection Summary	
Cycle Length	68
Control Type	Semi Act-Uncoord
Natural Cycle	70

Splits and Phases: 18: SCOTTSDALE RD & 3RD AVE.



2022 Total PM
19: DRINKWATER BLVD /DRINKWATER BLVD & 3RD AVE. HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	41	15	90	65	16	50	91	554	114	63	491	34
Future Volume (vph)	41	15	90	65	16	50	91	554	114	63	491	34
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99			0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87			0.95		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1689			1804		1676	5196		1676	3725	1454
Flt Permitted	0.58	1.00			0.67		0.44	1.00		0.36	1.00	1.00
Satd. Flow (perm)	1022	1689			1240		781	5196		627	3725	1454
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.89	0.89	0.89	0.88	0.88	0.88
Adj. Flow (vph)	47	17	103	76	19	58	102	622	128	72	558	39
RTOR Reduction (vph)	0	0	0	0	25	0	0	13	0	0	0	9
Lane Group Flow (vph)	47	120	0	0	128	0	102	737	0	72	558	30
Confl. Peds. (#/hr)			1			5			1			3
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		8			4			6			2	2
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	17.2	17.2			17.2		92.7	92.7		92.7	92.7	92.7
Effective Green, g (s)	17.2	17.2			17.2		92.7	92.7		92.7	92.7	92.7
Actuated g/C Ratio	0.14	0.14			0.14		0.77	0.77		0.77	0.77	0.77
Clearance Time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Vehicle Extension (s)	2.0	2.0			2.0		0.2	0.2		2.0	2.0	2.0
Lane Grp Cap (vph)	146	242			177		603	4013		484	2877	1123
v/s Ratio Prot		0.07						0.14			c0.15	
v/s Ratio Perm	0.05				c0.10		0.13			0.11		0.02
v/c Ratio	0.32	0.50			0.72		0.17	0.18		0.15	0.19	0.03
Uniform Delay, d1	46.2	47.4			49.1		3.6	3.6		3.5	3.7	3.2
Progression Factor	1.00	1.00			1.00		2.16	2.65		0.83	0.83	0.70
Incremental Delay, d2	0.5	0.6			11.7		0.5	0.1		0.6	0.1	0.0
Delay (s)	46.6	48.0			60.8		8.2	9.7		3.6	3.2	2.3
Level of Service	D	D			E		A	A		A	A	A
Approach Delay (s)		47.6			60.8			9.5				3.2
Approach LOS		D			E			A				A

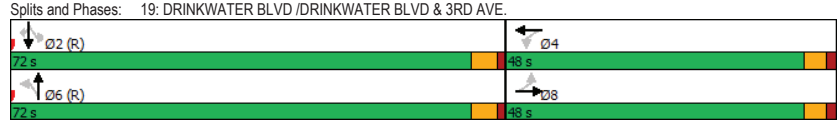
Intersection Summary	
HCM 2000 Control Delay	14.9
HCM 2000 Volume to Capacity ratio	0.28
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	59.8%
Analysis Period (min)	15
Sum of lost time (s)	10.1
ICU Level of Service	B
Description: Last Update: Sept 2017	
c Critical Lane Group	

2022 Total PM
 19: DRINKWATER BLVD /DRINKWATER BLVD & 3RD AVE.

Southbridge Expansion
 Timing Report, Sorted By Phase

	2	4	6	8
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	72	48	72	48
Maximum Split (%)	60.0%	40.0%	60.0%	40.0%
Minimum Split (s)	22.2	38.9	32.2	30.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	0.2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	9	7	7
Flash Dont Walk (s)	10	25	20	19
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	40	112	40	112
End Time (s)	112	40	112	40
Yield/Force Off (s)	106.8	35.1	106.8	35.1
Yield/Force Off 170(s)	96.8	10.1	86.8	16.1
Local Start Time (s)	0	72	0	72
Local Yield (s)	66.8	115.1	66.8	115.1
Local Yield 170(s)	56.8	90.1	46.8	96.1

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 40 (33%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Total PM
 20: 68th Street & INDIAN SCHOOL


Southbridge Expansion
 HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔↔	↔	↔	↔↔	↔↔
Traffic Volume (vph)	244	790	20	114	725	181	72	501	121	134	422	183
Future Volume (vph)	244	790	20	114	725	181	72	501	121	134	422	183
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	5353	1472	1676	5353	1462	1676	3725	1480	1676	3537	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	5353	1472	1676	5353	1462	1676	3725	1480	1676	3537	
Peak-hour factor, PHF	0.95	0.95	0.95	0.85	0.85	0.85	0.85	0.85	0.85	0.94	0.94	0.94
Adj. Flow (vph)	257	832	21	134	853	213	85	589	142	143	449	195
RTOR Reduction (vph)	0	0	11	0	0	70	0	0	0	0	41	0
Lane Group Flow (vph)	257	832	10	134	853	143	85	589	142	143	603	0
Confl. Peds. (#/hr)			5			6			6			5
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5 10	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	23.6	58.4	58.4	9.7	39.0	50.8	11.8	26.1	35.8	11.8	26.4	
Effective Green, g (s)	23.6	58.4	58.4	9.7	39.0	50.8	11.8	26.1	35.8	11.8	26.4	
Actuated g/C Ratio	0.18	0.46	0.46	0.08	0.31	0.40	0.09	0.20	0.28	0.09	0.21	
Clearance Time (s)		5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5	
Vehicle Extension (s)		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	309	2448	673	127	1634	581	154	761	476	154	731	
v/s Ratio Prot	c0.15	0.16		c0.08	c0.16	0.02	0.05	0.16	0.02	c0.09	c0.17	
v/s Ratio Perm			0.01			0.07			0.07			
v/c Ratio	0.83	0.34	0.01	1.06	0.52	0.25	0.55	0.77	0.30	0.93	0.82	
Uniform Delay, d1	50.1	22.3	18.9	59.0	36.6	25.7	55.4	48.0	36.1	57.5	48.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	16.4	0.4	0.0	95.4	1.2	0.1	2.4	4.5	0.1	50.6	7.2	
Delay (s)	66.6	22.6	19.0	154.4	37.8	25.7	57.8	52.5	36.2	108.1	55.6	
Level of Service	E	C	B	F	D	C	E	D	D	F	E	
Approach Delay (s)		32.7			48.7			50.2			65.1	
Approach LOS		C			D			D			E	

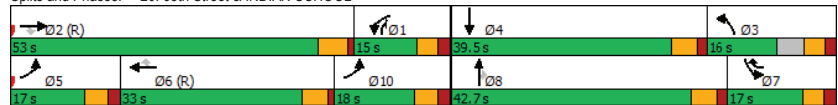
Intersection Summary	
HCM 2000 Control Delay	47.8
HCM 2000 Volume to Capacity ratio	0.73
Actuated Cycle Length (s)	127.7
Intersection Capacity Utilization	79.8%
Analysis Period (min)	15
Description: Last Update: Nov 2017	
c Critical Lane Group	

2022 Total PM
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase


										
Phase Number	1	2	3	4	5	6	7	8	10	
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT	EBL	
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead		
Lead-Lag Optimize										
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None	
Maximum Split (s)	15	53	16	39.5	17	33	17	42.7	18	
Maximum Split (%)	11.7%	41.5%	12.5%	30.9%	13.3%	25.8%	13.3%	33.4%	14.1%	
Minimum Split (s)	11	32.4	11	39.5	11	33	11	42.7	11	
Yellow Time (s)	3.3	4.4	3.3	4	3.6	4	3.3	4	3.6	
All-Red Time (s)	2	1	1.9	1.5	2	1	2	1.7	2	
Minimum Initial (s)	5	10	5	7	5	10	5	7	5	
Vehicle Extension (s)	2	2	2	2	2	2	2	2	2	
Minimum Gap (s)	1	1	1	1	1	1	1	1	1	
Time Before Reduce (s)	0	0	0	0	0	0	0	0	0	
Time To Reduce (s)	0	0	0	0	0	0	0	0	0	
Walk Time (s)		4		4		4		4		
Flash Dont Walk (s)		23		30		24		33		
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes	Yes	
Inhibit Max	No	No	No	No	No	No	No	No	No	
Start Time (s)	73	20	127.5	88	20	37	3	88	70	
End Time (s)	88	73	20	127.5	37	70	20	3	88	
Yield/Force Off (s)	82.7	67.6	14.8	122	31.4	65	14.7	125	82.4	
Yield/Force Off 170(s)	82.7	44.6	14.8	92	31.4	41	14.7	92	82.4	
Local Start Time (s)	53	0	107.5	68	0	17	110.7	68	50	
Local Yield (s)	62.7	47.6	122.5	102	11.4	45	122.4	105	62.4	
Local Yield 170(s)	62.7	24.6	122.5	72	11.4	21	122.4	72	62.4	
Intersection Summary										
Cycle Length	127.7									
Control Type	Actuated-Coordinated									
Natural Cycle	120									
Offset: 20 (16%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green										

Splits and Phases: 20: 68th Street & INDIAN SCHOOL



2022 Total PM
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

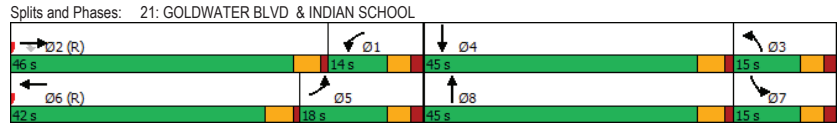
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔↔	↔	↔↔	↔↔		↔	↔↔		↔	↔↔	↔↔
Traffic Volume (vph)	221	727	64	66	658	61	96	356	44	79	543	172
Future Volume (vph)	221	727	64	66	658	61	96	356	44	79	543	172
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.0	3.0	5.3	5.0		5.3	5.3		5.3	5.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		1.00	0.95		1.00	0.91	
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Ftbp, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3317	3725	1510	3317	3684		1710	3672		1710	5166	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3317	3725	1510	3317	3684		1710	3672		1710	5166	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.90	0.90	0.90	0.89	0.89	0.89
Adj. Flow (vph)	240	790	70	73	731	68	107	396	49	89	610	193
RTOR Reduction (vph)	0	0	38	0	5	0	0	10	0	0	56	0
Lane Group Flow (vph)	240	790	32	73	794	0	107	435	0	89	747	0
Conf. Peds. (#/hr)	1											
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Prot	NA	Prot
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2											
Actuated Green, G (s)	13.3	52.4	52.4	9.4	48.5		11.3	20.7		16.6	26.0	
Effective Green, g (s)	13.3	52.4	54.4	9.4	48.5		11.3	20.7		16.6	26.0	
Actuated g/C Ratio	0.11	0.44	0.45	0.08	0.40		0.09	0.17		0.14	0.22	
Clearance Time (s)	5.3	5.0	5.0	5.3	5.0		5.3	5.3		5.3	5.3	
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0		2.0	1.0		2.0	1.0	
Lane Grp Cap (vph)	367	1626	684	259	1488		161	633		236	1119	
v/s Ratio Prot	c0.07	0.21		0.02	c0.22		c0.06	0.12		c0.05	c0.14	
v/s Ratio Perm	0.02											
v/c Ratio	0.65	0.49	0.05	0.28	0.53		0.66	0.69		0.38	0.67	
Uniform Delay, d1	51.1	24.2	18.3	52.1	27.2		52.5	46.6		47.0	43.0	
Progression Factor	1.00	1.00	1.00	0.91	0.81		1.00	1.00		1.07	1.01	
Incremental Delay, d2	3.2	1.0	0.1	0.2	1.3		7.8	2.5		0.4	1.2	
Delay (s)	54.3	25.2	18.4	47.4	23.3		60.3	49.1		50.8	44.6	
Level of Service	D	C	B	D	C		E	D		D	D	
Approach Delay (s)	31.1			25.3			51.3			45.2		
Approach LOS	C			C			D			D		
Intersection Summary												
HCM 2000 Control Delay	36.6			HCM 2000 Level of Service			D					
HCM 2000 Volume to Capacity ratio	0.59											
Actuated Cycle Length (s)	120.0											
Sum of lost time (s)	20.9											
Intersection Capacity Utilization	75.2%			ICU Level of Service			D					
Analysis Period (min)	15											
Description: Last Update: Nov 2017												
c Critical Lane Group												

2022 Total PM
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	1	2	3	4	5	6	7	8
Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	14	46	15	45	18	42	15	45
Maximum Split (%)	11.7%	38.3%	12.5%	37.5%	15.0%	35.0%	12.5%	37.5%
Minimum Split (s)	11	44	11	44.3	11	40	11	40.3
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1	2	1.3	2	1	2	1.3
Minimum Initial (s)	5	10	5	10	5	10	5	10
Vehicle Extension (s)	2	1	2	1	2	1	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		32		32		28		28
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	96	50	35	110	92	50	35	110
End Time (s)	110	96	50	35	110	92	50	35
Yield/Force Off (s)	104.7	91	44.7	29.7	104.7	87	44.7	29.7
Yield/Force Off 170(s)	104.7	59	44.7	29.7	104.7	59	44.7	29.7
Local Start Time (s)	46	0	105	60	42	0	105	60
Local Yield (s)	54.7	41	114.7	99.7	54.7	37	114.7	99.7
Local Yield 170(s)	54.7	9	114.7	99.7	54.7	9	114.7	99.7

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	115
Offset: 50 (42%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	



2022 Total PM
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	31	808	31	58	791	59	18	18	31	13	35	48
Future Volume (vph)	31	808	31	58	791	59	18	18	31	13	35	48
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2			4.7				4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00				1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99				0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00				1.00
Frt	1.00	0.99		1.00	0.99			0.94				0.93
Flt Protected	0.95	1.00		0.95	1.00			0.99				0.99
Satd. Flow (prot)	1676	3700		1676	3679			1799				1795
Flt Permitted	0.28	1.00		0.30	1.00			0.81				0.96
Satd. Flow (perm)	501	3700		525	3679			1469				1740
Peak-hour factor, PHF	0.92	0.90	0.90	0.87	0.87	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	898	34	67	909	64	20	34	14	38	52	
RTOR Reduction (vph)	0	1	0	0	3	0	0	29	0	0	34	0
Lane Group Flow (vph)	34	931	0	67	970	0	0	45	0	0	70	0
Conf. Peds. (#/hr)			4			5			5			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			8	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	98.1	98.1		98.1	98.1			12.0			12.7	
Effective Green, g (s)	98.1	98.1		98.1	98.1			12.0			12.7	
Actuated g/C Ratio	0.82	0.82		0.82	0.82			0.10			0.11	
Clearance Time (s)	5.2	5.2		5.2	5.2			4.7			4.0	
Vehicle Extension (s)	0.2	0.2		0.2	0.2			2.0			3.0	
Lane Grp Cap (vph)	409	3024		429	3007			146			184	
v/s Ratio Prot		0.25			0.26							
v/s Ratio Perm	0.07			0.13				0.03			0.04	
v/c Ratio	0.08	0.31		0.16	0.32			0.31			0.38	
Uniform Delay, d1	2.1	2.7		2.3	2.7			50.2			50.0	
Progression Factor	1.31	2.45		1.83	1.63			1.00			1.00	
Incremental Delay, d2	0.4	0.2		0.7	0.2			0.4			1.3	
Delay (s)	3.2	6.8		4.9	4.7			50.6			51.3	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		6.7			4.7			50.6			51.3	
Approach LOS		A			A			D			D	

Intersection Summary	
HCM 2000 Control Delay	9.3
HCM 2000 Volume to Capacity ratio	0.33
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	52.4%
Analysis Period (min)	15
Description: Last Update: Nov 2017	
c Critical Lane Group	

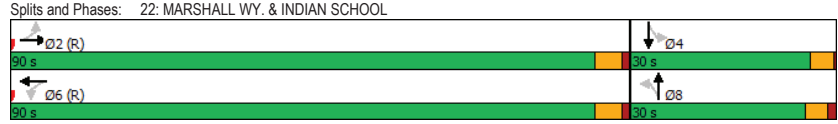
2022 Total PM
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	90	30	90	30
Maximum Split (%)	75.0%	25.0%	75.0%	25.0%
Minimum Split (s)	16	20	16	12
Yellow Time (s)	4	3.5	4	3.3
All-Red Time (s)	1.2	0.5	1.2	1.4
Minimum Initial (s)	10	4	10	7
Vehicle Extension (s)	0.2	3	0.2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	8
Flash Dont Walk (s)	8	11	7	17
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	70	40	70	40
End Time (s)	40	70	40	70
Yield/Force Off (s)	34.8	66	34.8	65.3
Yield/Force Off 170(s)	26.8	55	27.8	48.3
Local Start Time (s)	0	90	0	90
Local Yield (s)	84.8	116	84.8	115.3
Local Yield 170(s)	76.8	105	77.8	98.3

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	40
Offset: 70 (58%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green	



2022 Total PM
23: SCOTTSDALE RD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	662	109	162	675	180	60	445	111	225	650	169
Future Volume (vph)	126	662	109	162	675	180	60	445	111	225	650	169
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Ftpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	3634		1676	3594		1676	3602		1676	3725	1475
Flt Permitted	0.16	1.00		0.22	1.00		0.14	1.00		0.19	1.00	1.00
Satd. Flow (perm)	281	3634		382	3594		250	3602		335	3725	1475
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	133	697	115	178	742	198	67	494	123	250	722	188
RTOR Reduction (vph)	0	10	0	0	18	0	0	20	0	0	0	127
Lane Group Flow (vph)	133	802	0	178	922	0	67	597	0	250	722	61
Conf. Peds. (#/hr)			9			5			4			9
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	57.9	47.3		57.9	47.3		42.2	28.2		42.2	28.2	38.8
Effective Green, g (s)	57.9	47.3		57.9	47.3		42.2	28.2		42.2	28.2	38.8
Actuated g/C Ratio	0.48	0.39		0.48	0.39		0.35	0.23		0.35	0.23	0.32
Clearance Time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	258	1432		298	1416		254	846		274	875	539
v/s Ratio Prot	0.05	0.22		c0.05	c0.26		0.03	0.17		c0.11	0.19	0.01
v/s Ratio Perm	0.20			0.23			0.06			c0.21		0.03
v/c Ratio	0.52	0.56		0.60	0.65		0.26	0.71		0.91	0.83	0.11
Uniform Delay, d1	38.7	28.3		36.5	29.6		43.1	42.1		44.6	43.6	28.5
Progression Factor	1.43	1.17		1.16	1.33		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	1.5		2.0	2.2		0.2	2.2		31.8	6.1	0.0
Delay (s)	56.1	34.6		44.5	41.6		43.3	44.3		76.4	49.7	28.5
Level of Service	E	C		D	D		D	D		E	D	C
Approach Delay (s)		37.7			42.0			44.2			52.0	
Approach LOS		D			D			D			D	

Intersection Summary

HCM 2000 Control Delay	44.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

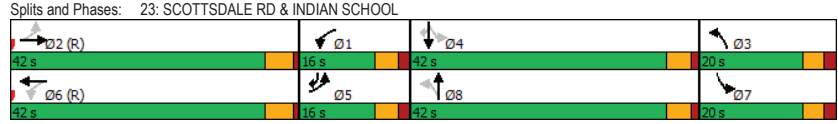
2022 Total PM
23: SCOTTSDALE RD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	←		→		↖		↗	
Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	16	42	20	42	16	42	20	42
Maximum Split (%)	13.3%	35.0%	16.7%	35.0%	13.3%	35.0%	16.7%	35.0%
Minimum Split (s)	11	30	10	32.8	11	33	10	34.8
Yellow Time (s)	3.3	4	3	3.6	3.3	4	3	3.6
All-Red Time (s)	1.8	1	2	1.2	1.8	1	2	1.2
Minimum Initial (s)	5	10	5	10	5	10	5	10
Vehicle Extension (s)	2	1	2	2	2	1	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		8		8
Flash Dont Walk (s)		18		21		20		22
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	42	0	100	58	42	0	100	58
End Time (s)	58	42	0	100	58	42	0	100
Yield/Force Off (s)	52.9	37	115	95.2	52.9	37	115	95.2
Yield/Force Off 170(s)	52.9	19	115	74.2	52.9	17	115	73.2
Local Start Time (s)	42	0	100	58	42	0	100	58
Local Yield (s)	52.9	37	115	95.2	52.9	37	115	95.2
Local Yield 170(s)	52.9	19	115	74.2	52.9	17	115	73.2

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green, Master Intersection	



2022 Total PM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	→		↖		↗	
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	↑
Traffic Volume (vph)	976	57	88	1027	58	97
Future Volume (vph)	976	57	88	1027	58	97
Ideal Flow (vphpl)	2000	1800	1800	2000	1800	1800
Total Lost time (s)		5.2		5.2		4.8
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frbp, ped/bikes	1.00		1.00	1.00	0.99	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.92	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	3689		1676	3725	1567	
Flt Permitted	1.00		0.24	1.00	0.98	
Satd. Flow (perm)	3689		419	3725	1567	
Peak-hour factor, PHF	0.95	0.95	0.89	0.89	0.88	0.88
Adj. Flow (vph)	1027	60	99	1154	66	110
RTOR Reduction (vph)	2	0	0	0	57	0
Lane Group Flow (vph)	1085	0	99	1154	119	0
Conf. Peds. (#/hr)		3				6
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	90.1		90.1	90.1	19.9	
Effective Green, g (s)	90.1		90.1	90.1	19.9	
Actuated g/C Ratio	0.75		0.75	0.75	0.17	
Clearance Time (s)	5.2		5.2	5.2	4.8	
Vehicle Extension (s)	0.2		0.2	0.2	2.0	
Lane Grp Cap (vph)	2769		314	2796	259	
v/s Ratio Prot	0.29			c0.31	c0.08	
v/s Ratio Perm			0.24			
v/c Ratio	0.39		0.32	0.41	0.46	
Uniform Delay, d1	5.3		4.9	5.4	45.2	
Progression Factor	2.22		0.54	0.57	1.00	
Incremental Delay, d2	0.3		2.4	0.4	0.5	
Delay (s)	12.0		5.1	3.5	45.7	
Level of Service	B		A	A	D	
Approach Delay (s)	12.0			3.6	45.7	
Approach LOS	B			A	D	

Intersection Summary

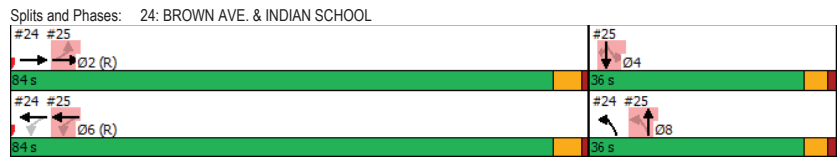
HCM 2000 Control Delay	10.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

2022 Total PM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	→	↓	←	↖
Phase Number	2	4	6	8
Node Number	24	25	24	24
Movement	EBT	SBTL	WBTL	NBL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	84	36	84	36
Maximum Split (%)	70.0%	30.0%	70.0%	30.0%
Minimum Split (s)	23.2	12	27.2	35.8
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.5	1.2	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	0.2	2	0.2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	11		15	24
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	98	62	98	62
End Time (s)	62	98	62	98
Yield/Force Off (s)	56.8	93.2	56.8	93.2
Yield/Force Off 170(s)	45.8	93.2	41.8	69.2
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.8	115.2	78.8	115.2
Local Yield 170(s)	67.8	115.2	63.8	91.2

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 98 (82%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	



2022 Total PM
25: BUCKBOARD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↖	→	↘	↙	←	↖	↘	↙	↗	↘	↙	↗
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖↗	↖↗		↖↗	↖↗	↖↗
Traffic Volume (vph)	34	1023	7	62	1020	26	10	4	46	114	3	79
Future Volume (vph)	34	1023	7	62	1020	26	10	4	46	114	3	79
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2			4.8			4.8	4.8
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.98			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1676	3721		1676	3708			1709			1869	1500
Flt Permitted	0.21	1.00		0.24	1.00			0.95			0.69	1.00
Satd. Flow (perm)	375	3721		420	3708			1633			1353	1500
Peak-hour factor, PHF	0.95	0.95	0.95	0.89	0.89	0.89	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	36	1077	7	70	1146	29	11	5	52	127	3	88
RTOR Reduction (vph)	0	0	0	0	1	0	0	43	0	0	0	73
Lane Group Flow (vph)	36	1084	0	70	1174	0	0	25	0	0	130	15
Conf. Peds. (#/hr)			9			8			13			
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	4
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	90.1	90.1		90.1	90.1			19.9			19.9	19.9
Effective Green, g (s)	90.1	90.1		90.1	90.1			19.9			19.9	19.9
Actuated g/C Ratio	0.75	0.75		0.75	0.75			0.17			0.17	0.17
Clearance Time (s)	5.2	5.2		5.2	5.2			4.8			4.8	4.8
Vehicle Extension (s)	0.2	0.2		0.2	0.2			2.0			2.0	2.0
Lane Grp Cap (vph)	281	2793		315	2784			270			224	248
v/s Ratio Prot		0.29			0.32							
v/s Ratio Perm	0.10			0.17				0.02			0.10	0.01
v/c Ratio	0.13	0.39		0.22	0.42			0.09			0.58	0.06
Uniform Delay, d1	4.1	5.3		4.5	5.5			42.4			46.2	42.2
Progression Factor	0.50	0.47		1.50	1.95			1.00			1.00	1.00
Incremental Delay, d2	0.9	0.4		1.2	0.3			0.1			2.5	0.0
Delay (s)	2.9	2.8		7.9	11.0			42.4			48.7	42.2
Level of Service	A	A		A	B			D			D	D
Approach Delay (s)		2.8			10.8			42.4			46.0	
Approach LOS		A			B			D			D	

Intersection Summary	
HCM 2000 Control Delay	11.2
HCM 2000 Volume to Capacity ratio	0.45
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	64.9%
Analysis Period (min)	15
Sum of lost time (s)	10.0
ICU Level of Service	C
Description: Last Update: Nov 2017	
c Critical Lane Group	

2022 Total PM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	83	1114	59	286	878	217	85	472	419	326	263	57
Future Volume (vph)	83	1114	59	286	878	217	85	472	419	326	263	57
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.1	5.3	5.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Fit Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1710	3698		1710	3725	1510	1710	3725	1505	3317	3629	
Fit Permitted	0.11	1.00		0.09	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	204	3698		168	3725	1510	1710	3725	1505	3317	3629	
Peak-hour factor, PHF	0.94	0.94	0.94	0.89	0.89	0.89	0.90	0.90	0.90	0.80	0.80	0.80
Adj. Flow (vph)	88	1185	63	321	987	244	94	524	466	408	329	71
RTOR Reduction (vph)	0	3	0	0	0	106	0	0	169	0	15	0
Lane Group Flow (vph)	88	1245	0	321	987	138	94	524	297	408	385	0
Confl. Peds. (#/hr)			2			1			4			3
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6			8			
Actuated Green, G (s)	56.5	42.8		56.5	42.8	42.8	9.0	25.9	25.9	16.7	33.6	
Effective Green, g (s)	56.5	42.8		56.5	42.8	42.8	9.0	25.9	25.9	16.7	33.6	
Actuated g/C Ratio	0.47	0.36		0.47	0.36	0.36	0.08	0.22	0.22	0.14	0.28	
Clearance Time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.1	5.3	5.1	
Vehicle Extension (s)	2.0	0.2		2.0	0.2	0.2	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	267	1318		255	1328	538	128	803	324	461	1016	
v/s Ratio Prot	0.04	0.34		c0.14	0.26		0.05	0.14		c0.12	0.11	
v/s Ratio Perm	0.12			c0.45		0.09			c0.20			
v/c Ratio	0.33	0.94		1.26	0.74	0.26	0.73	0.65	0.92	0.89	0.38	
Uniform Delay, d1	39.8	37.4		49.8	33.8	27.3	54.3	42.9	46.0	50.7	34.8	
Progression Factor	1.21	1.04		1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.05	
Incremental Delay, d2	0.3	14.1		144.2	3.8	1.2	17.0	4.1	32.9	17.5	1.1	
Delay (s)	48.4	53.2		194.0	37.6	28.5	71.3	47.0	78.9	68.9	37.5	
Level of Service	D	D		F	D	C	E	D	E	E	D	
Approach Delay (s)		52.9			68.5			62.8			53.3	
Approach LOS		D			E			E			D	

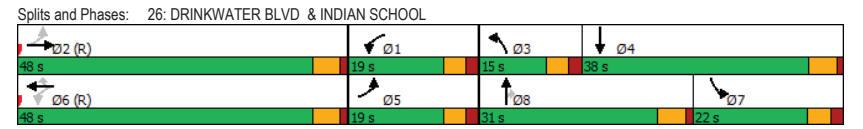
Intersection Summary			
HCM 2000 Control Delay	60.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

2022 Total PM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBT	EBL	WBTL	SBL	NBT
Lead/Lag			Lead	Lag			Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	Max	None	C-Max	None	Max
Maximum Split (s)	19	48	15	38	19	48	22	31
Maximum Split (%)	15.8%	40.0%	12.5%	31.7%	15.8%	40.0%	18.3%	25.8%
Minimum Split (s)	11	16	11	13	11	16	11	13
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1.2	2	1.1	2	1.2	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	0.2	2	2	2	0.2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		9		7		11
Flash Dont Walk (s)		21		20		19		20
Dual Entry	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	18	90	37	52	18	90	68	37
End Time (s)	37	18	52	90	37	18	90	68
Yield/Force Off (s)	31.7	12.8	46.7	84.9	31.7	12.8	84.7	62.9
Yield/Force Off 170(s)	31.7	111.8	46.7	64.9	31.7	113.8	84.7	42.9
Local Start Time (s)	48	0	67	82	48	0	98	67
Local Yield (s)	61.7	42.8	76.7	114.9	61.7	42.8	114.7	92.9
Local Yield 170(s)	61.7	21.8	76.7	94.9	61.7	23.8	114.7	72.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 90 (75%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green	



2022 Total PM
27: 70th St & GOLDWATER BLVD

Southbridge Expansion
HCM 6th WSC

Intersection						
Int Delay, s/veh	2.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑	↑	↑
Traffic Vol, veh/h	724	163	31	315	72	14
Future Vol, veh/h	724	163	31	315	72	14
Conflicting Peds, #/hr	0	8	0	0	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	70	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	787	177	34	342	78	15

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	972
Stage 1	-	-	884
Stage 2	-	-	239
Critical Hdwy	-	5.34	6.29
Critical Hdwy Stg 1	-	-	6.64
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	-	3.12	3.67
Pot Cap-1 Maneuver	-	404	232
Stage 1	-	-	291
Stage 2	-	-	750
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	401	211
Mov Cap-2 Maneuver	-	-	211
Stage 1	-	-	265
Stage 2	-	-	750

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	28.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	211	443	-	-	401	-
HCM Lane V/C Ratio	0.371	0.034	-	-	0.084	-
HCM Control Delay (s)	31.8	13.4	-	-	14.8	-
HCM Lane LOS	D	B	-	-	B	-
HCM 95th %tile Q(veh)	1.6	0.1	-	-	0.3	-

2022 Total PM
28: GOLDWATER BLVD & SCOTTSDALE RD


Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	18	15	22	621	25	21	25	301	4	29	632	18
Future Volume (vph)	18	15	22	621	25	21	25	301	4	29	632	18
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		4.9		4.9	4.9		5.2	5.2		5.2	5.2	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95		1.00	0.91	
Frpb, ped/bikes		0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.95		1.00	0.99		1.00	1.00		1.00	1.00	
Fit Protected		0.98		0.95	0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1803		1593	1767		1676	3717		1676	5327	
Fit Permitted		0.98		0.95	0.96		0.36	1.00		0.52	1.00	
Satd. Flow (perm)		1803		1593	1767		629	3717		922	5327	
Peak-hour factor, PHF	0.80	0.80	0.80	0.88	0.88	0.88	0.84	0.84	0.84	0.95	0.95	0.95
Adj. Flow (vph)	22	19	28	706	28	24	30	358	5	31	665	19
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	70	0	381	375	0	30	363	0	31	682	0
Conf. Peds. (#/hr)			4			4			4			3
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4		6	6		2	2	
Permitted Phases							6			2		
Actuated Green, G (s)		8.0		33.7	33.7		63.3	63.3		63.3	63.3	
Effective Green, g (s)		8.0		33.7	33.7		63.3	63.3		63.3	63.3	
Actuated g/C Ratio		0.07		0.28	0.28		0.53	0.53		0.53	0.53	
Clearance Time (s)		4.9		4.9	4.9		5.2	5.2		5.2	5.2	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		120		447	496		331	1960		486	2809	
v/s Ratio Prot		c0.04		c0.24	0.21			0.10			c0.13	
v/s Ratio Perm							0.05			0.03		
v/c Ratio		0.58		0.85	0.76		0.09	0.18		0.06	0.24	
Uniform Delay, d1		54.4		40.8	39.4		14.1	14.8		13.9	15.4	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.6		14.0	5.8		0.5	0.2		0.3	0.2	
Delay (s)		59.0		54.8	45.2		14.6	15.1		14.1	15.6	
Level of Service		E		D	D		B	B		B	B	
Approach Delay (s)		59.0			50.0			15.0			15.5	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Total PM
28: GOLDWATER BLVD & SCOTTSDALE RD

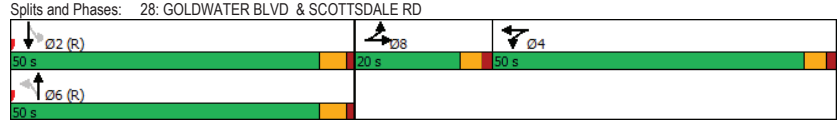
Southbridge Expansion
Timing Report, Sorted By Phase



Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	50	50	50	20
Maximum Split (%)	41.7%	41.7%	41.7%	16.7%
Minimum Split (s)	16	13	16	13
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	88	38	88	18
End Time (s)	18	88	18	38
Yield/Force Off (s)	12.8	83.1	12.8	33.1
Yield/Force Off 170(s)	12.8	83.1	12.8	33.1
Local Start Time (s)	0	70	0	50
Local Yield (s)	44.8	115.1	44.8	65.1
Local Yield 170(s)	44.8	115.1	44.8	65.1


Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 88 (73%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Total PM
29: OSBORN RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↕		↔	↕↕		↔	↕↕	↕	↔	↕↕	↕↕
Traffic Volume (vph)	26	214	73	181	327	125	129	709	60	131	1159	29
Future Volume (vph)	26	214	73	181	327	125	129	709	60	131	1159	29
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3559		1676	3552		1676	3725	1467	1676	5330	
Flt Permitted	0.18	1.00		0.41	1.00		0.13	1.00	1.00	0.24	1.00	
Satd. Flow (perm)	311	3559		723	3552		221	3725	1467	427	5330	
Peak-hour factor, PHF	0.83	0.83	0.83	0.80	0.80	0.80	0.84	0.84	0.84	0.88	0.88	0.88
Adj. Flow (vph)	31	258	88	226	409	156	154	844	71	149	1317	33
RTOR Reduction (vph)	0	31	0	0	37	0	0	0	38	0	2	0
Lane Group Flow (vph)	31	315	0	226	528	0	154	844	33	149	1348	0
Confl. Peds. (#/hr)			13			7			8			10
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	3	8		7	4		1	6	6	5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	32.5	23.4		32.5	23.4		66.1	55.9	55.9	66.5	56.3	
Effective Green, g (s)	32.5	23.4		32.5	23.4		66.1	55.9	55.9	66.5	56.3	
Actuated g/C Ratio	0.27	0.19		0.27	0.19		0.55	0.47	0.47	0.55	0.47	
Clearance Time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.0	
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	1.0	1.0	2.0	1.0	
Lane Grp Cap (vph)	187	694		268	692		245	1735	683	342	2500	
v/s Ratio Prot	0.01	0.09		c0.06	0.15		c0.05	0.23		0.04	0.25	
v/s Ratio Perm	0.03			c0.16			c0.29		0.02	0.20		
v/c Ratio	0.17	0.45		0.84	0.76		0.63	0.49	0.05	0.44	0.54	
Uniform Delay, d1	44.7	42.7		44.0	45.7		33.9	22.1	17.5	26.6	22.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.2		20.0	4.5		3.6	1.0	0.1	0.3	0.8	
Delay (s)	44.9	42.8		64.1	50.2		37.5	23.1	17.6	26.9	23.5	
Level of Service	D	D		E	D		D	C	B	C	C	
Approach Delay (s)		43.0			54.1			24.8			23.8	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.4
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			

c Critical Lane Group

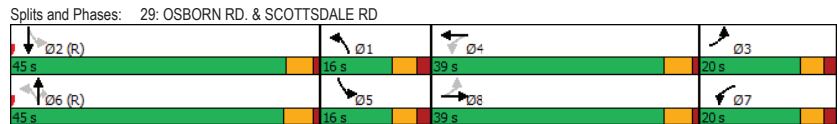
2022 Total PM
29: OSBORN RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	EBL	WBTL	SBL	NBTL	WBL	EBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	16	45	20	39	16	45	20	39
Maximum Split (%)	13.3%	37.5%	16.7%	32.5%	13.3%	37.5%	16.7%	32.5%
Minimum Split (s)	11	31	11	38.1	11	34.4	11	37.1
Yellow Time (s)	3.6	4	3.3	4	3.6	4.4	3.3	4
All-Red Time (s)	2	1	2	1.1	2	1	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	1	2	1	2	1	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		9		10		11
Flash Dont Walk (s)		18		24		19		21
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	5	80	60	21	5	80	60	21
End Time (s)	21	5	80	60	21	5	80	60
Yield/Force Off (s)	15.4	0	74.7	54.9	15.4	119.6	74.7	54.9
Yield/Force Off 170(s)	15.4	102	74.7	30.9	15.4	100.6	74.7	33.9
Local Start Time (s)	45	0	100	61	45	0	100	61
Local Yield (s)	55.4	40	114.7	94.9	55.4	39.6	114.7	94.9
Local Yield 170(s)	55.4	22	114.7	70.9	55.4	20.6	114.7	73.9

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 80 (67%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Total PM
30: 6th Ave & A1

Southbridge Expansion
HCM 6th TWSC

Intersection

Int Delay, s/veh	2.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔	↔	↔	↔
Traffic Vol, veh/h	7	89	154	69	70	12
Future Vol, veh/h	7	89	154	69	70	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	97	167	75	76	13

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	242	0	318
Stage 1	-	-	205
Stage 2	-	-	113
Critical Hdwy	4.12	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.218	-	3.518
Pot Cap-1 Maneuver	1324	-	836
Stage 1	-	-	829
Stage 2	-	-	912
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1324	-	836
Mov Cap-2 Maneuver	-	-	671
Stage 1	-	-	824
Stage 2	-	-	912

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1324	-	-	-	691
HCM Lane V/C Ratio	0.006	-	-	-	0.129
HCM Control Delay (s)	7.7	0	-	-	11
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.4

2022 Total PM
31: 6th Ave & A2

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	7	39	139	27	57	15
Future Vol, veh/h	7	39	139	27	57	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	42	151	29	62	16

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	180	0	0	224	166
Stage 1	-	-	-	166	-
Stage 2	-	-	-	58	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	1396	-	-	764	878
Stage 1	-	-	-	863	-
Stage 2	-	-	-	965	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1396	-	-	759	878
Mov Cap-2 Maneuver	-	-	-	759	-
Stage 1	-	-	-	858	-
Stage 2	-	-	-	965	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1396	-	-	-	781
HCM Lane V/C Ratio	0.005	-	-	-	0.1
HCM Control Delay (s)	7.6	0	-	-	10.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

2022 Total PM
33: Stetson Dr & C1

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	
Traffic Vol, veh/h	3	29	28	119	148	6
Future Vol, veh/h	3	29	28	119	148	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	32	30	129	161	7

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	354	165	168	0	0
Stage 1	165	-	-	-	-
Stage 2	189	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	644	879	1410	-	-
Stage 1	864	-	-	-	-
Stage 2	843	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	629	879	1410	-	-
Mov Cap-2 Maneuver	629	-	-	-	-
Stage 1	844	-	-	-	-
Stage 2	843	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	1.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1410	-	847	-	-
HCM Lane V/C Ratio	0.022	-	0.041	-	-
HCM Control Delay (s)	7.6	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

2022 Total PM
34: 5th Ave & C2

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	26	168	230	16	0	36
Future Vol, veh/h	26	168	230	16	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	183	250	17	0	39

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	267	0	0	498	259
Stage 1	-	-	-	259	-
Stage 2	-	-	-	239	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2,218	-	-	3,518	3,318
Pot Cap-1 Maneuver	1297	-	-	532	780
Stage 1	-	-	-	784	-
Stage 2	-	-	-	801	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1297	-	-	519	780
Mov Cap-2 Maneuver	-	-	-	519	-
Stage 1	-	-	-	765	-
Stage 2	-	-	-	801	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1297	-	-	-	780
HCM Lane V/C Ratio	0.022	-	-	-	0.05
HCM Control Delay (s)	7.8	0	-	-	9.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

2022 Total PM
35: 5TH AVE & D

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	35	82	136	22	16	27
Future Vol, veh/h	35	82	136	22	16	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	89	148	24	17	29

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	172	0	0	325	160
Stage 1	-	-	-	160	-
Stage 2	-	-	-	165	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2,218	-	-	3,518	3,318
Pot Cap-1 Maneuver	1405	-	-	669	885
Stage 1	-	-	-	869	-
Stage 2	-	-	-	864	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1405	-	-	650	885
Mov Cap-2 Maneuver	-	-	-	650	-
Stage 1	-	-	-	845	-
Stage 2	-	-	-	864	-

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1405	-	-	-	780
HCM Lane V/C Ratio	0.027	-	-	-	0.06
HCM Control Delay (s)	7.6	0	-	-	9.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

2022 Total PM
36: Vehicle Path & 6th Ave

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	78	81	0	168	55	0
Future Vol, veh/h	78	81	0	168	55	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	85	88	0	183	60	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	173	0	312
Stage 1	-	-	-	-	129
Stage 2	-	-	-	-	183
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1404	-	681
Stage 1	-	-	-	-	897
Stage 2	-	-	-	-	848
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1404	-	681
Mov Cap-2 Maneuver	-	-	-	-	681
Stage 1	-	-	-	-	897
Stage 2	-	-	-	-	848

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	681	-	-	1404	-
HCM Lane V/C Ratio	0.088	-	-	-	-
HCM Control Delay (s)	10.8	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0	-

2022 Total PM
37: Vehicle Path

Southbridge Expansion
HCM 6th TWSC

Intersection							
Int Delay, s/veh	2						
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations		↔	↔		↔	↔	
Traffic Vol, veh/h	2	174	170	54	78	2	
Future Vol, veh/h	2	174	170	54	78	2	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized	-	None	-	None	-	None	
Storage Length	-	-	-	-	0	-	
Veh in Median Storage, #	-	0	0	-	0	-	
Grade, %	-	0	0	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	2	189	185	59	85	2	

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	244	0	0	408	215
Stage 1	-	-	-	-	215
Stage 2	-	-	-	-	193
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	1322	-	-	599	825
Stage 1	-	-	-	-	821
Stage 2	-	-	-	-	840
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1322	-	-	598	825
Mov Cap-2 Maneuver	-	-	-	-	598
Stage 1	-	-	-	-	819
Stage 2	-	-	-	-	840

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12
HCM LOS	B		

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1322	-	-	-	602
HCM Lane V/C Ratio	0.002	-	-	-	0.144
HCM Control Delay (s)	7.7	0	-	-	12
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.5

2022 Total PM Mitigated

1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	148	61	415	172	226	47	1774	376	208	1843	60
Future Volume (vph)	107	148	61	415	172	226	47	1774	376	208	1843	60
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4	4.0	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	0.95	1.00	1.00
Frnt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	1.00	1.00	0.85	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1676	1945	1500	3252	1945	1500	1676	5199	1676	3711	1500	1500
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.07	1.00	0.06	1.00	1.00	1.00
Satd. Flow (perm)	1676	1945	1500	3252	1945	1500	119	5199	109	3711	1500	1500
Peak-hour factor, PHF	0.85	0.85	0.85	0.83	0.83	0.83	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	174	72	500	207	272	49	1867	396	219	1940	63
RTOR Reduction (vph)	0	0	0	0	0	223	0	20	0	0	0	32
Lane Group Flow (vph)	126	174	72	500	207	49	49	2243	0	219	1940	31
Bus Blockages (#/hr)	0	2	0	0	2	0	0	2	0	0	2	0
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	Perm
Protected Phases	8	8		4	4		1	6			2	2
Permitted Phases			8			4	6		2			2
Actuated Green, G (s)	18.9	18.9	18.9	26.3	26.3	26.3	65.8	59.4	84.8	71.4	71.4	71.4
Effective Green, g (s)	18.9	18.9	18.9	26.3	26.3	26.3	65.8	59.4	84.8	71.4	71.4	71.4
Actuated g/C Ratio	0.13	0.13	0.13	0.18	0.18	0.18	0.45	0.41	0.58	0.49	0.49	0.49
Clearance Time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4	4.0	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.2	3.0	0.2	0.2	0.2
Lane Grp Cap (vph)	218	252	195	588	352	271	122	2125	279	1823	737	737
v/s Ratio Prot	0.08	c0.09		c0.15	0.11		0.02	0.43	c0.11	c0.52		
v/s Ratio Perm			0.05			0.03	0.16		0.35		0.02	
v/c Ratio	0.58	0.69	0.37	0.85	0.59	0.18	0.40	1.06	0.78	1.06	0.04	0.04
Uniform Delay, d1	59.4	60.4	57.8	57.6	54.5	50.4	64.4	43.0	56.2	37.0	19.2	19.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	6.4	0.4	10.9	1.6	0.1	0.8	36.2	13.5	40.5	0.1	0.1
Delay (s)	61.8	66.8	58.2	68.5	56.2	50.5	65.2	79.2	69.7	77.5	19.3	19.3
Level of Service	E	E	E	E	E	D	E	E	E	E	B	B
Approach Delay (s)		63.4			60.9		78.9			75.1		
Approach LOS		E			E		E			E		

Intersection Summary		
HCM 2000 Control Delay	73.5	HCM 2000 Level of Service E
HCM 2000 Volume to Capacity ratio	0.97	
Actuated Cycle Length (s)	145.3	Sum of lost time (s) 22.3
Intersection Capacity Utilization	92.7%	ICU Level of Service F
Analysis Period (min)	15	
Description: Last Update: April 2018		
c Critical Lane Group		

2022 Total PM Mitigated

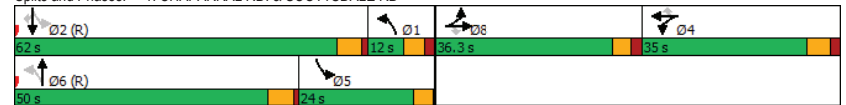
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion

Timing Report, Sorted By Phase

Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag	Lag	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	12	62	35	24	50	36.3
Maximum Split (%)	8.3%	42.7%	24.1%	16.5%	34.4%	25.0%
Minimum Split (s)	12.6	22.4	35	11	26.4	36.3
Yellow Time (s)	3.6	4.4	4	3.5	4.4	3.3
All-Red Time (s)	2	1	2	0.5	1	2
Minimum Initial (s)	7	12	7	7	12	7
Vehicle Extension (s)	2	0.2	2	3	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	9
Flash Dont Walk (s)		10	22		14	22
Dual Entry	No	Yes	No	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	4.7	88	53	138	88	16.7
End Time (s)	16.7	4.7	88	16.7	138	53
Yield/Force Off (s)	11.1	144.6	82	12.7	132.6	47.7
Yield/Force Off 170(s)	11.1	134.6	60	12.7	118.6	25.7
Local Start Time (s)	62	0	110.3	50	0	74
Local Yield (s)	68.4	56.6	139.3	70	44.6	105
Local Yield 170(s)	68.4	46.6	117.3	70	30.6	83
Intersection Summary						
Cycle Length	145.3					
Control Type	Actuated-Coordinated					
Natural Cycle	150					
Offset: 88 (61%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green						

Splits and Phases: 1: CHAPARRAL RD. & SCOTTSDALE RD



2022 Total PM Mitigated
3: SCOTTSDALE RD & HIGHLAND AVE/Granada Ave

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	685	18	49	27	18	37	44	1423	31	13	1110	88
Future Volume (vph)	685	18	49	27	18	37	44	1423	31	13	1110	88
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Ftpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.90		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3252	1727		1676	1765		1676	5333		1676	5288	
Flt Permitted	0.95	1.00		0.95	1.00		0.14	1.00		0.10	1.00	
Satd. Flow (perm)	3252	1727		1676	1765		243	5333		171	5288	
Peak-hour factor, PHF	0.85	0.85	0.85	0.80	0.80	0.80	0.91	0.91	0.91	0.87	0.87	0.87
Adj. Flow (vph)	806	21	58	34	22	46	48	1564	34	15	1276	101
RTOR Reduction (vph)	0	42	0	0	17	0	0	2	0	0	7	0
Lane Group Flow (vph)	806	37	0	34	52	0	48	1596	0	15	1370	0
Confl. Peds. (#/hr)			2						2			0
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6			2	
Permitted Phases							6			2		
Actuated Green, G (s)	32.4	32.4		8.0	8.0		63.8	63.8		63.8	63.8	
Effective Green, g (s)	32.4	32.4		8.0	8.0		63.8	63.8		63.8	63.8	
Actuated g/C Ratio	0.27	0.27		0.07	0.07		0.53	0.53		0.53	0.53	
Clearance Time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	877	465		111	117		129	2833		90	2809	
v/s Ratio Prot	c0.25	0.02		0.02	c0.03			c0.30			0.26	
v/s Ratio Perm							0.20			0.09		
v/c Ratio	0.92	0.08		0.31	0.45		0.37	0.56		0.17	0.49	
Uniform Delay, d1	42.6	32.7		53.4	53.9		16.4	18.8		14.5	17.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.1	0.0		0.6	1.0		8.0	0.8		4.0	0.6	
Delay (s)	56.7	32.7		54.0	54.9		24.5	19.6		18.4	18.4	
Level of Service	E	C		D	D		C	B		B	B	
Approach Delay (s)		54.5			54.6			19.8			18.4	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	15.9
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		

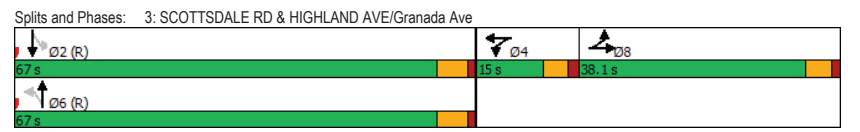
Description: Last Update: Sept 2017
c Critical Lane Group

2022 Total PM Mitigated
3: SCOTTSDALE RD & HIGHLAND AVE/Granada Ave

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	67	15	67	38.1
Maximum Split (%)	55.8%	12.5%	55.8%	31.7%
Minimum Split (s)	30.7	15.1	28.7	38.1
Yellow Time (s)	4.4	3.6	4.4	3.6
All-Red Time (s)	1.3	1.5	1.3	1.5
Minimum Initial (s)	10	10	10	10
Vehicle Extension (s)	1	2	1	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8		7	9
Flash Dont Walk (s)	17		16	24
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	94	40.9	94	55.9
End Time (s)	40.9	55.9	40.9	94
Yield/Force Off (s)	35.2	50.8	35.2	88.9
Yield/Force Off 170(s)	18.2	50.8	19.2	64.9
Local Start Time (s)	0	67	0	82
Local Yield (s)	61.3	76.9	61.3	115
Local Yield 170(s)	44.3	76.9	45.3	91

Intersection Summary	
Cycle Length	120.1
Control Type	Actuated-Coordinated
Natural Cycle	85
Offset: 94 (78%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Total PM Mitigated
4: Fashion Square Dr & Goldwater Blvd

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

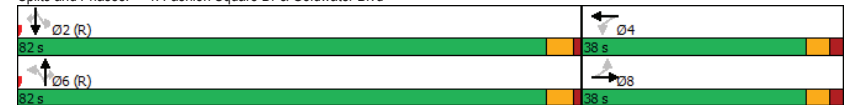
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	67	16	58	87	4	26	34	501	74	29	871	18
Future Volume (vph)	67	16	58	87	4	26	34	501	74	29	871	18
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		5.5		5.5	5.5		5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.91	1.00
Frbp, ped/bikes		0.99		1.00	0.98		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.94		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1796		1676	1676		1676	3725	1460	1676	5353	1466
Flt Permitted		0.84		0.63	1.00		0.27	1.00	1.00	0.43	1.00	1.00
Satd. Flow (perm)		1547		1120	1676		477	3725	1460	761	5353	1466
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	73	17	63	95	4	28	37	545	80	32	947	20
RTOR Reduction (vph)	0	21	0	0	20	0	0	0	29	0	0	7
Lane Group Flow (vph)	0	132	0	95	12	0	37	545	51	32	947	13
Confl. Peds. (#/hr)			2			3			2			1
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		8		4	4		6	6	2		2	2
Permitted Phases	8		4			6	6	2			2	2
Actuated Green, G (s)		32.5		32.5	32.5		76.8	76.8	76.8	76.8	76.8	76.8
Effective Green, g (s)		32.5		32.5	32.5		76.8	76.8	76.8	76.8	76.8	76.8
Actuated g/C Ratio		0.27		0.27	0.27		0.64	0.64	0.64	0.64	0.64	0.64
Clearance Time (s)		5.5		5.5	5.5		5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		418		303	453		305	2384	934	487	3425	938
v/s Ratio Prot				0.01			0.15				c0.18	
v/s Ratio Perm		c0.09		0.08			0.08		0.04	0.04		0.01
v/c Ratio		0.32		0.31	0.03		0.12	0.23	0.05	0.07	0.28	0.01
Uniform Delay, d1		34.9		34.9	32.1		8.4	9.1	8.1	8.1	9.4	7.8
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2				2.7	0.1		0.8	0.2	0.1	0.3	0.2	0.0
Delay (s)		36.9		37.6	32.2		9.2	9.3	8.2	8.4	9.6	7.9
Level of Service		D		D	C		A	A	A	A	A	A
Approach Delay (s)		36.9			36.2			9.2			9.6	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay		13.3					HCM 2000 Level of Service					B
HCM 2000 Volume to Capacity ratio		0.29										
Actuated Cycle Length (s)		120.0				Sum of lost time (s)					10.7	
Intersection Capacity Utilization		54.1%				ICU Level of Service					A	
Analysis Period (min)		15										
c Critical Lane Group												

2022 Total PM Mitigated
4: Fashion Square Dr & Goldwater Blvd

Southbridge Expansion
Timing Report, Sorted By Phase


Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	Max	C-Max	Max
Maximum Split (s)	82	38	82	38
Maximum Split (%)	68.3%	31.7%	68.3%	31.7%
Minimum Split (s)	28.2	21.5	22.2	21.5
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	2.2	1.2	2.2
Minimum Initial (s)	10	10	10	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	5
Flash Dont Walk (s)	16	11	10	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	82	0	82
End Time (s)	82	0	82	0
Yield/Force Off (s)	76.8	114.5	76.8	114.5
Yield/Force Off 170(s)	60.8	103.5	66.8	103.5
Local Start Time (s)	0	82	0	82
Local Yield (s)	76.8	114.5	76.8	114.5
Local Yield 170(s)	60.8	103.5	66.8	103.5
Intersection Summary				
Cycle Length	120			
Control Type	Actuated-Coordinated			
Natural Cycle	50			
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				

Split and Phases: 4: Fashion Square Dr & Goldwater Blvd



2022 Total PM Mitigated
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

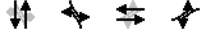


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↕↔		↔	↔↕↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	108	1160	203	216	1603	85	201	325	200	109	199	77
Future Volume (vph)	108	1160	203	216	1603	85	201	325	200	109	199	77
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00
Ftbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5223		1676	5309		1676	1961	1471	1676	1961	1500
Flt Permitted	0.12	1.00		0.12	1.00		0.52	1.00	1.00	0.23	1.00	1.00
Satd. Flow (perm)	218	5223		218	5309		915	1961	1471	410	1961	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	1261	221	235	1742	92	218	353	217	118	216	84
RTOR Reduction (vph)	0	20	0	0	4	0	0	0	124	0	0	68
Lane Group Flow (vph)	117	1462	0	235	1830	0	218	353	93	118	216	16
Conf. Peds. (#/hr)			1			2			5			
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	3		4	3		2	1	2	1	1	1
Permitted Phases	3			3			1		1		1	1
Actuated Green, G (s)	44.0	32.4		44.0	32.4		24.7	17.2	17.2	24.7	17.2	17.2
Effective Green, g (s)	44.0	32.4		44.0	32.4		24.7	17.2	17.2	24.7	17.2	17.2
Actuated g/C Ratio	0.49	0.36		0.49	0.36		0.28	0.19	0.19	0.28	0.19	0.19
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	295	1886		295	1917		315	376	282	218	376	287
v/s Ratio Prot	0.05	0.28		c0.10	c0.34		c0.06	c0.18		0.05	0.11	
v/s Ratio Perm	0.14			0.29			0.13		0.06	0.10		0.01
v/c Ratio	0.40	0.78		0.80	0.95		0.69	0.94	0.33	0.54	0.57	0.06
Uniform Delay, d1	32.3	25.4		30.2	27.9		31.3	35.7	31.3	34.9	32.9	29.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	1.9		13.0	11.5		5.2	30.5	0.2	1.5	1.3	0.0
Delay (s)	32.6	27.3		43.2	39.4		36.5	66.2	31.5	36.4	34.2	29.6
Level of Service	C	C		D	D		D	E	C	D	C	C
Approach Delay (s)		27.7			39.8			48.4			33.9	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	36.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	89.7	Sum of lost time (s)	21.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

2022 Total PM Mitigated
5: 68th Street & CAMELBACK RD.

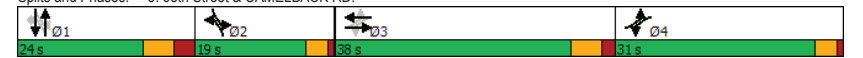
Southbridge Expansion
Timing Report, Sorted By Phase



Phase Number	1	2	3	4
Movement	NBSB	NBSBL	EBWB	EBWBL
Lead/Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	24	19	38	31
Maximum Split (%)	21.4%	17.0%	33.9%	27.7%
Minimum Split (s)	15	8	56	31
Yellow Time (s)	4.2	3	4.2	3
All-Red Time (s)	2.8	1	1.8	1
Minimum Initial (s)	8	4	10	4
Vehicle Extension (s)	2	1	1	1
Minimum Gap (s)	1	1	1	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)		0	33	
Flash Dont Walk (s)		0	17	
Dual Entry	No	No	No	No
Inhibit Max	No	No	No	No
Start Time (s)	0	24	43	81
End Time (s)	24	43	81	0
Yield/Force Off (s)	17	39	75	108
Yield/Force Off 170(s)	17	39	58	108
Local Start Time (s)	88	0	19	57
Local Yield (s)	105	15	51	84
Local Yield 170(s)	105	15	34	84

Intersection Summary	
Cycle Length	112
Control Type	Actuated-Uncoordinated
Natural Cycle	120

Splits and Phases: 5: 68th Street & CAMELBACK RD.



2022 Total PM Mitigated
7: CAMELBACK RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	201	622	284	107	635	187	342	958	106	354	710	212
Future Volume (vph)	201	622	284	107	635	187	342	958	106	354	710	212
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.5	5.0	5.3	5.5	5.0	5.0	5.0	5.6	5.4	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.97	0.91	0.97	0.97	0.95	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.98	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97	1.00	0.99	1.00	1.00	1.00	0.85	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3252	3725	1481	1676	3579	3252	5260	3252	5260	3252	3725	1466
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3252	3725	1481	1676	3579	3252	5260	3252	5260	3252	3725	1466
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.86	0.86	0.88	0.88	0.88	0.95	0.95	0.95
Adj. Flow (vph)	218	676	309	124	738	217	389	1089	120	373	747	223
RTOR Reduction (vph)	0	0	73	0	23	0	0	11	0	0	0	158
Lane Group Flow (vph)	218	676	236	124	932	0	389	1198	0	373	747	65
Confl. Peds. (#/hr)			8			12			10			8
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8	1	7	4		1	6		5	2	
Permitted Phases			8									2
Actuated Green, G (s)	11.9	27.0	47.3	19.0	34.1		20.3	35.9		17.2	33.0	33.0
Effective Green, g (s)	11.9	27.0	47.3	19.0	34.1		20.3	35.9		17.2	33.0	33.0
Actuated g/C Ratio	0.10	0.22	0.39	0.16	0.28		0.17	0.30		0.14	0.27	0.27
Clearance Time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	321	834	642	264	1012		547	1567		464	1020	401
v/s Ratio Prot	c0.07	0.18	0.06	0.07	c0.26		0.12	c0.23		0.11	c0.20	
v/s Ratio Perm			0.10									0.04
v/c Ratio	0.68	0.81	0.37	0.47	0.92		0.71	0.76		0.80	0.73	0.16
Uniform Delay, d1	52.5	44.3	26.0	46.2	41.9		47.3	38.5		50.0	39.7	33.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.4	5.7	0.1	0.5	13.0		3.6	3.6		9.2	4.6	0.9
Delay (s)	56.9	50.0	26.1	46.6	54.9		51.0	42.1		59.2	44.4	34.1
Level of Service	E	D	C	D	D		D	D		E	D	C
Approach Delay (s)		45.1			53.9			44.2			46.8	
Approach LOS		D			D			D			D	

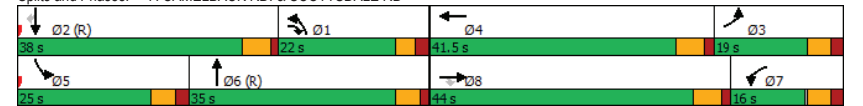
Intersection Summary			
HCM 2000 Control Delay	47.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.5	Sum of lost time (s)	21.4
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Total PM Mitigated
7: CAMELBACK RD. & SCOTTSDALE RD













Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBT	SBL	NBT	WBL	EBT
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	22	38	19	41.5	25	35	16	44
Maximum Split (%)	18.3%	31.5%	15.8%	34.4%	20.7%	29.0%	13.3%	36.5%
Minimum Split (s)	10	32.4	11	40.5	11	33	11	34.5
Yellow Time (s)	3	4.4	3.3	4	3.6	3.6	3.3	4
All-Red Time (s)	2	1	2	1.5	2	1.4	2	1.5
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		23		31		24		25
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	78	40	21	100	40	65	23.5	100
End Time (s)	100	78	40	21	65	100	40	23.5
Yield/Force Off (s)	95	72.6	34.7	15.5	59.4	95	34.7	18
Yield/Force Off 170(s)	95	49.6	34.7	105	59.4	71	34.7	113.5
Local Start Time (s)	38	0	101.5	60	0	25	104	60
Local Yield (s)	55	32.6	115.2	96	19.4	55	115.2	98.5
Local Yield 170(s)	55	9.6	115.2	65	19.4	31	115.2	73.5
Intersection Summary								
Cycle Length					120.5			
Control Type	Actuated-Coordinated							
Natural Cycle	100							
Offset: 40 (33%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green								

Splits and Phases: 7: CAMELBACK RD. & SCOTTSDALE RD



2022 Total PM Mitigated Southbridge Expansion
 8: SCOTTSDALE RD & Stetson Dr/DRINKWATER BLVD HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	128	27	38	97	40	479	22	811	27	249	714	119
Future Volume (vph)	128	27	38	97	40	479	22	811	27	249	714	119
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2	5.0	5.1	5.1		5.0	5.1	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1767		1676	1961	1437	1676	3704		3252	3577	
Flt Permitted	0.72	1.00		0.71	1.00	1.00	0.31	1.00		0.09	1.00	
Satd. Flow (perm)	1278	1767		1247	1961	1437	543	3704		300	3577	
Peak-hour factor, PHF	0.84	0.84	0.84	0.80	0.80	0.80	0.85	0.85	0.85	0.94	0.94	0.94
Adj. Flow (vph)	152	32	45	121	50	599	26	954	32	265	760	127
RTOR Reduction (vph)	0	0	0	0	0	25	0	3	0	0	15	0
Lane Group Flow (vph)	152	77	0	121	50	574	26	983	0	265	872	0
Confl. Peds. (#/hr)			7			35			18			30
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases	8	8		4	4	5	6	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)	53.5	53.5		53.5	53.5	64.1	40.6	40.6		56.2	56.2	
Effective Green, g (s)	53.5	53.5		53.5	53.5	64.1	40.6	40.6		56.2	56.2	
Actuated g/C Ratio	0.45	0.45		0.45	0.45	0.53	0.34	0.34		0.47	0.47	
Clearance Time (s)	5.2	5.2		5.2	5.2	5.0	5.1	5.1		5.0	5.1	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	569	787		555	874	767	183	1253		401	1675	
v/s Ratio Prot	0.12	0.04		0.10	0.03	c0.07	0.25	0.24		0.06	0.24	
v/s Ratio Perm	0.12			0.10		0.33	0.05			0.25		
v/c Ratio	0.27	0.10		0.22	0.06	0.75	0.14	0.78		0.66	0.52	
Uniform Delay, d1	20.9	19.3		20.4	18.9	21.7	27.6	35.8		24.3	22.4	
Progression Factor	1.00	1.00		0.43	0.44	0.68	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.2		0.9	0.1	3.5	1.6	5.0		3.2	1.2	
Delay (s)	22.1	19.5		9.8	8.5	18.2	29.2	40.7		27.4	23.6	
Level of Service	C	B		A	A	B	C	D		C	C	
Approach Delay (s)	21.2			16.3			40.5			24.5		
Approach LOS	C			B			D			C		

Intersection Summary

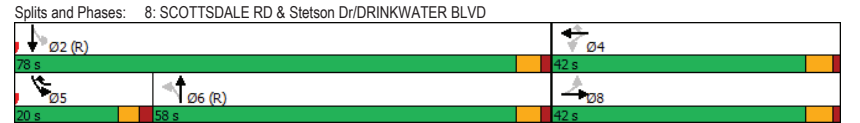
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Total PM Mitigated Southbridge Expansion
 8: SCOTTSDALE RD & Stetson Dr/DRINKWATER BLVD Timing Report, Sorted By Phase

Phase Number	2	4	5	6	8
Movement	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag		Lead		Lag	
Lead-Lag Optimize					
Recall Mode	C-Min	Max	Min	C-Min	Max
Maximum Split (s)	78	42	20	58	42
Maximum Split (%)	65.0%	35.0%	16.7%	48.3%	35.0%
Minimum Split (s)	21.1	37.2	15	38.1	33.2
Yellow Time (s)	3.6	4	3	3.6	4
All-Red Time (s)	1.5	1.2	2	1.5	1.2
Minimum Initial (s)	10	7	10	10	7
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	9	9		9	7
Flash Dont Walk (s)	7	23		24	21
Dual Entry	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	44	2	44	64	2
End Time (s)	2	44	64	2	44
Yield/Force Off (s)	116.9	38.8	59	116.9	38.8
Yield/Force Off 170(s)	109.9	15.8	59	92.9	17.8
Local Start Time (s)	0	78	0	20	78
Local Yield (s)	72.9	114.8	15	72.9	114.8
Local Yield 170(s)	65.9	91.8	15	48.9	93.8


Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 44 (37%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2022 Total PM Mitigated
 19: DRINKWATER BLVD /DRINKWATER BLVD & 3RD AVE. HCM Signalized Intersection Capacity Analysis

Southbridge Expansion



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	41	15	90	65	16	50	91	554	114	63	491	34
Future Volume (vph)	41	15	90	65	16	50	91	554	114	63	491	34
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91		1.00	0.95	1.00
Frbp. ped/bikes	1.00	0.99			0.99		1.00	1.00		1.00	1.00	0.97
Flpb. ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87			0.95		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1689			1804		1676	5196		1676	3725	1454
Flt Permitted	0.58	1.00			0.67		0.44	1.00		0.36	1.00	1.00
Satd. Flow (perm)	1022	1689			1240		781	5196		627	3725	1454
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.89	0.89	0.89	0.88	0.88	0.88
Adj. Flow (vph)	47	17	103	76	19	58	102	622	128	72	558	39
RTOR Reduction (vph)	0	0	0	0	25	0	0	13	0	0	0	9
Lane Group Flow (vph)	47	120	0	0	128	0	102	737	0	72	558	30
Confl. Peds. (#/hr)			1			5			1			3
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	17.2	17.2			17.2		92.7	92.7		92.7	92.7	92.7
Effective Green, g (s)	17.2	17.2			17.2		92.7	92.7		92.7	92.7	92.7
Actuated g/C Ratio	0.14	0.14			0.14		0.77	0.77		0.77	0.77	0.77
Clearance Time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Vehicle Extension (s)	2.0	2.0			2.0		0.2	0.2		2.0	2.0	2.0
Lane Grp Cap (vph)	146	242			177		603	4013		484	2877	1123
v/s Ratio Prot		0.07					0.14				c0.15	
v/s Ratio Perm	0.05				c0.10		0.13			0.11		0.02
v/c Ratio	0.32	0.50			0.72		0.17	0.18		0.15	0.19	0.03
Uniform Delay, d1	46.2	47.4			49.1		3.6	3.6		3.5	3.7	3.2
Progression Factor	1.00	1.00			1.00		2.16	2.65		0.94	0.84	1.17
Incremental Delay, d2	0.5	0.6			11.7		0.5	0.1		0.6	0.1	0.0
Delay (s)	46.6	48.0			60.8		8.2	9.7		3.9	3.2	3.8
Level of Service	D	D			E		A	A		A	A	A
Approach Delay (s)		47.6			60.8			9.5				3.3
Approach LOS		D			E			A				A


Intersection Summary

HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.1
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			

c Critical Lane Group

2022 Total PM Mitigated
 19: DRINKWATER BLVD /DRINKWATER BLVD & 3RD AVE.

Southbridge Expansion
 Timing Report, Sorted By Phase

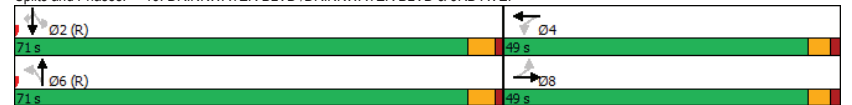


Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	71	49	71	49
Maximum Split (%)	59.2%	40.8%	59.2%	40.8%
Minimum Split (s)	22.2	38.9	32.2	30.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	0.2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	9	7	7
Flash Dont Walk (s)	10	25	20	19
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	40	111	40	111
End Time (s)	111	40	111	40
Yield/Force Off (s)	105.8	35.1	105.8	35.1
Yield/Force Off 170(s)	95.8	10.1	85.8	16.1
Local Start Time (s)	0	71	0	71
Local Yield (s)	65.8	115.1	65.8	115.1
Local Yield 170(s)	55.8	90.1	45.8	96.1

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 40 (33%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	

Splits and Phases: 19: DRINKWATER BLVD /DRINKWATER BLVD & 3RD AVE.



2022 Total PM Mitigated
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗↗	↘	↘	↗↗	↘	↘	↗↗	↘	↘	↗↗	↘
Traffic Volume (vph)	244	790	20	114	725	181	72	501	121	134	422	183
Future Volume (vph)	244	790	20	114	725	181	72	501	121	134	422	183
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99	
Ftpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	5353	1472	1676	5353	1464	1676	3725	1481	1676	3537	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	5353	1472	1676	5353	1464	1676	3725	1481	1676	3537	
Peak-hour factor, PHF	0.95	0.95	0.95	0.85	0.85	0.85	0.85	0.85	0.85	0.94	0.94	0.94
Adj. Flow (vph)	257	832	21	134	853	213	85	589	142	143	449	195
RTOR Reduction (vph)	0	0	12	0	0	69	0	0	0	0	42	0
Lane Group Flow (vph)	257	832	9	134	853	144	85	589	142	143	602	0
Conf. Peds. (#/hr)	5			6			6			5		
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5 10	2		1	6	7	3	8	1	7	4	
Permitted Phases	2			6			8					
Actuated Green, G (s)	21.8	55.7	55.7	10.7	39.1	53.9	13.8	24.8	35.5	14.8	26.1	
Effective Green, g (s)	21.8	55.7	55.7	10.7	39.1	53.9	13.8	24.8	35.5	14.8	26.1	
Actuated g/C Ratio	0.17	0.44	0.44	0.08	0.31	0.42	0.11	0.19	0.28	0.12	0.20	
Clearance Time (s)	5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5		
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Lane Grp Cap (vph)	286	2334	642	140	1639	617	181	723	473	194	722	
v/s Ratio Prot	c0.15	0.16		c0.08	c0.16	0.03	0.05	0.16	0.03	c0.09	c0.17	
v/s Ratio Perm	0.01			0.07			0.07					
v/c Ratio	0.90	0.36	0.01	0.96	0.52	0.23	0.47	0.81	0.30	0.74	0.83	
Uniform Delay, d1	51.9	24.0	20.4	58.3	36.6	23.7	53.5	49.3	36.3	54.6	48.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	27.8	0.4	0.0	62.0	1.2	0.1	0.7	6.7	0.1	11.8	7.8	
Delay (s)	79.7	24.5	20.5	120.3	37.7	23.7	54.2	55.9	36.4	66.4	56.6	
Level of Service	E	C	C	F	D	C	D	E	D	E	E	
Approach Delay (s)	37.2			44.5			52.4			58.3		
Approach LOS	D			D			D			E		

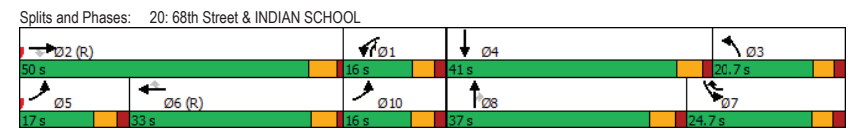
Intersection Summary			
HCM 2000 Control Delay	46.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	127.7	Sum of lost time (s)	27.2
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

2022 Total PM Mitigated
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8	10
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT	EBL
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	
Lead-Lag Optimize									
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None
Maximum Split (s)	16	50	20.7	41	17	33	24.7	37	16
Maximum Split (%)	12.5%	39.2%	16.2%	32.1%	13.3%	25.8%	19.3%	29.0%	12.5%
Minimum Split (s)	11	32.4	11	39.5	11	33	11	42.7	11
Yellow Time (s)	3.3	4.4	3.3	4	3.6	4	3.3	4	3.6
All-Red Time (s)	2	1	1.9	1.5	2	1	2	1.7	2
Minimum Initial (s)	5	10	5	7	5	10	5	7	5
Vehicle Extension (s)	2	2	2	2	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0	0
Walk Time (s)	4		4		4		4		
Flash Dont Walk (s)	23		30		24		33		
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes	Yes
Inhibit Max	No	No	No	No	No	No	No	No	No
Start Time (s)	70	20	127	86	20	37	123	86	70
End Time (s)	86	70	20	127	37	70	20	123	86
Yield/Force Off (s)	80.7	64.6	14.8	121.5	31.4	65	14.7	117.3	80.4
Yield/Force Off 170(s)	80.7	41.6	14.8	91.5	31.4	41	14.7	84.3	80.4
Local Start Time (s)	50	0	107	66	0	17	103	66	50
Local Yield (s)	60.7	44.6	122.5	101.5	11.4	45	122.4	97.3	60.4
Local Yield 170(s)	60.7	21.6	122.5	71.5	11.4	21	122.4	64.3	60.4

Intersection Summary	
Cycle Length	127.7
Control Type	Actuated-Coordinated
Natural Cycle	120
Offset: 20 (16%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	



2022 Total PM Mitigated
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

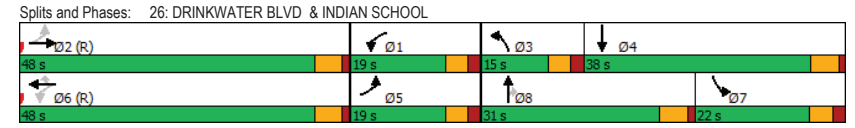
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	1114	59	286	878	217	85	472	419	326	263	57
Future Volume (vph)	83	1114	59	286	878	217	85	472	419	326	263	57
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.1	5.3	5.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	
Ftpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1710	3698		1710	3725	1510	1710	3725	1505	3317	3629	
Flt Permitted	0.11	1.00		0.09	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	204	3698		168	3725	1510	1710	3725	1505	3317	3629	
Peak-hour factor, PHF	0.94	0.94	0.94	0.89	0.89	0.89	0.90	0.90	0.90	0.80	0.80	0.80
Adj. Flow (vph)	88	1185	63	321	987	244	94	524	466	408	329	71
RTOR Reduction (vph)	0	3	0	0	0	106	0	0	169	0	15	0
Lane Group Flow (vph)	88	1245	0	321	987	138	94	524	297	408	385	0
Confl. Peds. (#/hr)			2			1			4			3
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6			8			
Actuated Green, G (s)	56.5	42.8		56.5	42.8	42.8	9.0	25.9	25.9	16.7	33.6	
Effective Green, g (s)	56.5	42.8		56.5	42.8	42.8	9.0	25.9	25.9	16.7	33.6	
Actuated g/C Ratio	0.47	0.36		0.47	0.36	0.36	0.08	0.22	0.22	0.14	0.28	
Clearance Time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.1	5.3	5.1	
Vehicle Extension (s)	2.0	0.2		2.0	0.2	0.2	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	267	1318		255	1328	538	128	803	324	461	1016	
v/s Ratio Prot	0.04	0.34		c0.14	0.26		0.05	0.14		c0.12	0.11	
v/s Ratio Perm	0.12			c0.45		0.09			c0.20			
v/c Ratio	0.33	0.94		1.26	0.74	0.26	0.73	0.65	0.92	0.89	0.38	
Uniform Delay, d1	39.8	37.4		49.8	33.8	27.3	54.3	42.9	46.0	50.7	34.8	
Progression Factor	1.21	1.04		1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.17	
Incremental Delay, d2	0.3	14.1		144.2	3.8	1.2	17.0	4.1	32.9	17.5	1.1	
Delay (s)	48.4	53.2		194.0	37.6	28.5	71.3	47.0	78.9	73.1	41.7	
Level of Service	D	D		F	D	C	E	D	E	E	D	
Approach Delay (s)		52.9			68.5			62.8			57.6	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	61.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

2022 Total PM Mitigated
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBT	EBL	WBTL	SBL	NBT
Lead/Lag			Lead	Lag			Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	Max	None	C-Max	None	Max
Maximum Split (s)	19	48	15	38	19	48	22	31
Maximum Split (%)	15.8%	40.0%	12.5%	31.7%	15.8%	40.0%	18.3%	25.8%
Minimum Split (s)	11	16	11	13	11	16	11	13
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1.2	2	1.1	2	1.2	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	0.2	2	2	2	0.2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		9		7		11
Flash Dont Walk (s)		21		20		19		20
Dual Entry	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	18	90	37	52	18	90	68	37
End Time (s)	37	18	52	90	37	18	90	68
Yield/Force Off (s)	31.7	12.8	46.7	84.9	31.7	12.8	84.7	62.9
Yield/Force Off 170(s)	31.7	111.8	46.7	64.9	31.7	113.8	84.7	42.9
Local Start Time (s)	48	0	67	82	48	0	98	67
Local Yield (s)	61.7	42.8	76.7	114.9	61.7	42.8	114.7	92.9
Local Yield 170(s)	61.7	21.8	76.7	94.9	61.7	23.8	114.7	72.9



2022 Total PM Mitigated
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

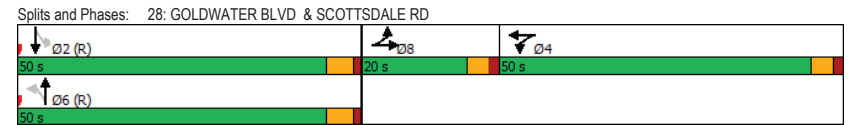
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	18	15	22	621	25	21	25	301	4	29	632	18
Future Volume (vph)	18	15	22	621	25	21	25	301	4	29	632	18
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		4.9		4.9	4.9		5.2	5.2		5.2	5.2	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95		1.00	0.91	
Frbp, ped/bikes		0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.95		1.00	0.99		1.00	1.00		1.00	1.00	
Flt Protected		0.98		0.95	0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1803		1593	1767		1676	3717		1676	5327	
Flt Permitted		0.98		0.95	0.96		0.36	1.00		0.52	1.00	
Satd. Flow (perm)		1803		1593	1767		629	3717		922	5327	
Peak-hour factor, PHF	0.80	0.80	0.80	0.88	0.88	0.88	0.84	0.84	0.84	0.95	0.95	0.95
Adj. Flow (vph)	22	19	28	706	28	24	30	358	5	31	665	19
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	70	0	381	375	0	30	363	0	31	682	0
Confl. Peds. (#/hr)			4			4			4			3
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6			2	
Permitted Phases							6			2		
Actuated Green, G (s)		8.0		33.7	33.7		63.3	63.3		63.3	63.3	
Effective Green, g (s)		8.0		33.7	33.7		63.3	63.3		63.3	63.3	
Actuated g/C Ratio		0.07		0.28	0.28		0.53	0.53		0.53	0.53	
Clearance Time (s)		4.9		4.9	4.9		5.2	5.2		5.2	5.2	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		120		447	496		331	1960		486	2809	
v/s Ratio Prot		c0.04		c0.24	0.21			0.10			c0.13	
v/s Ratio Perm							0.05			0.03		
v/c Ratio		0.58		0.85	0.76		0.09	0.18		0.06	0.24	
Uniform Delay, d1		54.4		40.8	39.4		14.1	14.8		13.9	15.4	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.6		14.0	5.8		0.5	0.2		0.3	0.2	
Delay (s)		59.0		54.8	45.2		14.6	15.1		14.1	15.6	
Level of Service		E		D	D		B	B		B	B	
Approach Delay (s)		59.0			50.0			15.0			15.5	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2022 Total PM Mitigated
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	50	50	50	20
Maximum Split (%)	41.7%	41.7%	41.7%	16.7%
Minimum Split (s)	16	13	16	13
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	88	38	88	18
End Time (s)	18	88	18	38
Yield/Force Off (s)	12.8	83.1	12.8	33.1
Yield/Force Off 170(s)	12.8	83.1	12.8	33.1
Local Start Time (s)	0	70	0	50
Local Yield (s)	44.8	115.1	44.8	65.1
Local Yield 170(s)	44.8	115.1	44.8	65.1
Intersection Summary				
Cycle Length				120
Control Type	Actuated-Coordinated			
Natural Cycle	50			
Offset: 88 (73%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				



APPENDIX I

2032 PEAK HOUR TRAFFIC ANALYSIS

2032 Background AM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

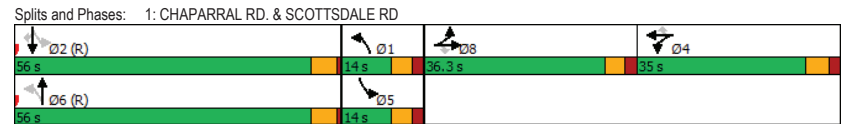
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	→	→	→	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	68	127	47	555	222	323	18	1227	213	189	1593	97
Future Volume (vph)	68	127	47	555	222	323	18	1227	213	189	1593	97
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4		5.6	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91		1.00	0.95	1.00
Frbp. ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.97
Flpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1945	1478	3252	1945	1478	1676	5200		1676	3711	1458
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.06	1.00		0.07	1.00	1.00
Satd. Flow (perm)	1676	1945	1478	3252	1945	1478	111	5200		122	3711	1458
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.89	0.89	0.89	0.88	0.88	0.88
Adj. Flow (vph)	72	134	49	610	244	355	20	1379	239	215	1810	110
RTOR Reduction (vph)	0	0	0	0	0	275	0	15	0	0	0	59
Lane Group Flow (vph)	72	134	49	610	244	80	20	1603	0	215	1810	51
Confl. Peds. (#/hr)			2			2			2			2
Bus Blockages (#/hr)	0	2	0	0	2	0	0	2	0	0	2	0
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases			8			4	6			2		2
Actuated Green, G (s)	16.4	16.4	16.4	30.8	30.8	30.8	71.8	63.4		71.8	63.4	63.4
Effective Green, g (s)	16.4	16.4	16.4	30.8	30.8	30.8	71.8	63.4		71.8	63.4	63.4
Actuated g/C Ratio	0.12	0.12	0.12	0.22	0.22	0.22	0.51	0.45		0.51	0.45	0.45
Clearance Time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4		5.6	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.2		2.0	0.2	0.2
Lane Grp Cap (vph)	194	225	171	708	423	322	149	2333		154	1665	654
v/s Ratio Prot	0.04	c0.07		c0.19	0.13		0.01	0.31		c0.08	0.49	
v/s Ratio Perm			0.03			0.05	0.06			c0.63		0.03
v/c Ratio	0.37	0.60	0.29	0.86	0.58	0.25	0.13	0.69		1.40	1.09	0.08
Uniform Delay, d1	57.7	59.3	57.1	53.2	49.4	45.7	59.5	31.0		50.7	39.0	22.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	2.8	0.3	10.2	1.2	0.1	0.1	1.7		212.8	49.8	0.2
Delay (s)	58.1	62.1	57.4	63.4	50.6	45.8	59.6	32.7		263.5	88.8	22.5
Level of Service	E	E	E	E	D	D	E	C		F	F	C
Approach Delay (s)		60.1			55.6			33.0			102.9	
Approach LOS		E			E			C			F	

Intersection Summary				
HCM 2000 Control Delay	68.1	HCM 2000 Level of Service		E
HCM 2000 Volume to Capacity ratio	1.14			
Actuated Cycle Length (s)	141.3	Sum of lost time (s)		22.3
Intersection Capacity Utilization	88.9%	ICU Level of Service		E
Analysis Period (min)	15			
Description: Last Update: Feb 2018				
c Critical Lane Group				

2032 Background AM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag		Lag			Lead	
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	14	56	35	14	56	36.3
Maximum Split (%)	9.9%	39.6%	24.8%	9.9%	39.6%	25.7%
Minimum Split (s)	11	16	35	11	16	36.3
Yellow Time (s)	3.6	4.4	4	3.6	4.4	3.3
All-Red Time (s)	2	1	2	2	1	2
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	9
Flash Dont Walk (s)		10	22		14	22
Dual Entry	No	Yes	No	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	106	50	15	106	50	120
End Time (s)	120	106	50	120	106	15
Yield/Force Off (s)	114.4	100.6	44	114.4	100.6	9.7
Yield/Force Off 170(s)	114.4	90.6	22	114.4	86.6	129
Local Start Time (s)	56	0	106.3	56	0	70
Local Yield (s)	64.4	50.6	135.3	64.4	50.6	101
Local Yield 170(s)	64.4	40.6	113.3	64.4	36.6	79
Intersection Summary						
Cycle Length	141.3					
Control Type	Actuated-Coordinated					
Natural Cycle	150					
Offset: 50 (35%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green						



2032 Background AM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	3	47	38	6	22	127	1231	35	16	837	27
Future Volume (vph)	105	3	47	38	6	22	127	1231	35	16	837	27
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1	5.1		5.1	5.1	5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	1.00	0.99		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1961	1480		1880	1500	1676	5326		1676	5323	
Flt Permitted	0.72	1.00	1.00		0.77	1.00	0.29	1.00		0.17	1.00	
Satd. Flow (perm)	1278	1961	1480		1507	1500	514	5326		295	5323	
Peak-hour factor, PHF	0.84	0.84	0.84	0.88	0.88	0.88	0.90	0.90	0.90	0.93	0.93	0.93
Adj. Flow (vph)	125	4	56	43	7	25	141	1368	39	17	900	29
RTOR Reduction (vph)	0	0	47	0	0	21	0	1	0	0	2	0
Lane Group Flow (vph)	125	4	9	0	50	4	141	1406	0	17	927	0
Confl. Peds. (#/hr)			1						3			4
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4		4	6			2		
Actuated Green, G (s)	19.0	19.0	19.0		19.0	19.0	95.4	95.4		95.4	95.4	
Effective Green, g (s)	19.0	19.0	19.0		19.0	19.0	95.4	95.4		95.4	95.4	
Actuated g/C Ratio	0.15	0.15	0.15		0.15	0.15	0.76	0.76		0.76	0.76	
Clearance Time (s)	5.1	5.1	5.1		5.1	5.1	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	194	297	224		228	227	391	4061		224	4059	
v/s Ratio Prot		0.00					0.26				0.17	
v/s Ratio Perm	c0.10		0.01		0.03	0.00	c0.27			0.06		
v/c Ratio	0.64	0.01	0.04		0.22	0.02	0.36	0.35		0.08	0.23	
Uniform Delay, d1	49.9	45.1	45.3		46.5	45.1	4.9	4.8		3.7	4.3	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.4	0.0	0.0		0.2	0.0	2.6	0.2		0.7	0.1	
Delay (s)	55.3	45.1	45.3		46.7	45.1	7.4	5.0		4.4	4.4	
Level of Service	E	D	D		D	D	A	A		A	A	
Approach Delay (s)		52.0			46.2		5.2			4.4		
Approach LOS		D			D		A			A		

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	125.1	Sum of lost time (s)	10.7
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

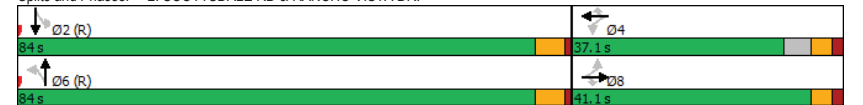
2032 Background AM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	84	37.1	84	41.1
Maximum Split (%)	67.1%	29.7%	67.1%	32.9%
Minimum Split (s)	16	37.1	16	41.1
Yellow Time (s)	4.4	3.3	4.4	3.3
All-Red Time (s)	1.2	1.8	1.2	1.8
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	11
Flash Dont Walk (s)	18	25	13	25
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	93	51.9	93	51.9
End Time (s)	51.9	93	51.9	93
Yield/Force Off (s)	46.3	87.9	46.3	87.9
Yield/Force Off 170(s)	28.3	62.9	33.3	62.9
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.4	120	78.4	120
Local Yield 170(s)	60.4	95	65.4	95

Intersection Summary	
Cycle Length	125.1
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 93 (74%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	

Splits and Phases: 2: SCOTTSDALE RD & RANCHO VISTA DR.



2032 Background AM Southbridge Expansion
 3: HIGHLAND AVE/Granada Ave & SCOTTSDALE RD HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	414	22	28	11	5	19	28	967	27	42	830	62
Future Volume (vph)	414	22	28	11	5	19	28	967	27	42	830	62
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.88		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3252	1781		1676	1728		1676	5326		1676	5291	
Flt Permitted	0.95	1.00		0.95	1.00		0.27	1.00		0.22	1.00	
Satd. Flow (perm)	3252	1781		1676	1728		475	5326		384	5291	
Peak-hour factor, PHF	0.91	0.91	0.91	0.81	0.81	0.81	0.88	0.88	0.88	0.93	0.93	0.93
Adj. Flow (vph)	455	24	31	14	6	23	32	1099	31	45	892	67
RTOR Reduction (vph)	0	25	0	0	22	0	0	2	0	0	5	0
Lane Group Flow (vph)	455	30	0	14	7	0	32	1128	0	45	954	0
Confl. Peds. (#/hr)			2						4			2
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6			2	
Permitted Phases							6			2		
Actuated Green, G (s)	22.6	22.6		4.3	4.3		78.3	78.3		78.3	78.3	
Effective Green, g (s)	22.6	22.6		4.3	4.3		78.3	78.3		78.3	78.3	
Actuated g/C Ratio	0.19	0.19		0.04	0.04		0.65	0.65		0.65	0.65	
Clearance Time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	606	332		59	61		307	3443		248	3421	
v/s Ratio Prot	c0.14	0.02		c0.01	0.00			c0.21			0.18	
v/s Ratio Perm							0.07			0.12		
v/c Ratio	0.75	0.09		0.24	0.11		0.10	0.33		0.18	0.28	
Uniform Delay, d1	46.6	40.7		56.8	56.6		8.1	9.6		8.6	9.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.6	0.0		0.8	0.3		0.7	0.3		1.6	0.2	
Delay (s)	51.2	40.8		57.6	56.8		8.8	9.9		10.2	9.4	
Level of Service	D	D		E	E		A	A		B	A	
Approach Delay (s)		50.1			57.1			9.8			9.5	
Approach LOS		D			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	15.9
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

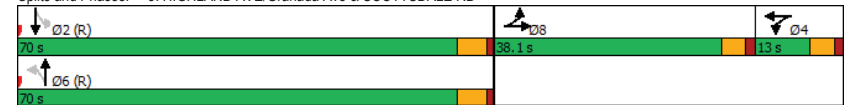
Description: Last Update: Sept 2017

c Critical Lane Group

2032 Background AM Southbridge Expansion
 3: HIGHLAND AVE/Granada Ave & SCOTTSDALE RD Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	70	13	70	38.1
Maximum Split (%)	57.8%	10.7%	57.8%	31.5%
Minimum Split (s)	30.7	13	28.7	38.1
Yellow Time (s)	4.4	3.6	4.4	3.6
All-Red Time (s)	1.3	1.5	1.3	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	1	2	1	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8		7	9
Flash Dont Walk (s)	17		16	24
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	42	29	42	112
End Time (s)	112	42	112	29
Yield/Force Off (s)	106.3	36.9	106.3	23.9
Yield/Force Off 170(s)	89.3	36.9	90.3	121
Local Start Time (s)	0	108.1	0	70
Local Yield (s)	64.3	116	64.3	103
Local Yield 170(s)	47.3	116	48.3	79

Split and Phases: 3: HIGHLAND AVE/Granada Ave & SCOTTSDALE RD



2032 Background AM
4: Fashion Square Drive

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

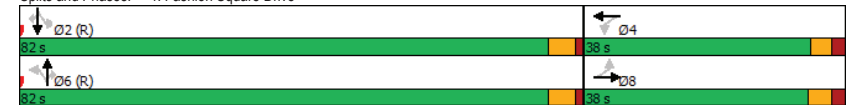
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	6	0	15	5	0	0	5	520	15	27	1125	44
Future Volume (vph)	6	0	15	5	0	0	5	520	15	27	1125	44
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		5.5		5.2			5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor		1.00		1.00			1.00	0.95	1.00	1.00	0.91	1.00
Frbp, ped/bikes		1.00		1.00			1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00			1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.91		1.00			1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99		0.95			0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1750		1676			1676	3725	1465	1676	5353	1466
Flt Permitted		0.90		0.85			0.22	1.00	1.00	0.44	1.00	1.00
Satd. Flow (perm)		1594		1502			383	3725	1465	776	5353	1466
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	0	16	5	0	0	5	565	16	29	1223	48
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	2	0	0	6
Lane Group Flow (vph)	0	4	0	5	0	0	5	565	14	29	1223	42
Confl. Peds. (#/hr)						1			1			1
Turn Type	Perm	NA		Perm			Perm	NA	Perm	Perm	NA	Perm
Protected Phases		8		4		4	6	6	6	2	2	2
Permitted Phases	8		4			6	6	6	2			2
Actuated Green, G (s)		4.4		4.7			104.9	104.9	104.9	104.9	104.9	104.9
Effective Green, g (s)		4.4		4.7			104.9	104.9	104.9	104.9	104.9	104.9
Actuated g/C Ratio		0.04		0.04			0.87	0.87	0.87	0.87	0.87	0.87
Clearance Time (s)		5.5		5.2			5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)		3.0		3.0			3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		58		58			334	3256	1280	678	4679	1281
v/s Ratio Prot								0.15			c0.23	
v/s Ratio Perm		0.00		c0.00			0.01		0.01	0.04		0.03
v/c Ratio		0.06		0.09			0.01	0.17	0.01	0.04	0.26	0.03
Uniform Delay, d1		55.8		55.6			1.0	1.1	1.0	1.0	1.2	1.0
Progression Factor		1.00		1.00			1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.5		0.6			0.1	0.1	0.0	0.1	0.1	0.0
Delay (s)		56.3		56.2			1.0	1.2	1.0	1.1	1.4	1.0
Level of Service		E		E			A	A	A	A	A	A
Approach Delay (s)		56.3		56.2		56.2		1.2			1.3	
Approach LOS		E		E		E		A			A	
Intersection Summary												
HCM 2000 Control Delay		2.1					HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio		0.25										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)			10.7		
Intersection Capacity Utilization		41.6%					ICU Level of Service			A		
Analysis Period (min)		15										
c Critical Lane Group												

2032 Background AM
4: Fashion Square Drive

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	82	38	82	38
Maximum Split (%)	68.3%	31.7%	68.3%	31.7%
Minimum Split (s)	16	21.2	16	21.5
Yellow Time (s)	4	3	4	3.3
All-Red Time (s)	1.2	2.2	1.2	2.2
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	5
Flash Dont Walk (s)	16	11	10	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	82	0	82
End Time (s)	82	0	82	0
Yield/Force Off (s)	76.8	114.8	76.8	114.5
Yield/Force Off 170(s)	60.8	103.8	66.8	103.5
Local Start Time (s)	0	82	0	82
Local Yield (s)	76.8	114.8	76.8	114.5
Local Yield 170(s)	60.8	103.8	66.8	103.5
Intersection Summary				
Cycle Length	120			
Control Type	Actuated-Coordinated			
Natural Cycle	40			
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				

Split and Phases: 4: Fashion Square Drive



2032 Background AM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	94	1323	113	186	1208	57	237	406	185	61	252	63
Future Volume (vph)	94	1323	113	186	1208	57	237	406	185	61	252	63
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5284		1676	5313		1676	1961	1479	1676	1961	1477
Flt Permitted	0.13	1.00		0.09	1.00		0.43	1.00	1.00	0.15	1.00	1.00
Satd. Flow (perm)	225	5284		161	5313		761	1961	1479	269	1961	1477
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	102	1438	123	202	1313	62	258	441	201	66	274	68
RTOR Reduction (vph)	0	9	0	0	5	0	0	0	87	0	0	51
Lane Group Flow (vph)	102	1552	0	202	1370	0	258	441	114	66	274	17
Confl. Peds. (#/hr)			1			5			2			3
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	3		4	3		2	1	2	1	1	1
Permitted Phases	3			3			1		1			1
Actuated Green, G (s)	54.1	50.1		54.1	50.1		30.7	26.7	26.7	30.7	26.7	26.7
Effective Green, g (s)	54.1	50.1		54.1	50.1		30.7	26.7	26.7	30.7	26.7	26.7
Actuated g/C Ratio	0.51	0.47		0.51	0.47		0.29	0.25	0.25	0.29	0.25	0.25
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	169	2502		139	2515		255	494	373	131	494	372
v/s Ratio Prot	0.02	0.29		c0.05	0.26		c0.04	0.22	0.02	0.14		
v/s Ratio Perm	0.28			c0.68			c0.25		0.08	0.13		0.01
v/c Ratio	0.60	0.62		1.45	0.54		1.01	0.89	0.31	0.50	0.55	0.05
Uniform Delay, d1	31.2	20.8		35.4	19.8		40.1	38.2	32.0	44.9	34.4	29.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.1	0.3		239.3	0.1		59.4	17.8	0.2	1.1	0.8	0.0
Delay (s)	35.3	21.1		274.8	19.9		99.5	55.9	32.2	46.0	35.2	29.9
Level of Service	D	C		F	B		F	E	C	D	D	C
Approach Delay (s)		22.0			52.5			63.1			36.0	
Approach LOS		C			D			E			D	

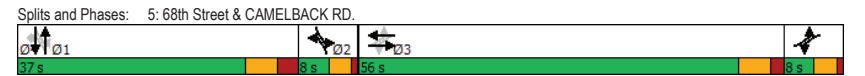
Intersection Summary			
HCM 2000 Control Delay	42.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	105.8	Sum of lost time (s)	21.0
Intersection Capacity Utilization	97.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

2032 Background AM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4
Movement	NBSB	NBSBL	EBWB	EBWBL
Lead/Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize				
Recall Mode	None	None	Ped	None
Maximum Split (s)	37	8	56	8
Maximum Split (%)	33.9%	7.3%	51.4%	7.3%
Minimum Split (s)	37	8	56	8
Yellow Time (s)	4.2	3	4.2	3
All-Red Time (s)	2.8	1	1.8	1
Minimum Initial (s)	8	4	10	4
Vehicle Extension (s)	2	1	1	1
Minimum Gap (s)	3	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		33	
Flash Dont Walk (s)	23		17	
Dual Entry	No	No	No	No
Inhibit Max	No	Yes	No	Yes
Start Time (s)	0	37	45	101
End Time (s)	37	45	101	0
Yield/Force Off (s)	30	41	95	105
Yield/Force Off 170(s)	7	41	78	105
Local Start Time (s)	72	0	8	64
Local Yield (s)	102	4	58	68
Local Yield 170(s)	79	4	41	68

Intersection Summary	
Cycle Length	109
Control Type	Actuated-Uncoordinated
Natural Cycle	110



2032 Background AM
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	[Traffic Light Diagram]											
Traffic Volume (vph)	235	1057	192	63	828	49	147	286	43	18	424	615
Future Volume (vph)	235	1057	192	63	828	49	147	286	43	18	424	615
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5353	1479	1676	5304		3252	3725	1486	3252	5353	1491
Flt Permitted	0.19	1.00	1.00	0.14	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	338	5353	1479	243	5304		3252	3725	1486	3252	5353	1491
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	270	1215	221	74	974	58	167	325	49	20	471	683
RTOR Reduction (vph)	0	0	78	0	5	0	0	0	31	0	0	50
Lane Group Flow (vph)	270	1215	143	74	1027	0	167	325	18	20	471	633
Confl. Peds. (#/hr)			2			2			5			3
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	3	8		7	4		1	6	7	5	2	3
Permitted Phases	8		8	4					6			2
Actuated Green, G (s)	71.4	49.0	49.0	71.4	49.0		12.9	22.7	45.1	5.3	15.1	37.5
Effective Green, g (s)	71.4	49.0	49.0	71.4	49.0		12.9	22.7	45.1	5.3	15.1	37.5
Actuated g/C Ratio	0.59	0.40	0.40	0.59	0.40		0.11	0.19	0.37	0.04	0.12	0.31
Clearance Time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Vehicle Extension (s)	2.0	0.2	0.2	2.0	0.2		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	444	2157	595	406	2137		344	695	619	141	664	528
v/s Ratio Prot	0.11	0.23		0.03	0.19		c0.05	0.09	0.01	0.01	0.09	c0.22
v/s Ratio Perm	c0.24		0.10	0.07					0.01			0.20
v/c Ratio	0.61	0.56	0.24	0.18	0.48		0.49	0.47	0.03	0.14	0.71	1.20
Uniform Delay, d1	27.3	28.0	24.0	23.8	26.9		51.2	44.1	24.3	56.0	51.1	42.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.2	0.1	0.1	0.1		0.4	2.3	0.0	0.2	6.3	106.9
Delay (s)	28.9	28.2	24.1	23.8	26.9		51.6	46.3	24.3	56.1	57.5	148.9
Level of Service	C	C	C	C	C		D	D	C	E	E	F
Approach Delay (s)		27.8			26.7			46.0			110.6	
Approach LOS		C			C			D			F	

Intersection Summary			
HCM 2000 Control Delay	51.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	121.6	Sum of lost time (s)	22.2
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		

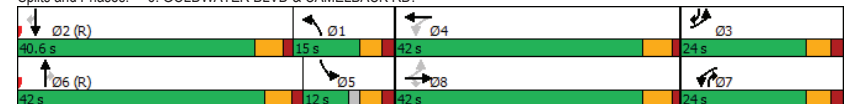
Description: Last Update: Sept 2017
c Critical Lane Group

2032 Background AM
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBTL	SBL	NBT	WBL	EBTL
Lead/Lag	Lag	Lead			Lag	Lead		
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Ped	None	C-Min	None	Ped
Maximum Split (s)	15	40.6	24	42	12	42	24	42
Maximum Split (%)	12.3%	33.4%	19.7%	34.5%	9.9%	34.5%	19.7%	34.5%
Minimum Split (s)	11	40.6	11	31	11	35.6	11	33
Yellow Time (s)	3.3	4	3.6	4.4	3.3	4	3.6	4.4
All-Red Time (s)	2	1.6	2	1.3	2	1.6	2	1.3
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	0.2	2	2	2	0.2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		7		7		7
Flash Dont Walk (s)		27		24		23		26
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	40.6	0	97.6	55.6	42	0	97.6	55.6
End Time (s)	55.6	40.6	0	97.6	55.6	42	0	97.6
Yield/Force Off (s)	50.3	35	116	91.9	50.3	36.4	116	91.9
Yield/Force Off 170(s)	50.3	8	116	67.9	50.3	13.4	116	65.9
Local Start Time (s)	40.6	0	97.6	55.6	42	0	97.6	55.6
Local Yield (s)	50.3	35	116	91.9	50.3	36.4	116	91.9
Local Yield 170(s)	50.3	8	116	67.9	50.3	13.4	116	65.9
Intersection Summary								
Cycle Length	121.6							
Control Type	Actuated-Coordinated							
Natural Cycle	100							
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green								

Splits and Phases: 6: GOLDWATER BLVD & CAMELBACK RD.



2032 Background AM
7: SCOTSDALE RD & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	152	808	214	84	718	153	230	803	53	167	723	132
Future Volume (vph)	152	808	214	84	718	153	230	803	53	167	723	132
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.91		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3252	3725	1479	1676	3608		3252	5292		3252	3725	1451
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3252	3725	1479	1676	3608		3252	5292		3252	3725	1451
Peak-hour factor, PHF	0.81	0.81	0.81	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	188	998	264	91	780	166	250	873	58	176	761	139
RTOR Reduction (vph)	0	0	40	0	16	0	0	6	0	0	0	93
Lane Group Flow (vph)	188	998	224	91	930	0	250	925	0	176	761	46
Confl. Peds. (#/hr)			6			18			16			
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8	1	7	4		1	6		5	2	
Permitted Phases			8									2
Actuated Green, G (s)	11.3	36.2	49.8	9.6	34.5		13.6	36.5		16.3	39.4	39.4
Effective Green, g (s)	11.3	36.2	49.8	9.6	34.5		13.6	36.5		16.3	39.4	39.4
Actuated g/C Ratio	0.09	0.30	0.41	0.08	0.29		0.11	0.30		0.14	0.33	0.33
Clearance Time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	306	1123	675	134	1037		368	1609		441	1223	476
v/s Ratio Prot	c0.06	c0.27	0.04	0.05	0.26		c0.08	0.17		c0.05	c0.20	
v/s Ratio Perm			0.11									0.03
v/c Ratio	0.61	0.89	0.33	0.68	0.90		0.68	0.57		0.40	0.62	0.10
Uniform Delay, d1	52.3	40.0	23.8	53.7	41.0		51.1	35.2		47.4	34.0	27.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.90	1.08		1.00	1.00	1.00
Incremental Delay, d2	2.6	8.6	0.1	10.2	10.0		3.7	1.4		0.2	2.4	0.4
Delay (s)	54.8	48.5	23.9	63.9	51.0		49.5	39.4		47.6	36.4	28.3
Level of Service	D	D	C	E	D		D	D		D	D	C
Approach Delay (s)		44.9			52.2			41.6			37.2	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	43.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.4
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		

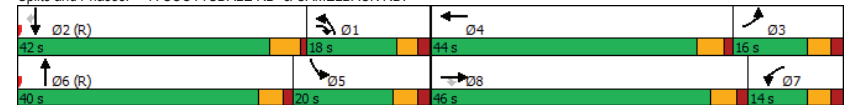
Description: Last Update: Sept 2017
c Critical Lane Group

2032 Background AM
7: SCOTSDALE RD & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBT	SBL	NBT	WBL	EBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	18	42	16	44	20	40	14	46
Maximum Split (%)	15.0%	35.0%	13.3%	36.7%	16.7%	33.3%	11.7%	38.3%
Minimum Split (s)	10	32.4	11	40.5	11	33	11	34.5
Yellow Time (s)	3	4.4	3.3	4	3.6	3.6	3.3	4
All-Red Time (s)	2	1	2	1.5	2	1.4	2	1.5
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		23		31		24		25
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	10	88	72	28	8	88	74	28
End Time (s)	28	10	88	72	28	8	88	74
Yield/Force Off (s)	23	4.6	82.7	66.5	22.4	3	82.7	68.5
Yield/Force Off 170(s)	23	101.6	82.7	35.5	22.4	99	82.7	43.5
Local Start Time (s)	42	0	104	60	40	0	106	60
Local Yield (s)	55	36.6	114.7	98.5	54.4	35	114.7	100.5
Local Yield 170(s)	55	13.6	114.7	67.5	54.4	11	114.7	75.5
Intersection Summary								
Cycle Length	120							
Control Type	Actuated-Coordinated							
Natural Cycle	100							
Offset: 88 (73%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green								

Splits and Phases: 7: SCOTSDALE RD & CAMELBACK RD.



2032 Background AM Southbridge Expansion
 8: Stetson Dr/DRINKWATER BLVD & SCOTTSDALE RD HCM Signalized Intersection Capacity Analysis

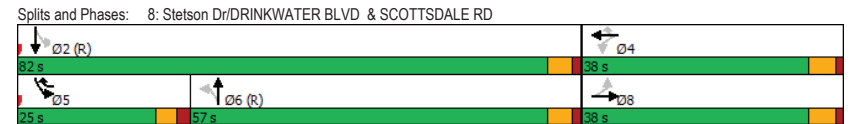
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	27	14	8	16	42	370	0	477	18	253	506	87
Future Volume (vph)	27	14	8	16	42	370	0	477	18	253	506	87
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		5.2		5.2	5.2	5.0		5.1		5.0	5.1	
Lane Util. Factor		1.00		1.00	1.00	1.00		0.95		0.97	0.95	
Frbp, ped/bikes		1.00		1.00	1.00	0.96		1.00		1.00	0.99	
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frt		0.98		1.00	1.00	0.85		0.99		1.00	0.98	
Flt Protected		0.97		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1860		1676	1961	1444		3702		3252	3597	
Flt Permitted		0.84		0.75	1.00	1.00		1.00		0.39	1.00	
Satd. Flow (perm)		1607		1318	1961	1444		3702		1335	3597	
Peak-hour factor, PHF	0.80	0.80	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	34	18	10	18	47	411	0	530	20	266	533	92
RTOR Reduction (vph)	0	0	0	0	0	144	0	2	0	0	10	0
Lane Group Flow (vph)	0	62	0	18	47	267	0	548	0	266	615	0
Confl. Peds. (#/hr)			8			35			14			18
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		8			4	5		6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)		25.6		25.6	25.6	34.7		70.0		84.1	84.1	
Effective Green, g (s)		25.6		25.6	25.6	34.7		70.0		84.1	84.1	
Actuated g/C Ratio		0.21		0.21	0.21	0.29		0.58		0.70	0.70	
Clearance Time (s)		5.2		5.2	5.2	5.0		5.1		5.0	5.1	
Vehicle Extension (s)		2.0		2.0	2.0	2.0		2.0		2.0	2.0	
Lane Grp Cap (vph)		342		281	418	417		2159		1080	2520	
v/s Ratio Prot				0.02	0.02	c0.05		0.15		0.02	0.17	
v/s Ratio Perm		0.04		0.01		0.14				c0.15		
v/c Ratio		0.18		0.06	0.11	0.64		0.25		0.25	0.24	
Uniform Delay, d1		38.6		37.6	38.0	37.2		12.2		6.3	6.5	
Progression Factor		1.00		0.95	0.98	1.68		1.00		0.29	0.28	
Incremental Delay, d2		0.1		0.0	0.0	2.5		0.3		0.0	0.2	
Delay (s)		38.7		35.7	37.2	64.9		12.5		1.9	2.0	
Level of Service		D		D	D	E		B		A	A	
Approach Delay (s)		38.7			61.1			12.5			2.0	
Approach LOS		D			E			B			A	

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Background AM Southbridge Expansion
 8: Stetson Dr/DRINKWATER BLVD & SCOTTSDALE RD Timing Report, Sorted By Phase

Phase Number	2	4	5	6	8
Movement	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag		Lead	Lag		
Lead-Lag Optimize					
Recall Mode	C-Max	None	None	C-Max	None
Maximum Split (s)	82	38	25	57	38
Maximum Split (%)	68.3%	31.7%	20.8%	47.5%	31.7%
Minimum Split (s)	21.1	37.2	10	38.1	33.2
Yellow Time (s)	3.6	4	3	3.6	4
All-Red Time (s)	1.5	1.2	2	1.5	1.2
Minimum Initial (s)	10	7	5	10	7
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	9	9		9	7
Flash Dont Walk (s)	7	23		24	21
Dual Entry	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	93	55	93	118	55
End Time (s)	55	93	118	55	93
Yield/Force Off (s)	49.9	87.8	113	49.9	87.8
Yield/Force Off 170(s)	42.9	64.8	113	25.9	66.8
Local Start Time (s)	0	82	0	25	82
Local Yield (s)	76.9	114.8	20	76.9	114.8
Local Yield 170(s)	69.9	91.8	20	52.9	93.8

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 93 (78%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Background AM
9: GOLDWATER BLVD & 5TH AVE

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	18	0	8	16	15	15	15	530	96	87	652	104
Future Volume (vph)	18	0	8	16	15	15	15	530	96	87	652	104
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2	4.0	4.0	4.0	4.0	5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.91	1.00	0.91
Frbp, ped/bikes	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	0.98	1.00	0.98	1.00
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1478	1676	1961	1475	1676	3627	1676	3627	1676	5221	1676
Flt Permitted	0.75	1.00	0.76	1.00	1.00	0.32	1.00	0.39	1.00	0.39	1.00	1.00
Satd. Flow (perm)	1318	1478	1336	1961	1475	571	3627	682	5221	682	5221	5221
Peak-hour factor, PHF	0.80	0.92	0.80	0.92	0.92	0.92	0.90	0.90	0.92	0.92	0.90	0.90
Adj. Flow (vph)	22	0	10	17	16	16	17	589	104	95	724	116
RTOR Reduction (vph)	0	0	9	0	0	14	0	6	0	0	10	0
Lane Group Flow (vph)	23	0	1	17	16	2	17	687	0	95	830	0
Confl. Peds. (#/hr)			2			2			2			3
Turn Type	Perm		Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4		4	6			2		
Actuated Green, G (s)	11.6		11.6	12.8	12.8	12.8	98.0	98.0		98.0	98.0	
Effective Green, g (s)	11.6		11.6	12.8	12.8	12.8	98.0	98.0		98.0	98.0	
Actuated g/C Ratio	0.10		0.10	0.11	0.11	0.11	0.82	0.82		0.82	0.82	
Clearance Time (s)	5.2		5.2	4.0	4.0	4.0	5.2	5.2		5.2	5.2	
Vehicle Extension (s)	2.0		2.0	3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	127		142	142	209	157	466	2962		556	4263	
v/s Ratio Prot				0.01			c0.19				0.16	
v/s Ratio Perm	c0.02		0.00	0.01		0.00	0.03			0.14		
v/c Ratio	0.18		0.01	0.12	0.08	0.01	0.04	0.23		0.17	0.19	
Uniform Delay, d1	49.8		49.0	48.5	48.3	47.9	2.1	2.5		2.3	2.4	
Progression Factor	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3		0.0	0.4	0.2	0.0	0.1	0.2		0.7	0.1	
Delay (s)	50.1		49.0	48.9	48.4	48.0	2.2	2.7		3.0	2.5	
Level of Service	D		D	D	D	D	A	A		A	A	
Approach Delay (s)		49.8			48.4			2.7			2.6	
Approach LOS		D			D			A			A	

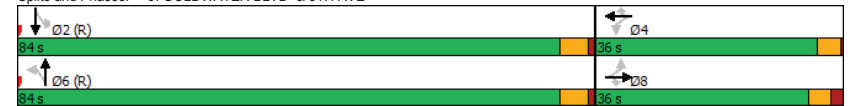
Intersection Summary			
HCM 2000 Control Delay	4.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.4
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Background AM
9: GOLDWATER BLVD & 5TH AVE

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	Min
Maximum Split (s)	84	36	84	36
Maximum Split (%)	70.0%	30.0%	70.0%	30.0%
Minimum Split (s)	16	20	16	34.2
Yellow Time (s)	4	3.5	4	3.3
All-Red Time (s)	1.2	0.5	1.2	1.9
Minimum Initial (s)	10	4	10	7
Vehicle Extension (s)	2	3	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	8
Flash Dont Walk (s)	14	11	11	21
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	20	104	20	104
End Time (s)	104	20	104	20
Yield/Force Off (s)	98.8	16	98.8	14.8
Yield/Force Off 170(s)	84.8	5	87.8	14.8
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.8	116	78.8	114.8
Local Yield 170(s)	64.8	105	67.8	114.8
Intersection Summary				
Cycle Length	120			
Control Type	Actuated-Coordinated			
Natural Cycle	60			
Offset: 20 (17%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				

Splits and Phases: 9: GOLDWATER BLVD & 5TH AVE



Intersection			
Intersection Delay, s/veh	3.5		
Intersection LOS	A		
Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	156	89	57
Demand Flow Rate, veh/h	159	90	58
Vehicles Circulating, veh/h	22	9	116
Vehicles Exiting, veh/h	77	165	65
Ped Vol Crossing Leg, #/h	0	1	5
Ped Cap Adj	1.000	1.000	0.999
Approach Delay, s/veh	3.7	3.2	3.4
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	159	90	58
Cap Entry Lane, veh/h	1349	1367	1226
Entry HV Adj Factor	0.979	0.985	0.983
Flow Entry, veh/h	156	89	57
Cap Entry, veh/h	1321	1347	1204
V/C Ratio	0.118	0.066	0.047
Control Delay, s/veh	3.7	3.2	3.4
LOS	A	A	A
95th %tile Queue, veh	0	0	0

Intersection						
Intersection Delay, s/veh	7.7					
Intersection LOS	A					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	105	39	20	62	8	44
Future Vol, veh/h	105	39	20	62	8	44
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	114	42	22	67	9	48
Number of Lanes	1	0	0	1	1	0
Approach	EB	WB	NB			
Opposing Approach	WB	EB				
Opposing Lanes	1	1	0			
Conflicting Approach Left		NB	EB			
Conflicting Lanes Left	0	1	1			
Conflicting Approach Right	NB		WB			
Conflicting Lanes Right	1	0	1			
HCM Control Delay	7.8	7.7	7.2			
HCM LOS	A	A	A			
Lane	NBLn1	EBLn1	WBLn1			
Vol Left, %	15%	0%	24%			
Vol Thru, %	0%	73%	76%			
Vol Right, %	85%	27%	0%			
Sign Control	Stop	Stop	Stop			
Traffic Vol by Lane	52	144	82			
LT Vol	8	0	20			
Through Vol	0	105	62			
RT Vol	44	39	0			
Lane Flow Rate	57	157	89			
Geometry Grp	1	1	1			
Degree of Util (X)	0.062	0.171	0.104			
Departure Headway (Hd)	3.98	3.937	4.2			
Convergence, Y/N	Yes	Yes	Yes			
Cap	905	906	848			
Service Time	1.98	1.983	2.252			
HCM Lane V/C Ratio	0.063	0.173	0.105			
HCM Control Delay	7.2	7.8	7.7			
HCM Lane LOS	A	A	A			
HCM 95th-tile Q	0.2	0.6	0.3			

Intersection						
Intersection Delay, s/veh	7.7					
Intersection LOS	A					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	70	66	30	41	6	35
Future Vol, veh/h	70	66	30	41	6	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	76	72	33	45	7	38
Number of Lanes	0	1	1	0	1	0
Approach	EB	WB	SB			
Opposing Approach	WB	EB				
Opposing Lanes	1	1	0			
Conflicting Approach Left	SB		WB			
Conflicting Lanes Left	1	0	1			
Conflicting Approach Right		SB	EB			
Conflicting Lanes Right	0	1	1			
HCM Control Delay	8.1	7.2	7.1			
HCM LOS	A	A	A			
Lane	EBLn1	WBLn1	SBLn1			
Vol Left, %	51%	0%	15%			
Vol Thru, %	49%	42%	0%			
Vol Right, %	0%	58%	85%			
Sign Control	Stop	Stop	Stop			
Traffic Vol by Lane	136	71	41			
LT Vol	70	0	6			
Through Vol	66	30	0			
RT Vol	0	41	35			
Lane Flow Rate	148	77	45			
Geometry Grp	1	1	1			
Degree of Util (X)	0.171	0.081	0.047			
Departure Headway (Hd)	4.175	3.777	3.834			
Convergence, Y/N	Yes	Yes	Yes			
Cap	859	942	916			
Service Time	2.199	1.825	1.932			
HCM Lane V/C Ratio	0.172	0.082	0.049			
HCM Control Delay	8.1	7.2	7.1			
HCM Lane LOS	A	A	A			
HCM 95th-tile Q	0.6	0.3	0.1			

Intersection						
Int Delay, s/veh	1.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	66	4	22	72	1	1
Future Vol, veh/h	66	4	22	72	1	1
Conflicting Peds, #/hr	0	2	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	72	4	24	78	1	1
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	78	0	202	77
Stage 1	-	-	-	-	76	-
Stage 2	-	-	-	-	126	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1520	-	787	984
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	900	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1517	-	772	982
Mov Cap-2 Maneuver	-	-	-	-	772	-
Stage 1	-	-	-	-	929	-
Stage 2	-	-	-	-	900	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	1.7	9.2			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	864	-	-	1517	-	
HCM Lane V/C Ratio	0.003	-	-	0.016	-	
HCM Control Delay (s)	9.2	-	-	7.4	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

2032 Background AM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (vph)	16	18	18	18	11	11	34	511	23	20	500	32
Future Volume (vph)	16	18	18	18	11	11	34	511	23	20	500	32
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		6.0		6.0		6.0		5.0		5.0		5.0
Lane Util. Factor		1.00		1.00		1.00		0.95		1.00		0.95
Frbp, ped/bikes		0.99		1.00		0.99		1.00		1.00		1.00
Flpb, ped/bikes		1.00		1.00		1.00		1.00		1.00		1.00
Frt		0.95		1.00		0.93		1.00		0.99		0.99
Flt Protected		0.99		0.95		1.00		0.95		1.00		0.95
Satd. Flow (prot)		1830		1676		1795		1676		3697		1676
Flt Permitted		0.89		0.72		1.00		0.43		1.00		0.42
Satd. Flow (perm)		1655		1270		1795		751		3697		749
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	20	20	20	12	12	37	555	25	22	543	35
RTOR Reduction (vph)	0	12	0	0	11	0	0	2	0	0	2	0
Lane Group Flow (vph)	0	45	0	20	13	0	37	578	0	22	576	0
Confl. Peds. (#/hr)			6			14			4			12
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt		NA
Protected Phases		3			3		2	1		2		1
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		5.6		5.6	5.6		31.8	26.2		31.8		26.2
Effective Green, g (s)		5.6		5.6	5.6		31.8	26.2		31.8		26.2
Actuated g/C Ratio		0.10		0.10	0.10		0.60	0.49		0.60		0.49
Clearance Time (s)		6.0		6.0	6.0		5.0	5.0		5.0		5.0
Vehicle Extension (s)		3.0		3.0	3.0		1.0	0.2		1.0		0.2
Lane Grp Cap (vph)		173		133	188		544	1813		543		1807
v/s Ratio Prot				0.01			c0.01	c0.16		0.00		0.16
v/s Ratio Perm		c0.03		0.02			0.03			0.02		
v/c Ratio		0.26		0.15	0.07		0.07	0.32		0.04		0.32
Uniform Delay, d1		22.0		21.7	21.6		4.5	8.2		4.4		8.2
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2		0.8		0.5	0.2		0.0	0.0		0.0		0.0
Delay (s)		22.8		22.3	21.7		4.5	8.3		4.4		8.2
Level of Service		C		C	C		A	A		A		A
Approach Delay (s)		22.8			22.0			8.0				8.1
Approach LOS		C			C			A				A

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	53.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

2032 Background AM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3
Movement	NBSB	NBSBL	EBWB
Lead/Lag	Lag	Lead	
Lead-Lag Optimize			
Recall Mode	Ped	None	None
Maximum Split (s)	74	74	46
Maximum Split (%)	38.1%	38.1%	23.7%
Minimum Split (s)	30	30	30
Yellow Time (s)	3.2	3.2	3.1
All-Red Time (s)	1.8	1.8	2.9
Minimum Initial (s)	10	10	6
Vehicle Extension (s)	0.2	1	3
Minimum Gap (s)	0.2	0.2	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)	10		9
Flash Dont Walk (s)	10		15
Dual Entry	No	No	No
Inhibit Max	No	No	No
Start Time (s)	74	0	148
End Time (s)	148	74	0
Yield/Force Off (s)	143	69	188
Yield/Force Off 170(s)	133	69	173
Local Start Time (s)	74	0	148
Local Yield (s)	143	69	188
Local Yield 170(s)	133	69	173

Intersection Summary		
Cycle Length		194
Control Type	Actuated-Uncoordinated	
Natural Cycle		90

Splits and Phases: 13: SCOTTSDALE RD & 5TH AVE.



2032 Background AM Southbridge Expansion
 14: 5TH AVE./STETSON DR. & DRINKWATER BLVD HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	6	51	1	19	11	52	38	371	197	73	227	6
Future Volume (vph)	6	51	1	19	11	52	38	371	197	73	227	6
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.88		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	1956		1676	1689		1676	3725	1456	1676	3707	
Flt Permitted	0.71	1.00		0.71	1.00		0.59	1.00	1.00	0.50	1.00	
Satd. Flow (perm)	1255	1956		1261	1689		1041	3725	1456	883	3707	
Peak-hour factor, PHF	0.80	0.80	0.80	0.90	0.90	0.90	0.87	0.87	0.87	0.89	0.89	0.89
Adj. Flow (vph)	8	64	1	21	12	58	44	426	226	82	255	7
RTOR Reduction (vph)	0	1	0	0	48	0	0	0	73	0	1	0
Lane Group Flow (vph)	8	64	0	21	22	0	44	426	153	82	261	0
Confl. Peds. (#/hr)			1			7			3			4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	20.0	20.0		20.0	20.0		85.4	81.1	81.1	85.4	81.1	
Effective Green, g (s)	20.0	20.0		20.0	20.0		85.4	81.1	81.1	85.4	81.1	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.71	0.68	0.68	0.71	0.68	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	0.2	0.2	2.0	0.2	
Lane Grp Cap (vph)	209	326		210	281		763	2517	984	656	2505	
v/s Ratio Prot		c0.03			0.01		0.00	c0.11		c0.00	0.07	
v/s Ratio Perm	0.01			0.02			0.04		0.10	0.08		
v/c Ratio	0.04	0.20		0.10	0.08		0.06	0.17	0.16	0.12	0.10	
Uniform Delay, d1	41.9	43.1		42.4	42.2		5.2	7.1	7.0	5.7	6.8	
Progression Factor	1.00	1.00		1.00	1.00		0.84	0.84	0.53	0.40	0.40	
Incremental Delay, d2	0.0	0.1		0.1	0.0		0.0	0.1	0.3	0.0	0.1	
Delay (s)	42.0	43.2		42.4	42.3		4.4	6.1	4.1	2.3	2.8	
Level of Service	D	D		D	D		A	A	A	A	A	
Approach Delay (s)		43.1			42.3			5.3			2.7	
Approach LOS		D			D			A			A	

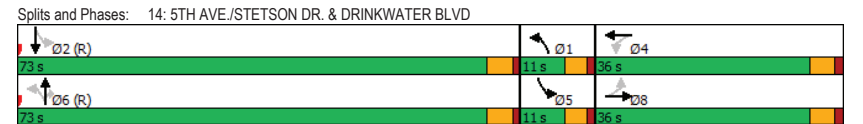
Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.17		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

Description: Last Update: Sept 2017
 c Critical Lane Group

2032 Background AM Southbridge Expansion
 14: 5TH AVE./STETSON DR. & DRINKWATER BLVD Timing Report, Sorted By Phase

Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag						
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	11	73	36	11	73	36
Maximum Split (%)	9.2%	60.8%	30.0%	9.2%	60.8%	30.0%
Minimum Split (s)	11	16	36	11	16	35
Yellow Time (s)	3.3	4	3.5	3.3	4	3.5
All-Red Time (s)	1.3	1	1.5	1.3	1	1.5
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	8		7	7
Flash Dont Walk (s)		13	23		12	23
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	3	50	14	3	50	14
End Time (s)	14	3	50	14	3	50
Yield/Force Off (s)	9.4	118	45	9.4	118	45
Yield/Force Off 170(s)	9.4	105	22	9.4	106	22
Local Start Time (s)	73	0	84	73	0	84
Local Yield (s)	79.4	68	115	79.4	68	115
Local Yield 170(s)	79.4	55	92	79.4	56	92

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 50 (42%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Background AM
15: GOLDWATER BLVD & 3rd Ave

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↑↑	↔	↑↑↑	↑↑↑
Traffic Vol, veh/h	6	19	619	28	38	652
Future Vol, veh/h	6	19	619	28	38	652
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	21	673	30	41	709
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1054	352	0	0	703	0
Stage 1	688	-	-	-	-	-
Stage 2	366	-	-	-	-	-
Critical Hdwy	6.29	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.67	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	254	644	-	-	890	-
Stage 1	447	-	-	-	-	-
Stage 2	636	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	242	644	-	-	890	-
Mov Cap-2 Maneuver	331	-	-	-	-	-
Stage 1	426	-	-	-	-	-
Stage 2	636	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	12.2	0	0.5			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	525	890	-	
HCM Lane V/C Ratio	-	-	0.052	0.046	-	
HCM Control Delay (s)	-	-	12.2	9.2	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-	

2032 Background AM
16: 3rd Ave & Marshall Way

Southbridge Expansion
HCM 6th AWSC

Intersection												
Intersection Delay, s/veh	7.6											
Intersection LOS	A											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	10	49	8	11	18	8	22	57	41	4	24	9
Future Vol, veh/h	10	49	8	11	18	8	22	57	41	4	24	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	53	9	12	20	9	24	62	45	4	26	10
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB	WB	NB	SB								
Opposing Approach	WB	EB	SB	NB								
Opposing Lanes	1	1	1	1								
Conflicting Approach Left	SB	NB	EB	WB								
Conflicting Lanes Left	1	1	1	1								
Conflicting Approach Right	NB	SB	WB	EB								
Conflicting Lanes Right	1	1	1	1								
HCM Control Delay	7.7	7.5	7.7	7.4								
HCM LOS	A	A	A	A								
Lane	NBLn1	EBLn1	WBLn1	SBLn1								
Vol Left, %	18%	15%	30%	11%								
Vol Thru, %	47%	73%	49%	65%								
Vol Right, %	34%	12%	22%	24%								
Sign Control	Stop	Stop	Stop	Stop								
Traffic Vol by Lane	120	67	37	37								
LT Vol	22	10	11	4								
Through Vol	57	49	18	24								
RT Vol	41	8	8	9								
Lane Flow Rate	130	73	40	40								
Geometry Grp	1	1	1	1								
Degree of Util (X)	0.145	0.085	0.047	0.046								
Departure Headway (Hd)	3.993	4.22	4.217	4.108								
Convergence, Y/N	Yes	Yes	Yes	Yes								
Cap	888	838	835	859								
Service Time	2.062	2.305	2.312	2.195								
HCM Lane V/C Ratio	0.146	0.087	0.048	0.047								
HCM Control Delay	7.7	7.7	7.5	7.4								
HCM Lane LOS	A	A	A	A								
HCM 95th-tile Q	0.5	0.3	0.1	0.1								


2032 Background AM
17: 3rd Ave & Craftsman Ct

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	13	62	38	13	19	3
Future Vol, veh/h	13	62	38	13	19	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	67	41	14	21	3
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	55	0	0	143	48	
Stage 1	-	-	-	48	-	
Stage 2	-	-	-	95	-	
Critical Hdwy	4.12	-	-	6.42	6.22	
Critical Hdwy Stg 1	-	-	-	5.42	-	
Critical Hdwy Stg 2	-	-	-	5.42	-	
Follow-up Hdwy	2.218	-	-	3.518	3.318	
Pot Cap-1 Maneuver	1550	-	-	850	1021	
Stage 1	-	-	-	974	-	
Stage 2	-	-	-	929	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	1550	-	-	842	1021	
Mov Cap-2 Maneuver	-	-	-	842	-	
Stage 1	-	-	-	965	-	
Stage 2	-	-	-	929	-	
Approach	EB	WB	SB			
HCM Control Delay, s	1.3	0	9.3			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1550	-	-	-	863	
HCM Lane V/C Ratio	0.009	-	-	-	0.028	
HCM Control Delay (s)	7.3	0	-	-	9.3	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

2032 Background AM
18: SCOTTS DALE RD & 3RD AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	4	20	11	27	6	65	75	501	33	77	429	23
Future Volume (vph)	4	20	11	27	6	65	75	501	33	77	429	23
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Ftbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.86		1.00	0.99		1.00	1.00	0.85
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1846		1676	1670		1676	3685		1676	3725	1464
Fit Permitted	0.77	1.00		0.77	1.00		0.48	1.00		0.43	1.00	1.00
Satd. Flow (perm)	1357	1846		1357	1670		855	3685		764	3725	1464
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	22	12	29	7	71	82	545	36	84	466	25
RTOR Reduction (vph)	0	11	0	0	64	0	0	4	0	0	0	7
Lane Group Flow (vph)	4	23	0	29	14	0	82	577	0	84	466	18
Conf. Peds. (#/hr)			7			4			8			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		1
Actuated Green, G (s)	5.2	5.2		5.2	5.2		35.7	35.7		35.7	35.7	35.7
Effective Green, g (s)	5.2	5.2		5.2	5.2		35.7	35.7		35.7	35.7	35.7
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.70	0.70		0.70	0.70	0.70
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	138	188		138	170		599	2584		535	2612	1026
v/s Ratio Prot		0.01			0.01			0.16			0.13	
v/s Ratio Perm	0.00			c0.02			0.10			0.11		0.01
v/c Ratio	0.03	0.12		0.21	0.08		0.14	0.22		0.16	0.18	0.02
Uniform Delay, d1	20.6	20.8		21.0	20.7		2.5	2.7		2.6	2.6	2.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.0	0.1		0.3	0.1		0.0	0.0		0.1	0.0	0.0
Delay (s)	20.6	20.9		21.2	20.8		2.5	2.7		2.6	2.6	2.3
Level of Service	C	C		C	C		A	A		A	A	A
Approach Delay (s)		20.9			20.9			2.7			2.6	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay	4.6		HCM 2000 Level of Service				A					
HCM 2000 Volume to Capacity ratio	0.22											
Actuated Cycle Length (s)	50.9				Sum of lost time (s)				10.0			
Intersection Capacity Utilization	55.2%		ICU Level of Service				B					
Analysis Period (min)	15											
c Critical Lane Group												

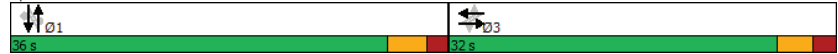
2032 Background AM
18: SCOTSDALE RD & 3RD AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	3
Movement	NBSB	EBWB
Lead/Lag		
Lead-Lag Optimize		
Recall Mode	Ped	None
Maximum Split (s)	36	32
Maximum Split (%)	52.9%	47.1%
Minimum Split (s)	36	32
Yellow Time (s)	3.2	3
All-Red Time (s)	1.8	2
Minimum Initial (s)	10	6
Vehicle Extension (s)	0.2	2
Minimum Gap (s)	1	2
Time Before Reduce (s)	0	0
Time To Reduce (s)	0	0
Walk Time (s)	18	6
Flash Dont Walk (s)	12	15
Dual Entry	No	No
Inhibit Max	No	No
Start Time (s)	0	36
End Time (s)	36	0
Yield/Force Off (s)	31	63
Yield/Force Off 170(s)	19	48
Local Start Time (s)	0	36
Local Yield (s)	31	63
Local Yield 170(s)	19	48

Intersection Summary	
Cycle Length	68
Control Type	Actuated-Uncoordinated
Natural Cycle	70

Splits and Phases: 18: SCOTSDALE RD & 3RD AVE.



2032 Background AM
19: DRINKWATER BLVD & 3RD AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	9	1	23	76	11	75	109	570	29	23	196	23
Future Volume (vph)	9	1	23	76	11	75	109	570	29	23	196	23
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00			0.99		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85			0.94		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1676			1785		1676	5307		1676	3725	1444
Flt Permitted	0.54	1.00			0.84		0.60	1.00		0.37	1.00	1.00
Satd. Flow (perm)	949	1676			1526		1061	5307		645	3725	1444
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.83	0.83	0.83	0.81	0.81	0.81
Adj. Flow (vph)	11	1	29	87	13	86	131	687	35	28	242	28
RTOR Reduction (vph)	0	0	0	0	30	0	0	3	0	0	0	7
Lane Group Flow (vph)	11	30	0	0	156	0	131	719	0	28	242	21
Confl. Peds. (#/hr)						2			4			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	18.4	18.4			18.4		91.5	91.5		91.5	91.5	91.5
Effective Green, g (s)	18.4	18.4			18.4		91.5	91.5		91.5	91.5	91.5
Actuated g/C Ratio	0.15	0.15			0.15		0.76	0.76		0.76	0.76	0.76
Clearance Time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	145	256			233		809	4046		491	2840	1101
v/s Ratio Prot		0.02						c0.14			0.06	
v/s Ratio Perm	0.01				c0.10		0.12			0.04		0.01
v/c Ratio	0.08	0.12			0.67		0.16	0.18		0.06	0.09	0.02
Uniform Delay, d1	43.5	43.8			47.9		3.9	3.9		3.5	3.6	3.4
Progression Factor	1.00	1.00			1.00		1.00	1.00		0.32	0.31	0.12
Incremental Delay, d2	0.1	0.1			5.5		0.4	0.1		0.2	0.1	0.0
Delay (s)	43.6	43.9			53.4		4.3	4.0		1.4	1.2	0.4
Level of Service	D	D			D		A	A		A	A	A
Approach Delay (s)		43.8			53.4			4.1			1.1	
Approach LOS		D			D			A			A	

Intersection Summary	
HCM 2000 Control Delay	11.3
HCM 2000 Volume to Capacity ratio	0.26
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	60.1%
Analysis Period (min)	15
Description: Last Update: Sept 2017	
c Critical Lane Group	

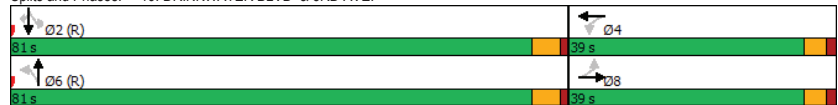
2032 Background AM
19: DRINKWATER BLVD & 3RD AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

	2	4	6	8
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	Min	C-Min	None
Maximum Split (s)	81	39	81	39
Maximum Split (%)	67.5%	32.5%	67.5%	32.5%
Minimum Split (s)	22.2	38.9	16	30.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	9	7	7
Flash Dont Walk (s)	10	25	20	19
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	62	23	62	23
End Time (s)	23	62	23	62
Yield/Force Off (s)	17.8	57.1	17.8	57.1
Yield/Force Off 170(s)	7.8	57.1	117.8	38.1
Local Start Time (s)	0	81	0	81
Local Yield (s)	75.8	115.1	75.8	115.1
Local Yield 170(s)	65.8	115.1	55.8	96.1

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 62 (52%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	

Splits and Phases: 19: DRINKWATER BLVD & 3RD AVE.



2032 Background AM
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔↔	↔	↔	↔↔	↔↔
Traffic Volume (vph)	197	804	8	33	772	111	48	601	101	138	377	196
Future Volume (vph)	197	804	8	33	772	111	48	601	101	138	377	196
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5	5.5
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99	0.99
Ftpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	0.95
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5353	1474	1676	5353	1473	1676	3725	1476	1676	3516	3516
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1676	5353	1474	1676	5353	1473	1676	3725	1476	1676	3516	3516
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.86	0.86	0.86	0.84	0.84	0.84
Adj. Flow (vph)	221	903	9	37	858	123	56	699	117	164	449	233
RTOR Reduction (vph)	0	0	5	0	0	73	0	0	0	0	58	0
Lane Group Flow (vph)	221	903	4	37	858	50	56	699	117	164	624	0
Conf. Peds. (#/hr)			4			4			7			3
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5 9	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	20.6	48.7	48.7	5.7	29.9	48.2	15.4	28.3	34.0	18.3	31.5	
Effective Green, g (s)	20.6	48.7	48.7	5.7	29.9	48.2	15.4	28.3	34.0	18.3	31.5	
Actuated g/C Ratio	0.17	0.40	0.40	0.05	0.24	0.39	0.13	0.23	0.28	0.15	0.26	
Clearance Time (s)		5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5	
Vehicle Extension (s)		1.0	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	281	2124	585	77	1304	578	210	859	472	249	902	
v/s Ratio Prot	c0.13	0.17		0.02	c0.16	0.01	0.03	c0.19	0.01	c0.10	0.18	
v/s Ratio Perm			0.00			0.02			0.07			
v/c Ratio	0.79	0.43	0.01	0.48	0.66	0.09	0.27	0.81	0.25	0.66	0.69	
Uniform Delay, d1	48.9	26.8	22.4	57.1	41.8	23.4	48.5	44.7	34.4	49.3	41.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.5	0.6	0.0	1.7	2.6	0.0	0.2	5.6	0.1	4.7	1.9	
Delay (s)	61.5	27.5	22.4	58.8	44.4	23.4	48.8	50.3	34.5	54.0	43.1	
Level of Service	E	C	C	E	D	C	D	D	C	D	D	
Approach Delay (s)		34.1			42.4			48.1			45.2	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	41.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	122.7	Sum of lost time (s)	25.6
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		

Description: Last Update: Sept 2017

c Critical Lane Group

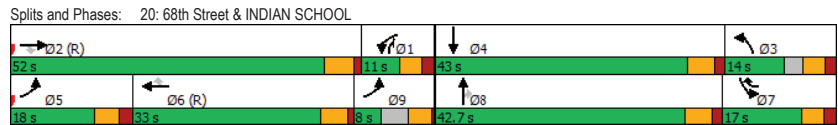
2032 Background AM
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	1	2	3	4	5	6	7	8	9
Phase Number	1	2	3	4	5	6	7	8	9
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT	EBL
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	
Lead-Lag Optimize									
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None
Maximum Split (s)	11	52	14	43	18	33	17	42.7	8
Maximum Split (%)	9.0%	42.4%	11.4%	35.0%	14.7%	26.9%	13.9%	34.8%	6.5%
Minimum Split (s)	11	32.4	11	39.5	11	33	11	42.7	8
Yellow Time (s)	3.3	4.4	3.3	4	3.6	4	3.3	4	3.5
All-Red Time (s)	2	1	1.9	1.5	2	1	2	1.7	0.5
Minimum Initial (s)	5	10	5	7	5	10	5	7	4
Vehicle Extension (s)	2	1	2	2	2	1	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4	
Flash Dont Walk (s)		23		30		24		33	
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	64	12	118	75	12	30	117.7	75	63
End Time (s)	75	64	12	118	30	63	12	117.7	75
Yield/Force Off (s)	69.7	58.6	6.8	112.5	24.4	58	6.7	112	71
Yield/Force Off 170(s)	69.7	35.6	6.8	82.5	24.4	34	6.7	79	71
Local Start Time (s)	52	0	106	63	0	18	105.7	63	51
Local Yield (s)	57.7	46.6	117.5	100.5	12.4	46	117.4	100	59
Local Yield 170(s)	57.7	23.6	117.5	70.5	12.4	22	117.4	67	59

Intersection Summary

Cycle Length	122.7
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 12 (10%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	



2032 Background AM
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	203	757	86	68	667	41	81	423	16	41	513	91
Future Volume (vph)	203	757	86	68	667	41	81	423	16	41	513	91
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	1000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.0	3.0	5.3	5.0		5.3	5.3		5.3	5.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		1.00	0.95		1.00	0.91	
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3317	3725	1510	3317	3695		1710	1854		1710	5237	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3317	3725	1510	3317	3695		1710	1854		1710	5237	
Peak-hour factor, PHF	0.87	0.87	0.87	0.89	0.89	0.89	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	233	870	99	76	749	46	99	516	20	50	626	111
RTOR Reduction (vph)	0	0	58	0	3	0	0	2	0	0	23	0
Lane Group Flow (vph)	233	870	41	76	792	0	99	534	0	50	714	0
Conf. Peds. (#/hr)			1				1					2
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	13.7	50.4	50.4	7.3	44.0		22.0	40.3		7.4	25.7	
Effective Green, g (s)	13.7	50.4	52.4	7.3	44.0		22.0	40.3		7.4	25.7	
Actuated g/C Ratio	0.11	0.40	0.41	0.06	0.35		0.17	0.32		0.06	0.20	
Clearance Time (s)	5.3	5.0	5.0	5.3	5.0		5.3	5.3		5.3	5.3	
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0		2.0	1.0		2.0	1.0	
Lane Grp Cap (vph)	359	1486	626	191	1287		297	591		100	1065	
v/s Ratio Prot	c0.07	c0.23		0.02	0.21		0.06	c0.29		c0.03	0.14	
v/s Ratio Perm			0.03									
v/c Ratio	0.65	0.59	0.07	0.40	0.62		0.33	0.90		0.50	0.67	
Uniform Delay, d1	54.0	29.8	22.2	57.4	34.1		45.7	41.1		57.7	46.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.0	1.7	0.2	0.5	2.2		0.2	16.8		1.4	1.3	
Delay (s)	57.0	31.5	22.4	57.9	36.3		46.0	58.0		59.1	47.7	
Level of Service	E	C	C	E	D		D	E		E	D	
Approach Delay (s)		35.7			38.2			56.1			48.4	
Approach LOS		D			D			E			D	

Intersection Summary

HCM 2000 Control Delay	42.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	126.3	Sum of lost time (s)	20.9
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

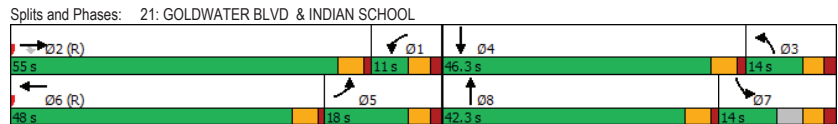
2032 Background AM
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	←		→		↖		↗	
Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	11	55	14	46.3	18	48	14	42.3
Maximum Split (%)	8.7%	43.5%	11.1%	36.7%	14.3%	38.0%	11.1%	33.5%
Minimum Split (s)	11	37	11	46.3	11	35	11	42.3
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1	2	1.3	2	1	2	1.3
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	1	2	1	2	1	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		9		8		9
Flash Dont Walk (s)		24		32		22		28
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	75	20	6	86	68	20	2	86
End Time (s)	86	75	20	6	86	68	20	2
Yield/Force Off (s)	80.7	70	14.7	0.7	80.7	63	14.7	123
Yield/Force Off 170(s)	80.7	46	14.7	0.7	80.7	41	14.7	123
Local Start Time (s)	55	0	112.3	66	48	0	108.3	66
Local Yield (s)	60.7	50	121	107	60.7	43	121	103
Local Yield 170(s)	60.7	26	121	107	60.7	21	121	103

Intersection Summary

Cycle Length	126.3
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 20 (16%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	



2032 Background AM
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	←		→		↖		↗					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖↗	↖↗		↖	↖	↖
Traffic Volume (vph)	32	732	15	78	779	33	5	5	10	1	5	16
Future Volume (vph)	32	732	15	78	779	33	5	5	10	1	5	16
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2			5.1				5.1
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00				1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99				0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00				1.00
Frt	1.00	1.00		1.00	0.99			0.93				0.90
Flt Protected	0.95	1.00		0.95	1.00			0.99				1.00
Satd. Flow (prot)	1676	3712		1676	3698			1790				1742
Flt Permitted	0.28	1.00		0.35	1.00			0.91				0.99
Satd. Flow (perm)	493	3712		618	3698			1655				1726
Peak-hour factor, PHF	0.94	0.94	0.94	0.81	0.81	0.81	0.86	0.86	0.86	0.80	0.80	0.80
Adj. Flow (vph)	34	779	16	96	962	41	6	6	12	1	6	20
RTOR Reduction (vph)	0	1	0	0	1	0	0	11	0	0	19	0
Lane Group Flow (vph)	34	794	0	96	1002	0	0	13	0	0	8	0
Conf. Peds. (#/hr)			4			3			4			2
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	102.0	102.0		102.0	102.0			7.8				7.8
Effective Green, g (s)	102.0	102.0		102.0	102.0			7.8				7.8
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.06				0.06
Clearance Time (s)	5.2	5.2		5.2	5.2			5.1				5.1
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0				2.0
Lane Grp Cap (vph)	418	3152		524	3140			107				112
v/s Ratio Prot		0.21			0.27							
v/s Ratio Perm	0.07			0.16				0.01				0.00
v/c Ratio	0.08	0.25		0.18	0.32			0.12				0.07
Uniform Delay, d1	1.5	1.7		1.6	1.9			52.9				52.8
Progression Factor	1.00	1.00		1.00	1.00			1.00				1.00
Incremental Delay, d2	0.4	0.2		0.8	0.3			0.2				0.1
Delay (s)	1.8	1.9		2.4	2.1			53.1				52.9
Level of Service	A	A		A	A			D				D
Approach Delay (s)		1.9			2.2			53.1				52.9
Approach LOS		A			A			D				D

Intersection Summary

HCM 2000 Control Delay	3.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	10.3
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

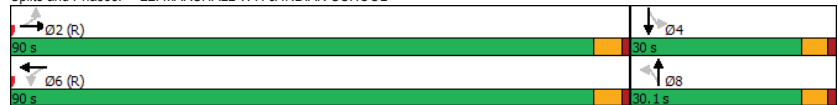
2032 Background AM
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	←	↓	→	↑
Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	90	30	90	30.1
Maximum Split (%)	74.9%	25.0%	74.9%	25.1%
Minimum Split (s)	16	29.1	16	30.1
Yellow Time (s)	4	3.6	4	3.6
All-Red Time (s)	1.2	1.5	1.2	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	8
Flash Dont Walk (s)	8	17	7	17
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	118	87.9	118	87.9
End Time (s)	87.9	118	87.9	118
Yield/Force Off (s)	82.7	112.9	82.7	112.9
Yield/Force Off 170(s)	74.7	95.9	75.7	95.9
Local Start Time (s)	0	90	0	90
Local Yield (s)	84.8	115	84.8	115
Local Yield 170(s)	76.8	98	77.8	98

Intersection Summary	
Cycle Length	120.1
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 118 (98%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green	

Splits and Phases: 22: MARSHALL WY. & INDIAN SCHOOL



2032 Background AM
23: INDIAN SCHOOL & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	←	→	↙	↘	←	↙	↘	↑	↙	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	103	620	62	5	874	109	67	395	82	80	314	61
Future Volume (vph)	103	620	62	5	874	109	67	395	82	80	314	61
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	3667		1676	3648		1676	3614		1676	3725	1454
Flt Permitted	0.17	1.00		0.31	1.00		0.41	1.00		0.21	1.00	1.00
Satd. Flow (perm)	304	3667		550	3648		719	3614		364	3725	1454
Peak-hour factor, PHF	0.94	0.94	0.94	0.91	0.91	0.91	0.83	0.83	0.83	0.86	0.86	0.86
Adj. Flow (vph)	110	660	66	5	960	120	81	476	99	93	365	71
RTOR Reduction (vph)	0	5	0	0	7	0	0	16	0	0	0	52
Lane Group Flow (vph)	110	721	0	5	1073	0	81	559	0	93	365	19
Confl. Peds. (#/hr)			8			21			11			20
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	67.9	62.1		67.9	62.1		32.2	26.7		32.2	26.7	32.5
Effective Green, g (s)	67.9	62.1		67.9	62.1		32.2	26.7		32.2	26.7	32.5
Actuated g/C Ratio	0.57	0.52		0.57	0.52		0.27	0.22		0.27	0.22	0.27
Clearance Time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	238	1897		365	1887		236	804		157	828	455
v/s Ratio Prot	c0.02	0.20		0.00	c0.29		0.02	c0.15		c0.03	0.10	0.00
v/s Ratio Perm	0.24			0.01			0.08			0.13		0.01
v/c Ratio	0.46	0.38		0.01	0.57		0.34	0.70		0.59	0.44	0.04
Uniform Delay, d1	29.7	17.4		16.5	19.8		40.4	42.9		48.7	40.2	32.3
Progression Factor	1.00	1.00		0.55	0.75		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	0.6		0.0	1.2		0.3	2.1		3.9	0.1	0.0
Delay (s)	30.2	18.0		9.0	16.0		40.7	45.0		52.6	40.4	32.3
Level of Service	C	B		A	B		D	D		D	D	C
Approach Delay (s)		19.6			16.0			44.5				41.4
Approach LOS		B			B			D				D

Intersection Summary			
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

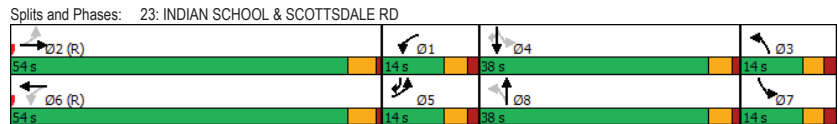
2032 Background AM
23: INDIAN SCHOOL & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	14	54	14	38	14	54	14	38
Maximum Split (%)	11.7%	45.0%	11.7%	31.7%	11.7%	45.0%	11.7%	31.7%
Minimum Split (s)	11	30	10	32.8	11	33	10	34.8
Yellow Time (s)	3.3	4	3	3.6	3.3	4	3	3.6
All-Red Time (s)	1.8	1	2	1.2	1.8	1	2	1.2
Minimum Initial (s)	5	10	5	10	5	10	5	10
Vehicle Extension (s)	2	1	2	2	2	1	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		8		8
Flash Dont Walk (s)		18		21		20		22
Dual Entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	54	0	106	68	54	0	106	68
End Time (s)	68	54	0	106	68	54	0	106
Yield/Force Off (s)	62.9	49	115	101.2	62.9	49	115	101.2
Yield/Force Off 170(s)	62.9	31	115	80.2	62.9	29	115	79.2
Local Start Time (s)	54	0	106	68	54	0	106	68
Local Yield (s)	62.9	49	115	101.2	62.9	49	115	101.2
Local Yield 170(s)	62.9	31	115	80.2	62.9	29	115	79.2

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green	



2032 Background AM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	↑
Traffic Volume (vph)	989	25	27	1141	1	16
Future Volume (vph)	989	25	27	1141	1	16
Ideal Flow (vphpl)	2000	1800	1800	2000	1800	1800
Total Lost time (s)	5.2		5.2	5.2	5.1	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frbp, ped/bikes	1.00		1.00	1.00	0.98	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.87	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3709		1676	3725	1508	
Flt Permitted	1.00		0.25	1.00	1.00	
Satd. Flow (perm)	3709		432	3725	1508	
Peak-hour factor, PHF	0.92	0.92	0.93	0.93	0.80	0.80
Adj. Flow (vph)	1075	27	29	1227	1	20
RTOR Reduction (vph)	1	0	0	0	18	0
Lane Group Flow (vph)	1101	0	29	1227	3	0
Conf. Peds. (#/hr)		4				5
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	98.0		98.0	98.0	11.7	
Effective Green, g (s)	98.0		98.0	98.0	11.7	
Actuated g/C Ratio	0.82		0.82	0.82	0.10	
Clearance Time (s)	5.2		5.2	5.2	5.1	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	3029		352	3042	147	
v/s Ratio Prot	0.30			c0.33	c0.00	
v/s Ratio Perm			0.07			
v/c Ratio	0.36		0.08	0.40	0.02	
Uniform Delay, d1	2.9		2.2	3.0	49.0	
Progression Factor	0.46		0.33	0.26	1.00	
Incremental Delay, d2	0.3		0.4	0.4	0.0	
Delay (s)	1.6		1.1	1.1	49.0	
Level of Service	A		A	A	D	
Approach Delay (s)	1.6			1.1	49.0	
Approach LOS	A			A	D	

Intersection Summary

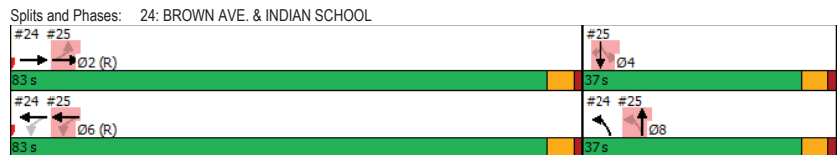
HCM 2000 Control Delay	1.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.3
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Background AM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	→	↓	←	↖
Phase Number	2	4	6	8
Node Number	24	25	24	24
Movement	EBT	SBTL	WBTL	NBL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	83	37	83	37
Maximum Split (%)	69.2%	30.8%	69.2%	30.8%
Minimum Split (s)	23.2	12.1	27.2	36.1
Yellow Time (s)	4	3.6	4	3.6
All-Red Time (s)	1.2	1.5	1.2	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	11		15	24
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	106	69	106	69
End Time (s)	69	106	69	106
Yield/Force Off (s)	63.8	100.9	63.8	100.9
Yield/Force Off 170(s)	52.8	100.9	48.8	76.9
Local Start Time (s)	0	83	0	83
Local Yield (s)	77.8	114.9	77.8	114.9
Local Yield 170(s)	66.8	114.9	62.8	90.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 106 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	



2032 Background AM
25: BUCKBOARD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↖	→	↘	↙	←	↖	↘	↙	↗	↘	↙	↗	↘	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↖	↖↗		↖	↖↗		↖↗	↖↗		↖↗	↖↗	↖↗		
Traffic Volume (vph)	137	862	11	49	1105	160	3	1	19	46	0	58		
Future Volume (vph)	137	862	11	49	1105	160	3	1	19	46	0	58		
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800		
Total Lost time (s)	5.2	5.2		5.2	5.2			5.1				5.1	5.1	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00				1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00				1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00				1.00	1.00	
Frt	1.00	1.00		1.00	0.98			0.89				1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.99				0.95	1.00	
Satd. Flow (prot)	1676	3717		1676	3640			1730				1863	1500	
Flt Permitted	0.18	1.00		0.28	1.00			0.96				0.74	1.00	
Satd. Flow (perm)	324	3717		502	3640			1674				1448	1500	
Peak-hour factor, PHF	0.90	0.90	0.90	0.94	0.94	0.94	0.80	0.80	0.80	0.80	0.80	0.80	0.80	
Adj. Flow (vph)	152	958	12	52	1176	170	4	1	24	58	0	72		
RTOR Reduction (vph)	0	0	0	0	5	0	0	22	0	0	0	66		
Lane Group Flow (vph)	152	970	0	52	1341	0	0	7	0	0	58	7		
Conf. Peds. (#/hr)			3			5								
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm	NA	Perm
Protected Phases		2			6			8			8		4	4
Permitted Phases	2			6			8			4			4	4
Actuated Green, G (s)	98.0	98.0		98.0	98.0			11.7			11.7	11.7		11.7
Effective Green, g (s)	98.0	98.0		98.0	98.0			11.7			11.7	11.7		11.7
Actuated g/C Ratio	0.82	0.82		0.82	0.82			0.10			0.10	0.10		0.10
Clearance Time (s)	5.2	5.2		5.2	5.2			5.1			5.1	5.1		5.1
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	2.0		2.0
Lane Grp Cap (vph)	264	3035		409	2972			163			141	146		146
v/s Ratio Prot		0.26			0.37									
v/s Ratio Perm	c0.47			0.10				0.00			c0.04	0.00		0.00
v/c Ratio	0.58	0.32		0.13	0.45			0.05			0.41	0.05		0.05
Uniform Delay, d1	3.8	2.7		2.3	3.2			49.1			50.9	49.1		49.1
Progression Factor	0.55	0.11		1.00	1.00			1.00			1.00	1.00		1.00
Incremental Delay, d2	8.5	0.3		0.6	0.5			0.0			0.7	0.1		0.1
Delay (s)	10.6	0.6		2.9	3.7			49.1			51.6	49.2		49.2
Level of Service	B	A		A	A			D			D	D		D
Approach Delay (s)		1.9			3.7			49.1			50.2			50.2
Approach LOS		A			A			D			D			D

Intersection Summary	
HCM 2000 Control Delay	5.7
HCM 2000 Volume to Capacity ratio	0.56
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	64.5%
Analysis Period (min)	15
Sum of lost time (s)	10.3
ICU Level of Service	C
Description: Last Update: Sept 2017	
c Critical Lane Group	

2032 Background AM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

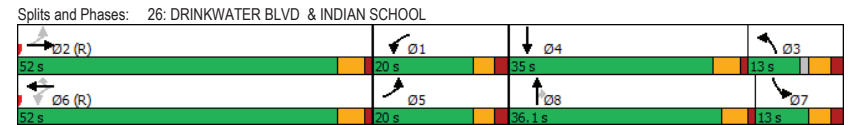
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	101	671	41	365	1279	230	71	429	209	96	165	20
Future Volume (vph)	101	671	41	365	1279	230	71	429	209	96	165	20
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.1	5.3	5.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1710	3694		1710	3725	1503	1710	3725	1498	3317	3666	
Flt Permitted	0.07	1.00		0.24	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	129	3694		432	3725	1503	1710	3725	1498	3317	3666	
Peak-hour factor, PHF	0.85	0.85	0.85	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	119	789	48	392	1375	247	79	477	232	107	183	22
RTOR Reduction (vph)	0	3	0	0	0	62	0	0	191	0	9	0
Lane Group Flow (vph)	119	834	0	392	1375	185	79	477	41	107	196	0
Confl. Peds. (#/hr)			4			4			8			6
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6			8			
Actuated Green, G (s)	70.3	55.6		70.3	55.6	55.6	15.3	21.2	21.2	8.7	14.6	
Effective Green, g (s)	70.3	55.6		70.3	55.6	55.6	15.3	21.2	21.2	8.7	14.6	
Actuated g/C Ratio	0.58	0.46		0.58	0.46	0.46	0.13	0.18	0.18	0.07	0.12	
Clearance Time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.1	5.3	5.1	
Vehicle Extension (s)	2.0	0.2		2.0	0.2	0.2	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	266	1696		405	1710	690	216	652	262	238	441	
v/s Ratio Prot	0.05	0.23		c0.12	0.37		c0.05	c0.13		0.03	0.05	
v/s Ratio Perm	0.20			c0.44		0.12			0.03			
v/c Ratio	0.45	0.49		0.97	0.80	0.27	0.37	0.73	0.16	0.45	0.44	
Uniform Delay, d1	40.1	22.9		32.0	28.1	20.2	48.5	47.3	42.4	53.9	49.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	1.0		35.8	4.1	1.0	0.4	3.7	0.1	0.5	0.3	
Delay (s)	40.5	23.9		67.8	32.2	21.2	48.8	50.9	42.5	54.4	49.7	
Level of Service	D	C		E	C	C	D	D	D	D	D	
Approach Delay (s)		26.0			37.8			48.2			51.3	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	38.1	HCM 2000 Level of Service	
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	
Intersection Capacity Utilization	80.9%	ICU Level of Service	
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Background AM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBT	EBL	WBTL	SBL	NBT
Lead/Lag			Lag	Lead			Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	20	52	13	35	20	52	13	36.1
Maximum Split (%)	16.5%	42.9%	10.7%	28.9%	16.5%	42.9%	10.7%	29.8%
Minimum Split (s)	11	33.2	11	34.1	11	31.2	11	36.1
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1.2	2	1.1	2	1.2	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	0.2	2	2	2	0.2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		9		7		11
Flash Dont Walk (s)		21		20		19		20
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	36.9	106	91.9	56.9	36.9	106	93	56.9
End Time (s)	56.9	36.9	106	91.9	56.9	36.9	106	93
Yield/Force Off (s)	51.6	31.7	100.7	86.8	51.6	31.7	100.7	87.9
Yield/Force Off 170(s)	51.6	10.7	100.7	86.8	51.6	12.7	100.7	87.9
Local Start Time (s)	52	0	107	72	52	0	108.1	72
Local Yield (s)	66.7	46.8	115.8	101.9	66.7	46.8	115.8	103
Local Yield 170(s)	66.7	25.8	115.8	101.9	66.7	27.8	115.8	103
Intersection Summary								
Cycle Length	121.1							
Control Type	Actuated-Coordinated							
Natural Cycle	145							
Offset: 106 (88%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green								




2032 Background AM
27: 70th St & GOLDWATER BLVD

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑	↑	↑
Traffic Vol, veh/h	451	63	11	344	120	30
Future Vol, veh/h	451	63	11	344	120	30
Conflicting Peds, #/hr	0	4	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	70	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	490	68	12	374	130	33
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	562	0	739	284
Stage 1	-	-	-	-	528	-
Stage 2	-	-	-	-	211	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	633	-	384	608
Stage 1	-	-	-	-	479	-
Stage 2	-	-	-	-	774	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	631	-	376	605
Mov Cap-2 Maneuver	-	-	-	-	376	-
Stage 1	-	-	-	-	468	-
Stage 2	-	-	-	-	774	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.3	17.9			
HCM LOS			C			
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	376	605	-	-	631	-
HCM Lane V/C Ratio	0.347	0.054	-	-	0.019	-
HCM Control Delay (s)	19.6	11.3	-	-	10.8	-
HCM Lane LOS	C	B	-	-	B	-
HCM 95th %tile Q(veh)	1.5	0.2	-	-	0.1	-

2032 Background AM
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis



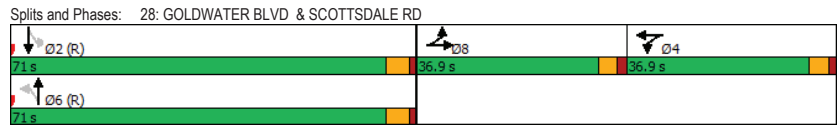
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑		↑	↑		↑	↑		↑	↑	↑
Traffic Volume (vph)	5	8	8	270	14	20	63	311	1	43	410	22
Future Volume (vph)	5	8	8	270	14	20	63	311	1	43	410	22
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.9			4.9			5.2			5.2		
Lane Util. Factor	1.00			0.95			1.00			0.95		
Frbp, ped/bikes	0.99			1.00			1.00			1.00		
Flpb, ped/bikes	1.00			1.00			1.00			1.00		
Frt	0.95			1.00			1.00			1.00		
Fit Protected	0.99			0.95			0.96			0.95		
Satd. Flow (prot)	1827			1593			1754			1676		
Fit Permitted	0.99			0.95			0.96			0.46		
Satd. Flow (perm)	1827			1593			1754			813		
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.82	0.82	0.82	0.87	0.87	0.87
Adj. Flow (vph)	6	10	10	310	16	23	77	379	1	49	471	25
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	26	0	177	168	0	77	380	0	49	494	0
Conf. Peds. (#/hr)	2			3			7			2		
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4		6	6		2	2	
Permitted Phases	6			2			6			2		
Actuated Green, G (s)	9.3			21.3			99.2			99.2		
Effective Green, g (s)	9.3			21.3			99.2			99.2		
Actuated g/C Ratio	0.06			0.15			0.69			0.69		
Clearance Time (s)	4.9			4.9			5.2			5.2		
Vehicle Extension (s)	2.0			2.0			2.0			2.0		
Lane Grp Cap (vph)	117			234			556			2551		
v/s Ratio Prot	c0.01			c0.11			0.10			c0.10		
v/s Ratio Perm							0.09			0.05		
v/c Ratio	0.22			0.76			0.65			0.14		
Uniform Delay, d1	64.3			59.3			58.2			7.9		
Progression Factor	1.00			1.00			1.00			1.00		
Incremental Delay, d2	0.4			11.7			4.4			0.5		
Delay (s)	64.7			70.9			62.6			8.5		
Level of Service	E			E			E			A		
Approach Delay (s)	64.7			66.8			8.2			8.0		
Approach LOS	E			E			A			A		
Intersection Summary												
HCM 2000 Control Delay	24.0			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.25											
Actuated Cycle Length (s)	144.8			Sum of lost time (s)			15.0					
Intersection Capacity Utilization	55.3%			ICU Level of Service			B					
Analysis Period (min)	15											
Description: Last Update: Sept 2017												
c Critical Lane Group												

2032 Background AM
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

	↓	↘	↑	↙
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	71	36.9	71	36.9
Maximum Split (%)	49.0%	25.5%	49.0%	25.5%
Minimum Split (s)	23.2	36.9	27.2	36.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	8	8	9
Flash Dont Walk (s)	11	24	14	23
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	24	131.9	24	95
End Time (s)	95	24	95	131.9
Yield/Force Off (s)	89.8	19.1	89.8	127
Yield/Force Off 170(s)	78.8	139.9	75.8	104
Local Start Time (s)	0	107.9	0	71
Local Yield (s)	65.8	139.9	65.8	103
Local Yield 170(s)	54.8	115.9	51.8	80

Intersection Summary	
Cycle Length	144.8
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 24 (17%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Background AM
29: SCOTTSDALE RD & OSBORN RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↘	→	↙	↗	←	↖	↘	↗	↖	↘	↗	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↘	↗	↗	↗	↗	↗	↗
Traffic Volume (vph)	57	192	96	97	180	101	71	903	122	96	601	22
Future Volume (vph)	57	192	96	97	180	101	71	903	122	96	601	22
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.95		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3517		1676	3502		1676	3725	1473	1676	5320	
Flt Permitted	0.38	1.00		0.36	1.00		0.37	1.00	1.00	0.22	1.00	
Satd. Flow (perm)	664	3517		643	3502		646	3725	1473	388	5320	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	71	240	120	121	225	126	78	992	134	104	653	24
RTOR Reduction (vph)	0	60	0	0	73	0	0	0	59	0	3	0
Lane Group Flow (vph)	71	300	0	121	278	0	78	992	75	104	674	0
Conf. Peds. (#/hr)			6			6			5			9
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	3	8		7	4		1	6	6	5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	25.6	20.6		25.6	20.6		73.1	67.5	67.5	73.1	67.5	
Effective Green, g (s)	25.6	20.6		25.6	20.6		73.1	67.5	67.5	73.1	67.5	
Actuated g/C Ratio	0.21	0.17		0.21	0.17		0.61	0.56	0.56	0.61	0.56	
Clearance Time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.4	
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	1.0	1.0	2.0	1.0	
Lane Grp Cap (vph)	183	603		180	600		441	2093	827	296	2990	
v/s Ratio Prot	0.02	0.09		c0.03	0.08		0.01	c0.27		c0.02	0.13	
v/s Ratio Perm	0.07			c0.12			0.10		0.05	0.20		
v/c Ratio	0.39	0.50		0.67	0.46		0.18	0.47	0.09	0.35	0.23	
Uniform Delay, d1	45.7	45.1		48.5	44.8		11.8	15.7	12.1	20.8	13.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.2		7.5	0.2		0.1	0.8	0.2	0.3	0.2	
Delay (s)	46.2	45.3		56.0	45.0		11.8	16.5	12.4	21.1	13.4	
Level of Service	D	D		E	D		B	B	B	C	B	
Approach Delay (s)		45.4			47.8			15.7			14.4	
Approach LOS		D			D			B			B	

Intersection Summary	
HCM 2000 Control Delay	25.0
HCM 2000 Volume to Capacity ratio	0.52
Actuated Cycle Length (s)	120.1
Intersection Capacity Utilization	64.8%
Analysis Period (min)	15
Description: Last Update: Sept 2017	
c Critical Lane Group	

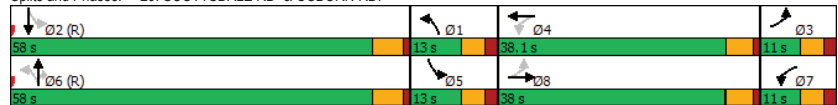
2032 Background AM
29: SCOTTSDALE RD & OSBORN RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	EBL	WBTL	SBL	NBTL	WBL	EBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	13	58	11	38.1	13	58	11	38
Maximum Split (%)	10.8%	48.3%	9.2%	31.7%	10.8%	48.3%	9.2%	31.6%
Minimum Split (s)	11	31.4	11	38.1	11	34.4	11	37.1
Yellow Time (s)	3.6	4.4	3.3	4	3.6	4.4	3.3	4
All-Red Time (s)	2	1	2	1.1	2	1	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	1	2	1	2	1	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		9		10		11
Flash Dont Walk (s)		18		24		19		21
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	58	0	109.1	71	58	0	109.1	71
End Time (s)	71	58	0	109.1	71	58	0	109.1
Yield/Force Off (s)	65.4	52.6	114.8	104	65.4	52.6	114.8	104
Yield/Force Off 170(s)	65.4	34.6	114.8	80	65.4	33.6	114.8	83
Local Start Time (s)	58	0	109.1	71	58	0	109.1	71
Local Yield (s)	65.4	52.6	114.8	104	65.4	52.6	114.8	104
Local Yield 170(s)	65.4	34.6	114.8	80	65.4	33.6	114.8	83

Intersection Summary	
Cycle Length	120.1
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	

Splits and Phases: 29: SCOTTSDALE RD & OSBORN RD.



2032 Background PM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	127	175	72	461	204	267	56	2069	408	246	2155	71
Future Volume (vph)	127	175	72	461	204	267	56	2069	408	246	2155	71
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4		5.6	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91		1.00	0.95	1.00
Fr	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1945	1500	3252	1945	1500	1676	5207		1676	3711	1500
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.06	1.00		0.06	1.00	1.00
Satd. Flow (perm)	1676	1945	1500	3252	1945	1500	113	5207		113	3711	1500
Peak-hour factor, PHF	0.85	0.85	0.85	0.83	0.83	0.83	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	206	85	555	246	322	59	2178	429	259	2268	75
RTOR Reduction (vph)	0	0	0	0	0	223	0	18	0	0	0	43
Lane Group Flow (vph)	149	206	85	555	246	99	59	2589	0	259	2268	32
Bus Blockages (#/hr)	0	2	0	0	2	0	0	2	0	0	2	0
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases			8			4	6			2		2
Actuated Green, G (s)	20.7	20.7	20.7	28.7	28.7	28.7	73.6	62.2		73.6	62.2	62.2
Effective Green, g (s)	20.7	20.7	20.7	28.7	28.7	28.7	73.6	62.2		73.6	62.2	62.2
Actuated g/C Ratio	0.14	0.14	0.14	0.20	0.20	0.20	0.51	0.43		0.51	0.43	0.43
Clearance Time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4		5.6	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.2		2.0	0.2	0.2
Lane Grp Cap (vph)	238	277	213	642	384	296	179	2229		179	1588	642
v/s Ratio Prot	0.09	c0.11		c0.17	0.13		0.03	0.50		c0.11	0.61	
v/s Ratio Perm			0.06			0.07	0.14			c0.61		0.02
w/c Ratio	0.63	0.74	0.40	0.86	0.64	0.33	0.33	1.16		1.45	1.43	0.05
Uniform Delay, d1	58.7	59.8	56.6	56.4	53.6	50.1	59.9	41.6		63.5	41.6	24.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.7	9.1	0.4	11.3	2.7	0.2	0.4	78.1		229.6	196.4	0.1
Delay (s)	62.3	68.8	57.1	67.7	56.3	50.3	60.3	119.7		293.2	238.0	24.4
Level of Service	E	E	E	E	E	D	E	F		F	F	C
Approach Delay (s)		64.4			60.2		118.4				237.3	
Approach LOS		E			E		F				F	

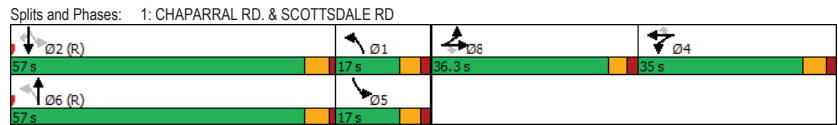
Intersection Summary	
HCM 2000 Control Delay	150.6
HCM 2000 Volume to Capacity ratio	1.19
Actuated Cycle Length (s)	145.3
Intersection Capacity Utilization	102.2%
Analysis Period (min)	15
Description: Last Update: April 2018	
c Critical Lane Group	

2032 Background PM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	4	5	6	8		
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL		
Lead/Lag	Lag	Lead	Lag	Lag	Lead	Lead		
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	C-Min	None		
Maximum Split (s)	17	57	35	17	57	36.3		
Maximum Split (%)	11.7%	39.2%	24.1%	11.7%	39.2%	25.0%		
Minimum Split (s)	11	16	35	11	16	36.3		
Yellow Time (s)	3.6	4.4	4	3.6	4.4	3.3		
All-Red Time (s)	2	1	2	2	1	2		
Minimum Initial (s)	5	10	7	5	10	7		
Vehicle Extension (s)	2	0.2	2	2	0.2	2		
Minimum Gap (s)	1	1	1	1	1	1		
Time Before Reduce (s)	0	0	0	0	0	0		
Time To Reduce (s)	0	0	0	0	0	0		
Walk Time (s)		7	7		7	9		
Flash Dont Walk (s)		10	22		14	22		
Dual Entry	No	Yes	No	No	Yes	No		
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes		
Start Time (s)	145	88	53	145	88	16.7		
End Time (s)	16.7	145	88	16.7	145	53		
Yield/Force Off (s)	11.1	139.6	82	11.1	139.6	47.7		
Yield/Force Off 170(s)	11.1	129.6	60	11.1	125.6	25.7		
Local Start Time (s)	57	0	110.3	57	0	74		
Local Yield (s)	68.4	51.6	139.3	68.4	51.6	105		
Local Yield 170(s)	68.4	41.6	117.3	68.4	37.6	83		

Intersection Summary	
Cycle Length	145.3
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 88 (61%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Background PM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	179	20	218	20	5	25	51	2409	67	16	1009	44
Future Volume (vph)	179	20	218	20	5	25	51	2409	67	16	1009	44
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1	5.1		5.1	5.1	5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1961	1500		1886	1480	1676	5328		1676	5314	
Flt Permitted	0.74	1.00	1.00		0.82	1.00	0.19	1.00		0.04	1.00	
Satd. Flow (perm)	1303	1961	1500		1610	1480	336	5328		78	5314	
Peak-hour factor, PHF	0.81	0.81	0.81	0.86	0.86	0.86	0.90	0.90	0.90	0.83	0.83	0.83
Adj. Flow (vph)	221	25	269	23	6	29	57	2677	74	19	1216	53
RTOR Reduction (vph)	0	0	67	0	0	17	0	2	0	0	3	0
Lane Group Flow (vph)	221	25	202	0	29	12	57	2749	0	19	1266	0
Conf. Peds. (#/hr)						1			2			2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4		4	6			2		
Actuated Green, G (s)	26.0	26.0	26.0		26.0	26.0	90.4	90.4		90.4	90.4	
Effective Green, g (s)	26.0	26.0	26.0		26.0	26.0	90.4	90.4		90.4	90.4	
Actuated g/C Ratio	0.20	0.20	0.20		0.20	0.20	0.71	0.71		0.71	0.71	
Clearance Time (s)	5.1	5.1	5.1		5.1	5.1	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	266	401	306		329	302	238	3789		55	3779	
v/s Ratio Prot		0.01						c0.52			0.24	
v/s Ratio Perm	c0.17		0.13		0.02	0.01	0.17			0.24		
v/c Ratio	0.83	0.06	0.66		0.09	0.04	0.24	0.73		0.35	0.34	
Uniform Delay, d1	48.4	40.7	46.5		40.9	40.5	6.4	10.9		7.0	7.0	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.5	0.0	4.1		0.0	0.0	2.4	1.2		16.4	0.2	
Delay (s)	67.0	40.8	50.6		41.0	40.5	8.8	12.2		23.4	7.2	
Level of Service	E	D	D		D	D	A	B		C	A	
Approach Delay (s)		57.2			40.8			12.1			7.4	
Approach LOS		E			D			B			A	

Intersection Summary	
HCM 2000 Control Delay	16.2
HCM 2000 Volume to Capacity ratio	0.75
Actuated Cycle Length (s)	127.1
Intersection Capacity Utilization	75.8%
Analysis Period (min)	15
Description: Last Update: Sept 2017	
c Critical Lane Group	

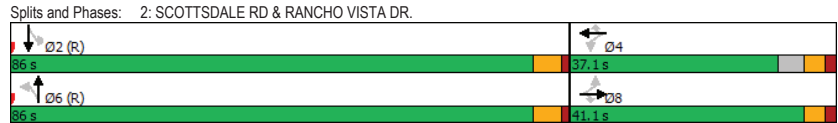
2032 Background PM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
Timing Report, Sorted By Phase

	2	4	6	8
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	86	37.1	86	41.1
Maximum Split (%)	67.7%	29.2%	67.7%	32.3%
Minimum Split (s)	16	37.1	16	41.1
Yellow Time (s)	4.4	3.3	4.4	3.3
All-Red Time (s)	1.2	1.8	1.2	1.8
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	11
Flash Dont Walk (s)	18	25	13	25
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	76	34.9	76	34.9
End Time (s)	34.9	76	34.9	76
Yield/Force Off (s)	29.3	70.9	29.3	70.9
Yield/Force Off 170(s)	11.3	45.9	16.3	45.9
Local Start Time (s)	0	86	0	86
Local Yield (s)	80.4	122	80.4	122
Local Yield 170(s)	62.4	97	67.4	97

Intersection Summary

Cycle Length	127.1
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 76 (60%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Background PM
3: SCOTTSDALE RD & HIGHLAND AVE/Granada Ave

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	803	22	58	32	22	44	52	1623	37	15	1261	101
Future Volume (vph)	803	22	58	32	22	44	52	1623	37	15	1261	101
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.90		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3252	1730		1676	1766		1676	5332		1676	5288	
Flt Permitted	0.95	1.00		0.95	1.00		0.10	1.00		0.07	1.00	
Satd. Flow (perm)	3252	1730		1676	1766		168	5332		117	5288	
Peak-hour factor, PHF	0.85	0.85	0.85	0.80	0.80	0.80	0.91	0.91	0.91	0.87	0.87	0.87
Adj. Flow (vph)	945	26	68	40	28	55	57	1784	41	17	1449	116
RTOR Reduction (vph)	0	47	0	0	8	0	0	2	0	0	8	0
Lane Group Flow (vph)	945	47	0	40	75	0	57	1823	0	17	1557	0
Confl. Peds. (#/hr)			2						2			2
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6			2	
Permitted Phases							6				2	
Actuated Green, G (s)	36.5	36.5		7.4	7.4		60.3	60.3		60.3	60.3	
Effective Green, g (s)	36.5	36.5		7.4	7.4		60.3	60.3		60.3	60.3	
Actuated g/C Ratio	0.30	0.30		0.06	0.06		0.50	0.50		0.50	0.50	
Clearance Time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	988	525		103	108		84	2677		58	2655	
v/s Ratio Prot	c0.29	0.03		0.02	c0.04			c0.34			0.29	
v/s Ratio Perm							0.34				0.15	
v/c Ratio	0.96	0.09		0.39	0.69		0.68	0.68		0.29	0.59	
Uniform Delay, d1	41.0	29.9		54.2	55.2		22.6	22.6		17.5	21.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.7	0.0		0.9	14.2		36.2	1.4		12.4	1.0	
Delay (s)	59.7	29.9		55.1	69.5		58.8	24.0		29.8	22.1	
Level of Service	E	C		E	E		E	C		C	C	
Approach Delay (s)		57.0			64.8			25.1			22.1	
Approach LOS		E			E			C			C	

Intersection Summary

HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	15.9
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Background PM
3: SCOTTSDALE RD & HIGHLAND AVE/Granada Ave

Southbridge Expansion
Timing Report, Sorted By Phase

	↓	↘	↑	↗
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	67	15	67	38.1
Maximum Split (%)	55.8%	12.5%	55.8%	31.7%
Minimum Split (s)	30.7	13	28.7	38.1
Yellow Time (s)	4.4	3.6	4.4	3.6
All-Red Time (s)	1.3	1.5	1.3	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	1	2	1	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8		7	9
Flash Dont Walk (s)	17		16	24
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	94	40.9	94	55.9
End Time (s)	40.9	55.9	40.9	94
Yield/Force Off (s)	35.2	50.8	35.2	88.9
Yield/Force Off 170(s)	18.2	50.8	19.2	64.9
Local Start Time (s)	0	67	0	82
Local Yield (s)	61.3	76.9	61.3	115
Local Yield 170(s)	44.3	76.9	45.3	91
Intersection Summary				
Cycle Length	120.1			
Control Type	Actuated-Coordinated			
Natural Cycle	85			
Offset: 94 (78%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				

Splits and Phases: 3: SCOTTSDALE RD & HIGHLAND AVE/Granada Ave



2032 Background PM
4: Fashion Square Dr & Goldwater Blvd

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

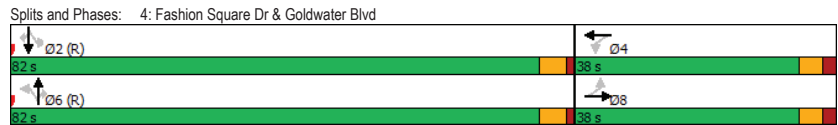
	↖	→	↘	↙	←	↗	↖	↗	↘	↙	↖	↗
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	80	19	68	103	5	30	41	585	87	34	1025	22
Future Volume (vph)	80	19	68	103	5	30	41	585	87	34	1025	22
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		5.5		5.5	5.5		5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.91	1.00
Frbp, ped/bikes		0.99		1.00	0.98		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.95		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1798		1676	1678		1676	3725	1460	1676	5353	1466
Flt Permitted		0.83		0.55	1.00		0.24	1.00	1.00	0.40	1.00	1.00
Satd. Flow (perm)		1526		971	1678		415	3725	1460	714	5353	1466
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	21	74	112	5	33	45	636	95	37	1114	24
RTOR Reduction (vph)	0	24	0	0	28	0	0	0	23	0	0	6
Lane Group Flow (vph)	0	158	0	112	10	0	45	636	72	37	1114	18
Conf. Peds. (#/hr)			2			3			2			1
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6		6	2		2
Actuated Green, G (s)		17.9		17.9	17.9		91.4	91.4	91.4	91.4	91.4	91.4
Effective Green, g (s)		17.9		17.9	17.9		91.4	91.4	91.4	91.4	91.4	91.4
Actuated g/C Ratio		0.15		0.15	0.15		0.76	0.76	0.76	0.76	0.76	0.76
Clearance Time (s)		5.5		5.5	5.5		5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		227		144	250		316	2837	1112	543	4077	1116
v/s Ratio Prot					0.01			0.17			c0.21	
v/s Ratio Perm		0.10		c0.12			0.11		0.05	0.05		0.01
v/c Ratio		0.70		0.78	0.04		0.14	0.22	0.07	0.07	0.27	0.02
Uniform Delay, d1		48.5		49.1	43.7		3.8	4.1	3.6	3.6	4.3	3.5
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		9.0		22.7	0.1		0.9	0.2	0.1	0.2	0.2	0.0
Delay (s)		57.4		71.9	43.8		4.8	4.3	3.7	3.8	4.5	3.5
Level of Service		E		E	D		A	A	A	A	A	A
Approach Delay (s)		57.4			64.8			4.2			4.4	
Approach LOS		E			E			A			A	
Intersection Summary												
HCM 2000 Control Delay	12.6		HCM 2000 Level of Service				B					
HCM 2000 Volume to Capacity ratio	0.36											
Actuated Cycle Length (s)	120.0				Sum of lost time (s)				10.7			
Intersection Capacity Utilization	56.6%		ICU Level of Service				B					
Analysis Period (min)	15											
c Critical Lane Group												

2032 Background PM
4: Fashion Square Dr & Goldwater Blvd

Southbridge Expansion
Timing Report, Sorted By Phase

	↓	←	↑	→
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	82	38	82	38
Maximum Split (%)	68.3%	31.7%	68.3%	31.7%
Minimum Split (s)	16	21.5	16	21.5
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	2.2	1.2	2.2
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	5
Flash Dont Walk (s)	16	11	10	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	82	0	82
End Time (s)	82	0	82	0
Yield/Force Off (s)	76.8	114.5	76.8	114.5
Yield/Force Off 170(s)	60.8	103.5	66.8	103.5
Local Start Time (s)	0	82	0	82
Local Yield (s)	76.8	114.5	76.8	114.5
Local Yield 170(s)	60.8	103.5	66.8	103.5

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	45
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Background PM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↖	→	↘	↙	←	↗	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘
Traffic Volume (vph)	128	1299	228	251	1813	92	228	384	233	122	235	91
Future Volume (vph)	128	1299	228	251	1813	92	228	384	233	122	235	91
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5223		1676	5311		1676	1961	1457	1676	1961	1500
Flt Permitted	0.10	1.00		0.10	1.00		0.49	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	169	5223		169	5311		861	1961	1457	861	1961	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	1412	248	273	1971	100	248	417	253	133	255	99
RTOR Reduction (vph)	0	22	0	0	5	0	0	0	127	0	0	90
Lane Group Flow (vph)	139	1638	0	273	2066	0	248	417	126	133	255	9
Conf. Peds. (#/hr)			1			2			5			
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	3		4	3		2	1		2	1	
Permitted Phases	3			3			1		1	1		1
Actuated Green, G (s)	57.2	41.7		57.2	41.7		14.3	8.2	8.2	14.3	8.2	8.2
Effective Green, g (s)	57.2	41.7		57.2	41.7		14.3	8.2	8.2	14.3	8.2	8.2
Actuated g/C Ratio	0.62	0.45		0.62	0.45		0.15	0.09	0.09	0.15	0.09	0.09
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	357	2354		357	2394		186	173	129	186	173	132
v/s Ratio Prot	0.07	0.31		c0.13	c0.39		c0.09	c0.21		0.05	0.13	
v/s Ratio Perm	0.18			0.34			0.12		0.09	0.06		0.01
v/c Ratio	0.39	0.70		0.76	0.86		1.33	2.41	0.98	0.72	1.47	0.07
Uniform Delay, d1	28.0	20.3		25.8	22.8		40.1	42.1	42.1	39.0	42.1	38.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.7		8.5	3.4		181.9	652.0	71.7	10.3	241.8	0.1
Delay (s)	28.2	21.1		34.3	26.2		222.0	694.1	113.8	49.4	284.0	38.7
Level of Service	C	C		C	C		F	F	F	D	F	D
Approach Delay (s)		21.6			27.1			406.7			170.0	
Approach LOS		C			C			F			F	

Intersection Summary	
HCM 2000 Control Delay	100.7
HCM 2000 Volume to Capacity ratio	1.06
Actuated Cycle Length (s)	92.5
Intersection Capacity Utilization	87.6%
Analysis Period (min)	15
c Critical Lane Group	

2032 Background PM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

	1	2	3	4
Phase Number	1	2	3	4
Movement	NBSB NBSBL	EBWB EBWBL		
Lead/Lag	Lead Lag	Lead Lag		
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	15	10	56	31
Maximum Split (%)	13.4%	8.9%	50.0%	27.7%
Minimum Split (s)	15	8	56	31
Yellow Time (s)	4.2	3	4.2	3
All-Red Time (s)	2.8	1	1.8	1
Minimum Initial (s)	8	4	10	4
Vehicle Extension (s)	2	1	1	1
Minimum Gap (s)	1	1	1	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	0		33	
Flash Dont Walk (s)	0		17	
Dual Entry	No	No	No	No
Inhibit Max	No	No	No	No
Start Time (s)	0	15	25	81
End Time (s)	15	25	81	0
Yield/Force Off (s)	8	21	75	108
Yield/Force Off 170(s)	8	21	58	108
Local Start Time (s)	97	0	10	66
Local Yield (s)	105	6	60	93
Local Yield 170(s)	105	6	43	93

Intersection Summary	
Cycle Length	112
Control Type	Actuated-Uncoordinated
Natural Cycle	140

Splits and Phases: 5: 68th Street & CAMELBACK RD.



2032 Background PM
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔↔	↔	↔↔	↔	↔↔	↔↔	↔	↔↔	↔↔	↔
Traffic Volume (vph)	290	1199	257	67	1247	127	303	282	124	95	534	619
Future Volume (vph)	290	1199	257	67	1247	127	303	282	124	95	534	619
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	0.97	0.91	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5353	1479	1676	5271		3252	3725	1491	3252	5353	1491
Flt Permitted	0.10	1.00	1.00	0.10	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	185	5353	1479	185	5271		3252	3725	1491	3252	5353	1491
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95	0.88	0.88	0.88
Adj. Flow (vph)	315	1303	279	73	1355	138	319	297	131	108	607	703
RTOR Reduction (vph)	0	0	118	0	10	0	0	0	48	0	0	77
Lane Group Flow (vph)	315	1303	161	73	1483	0	319	297	83	108	607	626
Confl. Peds. (#/hr)			2			3			2			1
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	3	8		7	4		1	6	7	5	2	3
Permitted Phases	8		8	4					6			2
Actuated Green, G (s)	62.4	38.2	38.2	62.4	38.2		15.2	16.5	40.7	19.5	20.8	45.0
Effective Green, g (s)	62.4	38.2	38.2	62.4	38.2		15.2	16.5	40.7	19.5	20.8	45.0
Actuated g/C Ratio	0.52	0.32	0.32	0.52	0.32		0.13	0.14	0.34	0.16	0.17	0.37
Clearance Time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	394	1695	468	394	1669		409	509	572	525	923	625
v/s Ratio Prot	0.16	0.24		0.04	0.28		0.10	0.08	0.03	0.03	0.11	0.20
v/s Ratio Perm	0.25		0.11	0.06					0.03			0.22
v/c Ratio	0.80	0.77	0.34	0.19	0.89		0.78	0.58	0.15	0.21	0.66	1.00
Uniform Delay, d1	40.6	37.2	31.6	32.8	39.2		51.1	48.8	27.8	43.8	46.6	37.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.2	1.9	0.2	0.1	6.0		8.3	4.8	0.0	0.1	3.7	36.3
Delay (s)	50.8	39.2	31.7	32.9	45.2		59.4	53.7	27.9	43.9	50.2	74.1
Level of Service	D	D	C	C	D		E	D	C	D	D	E
Approach Delay (s)	40.0				44.6			51.6				61.6
Approach LOS	D				D			D				E

Intersection Summary	
HCM 2000 Control Delay	48.3
HCM 2000 Volume to Capacity ratio	0.97
Actuated Cycle Length (s)	120.6
Intersection Capacity Utilization	99.6%
Analysis Period (min)	15
Description: Last Update: Sept 2017	
c Critical Lane Group	

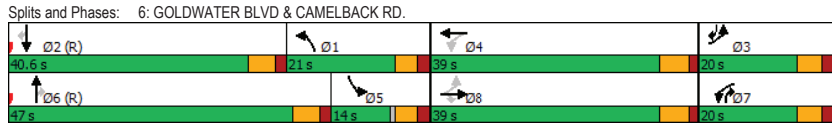
2032 Background PM
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase



Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBTL	SBL	NBT	WBL	EBTL
Lead/Lag	Lag	Lead			Lag	Lead		
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Ped	None	C-Min	None	Ped
Maximum Split (s)	21	40.6	20	39	14	47	20	39
Maximum Split (%)	17.4%	33.7%	16.6%	32.3%	11.6%	39.0%	16.6%	32.3%
Minimum Split (s)	11	40.6	11	31	11	35.6	11	33
Yellow Time (s)	3.3	4	3.6	4.4	3.3	4	3.6	4.4
All-Red Time (s)	2	1.6	2	1.3	2	1.6	2	1.3
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	1	2	2	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		7		7		7
Flash Dont Walk (s)		27		24		23		26
Dual Entry	No	Yes	Yes	No	No	Yes	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	88.6	48	28	109.6	95	48	28	109.6
End Time (s)	109.6	88.6	48	28	109.6	95	48	28
Yield/Force Off (s)	104.3	83	42.4	22.3	104.3	89.4	42.4	22.3
Yield/Force Off 170(s)	104.3	56	42.4	118.9	104.3	66.4	42.4	116.9
Local Start Time (s)	40.6	0	100.6	61.6	47	0	100.6	61.6
Local Yield (s)	56.3	35	115	94.9	56.3	41.4	115	94.9
Local Yield 170(s)	56.3	8	115	70.9	56.3	18.4	115	68.9

Intersection Summary	
Cycle Length	120.6
Control Type	Actuated-Coordinated
Natural Cycle	130
Offset: 48 (40%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green	



2032 Background PM
7: CAMELBACK RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

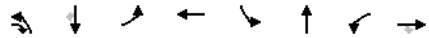


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕	↔↔	↔↔	↕↕		↔↔	↕↕	↔↔	↔↔	↕↕	↔↔
Traffic Volume (vph)	237	736	284	122	751	222	333	1075	119	419	789	249
Future Volume (vph)	237	736	284	122	751	222	333	1075	119	419	789	249
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.91		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	0.98
Ftpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3252	3725	1481	1676	3578		3252	5260		3252	3725	1466
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3252	3725	1481	1676	3578		3252	5260		3252	3725	1466
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.86	0.86	0.88	0.88	0.88	0.95	0.95	0.95
Adj. Flow (vph)	258	800	309	142	873	258	378	1222	135	441	831	262
RTOR Reduction (vph)	0	0	69	0	23	0	0	11	0	0	0	155
Lane Group Flow (vph)	258	800	240	142	1108	0	378	1346	0	441	831	107
Conf. Peds. (#/hr)			8			12			10			8
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8	1	7	4		1	6		5	2	
Permitted Phases			8									2
Actuated Green, G (s)	12.6	30.4	51.1	17.2	35.0		20.7	32.9		18.6	31.0	31.0
Effective Green, g (s)	12.6	30.4	51.1	17.2	35.0		20.7	32.9		18.6	31.0	31.0
Actuated g/C Ratio	0.10	0.25	0.42	0.14	0.29		0.17	0.27		0.15	0.26	0.26
Clearance Time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	340	939	689	239	1039		558	1436		501	958	377
v/s Ratio Prot	c0.08	0.21	0.06	c0.08	c0.31		0.12	c0.26		0.14	c0.22	
v/s Ratio Perm			0.10									0.07
v/c Ratio	0.76	0.85	0.35	0.59	1.07		0.68	0.94		0.88	0.87	0.28
Uniform Delay, d1	52.5	42.9	23.4	48.4	42.8		46.8	42.8		49.9	42.8	35.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.4	7.3	0.1	2.6	47.5		2.6	12.9		16.0	10.5	1.9
Delay (s)	60.8	50.2	23.6	51.0	90.3		49.3	55.7		65.8	53.2	37.7
Level of Service	E	D	C	D	F		D	E		E	D	D
Approach Delay (s)		46.2			85.9			54.3				54.2
Approach LOS		D			F			D				D

Intersection Summary			
HCM 2000 Control Delay	59.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.5	Sum of lost time (s)	21.4
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Background PM
7: CAMELBACK RD. & SCOTTSDALE RD

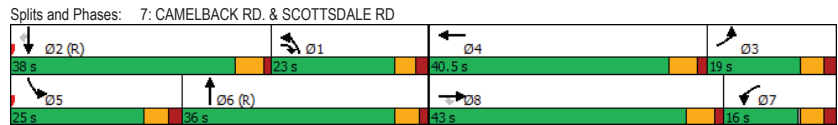
Southbridge Expansion
Timing Report, Sorted By Phase



Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBT	SBL	NBT	WBL	EBT
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	23	38	19	40.5	25	36	16	43
Maximum Split (%)	19.1%	31.5%	15.8%	33.6%	20.7%	29.9%	13.3%	35.7%
Minimum Split (s)	10	32.4	11	40.5	11	33	11	34.5
Yellow Time (s)	3	4.4	3.3	4	3.6	3.6	3.3	4
All-Red Time (s)	2	1	2	1.5	2	1.4	2	1.5
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		23		31		24		25
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	78	40	21	101	40	65	23.5	101
End Time (s)	101	78	40	21	65	101	40	23.5
Yield/Force Off (s)	96	72.6	34.7	15.5	59.4	96	34.7	18
Yield/Force Off 170(s)	96	49.6	34.7	105	59.4	72	34.7	113.5
Local Start Time (s)	38	0	101.5	61	0	25	104	61
Local Yield (s)	56	32.6	115.2	96	19.4	56	115.2	98.5
Local Yield 170(s)	56	9.6	115.2	65	19.4	32	115.2	73.5


Intersection Summary

Cycle Length	120.5
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 40 (33%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green	



2032 Background PM
8: SCOTTSDALE RD & Stetson Dr/DRINKWATER BLVD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	56	25	8	115	35	567	0	918	32	295	791	86
Future Volume (vph)	56	25	8	115	35	567	0	918	32	295	791	86
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		5.2		5.2	5.2	5.0		5.1		5.0	5.1	
Lane Util. Factor		1.00		1.00	1.00	1.00		0.95		0.97	0.95	
Frbp, ped/bikes		1.00		1.00	1.00	0.96		1.00		1.00	0.99	
Ftpb, ped/bikes		1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frt		0.99		1.00	1.00	0.85		0.99		1.00	0.99	
Flt Protected		0.97		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1874		1676	1961	1445		3703		3252	3624	
Flt Permitted		0.79		0.69	1.00	1.00		1.00		0.16	1.00	
Satd. Flow (perm)		1536		1217	1961	1445		3703		557	3624	
Peak-hour factor, PHF	0.84	0.84	0.84	0.80	0.80	0.80	0.85	0.85	0.85	0.94	0.94	0.94
Adj. Flow (vph)	67	30	10	144	44	709	0	1080	38	314	841	91
RTOR Reduction (vph)	0	0	0	0	0	25	0	2	0	0	5	0
Lane Group Flow (vph)	0	107	0	144	44	684	0	1116	0	314	927	0
Conf. Peds. (#/hr)			7			35			18		30	
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		8			4	5		6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)		27.7		27.7	27.7	38.2		66.5		82.0	82.0	
Effective Green, g (s)		27.7		27.7	27.7	38.2		66.5		82.0	82.0	
Actuated g/C Ratio		0.23		0.23	0.23	0.32		0.55		0.68	0.68	
Clearance Time (s)		5.2		5.2	5.2	5.0		5.1		5.0	5.1	
Vehicle Extension (s)		2.0		2.0	2.0	2.0		2.0		2.0	2.0	
Lane Grp Cap (vph)		354		280	452	459		2052		616	2476	
v/s Ratio Prot					0.02	c0.13		c0.30		0.04	0.26	
v/s Ratio Perm		0.07		0.12		0.34				0.30		
v/c Ratio		0.30		0.51	0.10	1.49		0.54		0.51	0.37	
Uniform Delay, d1		38.2		40.3	36.3	40.9		17.1		11.0	8.1	
Progression Factor		1.00		0.97	1.02	0.72		1.00		1.00	1.00	
Incremental Delay, d2		0.2		0.7	0.0	232.1		1.0		0.2	0.4	
Delay (s)		38.3		39.6	37.0	261.7		18.1		11.3	8.5	
Level of Service		D		D	D	F		B		B	A	
Approach Delay (s)		38.3			215.0			18.1			9.2	
Approach LOS		D			F			B			A	

Intersection Summary

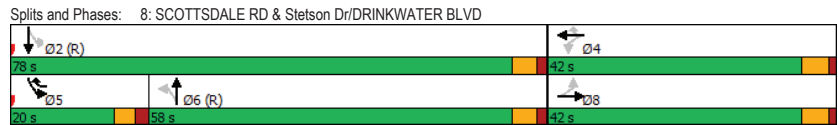
HCM 2000 Control Delay	67.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Background PM
8: SCOTTSDALE RD & Stetson Dr/DRINKWATER BLVD

Southbridge Expansion
Timing Report, Sorted By Phase

	2	4	5	6	8
Phase Number	2	4	5	6	8
Movement	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag			Lead	Lag	
Lead-Lag Optimize					
Recall Mode	C-Min	None	None	C-Min	None
Maximum Split (s)	78	42	20	58	42
Maximum Split (%)	65.0%	35.0%	16.7%	48.3%	35.0%
Minimum Split (s)	21.1	37.2	15	38.1	33.2
Yellow Time (s)	3.6	4	3	3.6	4
All-Red Time (s)	1.5	1.2	2	1.5	1.2
Minimum Initial (s)	10	7	10	10	7
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	9	9		9	7
Flash Dont Walk (s)	7	23		24	21
Dual Entry	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	44	2	44	64	2
End Time (s)	2	44	64	2	44
Yield/Force Off (s)	116.9	38.8	59	116.9	38.8
Yield/Force Off 170(s)	109.9	15.8	59	92.9	17.8
Local Start Time (s)	0	78	0	20	78
Local Yield (s)	72.9	114.8	15	72.9	114.8
Local Yield 170(s)	65.9	91.8	15	48.9	93.8

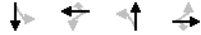
Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 44 (37%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Background PM
9: GOLDWATER BLVD /GOLDWATER BLVD #2 & 5TH AVE HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	3	0	2	3	3	3	1	1	1	1	1	1
Traffic Volume (vph)	33	0	23	49	35	85	11	743	44	48	800	80
Future Volume (vph)	33	0	23	49	35	85	11	743	44	48	800	80
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2		5.2	4.0	4.0	4.0	5.2	5.2		5.2	5.2	
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.91	
Frpb, ped/bikes	1.00		0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95		1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676		1478	1676	1961	1472	1676	3692		1676	5268	
Flt Permitted	0.73		1.00	0.76	1.00	1.00	0.26	1.00		0.28	1.00	
Satd. Flow (perm)	1292		1478	1336	1961	1472	462	3692		503	5268	
Peak-hour factor, PHF	0.80	0.92	0.80	0.92	0.92	0.92	0.81	0.81	0.92	0.92	0.85	0.85
Adj. Flow (vph)	41	0	29	53	38	92	14	917	48	52	941	94
RTOR Reduction (vph)	0	0	26	0	0	81	0	2	0	0	6	0
Lane Group Flow (vph)	41	0	3	53	38	11	14	963	0	52	1029	0
Conf. Peds. (#/hr)			2			3			3			2
Turn Type	Perm		Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4		4	6			2		
Actuated Green, G (s)	12.6		12.6	13.8	13.8	13.8	97.0	97.0		97.0	97.0	
Effective Green, g (s)	12.6		12.6	13.8	13.8	13.8	97.0	97.0		97.0	97.0	
Actuated g/C Ratio	0.10		0.10	0.12	0.12	0.12	0.81	0.81		0.81	0.81	
Clearance Time (s)	5.2		5.2	4.0	4.0	4.0	5.2	5.2		5.2	5.2	
Vehicle Extension (s)	2.0		2.0	3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	135		155	153	225	169	373	2984		406	4258	
v/s Ratio Prot					0.02			c0.26			0.20	
v/s Ratio Perm	0.03		0.00	c0.04		0.01	0.03			0.10		
v/c Ratio	0.30		0.02	0.35	0.17	0.06	0.04	0.32		0.13	0.24	
Uniform Delay, d1	49.6		48.2	48.9	47.9	47.3	2.3	3.0		2.5	2.7	
Progression Factor	1.00		1.00	1.00	1.00	1.00	1.96	2.16		1.00	1.00	
Incremental Delay, d2	0.5		0.0	1.4	0.4	0.2	0.2	0.3		0.7	0.1	
Delay (s)	50.1		48.2	50.3	48.3	47.5	4.6	6.7		3.1	2.9	
Level of Service	D		D	D	D	D	A	A		A	A	
Approach Delay (s)		49.3			48.5			6.7			2.9	
Approach LOS		D			D			A			A	

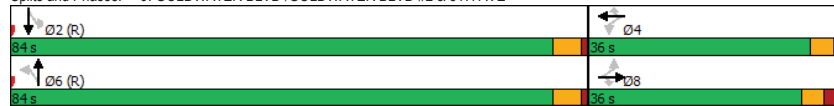
Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.4
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			



Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	84	36	84	36
Maximum Split (%)	70.0%	30.0%	70.0%	30.0%
Minimum Split (s)	16	20	16	34.2
Yellow Time (s)	4	3.5	4	3.3
All-Red Time (s)	1.2	0.5	1.2	1.9
Minimum Initial (s)	10	4	10	7
Vehicle Extension (s)	2	3	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	8
Flash Dont Walk (s)	14	11	11	21
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	110	74	110	74
End Time (s)	74	110	74	110
Yield/Force Off (s)	68.8	106	68.8	104.8
Yield/Force Off 170(s)	54.8	95	57.8	83.8
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.8	116	78.8	114.8
Local Yield 170(s)	64.8	105	67.8	93.8

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 110 (92%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	

Splits and Phases: 9: GOLDWATER BLVD /GOLDWATER BLVD #2 & 5TH AVE



Intersection			
Intersection Delay, s/veh	3.3		
Intersection LOS	A		
Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	61	133	68
Demand Flow Rate, veh/h	63	135	69
Vehicles Circulating, veh/h	9	17	37
Vehicles Exiting, veh/h	143	89	34
Ped Vol Crossing Leg, #/h	0	2	3
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.1	3.5	3.2
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	63	135	69
Cap Entry Lane, veh/h	1367	1356	1329
Entry HV Adj Factor	0.973	0.982	0.986
Flow Entry, veh/h	61	133	68
Cap Entry, veh/h	1330	1331	1309
V/C Ratio	0.046	0.100	0.052
Control Delay, s/veh	3.1	3.5	3.2
LOS	A	A	A
95th %tile Queue, veh	0	0	0

2032 Background PM
10: Marshall Way & 5th Ave

Southbridge Expansion
HCM 6th AWSC

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	33	23	8	114	16	47
Future Vol, veh/h	33	23	8	114	16	47
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	25	9	124	17	51
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.2	7.9	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	25%	0%	7%
Vol Thru, %	0%	59%	93%
Vol Right, %	75%	41%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	63	56	122
LT Vol	16	0	8
Through Vol	0	33	114
RT Vol	47	23	0
Lane Flow Rate	68	61	133
Geometry Grp	1	1	1
Degree of Util (X)	0.074	0.066	0.152
Departure Headway (Hd)	3.868	3.909	4.114
Convergence, Y/N	Yes	Yes	Yes
Cap	911	909	870
Service Time	1.955	1.964	2.15
HCM Lane V/C Ratio	0.075	0.067	0.153
HCM Control Delay	7.3	7.2	7.9
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	0.2	0.5

2032 Background PM
11: 5th Ave & Stetson Dr

Southbridge Expansion
HCM 6th AWSC

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	25	67	49	30	46	61
Future Vol, veh/h	25	67	49	30	46	61
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	73	53	33	50	66
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left			WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.9	7.5	7.7
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	27%	0%	43%
Vol Thru, %	73%	62%	0%
Vol Right, %	0%	38%	57%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	92	79	107
LT Vol	25	0	46
Through Vol	67	49	0
RT Vol	0	30	61
Lane Flow Rate	100	86	116
Geometry Grp	1	1	1
Degree of Util (X)	0.118	0.095	0.129
Departure Headway (Hd)	4.258	3.987	3.995
Convergence, Y/N	Yes	Yes	Yes
Cap	833	887	883
Service Time	2.327	2.065	2.086
HCM Lane V/C Ratio	0.12	0.097	0.131
HCM Control Delay	7.9	7.5	7.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.4	0.3	0.4


2032 Background PM
12: Craftsman Ct & 5th Ave

Southbridge Expansion
HCM 6th WSC

Intersection						
Int Delay, s/veh	2.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Vol, veh/h	94	18	20	54	20	30
Future Vol, veh/h	94	18	20	54	20	30
Conflicting Peds, #/hr	0	14	0	0	0	6
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	102	20	22	59	22	33
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	136	0	229	132
Stage 1	-	-	-	-	126	-
Stage 2	-	-	-	-	103	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1448	-	759	917
Stage 1	-	-	-	-	900	-
Stage 2	-	-	-	-	921	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1431	-	738	902
Mov Cap-2 Maneuver	-	-	-	-	738	-
Stage 1	-	-	-	-	875	-
Stage 2	-	-	-	-	921	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	2	9.7			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	828	-	-	1431	-	
HCM Lane V/C Ratio	0.066	-	-	0.015	-	
HCM Control Delay (s)	9.7	-	-	7.6	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

2032 Background PM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔		↔		↔		↔		
Traffic Volume (vph)	62	25	110	75	27	25	58	838	19	44	818	101
Future Volume (vph)	62	25	110	75	27	25	58	838	19	44	818	101
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.0		4.0		4.0		5.0		4.8		4.8	
Lane Util. Factor	1.00		1.00		1.00		1.00		0.95		1.00	
Frbp, ped/bikes	0.99		1.00		0.99		1.00		1.00		1.00	
Flpb, ped/bikes	1.00		1.00		1.00		1.00		1.00		1.00	
Frt	0.92		1.00		0.93		1.00		1.00		1.00	
Fit Protected	0.98		0.95		1.00		0.95		1.00		0.95	
Satd. Flow (prot)	1760		1676		1800		1676		3710		1676	
Fit Permitted	0.89		0.57		1.00		0.16		1.00		0.19	
Satd. Flow (perm)	1595		1010		1800		288		3710		339	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	27	120	82	29	27	63	911	21	48	889	110
RTOR Reduction (vph)	0	24	0	0	18	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	190	0	82	38	0	63	931	0	48	995	0
Conf. Peds. (#/hr)	11		8		12		21		12		21	
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	4		4		4		2		1		2	
Permitted Phases	4		4		1		1		1		1	
Actuated Green, G (s)	16.7		16.7		16.7		32.5		25.1		32.5	
Effective Green, g (s)	16.7		16.7		16.7		32.5		25.1		32.5	
Actuated g/C Ratio	0.27		0.27		0.27		0.52		0.40		0.52	
Clearance Time (s)	4.0		4.0		4.0		5.0		4.8		5.0	
Vehicle Extension (s)	3.0		3.0		3.0		1.0		0.2		1.0	
Lane Grp Cap (vph)	422		267		477		311		1478		331	
v/s Ratio Prot	c0.12		0.08		0.08		c0.02		0.25		0.02	
v/s Ratio Perm	c0.12		0.08		0.08		0.08		0.06		0.06	
v/c Ratio	0.45		0.31		0.08		0.20		0.63		0.15	
Uniform Delay, d1	19.3		18.5		17.4		8.7		15.2		8.4	
Progression Factor	1.00		1.00		1.00		1.00		1.00		1.00	
Incremental Delay, d2	0.8		0.7		0.1		0.1		0.6		0.1	
Delay (s)	20.1		19.2		17.5		8.9		15.9		8.4	
Level of Service	C		B		B		A		B		A	
Approach Delay (s)	20.1		18.5		15.4		15.4		16.4		16.4	
Approach LOS	C		B		B		B		B		B	
Intersection Summary												
HCM 2000 Control Delay	16.4		HCM 2000 Level of Service				B					
HCM 2000 Volume to Capacity ratio	0.53											
Actuated Cycle Length (s)	63.0		Sum of lost time (s)				13.8					
Intersection Capacity Utilization	62.8%		ICU Level of Service				B					
Analysis Period (min)	15											
c	Critical Lane Group											

2032 Background PM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

	1		2		4	
Phase Number	1	2	4			
Movement	NBSB	NBSBL	EBWB			
Lead/Lag	Lag	Lead				
Lead-Lag Optimize						
Recall Mode	Ped	None	None			
Maximum Split (s)	68	68	58			
Maximum Split (%)	35.1%	35.1%	29.9%			
Minimum Split (s)	30	30	20			
Yellow Time (s)	3.2	3.2	3.5			
All-Red Time (s)	1.6	1.8	0.5			
Minimum Initial (s)	10	10	4			
Vehicle Extension (s)	0.2	1	3			
Minimum Gap (s)	0.2	0.2	1			
Time Before Reduce (s)	0	0	0			
Time To Reduce (s)	0	0	0			
Walk Time (s)	10		5			
Flash Dont Walk (s)	10		11			
Dual Entry	No	No	Yes			
Inhibit Max	No	No	Yes			
Start Time (s)	68	0	136			
End Time (s)	136	68	0			
Yield/Force Off (s)	131.2	63	190			
Yield/Force Off 170(s)	121.2	63	179			
Local Start Time (s)	68	0	136			
Local Yield (s)	131.2	63	190			
Local Yield 170(s)	121.2	63	179			

Intersection Summary

Cycle Length	194
Control Type	Semi Act-Uncoord
Natural Cycle	80

Splits and Phases: 13: SCOTTSDALE RD & 5TH AVE.



2032 Background PM
14: DRINKWATER BLVD/DRINKWATER BLVD & 5TH AVE./STURGEON DR

Southbridge Expansion
Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	27	49	43	132	90	115	60	594	94	52	303	35
Future Volume (vph)	27	49	43	132	90	115	60	594	94	52	303	35
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.95	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.93		1.00	0.92		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	1808		1676	1776		1676	3725	1424	1676	3659	
Flt Permitted	0.33	1.00		0.64	1.00		0.51	1.00	1.00	0.39	1.00	
Satd. Flow (perm)	588	1808		1131	1776		900	3725	1424	688	3659	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.95	0.95	0.95	0.84	0.84	0.84
Adj. Flow (vph)	34	61	54	165	112	144	63	625	99	62	361	42
RTOR Reduction (vph)	0	29	0	0	43	0	0	0	36	0	5	0
Lane Group Flow (vph)	34	86	0	165	214	0	63	625	63	62	398	0
Confl. Peds. (#/hr)			4			7			10			6
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	24.5	24.5		24.5	24.5		80.9	76.8	76.8	80.9	76.8	
Effective Green, g (s)	24.5	24.5		24.5	24.5		80.9	76.8	76.8	80.9	76.8	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.67	0.64	0.64	0.67	0.64	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	0.2	0.2	2.0	0.2	
Lane Grp Cap (vph)	120	369		230	362		633	2394	911	497	2341	
v/s Ratio Prot		0.05			0.12		0.00	c0.17		c0.00	0.11	
v/s Ratio Perm	0.06			c0.15			0.06		0.04	0.08		
v/c Ratio	0.28	0.23		0.72	0.59		0.10	0.26	0.07	0.12	0.17	
Uniform Delay, d1	40.3	39.9		44.5	43.2		7.1	9.3	8.1	8.7	8.7	
Progression Factor	1.00	1.00		1.00	1.00		1.24	1.05	2.16	0.91	0.94	
Incremental Delay, d2	0.5	0.1		8.6	1.7		0.0	0.3	0.1	0.0	0.1	
Delay (s)	40.8	40.0		53.1	44.9		8.8	10.1	17.7	8.0	8.4	
Level of Service	D	D		D	D		A	B	B	A	A	
Approach Delay (s)		40.2			48.1			10.9			8.3	
Approach LOS		D			D			B			A	

Intersection Summary

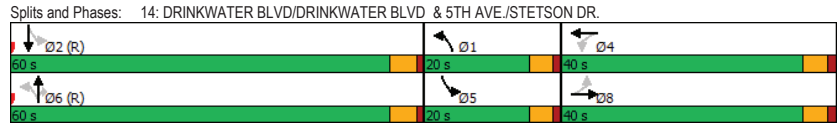
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			



Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag						
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	20	60	40	20	60	40
Maximum Split (%)	16.7%	50.0%	33.3%	16.7%	50.0%	33.3%
Minimum Split (s)	11	16	36	11	16	35
Yellow Time (s)	3.3	4	3.5	3.3	4	3.5
All-Red Time (s)	1.3	1	1.5	1.3	1	1.5
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	8		7	7
Flash Dont Walk (s)		13	23		12	23
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	110	50	10	110	50	10
End Time (s)	10	110	50	10	110	50
Yield/Force Off (s)	5.4	105	45	5.4	105	45
Yield/Force Off 170(s)	5.4	92	22	5.4	93	22
Local Start Time (s)	60	0	80	60	0	80
Local Yield (s)	75.4	55	115	75.4	55	115
Local Yield 170(s)	75.4	42	92	75.4	43	92

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 50 (42%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



Intersection

Int Delay, s/veh	1.3
Movement	WBL WBR NBT NBR SBL SBT
Lane Configurations	↔ ↗ ↘ ↙ ↚ ↛
Traffic Vol, veh/h	35 99 709 16 22 856
Future Vol, veh/h	35 99 709 16 22 856
Conflicting Peds, #/hr	0 0 0 0 0 0
Sign Control	Stop Stop Free Free Free Free
RT Channelized	- None - None - None
Storage Length	0 - - - 75 -
Veh in Median Storage, #	0 - 0 - - 0
Grade, %	0 - 0 - - 0
Peak Hour Factor	92 92 92 92 92 92
Heavy Vehicles, %	2 2 2 2 2 2
Mvmt Flow	38 108 771 17 24 930

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1200	394	0 0 788 0
Stage 1	780	-	- - - -
Stage 2	420	-	- - - -
Critical Hdwy	6.29	6.94	- - 4.14 -
Critical Hdwy Stg 1	5.84	-	- - - -
Critical Hdwy Stg 2	6.04	-	- - - -
Follow-up Hdwy	3.67	3.32	- - 2.22 -
Pot Cap-1 Maneuver	209	605	- - 827 -
Stage 1	401	-	- - - -
Stage 2	596	-	- - - -
Platoon blocked, %	-	-	- - - -
Mov Cap-1 Maneuver	203	605	- - 827 -
Mov Cap-2 Maneuver	298	-	- - - -
Stage 1	389	-	- - - -
Stage 2	596	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	15.8	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	477	827
HCM Lane V/C Ratio	-	-	0.305	0.029
HCM Control Delay (s)	-	-	15.8	9.5
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	1.3	0.1

2032 Background PM
16: 3rd Ave & Marshall Way

Southbridge Expansion
HCM 6th AWSC

Intersection												
Intersection Delay, s/veh	8											
Intersection LOS	A											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕			↕			↔	
Traffic Vol, veh/h	4	41	11	42	101	6	11	35	27	6	18	13
Future Vol, veh/h	4	41	11	42	101	6	11	35	27	6	18	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	45	12	46	110	7	12	38	29	7	20	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.6	8.3	7.7	7.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	7%	28%	16%
Vol Thru, %	48%	73%	68%	49%
Vol Right, %	37%	20%	4%	35%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	73	56	149	37
LT Vol	11	4	42	6
Through Vol	35	41	101	18
RT Vol	27	11	6	13
Lane Flow Rate	79	61	162	40
Geometry Grp	1	1	1	1
Degree of Util (X)	0.094	0.072	0.19	0.049
Departure Headway (Hd)	4.287	4.27	4.222	4.343
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	840	842	837	828
Service Time	2.293	2.278	2.308	2.349
HCM Lane V/C Ratio	0.094	0.072	0.194	0.048
HCM Control Delay	7.7	7.6	8.3	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.2	0.7	0.2

2032 Background PM
17: 3rd Ave & Craftsman Ct

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.7					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	30	67	109	20	25	29
Future Vol, veh/h	30	67	109	20	25	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	73	118	22	27	32

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	140	0	268
Stage 1	-	-	129
Stage 2	-	-	139
Critical Hdwy	4.12	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.218	-	3.518
Pot Cap-1 Maneuver	1443	-	721
Stage 1	-	-	897
Stage 2	-	-	888
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1443	-	704
Mov Cap-2 Maneuver	-	-	704
Stage 1	-	-	875
Stage 2	-	-	888

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1443	-	-	-	806
HCM Lane V/C Ratio	0.023	-	-	-	0.073
HCM Control Delay (s)	7.6	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

2032 Background PM
18: SCOTTSDALE RD & 3RD AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	67	32	123	77	65	232	72	643	33	41	882	61
Future Volume (vph)	67	32	123	77	65	232	72	643	33	41	882	61
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.88		1.00	0.88		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1705		1676	1706		1676	3692		1676	3725	1461
Flt Permitted	0.37	1.00		0.65	1.00		0.27	1.00		0.36	1.00	1.00
Satd. Flow (perm)	650	1705		1148	1706		472	3692		642	3725	1461
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	73	35	134	84	71	252	78	699	36	45	959	66
RTOR Reduction (vph)	0	53	0	0	111	0	0	4	0	0	0	21
Lane Group Flow (vph)	73	116	0	84	212	0	78	731	0	45	959	45
Confl. Peds. (#/hr)			8			11			15			7
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		1
Actuated Green, G (s)	10.9	10.9		10.9	10.9		30.2	30.2		30.2	30.2	30.2
Effective Green, g (s)	10.9	10.9		10.9	10.9		30.2	30.2		30.2	30.2	30.2
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.59	0.59		0.59	0.59	0.59
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	138	363		244	363		278	2181		379	2201	863
v/s Ratio Prot		0.07			c0.12			0.20			c0.26	
v/s Ratio Perm	0.11			0.07			0.17			0.07		0.03
v/c Ratio	0.53	0.32		0.34	0.58		0.28	0.34		0.12	0.44	0.05
Uniform Delay, d1	17.8	17.0		17.1	18.1		5.1	5.3		4.6	5.8	4.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.7	0.2		0.3	1.5		0.2	0.0		0.1	0.1	0.0
Delay (s)	19.5	17.1		17.4	19.6		5.3	5.4		4.6	5.8	4.4
Level of Service	B	B		B	B		A	A		A	A	A
Approach Delay (s)		17.9			19.2			5.4			5.7	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	51.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

2032 Background PM
18: SCOTTSDALE RD & 3RD AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	3
Movement	NBSB	EBWB
Lead/Lag		
Lead-Lag Optimize		
Recall Mode	Ped	None
Maximum Split (s)	36.9	31.1
Maximum Split (%)	54.3%	45.7%
Minimum Split (s)	35	31.1
Yellow Time (s)	3.2	3
All-Red Time (s)	1.8	2
Minimum Initial (s)	10	6
Vehicle Extension (s)	0.2	2
Minimum Gap (s)	1	2
Time Before Reduce (s)	0	0
Time To Reduce (s)	0	0
Walk Time (s)	18	5
Flash Dont Walk (s)	12	20
Dual Entry	No	No
Inhibit Max	No	No
Start Time (s)	0	36.9
End Time (s)	36.9	0
Yield/Force Off (s)	31.9	63
Yield/Force Off 170(s)	19.9	43
Local Start Time (s)	0	36.9
Local Yield (s)	31.9	63
Local Yield 170(s)	19.9	43

Intersection Summary	
Cycle Length	68
Control Type	Semi Act-Uncoord
Natural Cycle	70

Splits and Phases: 18: SCOTTSDALE RD & 3RD AVE.



2032 Background PM Southbridge Expansion
 19: DRINKWATER BLVD /DRINKWATER BLVD & 3RD AVE. HCM Signalized Intersection Capacity Analysis

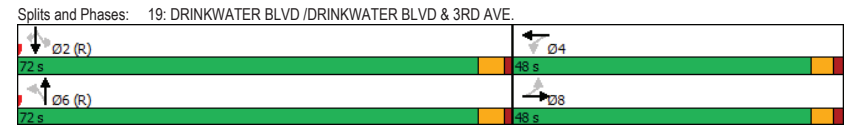
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	48	18	106	77	19	60	108	639	135	75	557	41
Future Volume (vph)	48	18	106	77	19	60	108	639	135	75	557	41
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99			0.99		1.00	1.00		1.00	1.00	0.97
Ftpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87			0.95		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1690			1802		1676	5192		1676	3725	1454
Flt Permitted	0.56	1.00			0.62		0.41	1.00		0.31	1.00	1.00
Satd. Flow (perm)	991	1690			1142		715	5192		547	3725	1454
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.89	0.89	0.89	0.88	0.88	0.88
Adj. Flow (vph)	55	21	122	90	22	70	121	718	152	85	633	47
RTOR Reduction (vph)	0	0	0	0	24	0	0	15	0	0	0	11
Lane Group Flow (vph)	55	143	0	0	158	0	121	855	0	85	633	36
Confl. Peds. (#/hr)			1			5			1			3
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	19.2	19.2			19.2		90.7	90.7		90.7	90.7	90.7
Effective Green, g (s)	19.2	19.2			19.2		90.7	90.7		90.7	90.7	90.7
Actuated g/C Ratio	0.16	0.16			0.16		0.76	0.76		0.76	0.76	0.76
Clearance Time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Vehicle Extension (s)	2.0	2.0			2.0		0.2	0.2		2.0	2.0	2.0
Lane Grp Cap (vph)	158	270			182		540	3924		413	2815	1098
v/s Ratio Prot		0.08						0.16			c0.17	
v/s Ratio Perm	0.06				c0.14		0.17			0.16		0.02
v/c Ratio	0.35	0.53			0.87		0.22	0.22		0.21	0.22	0.03
Uniform Delay, d1	44.8	46.3			49.1		4.3	4.3		4.2	4.3	3.7
Progression Factor	1.00	1.00			1.00		2.35	2.80		0.85	0.87	0.71
Incremental Delay, d2	0.5	0.9			31.5		0.7	0.1		1.1	0.2	0.1
Delay (s)	45.3	47.1			80.6		10.9	12.1		4.7	3.9	2.7
Level of Service	D	D			F		B	B		A	A	A
Approach Delay (s)		46.6			80.6			11.9			3.9	
Approach LOS		D			F			B			A	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.1
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Background PM Southbridge Expansion
 19: DRINKWATER BLVD /DRINKWATER BLVD & 3RD AVE. Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	72	48	72	48
Maximum Split (%)	60.0%	40.0%	60.0%	40.0%
Minimum Split (s)	22.2	38.9	32.2	30.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	0.2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	9	7	7
Flash Dont Walk (s)	10	25	20	19
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	40	112	40	112
End Time (s)	112	40	112	40
Yield/Force Off (s)	106.8	35.1	106.8	35.1
Yield/Force Off 170(s)	96.8	10.1	86.8	16.1
Local Start Time (s)	0	72	0	72
Local Yield (s)	66.8	115.1	66.8	115.1
Local Yield 170(s)	56.8	90.1	46.8	96.1

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 40 (33%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Background PM
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

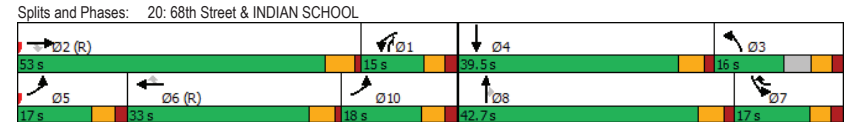
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔↔	↔	↔	↔	↔↔
Traffic Volume (vph)	289	871	24	104	789	205	85	589	116	147	495	216
Future Volume (vph)	289	871	24	104	789	205	85	589	116	147	495	216
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	5353	1472	1676	5353	1462	1676	3725	1480	1676	3537	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	5353	1472	1676	5353	1462	1676	3725	1480	1676	3537	
Peak-hour factor, PHF	0.95	0.95	0.95	0.85	0.85	0.85	0.85	0.85	0.85	0.94	0.94	0.94
Adj. Flow (vph)	304	917	25	122	928	241	100	693	136	156	527	230
RTOR Reduction (vph)	0	0	14	0	0	73	0	0	0	0	41	0
Lane Group Flow (vph)	304	917	11	122	928	168	100	693	136	156	716	0
Confl. Peds. (#/hr)			5			6			6			5
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5 10	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	23.8	55.5	55.5	9.7	35.9	47.9	11.5	28.8	38.5	12.0	29.6	
Effective Green, g (s)	23.8	55.5	55.5	9.7	35.9	47.9	11.5	28.8	38.5	12.0	29.6	
Actuated g/C Ratio	0.19	0.43	0.43	0.08	0.28	0.38	0.09	0.23	0.30	0.09	0.23	
Clearance Time (s)		5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5	
Vehicle Extension (s)		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	312	2326	639	127	1504	548	150	840	507	157	819	
v/s Ratio Prot	c0.18	0.17		0.07	c0.17	0.03	0.06	0.19	0.02	c0.09	c0.20	
v/s Ratio Perm			0.01			0.09			0.07			
v/c Ratio	0.97	0.39	0.02	0.96	0.62	0.31	0.67	0.82	0.27	0.99	0.87	
Uniform Delay, d1	51.6	24.6	20.6	58.8	39.9	28.2	56.2	47.1	33.9	57.8	47.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	43.5	0.5	0.0	67.1	1.9	0.1	8.4	6.3	0.1	69.5	10.0	
Delay (s)	95.1	25.1	20.6	125.9	41.8	28.3	64.6	53.4	34.0	127.3	57.2	
Level of Service	F	C	C	F	D	C	E	D	C	F	E	
Approach Delay (s)		42.1			47.2			51.7			69.2	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	51.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	127.7	Sum of lost time (s)	27.2
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

2032 Background PM
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8	10
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT	EBL
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	
Lead-Lag Optimize									
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None
Maximum Split (s)	15	53	16	39.5	17	33	17	42.7	18
Maximum Split (%)	11.7%	41.5%	12.5%	30.9%	13.3%	25.8%	13.3%	33.4%	14.1%
Minimum Split (s)	11	32.4	11	39.5	11	33	11	42.7	11
Yellow Time (s)	3.3	4.4	3.3	4	3.6	4	3.3	4	3.6
All-Red Time (s)	2	1	1.9	1.5	2	1	2	1.7	2
Minimum Initial (s)	5	10	5	7	5	10	5	7	5
Vehicle Extension (s)	2	2	2	2	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4	
Flash Dont Walk (s)		23		30		24		33	
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes	Yes
Inhibit Max	No	No	No	No	No	No	No	No	No
Start Time (s)	73	20	127.5	88	20	37	3	88	70
End Time (s)	88	73	20	127.5	37	70	20	3	88
Yield/Force Off (s)	82.7	67.6	14.8	122	31.4	65	14.7	125	82.4
Yield/Force Off 170(s)	82.7	44.6	14.8	92	31.4	41	14.7	92	82.4
Local Start Time (s)	53	0	107.5	68	0	17	110.7	68	50
Local Yield (s)	62.7	47.6	122.5	102	11.4	45	122.4	105	62.4
Local Yield 170(s)	62.7	24.6	122.5	72	11.4	21	122.4	72	62.4



2032 Background PM
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕	↔↔	↔↔	↕↕	↔↔	↔↔	↕↕	↔↔	↔↔	↕↕	↔↔
Traffic Volume (vph)	237	823	72	78	720	62	109	413	52	81	632	181
Future Volume (vph)	237	823	72	78	720	62	109	413	52	81	632	181
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.0	3.0	5.3	5.0		5.3	5.3		5.3	5.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		1.00	0.95		1.00	0.91	
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3317	3725	1510	3317	3687		1710	3671		1710	5180	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3317	3725	1510	3317	3687		1710	3671		1710	5180	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.90	0.90	0.90	0.89	0.89	0.89
Adj. Flow (vph)	258	895	78	87	800	69	121	459	58	91	710	203
RTOR Reduction (vph)	0	0	46	0	5	0	0	10	0	0	49	0
Lane Group Flow (vph)	258	895	32	87	864	0	121	507	0	91	864	0
Confl. Peds. (#/hr)			1									3
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	12.2	46.8	46.8	10.9	45.5		12.6	22.9		18.5	28.8	
Effective Green, g (s)	12.2	46.8	48.8	10.9	45.5		12.6	22.9		18.5	28.8	
Actuated g/C Ratio	0.10	0.39	0.41	0.09	0.38		0.10	0.19		0.15	0.24	
Clearance Time (s)	5.3	5.0	5.0	5.3	5.0		5.3	5.3		5.3	5.3	
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0		2.0	1.0		2.0	1.0	
Lane Grp Cap (vph)	337	1452	614	301	1397		179	700		263	1243	
v/s Ratio Prot	c0.08	c0.24		0.03	0.23		c0.07	0.14		0.05	c0.17	
v/s Ratio Perm			0.02									
v/c Ratio	0.77	0.62	0.05	0.29	0.62		0.68	0.72		0.35	0.70	
Uniform Delay, d1	52.5	29.4	21.6	50.9	30.2		51.7	45.6		45.3	41.6	
Progression Factor	1.00	1.00	1.00	0.88	0.74		1.00	1.00		1.12	0.98	
Incremental Delay, d2	9.0	2.0	0.2	0.2	2.0		7.7	3.2		0.3	1.4	
Delay (s)	61.5	31.4	21.7	44.9	24.3		59.4	48.8		51.1	42.1	
Level of Service	E	C	C	D	C		E	D		D	D	
Approach Delay (s)		37.1			26.1			50.8			42.9	
Approach LOS		D			C			D			D	

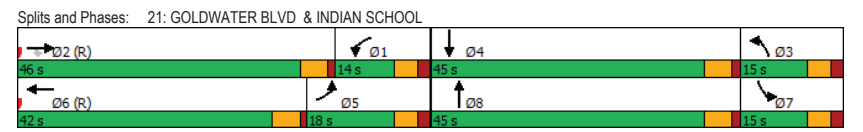
Intersection Summary			
HCM 2000 Control Delay	38.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

2032 Background PM
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	14	46	15	45	18	42	15	45
Maximum Split (%)	11.7%	38.3%	12.5%	37.5%	15.0%	35.0%	12.5%	37.5%
Minimum Split (s)	11	44	11	44.3	11	40	11	40.3
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1	2	1.3	2	1	2	1.3
Minimum Initial (s)	5	10	5	10	5	10	5	10
Vehicle Extension (s)	2	1	2	1	2	1	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		32		32		28		28
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	96	50	35	110	92	50	35	110
End Time (s)	110	96	50	35	110	92	50	35
Yield/Force Off (s)	104.7	91	44.7	29.7	104.7	87	44.7	29.7
Yield/Force Off 170(s)	104.7	59	44.7	29.7	104.7	59	44.7	29.7
Local Start Time (s)	46	0	105	60	42	0	105	60
Local Yield (s)	54.7	41	114.7	99.7	54.7	37	114.7	99.7
Local Yield 170(s)	54.7	9	114.7	99.7	54.7	9	114.7	99.7

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	115
Offset: 50 (42%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	



2032 Background PM
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	37	906	37	68	867	61	22	22	37	11	42	57
Future Volume (vph)	37	906	37	68	867	61	22	22	37	11	42	57
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2			4.7			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.94			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)	1676	3698		1676	3681			1800			1793	
Flt Permitted	0.26	1.00		0.26	1.00			0.74			0.97	
Satd. Flow (perm)	451	3698		459	3681			1345			1756	
Peak-hour factor, PHF	0.92	0.90	0.90	0.87	0.87	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	1007	41	78	997	66	24	24	40	12	46	62
RTOR Reduction (vph)	0	1	0	0	3	0	0	29	0	0	36	0
Lane Group Flow (vph)	40	1047	0	78	1060	0	0	59	0	0	84	0
Confl. Peds. (#/hr)			4			5			5			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	97.6	97.6		97.6	97.6			12.5			13.2	
Effective Green, g (s)	97.6	97.6		97.6	97.6			12.5			13.2	
Actuated g/C Ratio	0.81	0.81		0.81	0.81			0.10			0.11	
Clearance Time (s)	5.2	5.2		5.2	5.2			4.7			4.0	
Vehicle Extension (s)	0.2	0.2		0.2	0.2			2.0			3.0	
Lane Grp Cap (vph)	366	3007		373	2993			140			193	
v/s Ratio Prot		0.28			0.29							
v/s Ratio Perm	0.09			0.17				0.04			0.05	
v/c Ratio	0.11	0.35		0.21	0.35			0.42			0.43	
Uniform Delay, d1	2.3	2.9		2.5	2.9			50.4			49.9	
Progression Factor	0.97	2.02		2.00	1.89			1.00			1.00	
Incremental Delay, d2	0.5	0.3		1.0	0.3			0.8			1.6	
Delay (s)	2.7	6.2		6.0	5.8			51.1			51.5	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		6.0			5.8			51.1			51.5	
Approach LOS		A			A			D			D	

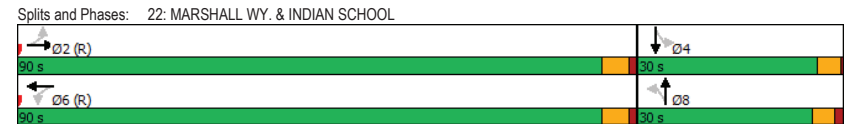
Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.9
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

2032 Background PM
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	90	30	90	30
Maximum Split (%)	75.0%	25.0%	75.0%	25.0%
Minimum Split (s)	16	20	16	12
Yellow Time (s)	4	3.5	4	3.3
All-Red Time (s)	1.2	0.5	1.2	1.4
Minimum Initial (s)	10	4	10	7
Vehicle Extension (s)	0.2	3	0.2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	8
Flash Dont Walk (s)	8	11	7	17
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	70	40	70	40
End Time (s)	40	70	40	70
Yield/Force Off (s)	34.8	66	34.8	65.3
Yield/Force Off 170(s)	26.8	55	27.8	48.3
Local Start Time (s)	0	90	0	90
Local Yield (s)	84.8	116	84.8	115.3
Local Yield 170(s)	76.8	105	77.8	98.3

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 70 (58%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green	



2032 Background PM
23: SCOTTSDALE RD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↑	↔	↔	↔↑	↔	↔	↔↑	↔	↔	↔↑	↔
Traffic Volume (vph)	118	763	125	191	774	168	66	494	132	210	730	152
Future Volume (vph)	118	763	125	191	774	168	66	494	132	210	730	152
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	3634		1676	3614		1676	3595		1676	3725	1475
Flt Permitted	0.10	1.00		0.14	1.00		0.13	1.00		0.16	1.00	1.00
Satd. Flow (perm)	175	3634		248	3614		231	3595		280	3725	1475
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	124	803	132	210	851	185	73	549	147	233	811	169
RTOR Reduction (vph)	0	10	0	0	14	0	0	22	0	0	0	104
Lane Group Flow (vph)	124	925	0	210	1022	0	73	674	0	233	811	65
Confl. Peds. (#/hr)			9			5			4			9
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	56.3	43.8		56.3	43.8		43.8	30.6		43.8	30.6	43.1
Effective Green, g (s)	56.3	43.8		56.3	43.8		43.8	30.6		43.8	30.6	43.1
Actuated g/C Ratio	0.47	0.36		0.47	0.36		0.36	0.26		0.36	0.26	0.36
Clearance Time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	238	1326		265	1319		243	916		255	949	592
v/s Ratio Prot	0.05	0.25		c0.08	0.28		0.03	0.19		c0.10	0.22	0.01
v/s Ratio Perm	0.19			c0.29			0.08			c0.23		0.03
v/c Ratio	0.52	0.70		0.79	0.77		0.30	0.74		0.91	0.85	0.11
Uniform Delay, d1	41.9	32.5		41.1	33.7		44.2	41.0		45.3	42.6	25.7
Progression Factor	1.33	1.17		0.76	1.06		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	2.9		12.7	4.1		0.3	2.7		33.6	7.3	0.0
Delay (s)	56.8	40.8		43.9	39.9		44.4	43.7		78.9	49.9	25.7
Level of Service	E	D		D	D		D	D		E	D	C
Approach Delay (s)		42.6			40.6			43.8			52.1	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	44.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		

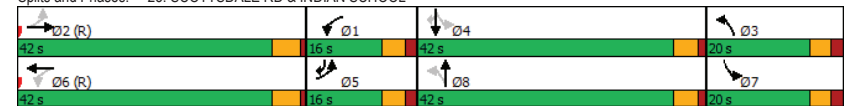
Description: Last Update: Sept 2017
c Critical Lane Group

2032 Background PM
23: SCOTTSDALE RD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	16	42	20	42	16	42	20	42
Maximum Split (%)	13.3%	35.0%	16.7%	35.0%	13.3%	35.0%	16.7%	35.0%
Minimum Split (s)	11	30	10	32.8	11	33	10	34.8
Yellow Time (s)	3.3	4	3	3.6	3.3	4	3	3.6
All-Red Time (s)	1.8	1	2	1.2	1.8	1	2	1.2
Minimum Initial (s)	5	10	5	10	5	10	5	10
Vehicle Extension (s)	2	1	2	2	2	1	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		8		8
Flash Dont Walk (s)		18		21		20		22
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	42	0	100	58	42	0	100	58
End Time (s)	58	42	0	100	58	42	0	100
Yield/Force Off (s)	52.9	37	115	95.2	52.9	37	115	95.2
Yield/Force Off 170(s)	52.9	19	115	74.2	52.9	17	115	73.2
Local Start Time (s)	42	0	100	58	42	0	100	58
Local Yield (s)	52.9	37	115	95.2	52.9	37	115	95.2
Local Yield 170(s)	52.9	19	115	74.2	52.9	17	115	73.2
Intersection Summary								
Cycle Length	120							
Control Type	Actuated-Coordinated							
Natural Cycle	90							
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green, Master Intersection								

Splits and Phases: 23: SCOTTSDALE RD & INDIAN SCHOOL



2032 Background PM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	1079	67	104	1146	68	115
Future Volume (vph)	1079	67	104	1146	68	115
Ideal Flow (vphpl)	2000	1800	1800	2000	1800	1800
Total Lost time (s)	5.2		5.2	5.2	4.8	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frbp, ped/bikes	1.00		1.00	1.00	0.99	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.91	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	3686		1676	3725	1567	
Flt Permitted	1.00		0.20	1.00	0.98	
Satd. Flow (perm)	3686		357	3725	1567	
Peak-hour factor, PHF	0.95	0.95	0.89	0.89	0.88	0.88
Adj. Flow (vph)	1136	71	117	1288	77	131
RTOR Reduction (vph)	3	0	0	0	57	0
Lane Group Flow (vph)	1204		117	1288	151	0
Confl. Peds. (#/hr)		3				6
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	88.8		88.8	88.8	21.2	
Effective Green, g (s)	88.8		88.8	88.8	21.2	
Actuated g/C Ratio	0.74		0.74	0.74	0.18	
Clearance Time (s)	5.2		5.2	5.2	4.8	
Vehicle Extension (s)	0.2		0.2	0.2	2.0	
Lane Grp Cap (vph)	2727		264	2756	276	
v/s Ratio Prot	0.33			c0.35	c0.10	
v/s Ratio Perm			0.33			
v/c Ratio	0.44		0.44	0.47	0.55	
Uniform Delay, d1	6.0		6.0	6.2	45.0	
Progression Factor	1.59		0.42	0.43	1.00	
Incremental Delay, d2	0.4		4.8	0.5	1.2	
Delay (s)	9.9		7.3	3.2	46.2	
Level of Service	A		A	A	D	
Approach Delay (s)	9.9			3.5	46.2	
Approach LOS	A			A	D	

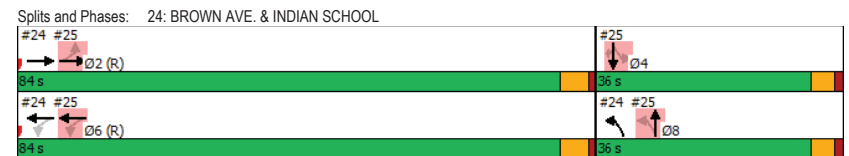
Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

2032 Background PM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Node Number	24	25	24	24
Movement	EBT	SBTL	WBTL	NBL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	84	36	84	36
Maximum Split (%)	70.0%	30.0%	70.0%	30.0%
Minimum Split (s)	23.2	12	27.2	35.8
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.5	1.2	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	0.2	2	0.2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	11		15	24
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	98	62	98	62
End Time (s)	62	98	62	98
Yield/Force Off (s)	56.8	93.2	56.8	93.2
Yield/Force Off 170(s)	45.8	93.2	41.8	69.2
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.8	115.2	78.8	115.2
Local Yield 170(s)	67.8	115.2	63.8	91.2

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 98 (82%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	



2032 Background PM
25: BUCKBOARD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↑		↔	↔↑			↔			↔	↔
Traffic Volume (vph)	41	1134	9	73	1137	30	11	5	54	135	4	94
Future Volume (vph)	41	1134	9	73	1137	30	11	5	54	135	4	94
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2			4.8			4.8	4.8
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.98			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1676	3720		1676	3707			1709			1870	1500
Flt Permitted	0.18	1.00		0.20	1.00			0.94			0.66	1.00
Satd. Flow (perm)	311	3720		358	3707			1625			1291	1500
Peak-hour factor, PHF	0.95	0.95	0.95	0.89	0.89	0.89	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	43	1194	9	82	1278	34	12	6	61	150	4	104
RTOR Reduction (vph)	0	0	0	0	1	0	0	50	0	0	0	65
Lane Group Flow (vph)	43	1203	0	82	1311	0	0	30	0	0	154	39
Confl. Peds. (#/hr)			9			8			13			
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	2	2		6	6		8	8		4	4	4
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	88.8	88.8		88.8	88.8			21.2		21.2	21.2	
Effective Green, g (s)	88.8	88.8		88.8	88.8			21.2		21.2	21.2	
Actuated g/C Ratio	0.74	0.74		0.74	0.74			0.18		0.18	0.18	
Clearance Time (s)	5.2	5.2		5.2	5.2			4.8		4.8	4.8	
Vehicle Extension (s)	0.2	0.2		0.2	0.2			2.0		2.0	2.0	
Lane Grp Cap (vph)	230	2752		264	2743			287		228	265	
v/s Ratio Prot		0.32			c0.35							
v/s Ratio Perm	0.14			0.23				0.02		c0.12	0.03	
v/c Ratio	0.19	0.44		0.31	0.48			0.10		0.68	0.15	
Uniform Delay, d1	4.7	6.0		5.3	6.3			41.4		46.2	41.8	
Progression Factor	0.56	0.52		0.88	1.33			1.00		1.00	1.00	
Incremental Delay, d2	1.6	0.5		2.0	0.4			0.1		6.1	0.1	
Delay (s)	4.3	3.6		6.7	8.7			41.5		52.3	41.9	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		3.6			8.6			41.5		48.1		
Approach LOS		A			A			D		D		

Intersection Summary		
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.52	B
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	68.4%	ICU Level of Service
Analysis Period (min)	15	C

Description: Last Update: Nov 2017
c Critical Lane Group

2032 Background PM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↑		↔	↔↑			↔			↔	↔
Traffic Volume (vph)	99	1242	70	338	968	241	100	558	496	362	311	67
Future Volume (vph)	99	1242	70	338	968	241	100	558	496	362	311	67
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.2		5.3	5.2		5.3	5.1		5.1	5.3	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1710	3697		1710	3725	1510	1710	3725	1505	3317	3629	
Flt Permitted	0.09	1.00		0.09	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	168	3697		168	3725	1510	1710	3725	1505	3317	3629	
Peak-hour factor, PHF	0.94	0.94	0.94	0.89	0.89	0.89	0.90	0.90	0.90	0.80	0.80	0.80
Adj. Flow (vph)	105	1321	74	380	1088	271	111	620	551	452	389	84
RTOR Reduction (vph)	0	3	0	0	0	106	0	0	165	0	15	0
Lane Group Flow (vph)	105	1392	0	380	1088	165	111	620	386	453	458	0
Confl. Peds. (#/hr)			2			1			4			3
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6		8				
Actuated Green, G (s)	56.5	42.8		56.5	42.8	42.8	9.4	25.9	25.9	16.7	33.2	
Effective Green, g (s)	56.5	42.8		56.5	42.8	42.8	9.4	25.9	25.9	16.7	33.2	
Actuated g/C Ratio	0.47	0.36		0.47	0.36	0.36	0.08	0.22	0.22	0.14	0.28	
Clearance Time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.1	5.3	5.1	
Vehicle Extension (s)	2.0	0.2		2.0	0.2	0.2	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	255	1318		255	1328	538	133	803	324	461	1004	
v/s Ratio Prot	0.05	0.38		c0.17	0.29		0.06	0.17		c0.14	0.13	
v/s Ratio Perm	0.15			c0.53		0.11			c0.26			
v/c Ratio	0.41	1.06		1.49	0.82	0.31	0.83	0.77	1.19	0.98	0.46	
Uniform Delay, d1	42.2	38.6		49.8	35.1	27.9	54.5	44.3	47.0	51.5	35.9	
Progression Factor	1.22	1.15		1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.08	
Incremental Delay, d2	0.4	40.2		240.3	5.7	1.5	32.9	7.1	112.0	36.8	1.5	
Delay (s)	51.7	84.5		290.1	40.8	29.4	87.4	51.4	159.1	90.3	40.3	
Level of Service	D	F		F	D	C	F	D	F	F	D	
Approach Delay (s)		82.2			93.5			100.8			64.8	
Approach LOS		F			F			F			E	

Intersection Summary		
HCM 2000 Control Delay	87.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.32	F
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	108.7%	ICU Level of Service
Analysis Period (min)	15	G

Description: Last Update: Nov 2017
c Critical Lane Group

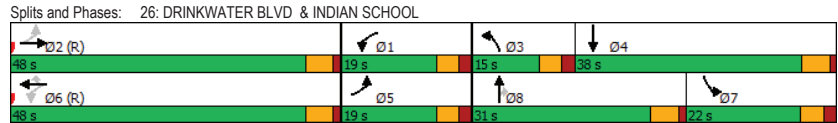
2032 Background PM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBT	EBL	WBTL	SBL	NBT
Lead/Lag			Lead	Lag			Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	Max	None	C-Max	None	Max
Maximum Split (s)	19	48	15	38	19	48	22	31
Maximum Split (%)	15.8%	40.0%	12.5%	31.7%	15.8%	40.0%	18.3%	25.8%
Minimum Split (s)	11	16	11	13	11	16	11	13
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1.2	2	1.1	2	1.2	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	0.2	2	2	2	0.2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		9		7		11
Flash Dont Walk (s)		21		20		19		20
Dual Entry	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	18	90	37	52	18	90	68	37
End Time (s)	37	18	52	90	37	18	90	68
Yield/Force Off (s)	31.7	12.8	46.7	84.9	31.7	12.8	84.7	62.9
Yield/Force Off 170(s)	31.7	111.8	46.7	64.9	31.7	113.8	84.7	42.9
Local Start Time (s)	48	0	67	82	48	0	98	67
Local Yield (s)	61.7	42.8	76.7	114.9	61.7	42.8	114.7	92.9
Local Yield 170(s)	61.7	21.8	76.7	94.9	61.7	23.8	114.7	72.9

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 90 (75%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green	



2032 Background PM
27: 70th St & GOLDWATER BLVD

Southbridge Expansion
HCM 6th TW5C

Intersection

Int Delay, s/veh	3.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑	↑↑	↑	↑
Traffic Vol, veh/h	842	192	37	360	85	16
Future Vol, veh/h	842	192	37	360	85	16
Conflicting Peds, #/hr	0	8	0	0	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	70	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	915	209	40	391	92	17

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	1304
Stage 1	-	-	1028
Stage 2	-	-	276
Critical Hdwy	-	5.34	6.29
Critical Hdwy Stg 1	-	-	6.64
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	-	3.12	3.67
Pot Cap-1 Maneuver	-	338	182
Stage 1	-	-	238
Stage 2	-	-	719
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	336	159
Mov Cap-2 Maneuver	-	-	159
Stage 1	-	-	208
Stage 2	-	-	719

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	48.7
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	159	394	-	-	336	-
HCM Lane V/C Ratio	0.581	0.044	-	-	0.12	-
HCM Control Delay (s)	55.1	14.6	-	-	17.2	-
HCM Lane LOS	F	B	-	-	C	-
HCM 95th %tile Q(veh)	3	0.1	-	-	0.4	-

2032 Background PM
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

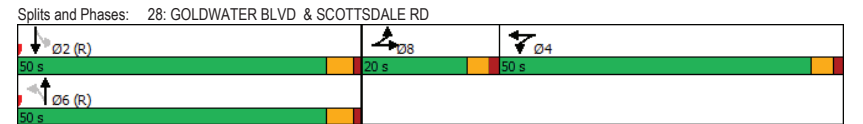
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	22	18	27	734	29	11	29	356	5	20	748	22
Future Volume (vph)	22	18	27	734	29	11	29	356	5	20	748	22
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		4.9		4.9	4.9		5.2	5.2		5.2	5.2	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95		1.00	0.91	
Frbp, ped/bikes		0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.95		1.00	1.00		1.00	1.00		1.00	1.00	
Flt Protected		0.98		0.95	0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1804		1593	1774		1676	3716		1676	5327	
Flt Permitted		0.98		0.95	0.96		0.29	1.00		0.47	1.00	
Satd. Flow (perm)		1804		1593	1774		519	3716		829	5327	
Peak-hour factor, PHF	0.80	0.80	0.80	0.88	0.88	0.88	0.84	0.84	0.84	0.95	0.95	0.95
Adj. Flow (vph)	28	22	34	834	33	12	35	424	6	21	787	23
RTOR Reduction (vph)	0	0	0	0	1	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	85	0	442	437	0	35	429	0	21	808	0
Confl. Peds. (#/hr)			4			4			4			3
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6			2	
Permitted Phases							6			2		
Actuated Green, G (s)		8.8		38.0	38.0		58.2	58.2		58.2	58.2	
Effective Green, g (s)		8.8		38.0	38.0		58.2	58.2		58.2	58.2	
Actuated g/C Ratio		0.07		0.32	0.32		0.49	0.49		0.49	0.49	
Clearance Time (s)		4.9		4.9	4.9		5.2	5.2		5.2	5.2	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		132		504	561		251	1802		402	2583	
v/s Ratio Prot		c0.05		c0.28	0.25			0.12			c0.15	
v/s Ratio Perm							0.07			0.03		
v/c Ratio		0.64		0.88	0.78		0.14	0.24		0.05	0.31	
Uniform Delay, d1		54.1		38.8	37.2		17.1	18.0		16.3	18.8	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		7.8		15.3	6.2		1.2	0.3		0.2	0.3	
Delay (s)		61.9		54.1	43.4		18.2	18.3		16.6	19.1	
Level of Service		E		D	D		B	B		B	B	
Approach Delay (s)		61.9			48.8			18.3			19.0	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Background PM
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	50	50	50	20
Maximum Split (%)	41.7%	41.7%	41.7%	16.7%
Minimum Split (s)	16	13	16	13
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	88	38	88	18
End Time (s)	18	88	18	38
Yield/Force Off (s)	12.8	83.1	12.8	33.1
Yield/Force Off 170(s)	12.8	83.1	12.8	33.1
Local Start Time (s)	0	70	0	50
Local Yield (s)	44.8	115.1	44.8	65.1
Local Yield 170(s)	44.8	115.1	44.8	65.1
Intersection Summary				
Cycle Length	120			
Control Type	Actuated-Coordinated			
Natural Cycle	60			
Offset: 88 (73%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				



2032 Background PM
29: OSBORN RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

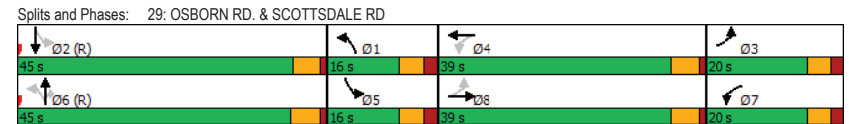
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	30	253	86	214	387	148	153	787	71	154	1314	34
Future Volume (vph)	30	253	86	214	387	148	153	787	71	154	1314	34
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3559		1676	3552		1676	3725	1467	1676	5329	
Flt Permitted	0.15	1.00		0.37	1.00		0.08	1.00	1.00	0.18	1.00	
Satd. Flow (perm)	263	3559		649	3552		142	3725	1467	312	5329	
Peak-hour factor, PHF	0.83	0.83	0.83	0.80	0.80	0.80	0.84	0.84	0.84	0.88	0.88	0.88
Adj. Flow (vph)	36	305	104	268	484	185	182	937	85	175	1493	39
RTOR Reduction (vph)	0	30	0	0	36	0	0	0	50	0	2	0
Lane Group Flow (vph)	36	379	0	268	633	0	182	937	35	175	1530	0
Confl. Peds. (#/hr)			13			7			8			10
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	38.5	26.8		38.5	26.8		60.1	49.8	49.8	60.5	50.2	
Effective Green, g (s)	38.5	26.8		38.5	26.8		60.1	49.8	49.8	60.5	50.2	
Actuated g/C Ratio	0.32	0.22		0.32	0.22		0.50	0.41	0.41	0.50	0.42	
Clearance Time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.0	
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	1.0	1.0	2.0	1.0	
Lane Grp Cap (vph)	222	794		308	793		202	1545	608	274	2229	
v/s Ratio Prot	0.02	0.11		c0.08	0.18		c0.08	0.25		0.05	0.29	
v/s Ratio Perm	0.04			c0.19			c0.37		0.02	0.27		
v/c Ratio	0.16	0.48		0.87	0.80		0.90	0.61	0.06	0.64	0.69	
Uniform Delay, d1	42.9	40.5		41.8	44.0		42.2	27.4	21.0	37.2	28.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.2		21.8	5.3		36.5	1.8	0.2	3.6	1.7	
Delay (s)	43.0	40.7		63.6	49.3		78.7	29.2	21.2	40.7	30.2	
Level of Service	D	D		E	D		E	C	C	D	C	
Approach Delay (s)		40.9			53.4			36.1			31.3	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	38.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.4
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Background PM
29: OSBORN RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	EBL	WBTL	SBL	NBTL	WBL	EBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	16	45	20	39	16	45	20	39
Maximum Split (%)	13.3%	37.5%	16.7%	32.5%	13.3%	37.5%	16.7%	32.5%
Minimum Split (s)	11	31	11	38.1	11	34.4	11	37.1
Yellow Time (s)	3.6	4	3.3	4	3.6	4.4	3.3	4
All-Red Time (s)	2	1	2	1.1	2	1	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	1	2	1	2	1	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		9		10		11
Flash Dont Walk (s)		18		24		19		21
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	5	80	60	21	5	80	60	21
End Time (s)	21	5	80	60	21	5	80	60
Yield/Force Off (s)	15.4	0	74.7	54.9	15.4	119.6	74.7	54.9
Yield/Force Off 170(s)	15.4	102	74.7	30.9	15.4	100.6	74.7	33.9
Local Start Time (s)	45	0	100	61	45	0	100	61
Local Yield (s)	55.4	40	114.7	94.9	55.4	39.6	114.7	94.9
Local Yield 170(s)	55.4	22	114.7	70.9	55.4	20.6	114.7	73.9
Intersection Summary								
Cycle Length	120							
Control Type	Actuated-Coordinated							
Natural Cycle	95							
Offset: 80 (67%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green								



2032 Total AM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	68	127	47	578	222	323	18	1242	230	189	1612	97
Future Volume (vph)	68	127	47	578	222	323	18	1242	230	189	1612	97
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4	5.6	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	0.95	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.97	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1676	1945	1478	3252	1945	1478	1676	5192	1676	3711	1458	1458
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.06	1.00	0.06	1.00	1.00	1.00
Satd. Flow (perm)	1676	1945	1478	3252	1945	1478	114	5192	114	3711	1458	1458
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.89	0.89	0.89	0.88	0.88	0.88
Adj. Flow (vph)	72	134	49	635	244	355	20	1396	258	215	1832	110
RTOR Reduction (vph)	0	0	0	0	0	271	0	16	0	0	0	60
Lane Group Flow (vph)	72	134	49	635	244	84	20	1638	0	215	1832	50
Confl. Peds. (#/hr)			2			2			2			2
Bus Blockages (#/hr)	0	2	0	0	2	0	0	2	0	0	2	0
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	Perm
Protected Phases	8	8		4	4		1	6	5	2		
Permitted Phases			8			4	6		2			2
Actuated Green, G (s)	16.4	16.4	16.4	32.4	32.4	32.4	70.2	61.8	70.2	61.8	61.8	61.8
Effective Green, g (s)	16.4	16.4	16.4	32.4	32.4	32.4	70.2	61.8	70.2	61.8	61.8	61.8
Actuated g/C Ratio	0.12	0.12	0.12	0.23	0.23	0.23	0.50	0.44	0.50	0.44	0.44	0.44
Clearance Time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4	5.6	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.2	2.0	0.2	0.2	0.2
Lane Grp Cap (vph)	194	225	171	745	445	338	149	2270	149	1623	637	637
v/s Ratio Prot	0.04	c0.07		c0.20	0.13		0.01	0.32	c0.09	0.49		
v/s Ratio Perm			0.03			0.06	0.06		c0.63		0.03	
v/c Ratio	0.37	0.60	0.29	0.85	0.55	0.25	0.13	0.72	1.44	1.13	0.08	0.08
Uniform Delay, d1	57.7	59.3	57.1	52.2	48.0	44.5	59.5	32.7	52.5	39.8	23.2	23.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	2.8	0.3	9.0	0.7	0.1	0.1	2.0	233.0	66.4	0.2	0.2
Delay (s)	58.1	62.1	57.4	61.1	48.7	44.7	59.6	34.7	285.5	106.2	23.4	23.4
Level of Service	E	E	E	E	D	D	E	C	F	F	C	C
Approach Delay (s)		60.1			53.9		35.0		119.8			
Approach LOS		E			D		C		F			

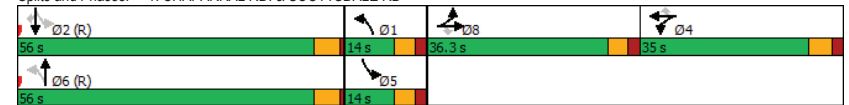
Intersection Summary			
HCM 2000 Control Delay	75.0	HCM 2000 Level of Service	
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	141.3	Sum of lost time (s)	
Intersection Capacity Utilization	90.1%	ICU Level of Service	
Analysis Period (min)	15		
Description: Last Update: Feb 2018			
c Critical Lane Group			

2032 Total AM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase


Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag	Lag					
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	14	56	35	14	56	36.3
Maximum Split (%)	9.9%	39.6%	24.8%	9.9%	39.6%	25.7%
Minimum Split (s)	11	16	35	11	16	36.3
Yellow Time (s)	3.6	4.4	4	3.6	4.4	3.3
All-Red Time (s)	2	1	2	2	1	2
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	9
Flash Dont Walk (s)		10	22		14	22
Dual Entry	No	Yes	No	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	106	50	15	106	50	120
End Time (s)	120	106	50	120	106	15
Yield/Force Off (s)	114.4	100.6	44	114.4	100.6	9.7
Yield/Force Off 170(s)	114.4	90.6	22	114.4	86.6	129
Local Start Time (s)	56	0	106.3	56	0	70
Local Yield (s)	64.4	50.6	135.3	64.4	50.6	101
Local Yield 170(s)	64.4	40.6	113.3	64.4	36.6	79

Splits and Phases: 1: CHAPARRAL RD. & SCOTTSDALE RD



2032 Total AM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↘	↔	↑	↘	↔	↑	↘	↔	↑	↘
Traffic Volume (vph)	105	3	47	38	6	22	127	1263	35	16	878	27
Future Volume (vph)	105	3	47	38	6	22	127	1263	35	16	878	27
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1	5.1	5.6	5.6	5.6	5.6	5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00	0.91
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.96	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1961	1480	1880	1500	1676	5327	1676	5324	1676	5324	1676
Flt Permitted	0.72	1.00	1.00	0.77	1.00	0.28	1.00	0.16	1.00	0.16	1.00	1.00
Satd. Flow (perm)	1278	1961	1480	1507	1500	489	5327	283	5324	283	5324	1676
Peak-hour factor, PHF	0.84	0.84	0.84	0.88	0.88	0.88	0.90	0.90	0.90	0.93	0.93	0.93
Adj. Flow (vph)	125	4	56	43	7	25	141	1403	39	17	944	29
RTOR Reduction (vph)	0	0	47	0	0	21	0	1	0	0	2	0
Lane Group Flow (vph)	125	4	9	0	50	4	141	1441	0	17	971	0
Confl. Peds. (#/hr)			1						3			4
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4		4	6		2			
Actuated Green, G (s)	19.0	19.0	19.0		19.0	19.0	95.4	95.4	95.4	95.4		
Effective Green, g (s)	19.0	19.0	19.0		19.0	19.0	95.4	95.4	95.4	95.4		
Actuated g/C Ratio	0.15	0.15	0.15		0.15	0.15	0.76	0.76	0.76	0.76		
Clearance Time (s)	5.1	5.1	5.1		5.1	5.1	5.6	5.6	5.6	5.6		
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0		
Lane Grp Cap (vph)	194	297	224		228	227	372	4062	215	4060		
v/s Ratio Prot		0.00					0.27			0.18		
v/s Ratio Perm	c0.10		0.01		0.03	0.00	c0.29		0.06			
v/c Ratio	0.64	0.01	0.04		0.22	0.02	0.38	0.35	0.08	0.24		
Uniform Delay, d1	49.9	45.1	45.3		46.5	45.1	5.0	4.8	3.8	4.3		
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	5.4	0.0	0.0		0.2	0.0	2.9	0.2	0.7	0.1		
Delay (s)	55.3	45.1	45.3		46.7	45.1	7.9	5.1	4.5	4.5		
Level of Service	E	D	D		D	D	A	A	A	A		
Approach Delay (s)		52.0			46.2		5.3		4.5			
Approach LOS		D			D		A		A			

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	125.1	Sum of lost time (s)	10.7
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

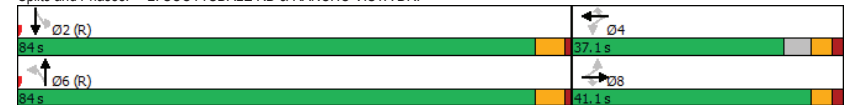
2032 Total AM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
Timing Report, Sorted By Phase



Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	84	37.1	84	41.1
Maximum Split (%)	67.1%	29.7%	67.1%	32.9%
Minimum Split (s)	16	37.1	16	41.1
Yellow Time (s)	4.4	3.3	4.4	3.3
All-Red Time (s)	1.2	1.8	1.2	1.8
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	11
Flash Dont Walk (s)	18	25	13	25
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	93	51.9	93	51.9
End Time (s)	51.9	93	51.9	93
Yield/Force Off (s)	46.3	87.9	46.3	87.9
Yield/Force Off 170(s)	28.3	62.9	33.3	62.9
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.4	120	78.4	120
Local Yield 170(s)	60.4	95	65.4	95
Intersection Summary				
Cycle Length	125.1			
Control Type	Actuated-Coordinated			
Natural Cycle	80			
Offset: 93 (74%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				

Signal Phases: 2: SCOTTSDALE RD & RANCHO VISTA DR.



2032 Total AM Southbridge Expansion
 3: HIGHLAND AVE/Granada Ave & SCOTTSDALE RD HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	420	22	28	11	5	19	28	993	27	42	870	63
Future Volume (vph)	420	22	28	11	5	19	28	993	27	42	870	63
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.88		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3252	1781		1676	1728		1676	5327		1676	5293	
Flt Permitted	0.95	1.00		0.95	1.00		0.25	1.00		0.21	1.00	
Satd. Flow (perm)	3252	1781		1676	1728		450	5327		370	5293	
Peak-hour factor, PHF	0.91	0.91	0.91	0.81	0.81	0.81	0.88	0.88	0.88	0.93	0.93	0.93
Adj. Flow (vph)	462	24	31	14	6	23	32	1128	31	45	935	68
RTOR Reduction (vph)	0	25	0	0	22	0	0	2	0	0	5	0
Lane Group Flow (vph)	462	30	0	14	7	0	32	1157	0	45	998	0
Confl. Peds. (#/hr)			2						4			2
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6			2	
Permitted Phases							6			2		
Actuated Green, G (s)	22.8	22.8		4.3	4.3		78.1	78.1		78.1	78.1	
Effective Green, g (s)	22.8	22.8		4.3	4.3		78.1	78.1		78.1	78.1	
Actuated g/C Ratio	0.19	0.19		0.04	0.04		0.64	0.64		0.64	0.64	
Clearance Time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	612	335		59	61		290	3435		238	3413	
v/s Ratio Prot	c0.14	0.02		c0.01	0.00			c0.22			0.19	
v/s Ratio Perm							0.07			0.12		
v/c Ratio	0.75	0.09		0.24	0.11		0.11	0.34		0.19	0.29	
Uniform Delay, d1	46.5	40.6		56.8	56.6		8.2	9.8		8.7	9.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.7	0.0		0.8	0.3		0.8	0.3		1.8	0.2	
Delay (s)	51.2	40.6		57.6	56.8		9.0	10.0		10.4	9.6	
Level of Service	D	D		E	E		A	B		B	A	
Approach Delay (s)		50.1			57.1			10.0			9.7	
Approach LOS		D			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	15.9
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		

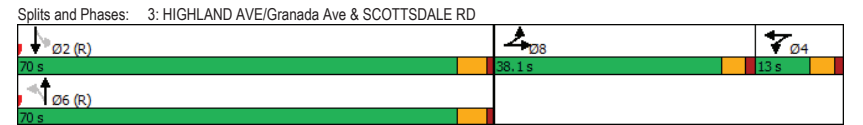
Description: Last Update: Sept 2017

c Critical Lane Group

2032 Total AM Southbridge Expansion
 3: HIGHLAND AVE/Granada Ave & SCOTTSDALE RD Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	70	13	70	38.1
Maximum Split (%)	57.8%	10.7%	57.8%	31.5%
Minimum Split (s)	30.7	13	28.7	38.1
Yellow Time (s)	4.4	3.6	4.4	3.6
All-Red Time (s)	1.3	1.5	1.3	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	1	2	1	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8		7	9
Flash Dont Walk (s)	17		16	24
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	42	29	42	112
End Time (s)	112	42	112	29
Yield/Force Off (s)	106.3	36.9	106.3	23.9
Yield/Force Off 170(s)	89.3	36.9	90.3	121
Local Start Time (s)	0	108.1	0	70
Local Yield (s)	64.3	116	64.3	103
Local Yield 170(s)	47.3	116	48.3	79

Intersection Summary	
Cycle Length	121.1
Control Type	Actuated-Coordinated
Natural Cycle	85
Offset: 42 (35%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Total AM
4: Fashion Square Drive

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

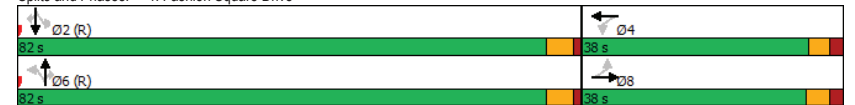
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	6	0	15	5	0	0	5	526	15	27	1127	44
Future Volume (vph)	6	0	15	5	0	0	5	526	15	27	1127	44
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		5.5		5.2			5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor		1.00		1.00			1.00	0.95	1.00	1.00	0.91	1.00
Frbp, ped/bikes		1.00		1.00			1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00			1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.91		1.00			1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99		0.95			0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1750		1676			1676	3725	1465	1676	5353	1466
Flt Permitted		0.90		0.74			0.22	1.00	1.00	0.44	1.00	1.00
Satd. Flow (perm)		1594		1310			380	3725	1465	771	5353	1466
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	0	16	5	0	0	5	572	16	29	1225	48
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	2	0	0	7
Lane Group Flow (vph)	0	4	0	5	0	0	5	572	14	29	1225	41
Confl. Peds. (#/hr)						1			1			1
Turn Type	Perm	NA		Perm			Perm	NA	Perm	Perm	NA	Perm
Protected Phases		8		4		4		6		6		2
Permitted Phases	8		4				6		6	2		2
Actuated Green, G (s)		7.2		7.5			102.1	102.1	102.1	102.1	102.1	102.1
Effective Green, g (s)		7.2		7.5			102.1	102.1	102.1	102.1	102.1	102.1
Actuated g/C Ratio		0.06		0.06			0.85	0.85	0.85	0.85	0.85	0.85
Clearance Time (s)		5.5		5.2			5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)		3.0		3.0			3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		95		81			323	3169	1246	655	4554	1247
v/s Ratio Prot								0.15			c0.23	
v/s Ratio Perm		0.00		c0.00			0.01		0.01	0.04		0.03
v/c Ratio		0.04		0.06			0.02	0.18	0.01	0.04	0.27	0.03
Uniform Delay, d1		53.2		52.9			1.4	1.6	1.3	1.4	1.7	1.4
Progression Factor		1.00		1.00			1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.2		0.3			0.1	0.1	0.0	0.1	0.1	0.0
Delay (s)		53.3		53.3			1.4	1.7	1.4	1.5	1.9	1.4
Level of Service		D		D			A	A	A	A	A	A
Approach Delay (s)		53.3			53.3			1.7			1.9	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay		2.6					HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio		0.26										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)		10.7			
Intersection Capacity Utilization		41.6%					ICU Level of Service		A			
Analysis Period (min)		15										
c Critical Lane Group												

2032 Total AM
4: Fashion Square Drive

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	Min	C-Min	Min
Maximum Split (s)	82	38	82	38
Maximum Split (%)	68.3%	31.7%	68.3%	31.7%
Minimum Split (s)	16	21.2	16	21.5
Yellow Time (s)	4	3	4	3.3
All-Red Time (s)	1.2	2.2	1.2	2.2
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	5
Flash Dont Walk (s)	16	11	10	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	82	0	82
End Time (s)	82	0	82	0
Yield/Force Off (s)	76.8	114.8	76.8	114.5
Yield/Force Off 170(s)	60.8	114.8	66.8	114.5
Local Start Time (s)	0	82	0	82
Local Yield (s)	76.8	114.8	76.8	114.5
Local Yield 170(s)	60.8	114.8	66.8	114.5
Intersection Summary				
Cycle Length	120			
Control Type	Actuated-Coordinated			
Natural Cycle	40			
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				

Split and Phases: 4: Fashion Square Drive



2032 Total AM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	94	1370	117	188	1252	60	245	406	188	67	252	63
Future Volume (vph)	94	1370	117	188	1252	60	245	406	188	67	252	63
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5285		1676	5313		1676	1961	1479	1676	1961	1477
Flt Permitted	0.12	1.00		0.08	1.00		0.43	1.00	1.00	0.15	1.00	1.00
Satd. Flow (perm)	206	5285		145	5313		761	1961	1479	269	1961	1477
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	102	1489	127	204	1361	65	266	441	204	73	274	68
RTOR Reduction (vph)	0	9	0	0	5	0	0	0	83	0	0	51
Lane Group Flow (vph)	102	1607	0	204	1421	0	266	441	121	73	274	17
Confl. Peds. (#/hr)			1			5			2			3
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	3		4	3		2	1	2	1	1	1
Permitted Phases	3			3			1		1			1
Actuated Green, G (s)	54.1	50.1		54.1	50.1		30.7	26.7	26.7	30.7	26.7	26.7
Effective Green, g (s)	54.1	50.1		54.1	50.1		30.7	26.7	26.7	30.7	26.7	26.7
Actuated g/C Ratio	0.51	0.47		0.51	0.47		0.29	0.25	0.25	0.29	0.25	0.25
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	160	2502		132	2515		255	494	373	131	494	372
v/s Ratio Prot	0.02	0.30		c0.06	0.27		c0.04	0.22		0.02	0.14	
v/s Ratio Perm	0.30			c0.73			c0.26		0.08	0.14		0.01
v/c Ratio	0.64	0.64		1.55	0.57		1.04	0.89	0.32	0.56	0.55	0.05
Uniform Delay, d1	33.1	21.1		36.1	20.0		40.1	38.2	32.2	45.2	34.4	29.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.0	0.4		279.4	0.2		68.1	17.8	0.2	2.9	0.8	0.0
Delay (s)	39.1	21.5		315.5	20.2		108.2	55.9	32.4	48.0	35.2	29.9
Level of Service	D	C		F	C		F	E	C	D	D	C
Approach Delay (s)		22.5			57.2			65.9			36.6	
Approach LOS		C			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	44.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	105.8	Sum of lost time (s)	21.0
Intersection Capacity Utilization	98.3%	ICU Level of Service	F
Analysis Period (min)	15		
c	Critical Lane Group		

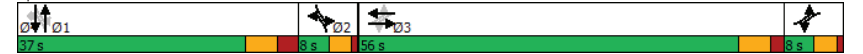
2032 Total AM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4
Movement	NBSB	NBSBL	EBWB	EBWBL
Lead/Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize				
Recall Mode	None	None	Ped	None
Maximum Split (s)	37	8	56	8
Maximum Split (%)	33.9%	7.3%	51.4%	7.3%
Minimum Split (s)	37	8	56	8
Yellow Time (s)	4.2	3	4.2	3
All-Red Time (s)	2.8	1	1.8	1
Minimum Initial (s)	8	4	10	4
Vehicle Extension (s)	2	1	1	1
Minimum Gap (s)	3	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		33	
Flash Dont Walk (s)	23		17	
Dual Entry	No	No	No	No
Inhibit Max	No	Yes	No	Yes
Start Time (s)	0	37	45	101
End Time (s)	37	45	101	0
Yield/Force Off (s)	30	41	95	105
Yield/Force Off 170(s)	7	41	78	105
Local Start Time (s)	72	0	8	64
Local Yield (s)	102	4	58	68
Local Yield 170(s)	79	4	41	68

Intersection Summary	
Cycle Length	109
Control Type	Actuated-Uncoordinated
Natural Cycle	110

Splits and Phases: 5: 68th Street & CAMELBACK RD.



2032 Total AM
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔↔	↔↔	↔	↔↔	↔↔↔	↔
Traffic Volume (vph)	235	1098	207	63	858	49	166	292	44	18	426	615
Future Volume (vph)	235	1098	207	63	858	49	166	292	44	18	426	615
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	0.97	0.91	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5353	1479	1676	5305		3252	3725	1488	3252	5353	1490
Flt Permitted	0.18	1.00	1.00	0.12	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	316	5353	1479	220	5305		3252	3725	1488	3252	5353	1490
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	270	1262	238	74	1009	58	189	332	50	20	473	683
RTOR Reduction (vph)	0	0	80	0	4	0	0	0	34	0	0	48
Lane Group Flow (vph)	270	1262	158	74	1063	0	189	332	16	20	473	635
Confl. Peds. (#/hr)			2			2			5			3
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	3	8		7	4		1	6	7	5	2	3
Permitted Phases	8		8	4					6			2
Actuated Green, G (s)	70.5	48.6	48.6	70.5	48.6		10.6	17.3	39.2	11.6	18.3	40.2
Effective Green, g (s)	70.5	48.6	48.6	70.5	48.6		10.6	17.3	39.2	11.6	18.3	40.2
Actuated g/C Ratio	0.58	0.40	0.40	0.58	0.40		0.09	0.14	0.32	0.10	0.15	0.33
Clearance Time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Vehicle Extension (s)	2.0	0.2	0.2	2.0	0.2		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	428	2139	591	389	2120		283	529	548	310	805	561
v/s Ratio Prot	0.11	0.24		0.03	0.20		c0.06	0.09	0.01	0.01	0.09	c0.20
v/s Ratio Perm	c0.25		0.11	0.08					0.01			0.22
v/c Ratio	0.63	0.59	0.27	0.19	0.50		0.67	0.63	0.03	0.06	0.59	1.13
Uniform Delay, d1	28.5	28.7	24.5	25.7	27.4		53.8	49.1	28.2	50.1	48.1	40.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.3	0.1	0.1	0.1		4.6	5.6	0.0	0.0	3.1	79.7
Delay (s)	30.7	28.9	24.6	25.8	27.5		58.4	54.7	28.2	50.1	51.3	120.4
Level of Service	C	C	C	C	C		E	D	C	D	D	F
Approach Delay (s)		28.6			27.4			53.6			91.4	
Approach LOS		C			C			D			F	

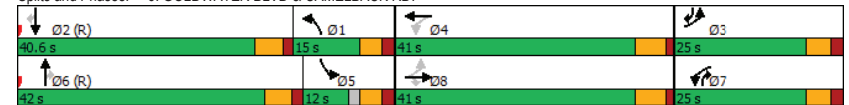
Intersection Summary			
HCM 2000 Control Delay	47.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	121.6	Sum of lost time (s)	22.2
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Total AM
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBTL	SBL	NBT	WBL	EBTL
Lead/Lag	Lag	Lead			Lag	Lead		
Lead-Lag Optimize								
Recall Mode	None	C-Min	Min	Ped	Min	C-Min	None	Ped
Maximum Split (s)	15	40.6	25	41	12	42	25	41
Maximum Split (%)	12.3%	33.4%	20.6%	33.7%	9.9%	34.5%	20.6%	33.7%
Minimum Split (s)	11	40.6	11	31	11	35.6	11	33
Yellow Time (s)	3.3	4	3.6	4.4	3.3	4	3.6	4.4
All-Red Time (s)	2	1.6	2	1.3	2	1.6	2	1.3
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	0.2	2	2	2	0.2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		7		7		7
Flash Dont Walk (s)		27		24		23		26
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	40.6	0	96.6	55.6	42	0	96.6	55.6
End Time (s)	55.6	40.6	0	96.6	55.6	42	0	96.6
Yield/Force Off (s)	50.3	35	116	90.9	50.3	36.4	116	90.9
Yield/Force Off 170(s)	50.3	8	116	66.9	50.3	13.4	116	64.9
Local Start Time (s)	40.6	0	96.6	55.6	42	0	96.6	55.6
Local Yield (s)	50.3	35	116	90.9	50.3	36.4	116	90.9
Local Yield 170(s)	50.3	8	116	66.9	50.3	13.4	116	64.9
Intersection Summary								
Cycle Length	121.6							
Control Type	Actuated-Coordinated							
Natural Cycle	110							
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green								

Splits and Phases: 6: GOLDWATER BLVD & CAMELBACK RD.



2032 Total AM
7: SCOTTSDALE RD & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	153	808	255	88	718	153	260	828	55	167	763	132
Future Volume (vph)	153	808	255	88	718	153	260	828	55	167	763	132
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.91		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3252	3725	1479	1676	3608		3252	5292		3252	3725	1451
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3252	3725	1479	1676	3608		3252	5292		3252	3725	1451
Peak-hour factor, PHF	0.81	0.81	0.81	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	189	998	315	96	780	166	283	900	60	176	803	139
RTOR Reduction (vph)	0	0	38	0	16	0	0	6	0	0	0	95
Lane Group Flow (vph)	189	998	277	96	930	0	283	954	0	176	803	44
Confl. Peds. (#/hr)			6			18			16			
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8	1	7	4		1	6		5	2	
Permitted Phases			8									2
Actuated Green, G (s)	11.4	36.2	51.1	9.7	34.5		14.9	34.4		18.3	38.0	38.0
Effective Green, g (s)	11.4	36.2	51.1	9.7	34.5		14.9	34.4		18.3	38.0	38.0
Actuated g/C Ratio	0.10	0.30	0.43	0.08	0.29		0.12	0.29		0.15	0.32	0.32
Clearance Time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	308	1123	691	135	1037		403	1517		495	1179	459
v/s Ratio Prot	c0.06	c0.27	0.05	0.06	0.26		c0.09	0.18		c0.05	c0.22	
v/s Ratio Perm			0.14									0.03
v/c Ratio	0.61	0.89	0.40	0.71	0.90		0.70	0.63		0.36	0.68	0.10
Uniform Delay, d1	52.2	40.0	23.9	53.8	41.0		50.4	37.2		45.6	35.7	28.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.85	1.07		1.00	1.00	1.00
Incremental Delay, d2	2.5	8.6	0.1	13.7	10.0		4.3	1.9		0.2	3.2	0.4
Delay (s)	54.7	48.5	24.0	67.4	51.0		47.1	41.6		45.7	38.9	29.3
Level of Service	D	D	C	E	D		D	D		D	D	C
Approach Delay (s)		44.2			52.5			42.8				38.8
Approach LOS		D			D			D				D

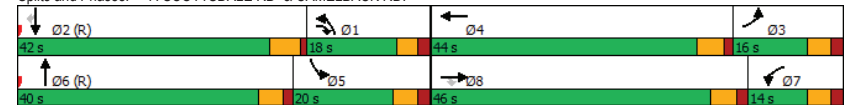
Intersection Summary			
HCM 2000 Control Delay	44.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.4
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Total AM
7: SCOTTSDALE RD & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBT	SBL	NBT	WBL	EBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	18	42	16	44	20	40	14	46
Maximum Split (%)	15.0%	35.0%	13.3%	36.7%	16.7%	33.3%	11.7%	38.3%
Minimum Split (s)	10	32.4	11	40.5	11	33	11	34.5
Yellow Time (s)	3	4.4	3.3	4	3.6	3.6	3.3	4
All-Red Time (s)	2	1	2	1.5	2	1.4	2	1.5
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		23		31		24		25
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	10	88	72	28	8	88	74	28
End Time (s)	28	10	88	72	28	8	88	74
Yield/Force Off (s)	23	4.6	82.7	66.5	22.4	3	82.7	68.5
Yield/Force Off 170(s)	23	101.6	82.7	35.5	22.4	99	82.7	43.5
Local Start Time (s)	42	0	104	60	40	0	106	60
Local Yield (s)	55	36.6	114.7	98.5	54.4	35	114.7	100.5
Local Yield 170(s)	55	13.6	114.7	67.5	54.4	11	114.7	75.5
Intersection Summary								
Cycle Length	120							
Control Type	Actuated-Coordinated							
Natural Cycle	100							
Offset: 88 (73%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green								

Splits and Phases: 7: SCOTTSDALE RD & CAMELBACK RD.



2032 Total AM Southbridge Expansion
 8: Stetson Dr/DRINKWATER BLVD & SCOTTSDALE RD HCM Signalized Intersection Capacity Analysis

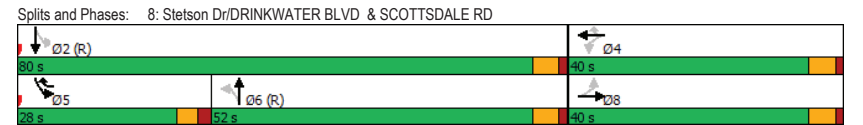
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	66	17	23	16	52	370	23	495	18	253	545	133
Future Volume (vph)	66	17	23	16	52	370	23	495	18	253	545	133
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2	5.0	5.1	5.1		5.0	5.1	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1767		1676	1961	1445	1676	3702		3252	3555	
Flt Permitted	0.72	1.00		0.72	1.00	1.00	0.38	1.00		0.38	1.00	
Satd. Flow (perm)	1269	1767		1278	1961	1445	671	3702		1295	3555	
Peak-hour factor, PHF	0.80	0.80	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	82	21	29	18	58	411	26	550	20	266	574	140
RTOR Reduction (vph)	0	0	0	0	0	110	0	2	0	0	14	0
Lane Group Flow (vph)	83	50	0	18	58	301	26	568	0	266	700	0
Confl. Peds. (#/hr)			8			35			14			18
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		8			4	5		6		5	2	
Permitted Phases	8			4		4		6		2		
Actuated Green, G (s)	25.6	25.6		25.6	25.6	35.5		69.2		84.1	84.1	
Effective Green, g (s)	25.6	25.6		25.6	25.6	35.5		69.2		84.1	84.1	
Actuated g/C Ratio	0.21	0.21		0.21	0.21	0.30		0.58		0.70	0.70	
Clearance Time (s)	5.2	5.2		5.2	5.2	5.0		5.1		5.0	5.1	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0		2.0	2.0	
Lane Grp Cap (vph)	270	376		272	418	427		386		2134	2491	
v/s Ratio Prot		0.03			0.03	c0.06		0.15		0.02	c0.20	
v/s Ratio Perm	0.07			0.01		0.15		0.04		0.15		
v/c Ratio	0.31	0.13		0.07	0.14	0.71		0.07		0.25	0.28	
Uniform Delay, d1	39.7	38.2		37.7	38.3	37.6		11.2		6.4	6.7	
Progression Factor	1.00	1.00		0.92	0.95	1.48		1.00		1.00	0.34	0.27
Incremental Delay, d2	0.2	0.1		0.0	0.1	4.3		0.3		0.0	0.2	
Delay (s)	40.0	38.3		34.6	36.4	60.1		11.5		2.2	2.1	
Level of Service	D	D		C	D	E		B		A	A	
Approach Delay (s)		39.3			56.3			12.9			2.1	
Approach LOS		D			E			B			A	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Total AM Southbridge Expansion
 8: Stetson Dr/DRINKWATER BLVD & SCOTTSDALE RD Timing Report, Sorted By Phase

Phase Number	2	4	5	6	8
Movement	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag		Lead	Lag		
Lead-Lag Optimize					
Recall Mode	C-Max	None	None	C-Max	None
Maximum Split (s)	80	40	28	52	40
Maximum Split (%)	66.7%	33.3%	23.3%	43.3%	33.3%
Minimum Split (s)	21.1	37.2	10	38.1	33.2
Yellow Time (s)	3.6	4	3	3.6	4
All-Red Time (s)	1.5	1.2	2	1.5	1.2
Minimum Initial (s)	10	7	5	10	7
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	9	9		9	7
Flash Dont Walk (s)	7	23		24	21
Dual Entry	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	93	53	93	1	53
End Time (s)	53	93	1	53	93
Yield/Force Off (s)	47.9	87.8	116	47.9	87.8
Yield/Force Off 170(s)	40.9	64.8	116	23.9	66.8
Local Start Time (s)	0	80	0	28	80
Local Yield (s)	74.9	114.8	23	74.9	114.8
Local Yield 170(s)	67.9	91.8	23	50.9	93.8

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 93 (78%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Total AM
9: GOLDWATER BLVD & 5TH AVE

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	27	12	17	38	28	33	19	530	113	100	652	108
Future Volume (vph)	27	12	17	38	28	33	19	530	113	100	652	108
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2	5.2	4.0	4.0	4.0	5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.91	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	1.00	0.98	1.00	0.98
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1676	1961	1478	1676	1961	1475	1676	3612	1676	5218	1676	5218
Flt Permitted	0.74	1.00	1.00	0.75	1.00	1.00	0.32	1.00	0.38	1.00	0.38	1.00
Satd. Flow (perm)	1302	1961	1478	1322	1961	1475	569	3612	667	5218	667	5218
Peak-hour factor, PHF	0.80	0.92	0.80	0.92	0.92	0.92	0.90	0.90	0.92	0.92	0.90	0.90
Adj. Flow (vph)	34	13	21	41	30	36	21	589	123	109	724	120
RTOR Reduction (vph)	0	0	19	0	0	32	0	8	0	0	10	0
Lane Group Flow (vph)	34	13	2	41	30	4	21	704	0	109	834	0
Confl. Peds. (#/hr)			2			2			2			3
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4		4	6			2		
Actuated Green, G (s)	12.1	12.1	12.1	13.3	13.3	13.3	97.5	97.5	97.5	97.5	97.5	97.5
Effective Green, g (s)	12.1	12.1	12.1	13.3	13.3	13.3	97.5	97.5	97.5	97.5	97.5	97.5
Actuated g/C Ratio	0.10	0.10	0.10	0.11	0.11	0.11	0.81	0.81	0.81	0.81	0.81	0.81
Clearance Time (s)	5.2	5.2	5.2	4.0	4.0	4.0	5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	131	197	149	146	217	163	462	2934	541	4239	541	4239
v/s Ratio Prot		0.01			0.02			c0.19				0.16
v/s Ratio Perm	0.03		0.00	c0.03		0.00	0.04		0.16			
v/c Ratio	0.26	0.07	0.01	0.28	0.14	0.02	0.05	0.24	0.20	0.20	0.20	0.20
Uniform Delay, d1	49.8	48.8	48.6	49.0	48.2	47.6	2.2	2.6	2.5	2.5	2.5	2.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1	0.0	1.1	0.3	0.1	0.2	0.2	0.8	0.1	0.8	0.1
Delay (s)	50.2	48.9	48.6	50.0	48.5	47.6	2.4	2.8	3.4	2.6	3.4	2.6
Level of Service	D	D	D	D	D	D	A	A	A	A	A	A
Approach Delay (s)		49.5			48.8			2.8			2.7	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.4
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

Description: Last Update: Sept 2017
c Critical Lane Group

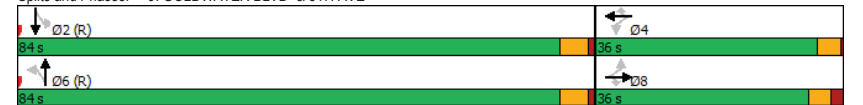
2032 Total AM
9: GOLDWATER BLVD & 5TH AVE

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	Min
Maximum Split (s)	84	36	84	36
Maximum Split (%)	70.0%	30.0%	70.0%	30.0%
Minimum Split (s)	16	20	16	34.2
Yellow Time (s)	4	3.5	4	3.3
All-Red Time (s)	1.2	0.5	1.2	1.9
Minimum Initial (s)	10	4	10	7
Vehicle Extension (s)	2	3	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	8
Flash Dont Walk (s)	14	11	11	21
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	20	104	20	104
End Time (s)	104	20	104	20
Yield/Force Off (s)	98.8	16	98.8	14.8
Yield/Force Off 170(s)	84.8	5	87.8	14.8
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.8	116	78.8	114.8
Local Yield 170(s)	64.8	105	67.8	114.8

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 20 (17%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	

Splits and Phases: 9: GOLDWATER BLVD & 5TH AVE



Intersection			
Intersection Delay, s/veh	3.7		
Intersection LOS	A		
Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	189	121	61
Demand Flow Rate, veh/h	193	124	62
Vehicles Circulating, veh/h	25	11	150
Vehicles Exiting, veh/h	109	201	68
Ped Vol Crossing Leg, #/h	0	1	5
Ped Cap Adj	1.000	1.000	0.999
Approach Delay, s/veh	3.9	3.4	3.5
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	193	124	62
Cap Entry Lane, veh/h	1345	1364	1184
Entry HV Adj Factor	0.980	0.976	0.984
Flow Entry, veh/h	189	121	61
Cap Entry, veh/h	1318	1332	1164
V/C Ratio	0.143	0.091	0.052
Control Delay, s/veh	3.9	3.4	3.5
LOS	A	A	A
95th %tile Queue, veh	1	0	0

Intersection						
Intersection Delay, s/veh	8					
Intersection LOS	A					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	135	39	23	88	10	46
Future Vol, veh/h	135	39	23	88	10	46
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	147	42	25	96	11	50
Number of Lanes	1	0	0	1	1	0
Approach	EB	WB	NB			
Opposing Approach	WB	EB				
Opposing Lanes	1	1	0			
Conflicting Approach Left		NB	EB			
Conflicting Lanes Left	0	1	1			
Conflicting Approach Right	NB		WB			
Conflicting Lanes Right	1	0	1			
HCM Control Delay	8.1	8	7.5			
HCM LOS	A	A	A			
Lane	NBLn1	EBLn1	WBLn1			
Vol Left, %	18%	0%	21%			
Vol Thru, %	0%	78%	79%			
Vol Right, %	82%	22%	0%			
Sign Control	Stop	Stop	Stop			
Traffic Vol by Lane	56	174	111			
LT Vol	10	0	23			
Through Vol	0	135	88			
RT Vol	46	39	0			
Lane Flow Rate	61	189	121			
Geometry Grp	1	1	1			
Degree of Util (X)	0.07	0.21	0.142			
Departure Headway (Hd)	4.142	3.997	4.226			
Convergence, Y/N	Yes	Yes	Yes			
Cap	870	889	840			
Service Time	2.142	2.06	2.295			
HCM Lane V/C Ratio	0.07	0.213	0.144			
HCM Control Delay	7.5	8.1	8			
HCM Lane LOS	A	A	A			
HCM 95th-tile Q	0.2	0.8	0.5			

Intersection						
Intersection Delay, s/veh	8					
Intersection LOS	A					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	100	68	34	44	13	60
Future Vol, veh/h	100	68	34	44	13	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	109	74	37	48	14	65
Number of Lanes	0	1	1	0	1	0
Approach	EB	WB		SB		
Opposing Approach	WB	EB				
Opposing Lanes	1	1		0		
Conflicting Approach Left	SB			WB		
Conflicting Lanes Left	1	0		1		
Conflicting Approach Right		SB		EB		
Conflicting Lanes Right	0	1		1		
HCM Control Delay	8.5	7.4		7.5		
HCM LOS	A	A		A		
Lane	EBLn1	WBLn1	SBLn1			
Vol Left, %	60%	0%	18%			
Vol Thru, %	40%	44%	0%			
Vol Right, %	0%	56%	82%			
Sign Control	Stop	Stop	Stop			
Traffic Vol by Lane	168	78	73			
LT Vol	100	0	13			
Through Vol	68	34	0			
RT Vol	0	44	60			
Lane Flow Rate	183	85	79			
Geometry Grp	1	1	1			
Degree of Util (X)	0.216	0.091	0.09			
Departure Headway (Hd)	4.258	3.874	4.061			
Convergence, Y/N	Yes	Yes	Yes			
Cap	838	911	888			
Service Time	2.31	1.96	2.061			
HCM Lane V/C Ratio	0.218	0.093	0.089			
HCM Control Delay	8.5	7.4	7.5			
HCM Lane LOS	A	A	A			
HCM 95th-tile Q	0.8	0.3	0.3			

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔				↔	↔
Traffic Vol, veh/h	75	4	22	79	1	1
Future Vol, veh/h	75	4	22	79	1	1
Conflicting Peds, #/hr	0	2	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	82	4	24	86	1	1
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	88	0	220	87
Stage 1	-	-	-	-	86	-
Stage 2	-	-	-	-	134	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1508	-	768	971
Stage 1	-	-	-	-	937	-
Stage 2	-	-	-	-	892	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1505	-	753	969
Mov Cap-2 Maneuver	-	-	-	-	753	-
Stage 1	-	-	-	-	919	-
Stage 2	-	-	-	-	892	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	1.6	9.3			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	847	-	-	1505	-	
HCM Lane V/C Ratio	0.003	-	-	0.016	-	
HCM Control Delay (s)	9.3	-	-	7.4	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

2032 Total AM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (vph)	32	20	43	18	15	11	88	548	23	25	532	36
Future Volume (vph)	32	20	43	18	15	11	88	548	23	25	532	36
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		6.0		6.0	6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.94		1.00	0.94		1.00	0.99		1.00	0.99	
Flt Protected		0.98		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1798		1676	1818		1676	3699		1676	3682	
Flt Permitted		0.88		0.69	1.00		0.38	1.00		0.38	1.00	
Satd. Flow (perm)		1603		1217	1818		668	3699		663	3682	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	22	47	20	16	12	96	596	25	27	578	39
RTOR Reduction (vph)	0	16	0	0	10	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	88	0	20	18	0	96	620	0	27	615	0
Confl. Peds. (#/hr)			6			14			4			12
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		3			3		2	1		2	1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		8.7		8.7	8.7		30.8	22.9		30.8	22.9	
Effective Green, g (s)		8.7		8.7	8.7		30.8	22.9		30.8	22.9	
Actuated g/C Ratio		0.16		0.16	0.16		0.55	0.41		0.55	0.41	
Clearance Time (s)		6.0		6.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0		3.0	3.0		1.0	0.2		1.0	0.2	
Lane Grp Cap (vph)		251		190	284		514	1526		512	1519	
v/s Ratio Prot				0.01			c0.03	c0.17		0.01	0.17	
v/s Ratio Perm		c0.05		0.02			0.08			0.02		
v/c Ratio		0.35		0.11	0.06		0.19	0.41		0.05	0.40	
Uniform Delay, d1		20.9		20.1	19.9		5.9	11.5		5.6	11.5	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.8		0.2	0.1		0.1	0.1		0.0	0.1	
Delay (s)		21.7		20.3	20.0		5.9	11.6		5.6	11.6	
Level of Service		C		C	C		A	B		A	B	
Approach Delay (s)		21.7			20.1			10.8			11.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	55.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		
c	Critical Lane Group		

2032 Total AM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3
Movement	NBSB	NBSBL	EBWB
Lead/Lag	Lag	Lead	
Lead-Lag Optimize			
Recall Mode	Ped	None	None
Maximum Split (s)	74	74	46
Maximum Split (%)	38.1%	38.1%	23.7%
Minimum Split (s)	30	30	30
Yellow Time (s)	3.2	3.2	3.1
All-Red Time (s)	1.8	1.8	2.9
Minimum Initial (s)	10	10	6
Vehicle Extension (s)	0.2	1	3
Minimum Gap (s)	0.2	0.2	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)			9
Flash Dont Walk (s)			15
Dual Entry	No	No	No
Inhibit Max	No	No	No
Start Time (s)	74	0	148
End Time (s)	148	74	0
Yield/Force Off (s)	143	69	188
Yield/Force Off 170(s)	133	69	173
Local Start Time (s)	74	0	148
Local Yield (s)	143	69	188
Local Yield 170(s)	133	69	173

Intersection Summary		
Cycle Length		194
Control Type	Actuated-Uncoordinated	
Natural Cycle	90	

Splits and Phases: 13: SCOTTSDALE RD & 5TH AVE.



2032 Total AM Southbridge Expansion
 14: 5TH AVE./STETSON DR. & DRINKWATER BLVD HCM Signalized Intersection Capacity Analysis

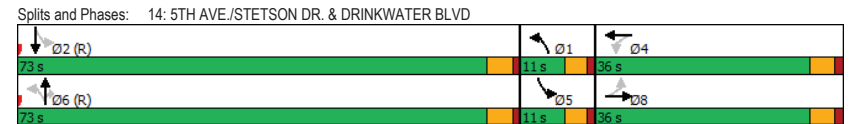
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	6	51	8	19	11	52	42	381	197	73	230	6
Future Volume (vph)	6	51	8	19	11	52	42	381	197	73	230	6
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.88		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	1918		1676	1689		1676	3725	1456	1676	3708	
Flt Permitted	0.71	1.00		0.71	1.00		0.59	1.00	1.00	0.49	1.00	
Satd. Flow (perm)	1255	1918		1251	1689		1038	3725	1456	871	3708	
Peak-hour factor, PHF	0.80	0.80	0.80	0.90	0.90	0.90	0.87	0.87	0.87	0.89	0.89	0.89
Adj. Flow (vph)	8	64	10	21	12	58	48	438	226	82	258	7
RTOR Reduction (vph)	0	5	0	0	48	0	0	0	73	0	1	0
Lane Group Flow (vph)	8	69	0	21	22	0	48	438	153	82	264	0
Conf. Peds. (#/hr)			1			7			3			4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	20.0	20.0		20.0	20.0		85.4	81.1	81.1	85.4	81.1	
Effective Green, g (s)	20.0	20.0		20.0	20.0		85.4	81.1	81.1	85.4	81.1	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.71	0.68	0.68	0.71	0.68	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	0.2	0.2	2.0	0.2	
Lane Grp Cap (vph)	209	319		208	281		761	2517	984	648	2505	
v/s Ratio Prot		c0.04			0.01		0.00	c0.12		c0.00	0.07	
v/s Ratio Perm	0.01			0.02			0.04		0.10	0.09		
v/c Ratio	0.04	0.22		0.10	0.08		0.06	0.17	0.16	0.13	0.11	
Uniform Delay, d1	41.9	43.2		42.4	42.2		5.2	7.1	7.0	5.7	6.8	
Progression Factor	1.00	1.00		1.00	1.00		0.84	0.83	0.53	0.48	0.45	
Incremental Delay, d2	0.0	0.1		0.1	0.0		0.0	0.1	0.3	0.0	0.1	
Delay (s)	42.0	43.3		42.5	42.3		4.4	6.1	4.1	2.8	3.2	
Level of Service	D	D		D	D		A	A	A	A	A	
Approach Delay (s)		43.2			42.3			5.4			3.1	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

Description: Last Update: Sept 2017
 c Critical Lane Group

2032 Total AM Southbridge Expansion
 14: 5TH AVE./STETSON DR. & DRINKWATER BLVD Timing Report, Sorted By Phase


Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag						
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	11	73	36	11	73	36
Maximum Split (%)	9.2%	60.8%	30.0%	9.2%	60.8%	30.0%
Minimum Split (s)	11	16	36	11	16	35
Yellow Time (s)	3.3	4	3.5	3.3	4	3.5
All-Red Time (s)	1.3	1	1.5	1.3	1	1.5
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	8		7	7
Flash Dont Walk (s)		13	23		12	23
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	3	50	14	3	50	14
End Time (s)	14	3	50	14	3	50
Yield/Force Off (s)	9.4	118	45	9.4	118	45
Yield/Force Off 170(s)	9.4	105	22	9.4	106	22
Local Start Time (s)	73	0	84	73	0	84
Local Yield (s)	79.4	68	115	79.4	68	115
Local Yield 170(s)	79.4	55	92	79.4	56	92
Intersection Summary						
Cycle Length	120					
Control Type	Actuated-Coordinated					
Natural Cycle	65					
Offset: 50 (42%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green						



Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↔
Traffic Vol, veh/h	6	19	640	28	38	683
Future Vol, veh/h	6	19	640	28	38	683
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	21	696	30	41	742
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1090	363	0	0	726	0
Stage 1	711	-	-	-	-	-
Stage 2	379	-	-	-	-	-
Critical Hdwy	6.29	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.67	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	242	634	-	-	873	-
Stage 1	435	-	-	-	-	-
Stage 2	626	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	231	634	-	-	873	-
Mov Cap-2 Maneuver	321	-	-	-	-	-
Stage 1	415	-	-	-	-	-
Stage 2	626	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	12.4	0	0.5			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	514	873	-	-
HCM Lane V/C Ratio	-	-	0.053	0.047	-	-
HCM Control Delay (s)	-	-	12.4	9.3	-	-
HCM Lane LOS	-	-	B	A	-	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-	-

Intersection												
Intersection Delay, s/veh	7.7											
Intersection LOS	A											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	50	8	11	19	8	22	61	41	4	27	9
Future Vol, veh/h	10	50	8	11	19	8	22	61	41	4	27	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	54	9	12	21	9	24	66	45	4	29	10
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB	WB			NB			SB				
Opposing Approach	WB	EB			SB			NB				
Opposing Lanes	1	1			1			1				
Conflicting Approach Left	SB	NB			EB			WB				
Conflicting Lanes Left	1	1			1			1				
Conflicting Approach Right	NB	SB			WB			EB				
Conflicting Lanes Right	1	1			1			1				
HCM Control Delay	7.7	7.6			7.8			7.4				
HCM LOS	A	A			A			A				
Lane	NBLn1	EBLn1	WBLn1	SBLn1								
Vol Left, %	18%	15%	29%	10%								
Vol Thru, %	49%	74%	50%	68%								
Vol Right, %	33%	12%	21%	23%								
Sign Control	Stop	Stop	Stop	Stop								
Traffic Vol by Lane	124	68	38	40								
LT Vol	22	10	11	4								
Through Vol	61	50	19	27								
RT Vol	41	8	8	9								
Lane Flow Rate	135	74	41	43								
Geometry Grp	1	1	1	1								
Degree of Util (X)	0.15	0.087	0.049	0.05								
Departure Headway (Hd)	4.005	4.235	4.234	4.125								
Convergence, Y/N	Yes	Yes	Yes	Yes								
Cap	884	834	831	854								
Service Time	2.079	2.325	2.333	2.217								
HCM Lane V/C Ratio	0.153	0.089	0.049	0.05								
HCM Control Delay	7.8	7.7	7.6	7.4								
HCM Lane LOS	A	A	A	A								
HCM 95th-tile Q	0.5	0.3	0.2	0.2								

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↖		↗	↗
Traffic Vol, veh/h	13	63	39	13	19	3
Future Vol, veh/h	13	63	39	13	19	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	68	42	14	21	3
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	56	0	0	145	49	
Stage 1	-	-	-	49	-	
Stage 2	-	-	-	96	-	
Critical Hdwy	4.12	-	-	6.42	6.22	
Critical Hdwy Stg 1	-	-	-	5.42	-	
Critical Hdwy Stg 2	-	-	-	5.42	-	
Follow-up Hdwy	2,218	-	-	3,518	3,318	
Pot Cap-1 Maneuver	1549	-	-	847	1020	
Stage 1	-	-	-	973	-	
Stage 2	-	-	-	928	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	1549	-	-	839	1020	
Mov Cap-2 Maneuver	-	-	-	839	-	
Stage 1	-	-	-	964	-	
Stage 2	-	-	-	928	-	
Approach	EB	WB	SB			
HCM Control Delay, s	1.3	0	9.3			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1549	-	-	-	860	
HCM Lane V/C Ratio	0.009	-	-	-	0.028	
HCM Control Delay (s)	7.3	0	-	-	9.3	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖		↖	↖		↖	↖		↖	↖	↖
Traffic Volume (vph)	5	20	12	27	6	65	76	591	33	77	486	24
Future Volume (vph)	5	20	12	27	6	65	76	591	33	77	486	24
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Fipb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.86		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1840		1676	1670		1676	3691		1676	3725	1464
Flt Permitted	0.77	1.00		0.77	1.00		0.46	1.00		0.39	1.00	1.00
Satd. Flow (perm)	1357	1840		1357	1670		805	3691		695	3725	1464
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	22	13	29	7	71	83	642	36	84	528	26
RTOR Reduction (vph)	0	12	0	0	64	0	0	3	0	0	0	8
Lane Group Flow (vph)	5	23	0	29	14	0	83	675	0	84	528	18
Conf. Peds. (#/hr)			7			4			8			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		1
Actuated Green, G (s)	5.2	5.2		5.2	5.2		35.7	35.7		35.7	35.7	35.7
Effective Green, g (s)	5.2	5.2		5.2	5.2		35.7	35.7		35.7	35.7	35.7
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.70	0.70		0.70	0.70	0.70
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	138	187		138	170		564	2588		487	2612	1026
v/s Ratio Prot		0.01			0.01			c0.18			0.14	
v/s Ratio Perm	0.00			c0.02			0.10			0.12		0.01
v/c Ratio	0.04	0.12		0.21	0.08		0.15	0.26		0.17	0.20	0.02
Uniform Delay, d1	20.6	20.8		21.0	20.7		2.5	2.8		2.6	2.6	2.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.0	0.1		0.3	0.1		0.0	0.0		0.1	0.0	0.0
Delay (s)	20.6	20.9		21.2	20.8		2.6	2.8		2.6	2.7	2.3
Level of Service	C	C		C	C		A	A		A	A	A
Approach Delay (s)		20.9			20.9			2.8			2.6	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay	4.4		HCM 2000 Level of Service				A					
HCM 2000 Volume to Capacity ratio	0.25											
Actuated Cycle Length (s)	50.9				Sum of lost time (s)				10.0			
Intersection Capacity Utilization	55.2%		ICU Level of Service				B					
Analysis Period (min)	15											
c Critical Lane Group												

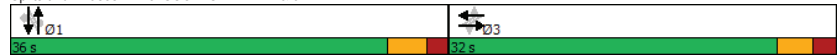
2032 Total AM
18: SCOTTSDALE RD & 3RD AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	3
Movement	NBSB	EBWB
Lead/Lag		
Lead-Lag Optimize		
Recall Mode	Ped	None
Maximum Split (s)	36	32
Maximum Split (%)	52.9%	47.1%
Minimum Split (s)	36	32
Yellow Time (s)	3.2	3
All-Red Time (s)	1.8	2
Minimum Initial (s)	10	6
Vehicle Extension (s)	0.2	2
Minimum Gap (s)	1	2
Time Before Reduce (s)	0	0
Time To Reduce (s)	0	0
Walk Time (s)	18	6
Flash Dont Walk (s)	12	15
Dual Entry	No	No
Inhibit Max	No	No
Start Time (s)	0	36
End Time (s)	36	0
Yield/Force Off (s)	31	63
Yield/Force Off 170(s)	19	48
Local Start Time (s)	0	36
Local Yield (s)	31	63
Local Yield 170(s)	19	48

Intersection Summary	
Cycle Length	68
Control Type	Actuated-Uncoordinated
Natural Cycle	70

Splits and Phases: 18: SCOTTSDALE RD & 3RD AVE.



2032 Total AM
19: DRINKWATER BLVD & 3RD AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	9	1	23	76	11	75	109	585	29	23	206	23
Future Volume (vph)	9	1	23	76	11	75	109	585	29	23	206	23
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00			0.99		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85			0.94		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1676			1785		1676	5308		1676	3725	1444
Flt Permitted	0.54	1.00			0.84		0.59	1.00		0.36	1.00	1.00
Satd. Flow (perm)	949	1676			1526		1049	5308		633	3725	1444
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.83	0.83	0.83	0.81	0.81	0.81
Adj. Flow (vph)	11	1	29	87	13	86	131	705	35	28	254	28
RTOR Reduction (vph)	0	0	0	0	30	0	0	3	0	0	0	7
Lane Group Flow (vph)	11	30	0	0	156	0	131	737	0	28	254	21
Confl. Peds. (#/hr)						2			4			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	18.4	18.4			18.4		91.5	91.5		91.5	91.5	91.5
Effective Green, g (s)	18.4	18.4			18.4		91.5	91.5		91.5	91.5	91.5
Actuated g/C Ratio	0.15	0.15			0.15		0.76	0.76		0.76	0.76	0.76
Clearance Time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	145	256			233		799	4047		482	2840	1101
v/s Ratio Prot		0.02					c0.14			0.07		
v/s Ratio Perm	0.01				c0.10		0.12			0.04		0.01
v/c Ratio	0.08	0.12			0.67		0.16	0.18		0.06	0.09	0.02
Uniform Delay, d1	43.5	43.8			47.9		3.9	3.9		3.5	3.6	3.4
Progression Factor	1.00	1.00			1.00		1.00	1.00		0.34	0.33	0.20
Incremental Delay, d2	0.1	0.1			5.5		0.4	0.1		0.2	0.1	0.0
Delay (s)	43.6	43.9			53.4		4.3	4.0		1.4	1.3	0.7
Level of Service	D	D			D		A	A		A	A	A
Approach Delay (s)		43.8			53.4			4.1			1.2	
Approach LOS		D			D			A			A	

Intersection Summary	
HCM 2000 Control Delay	11.1
HCM 2000 Volume to Capacity ratio	0.26
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	60.1%
Analysis Period (min)	15
Description: Last Update: Sept 2017	
c Critical Lane Group	

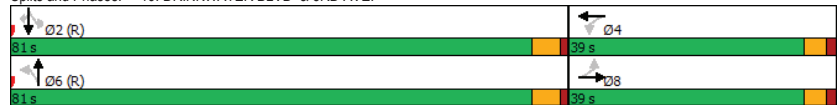
2032 Total AM
19: DRINKWATER BLVD & 3RD AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

	↓	←	↑	→
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	Min	C-Min	None
Maximum Split (s)	81	39	81	39
Maximum Split (%)	67.5%	32.5%	67.5%	32.5%
Minimum Split (s)	22.2	38.9	16	30.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	9	7	7
Flash Dont Walk (s)	10	25	20	19
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	62	23	62	23
End Time (s)	23	62	23	62
Yield/Force Off (s)	17.8	57.1	17.8	57.1
Yield/Force Off 170(s)	7.8	57.1	117.8	38.1
Local Start Time (s)	0	81	0	81
Local Yield (s)	75.8	115.1	75.8	115.1
Local Yield 170(s)	65.8	115.1	55.8	96.1

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 62 (52%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	

Splits and Phases: 19: DRINKWATER BLVD & 3RD AVE.



2032 Total AM
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↖	→	↘	↙	←	↗	↖	↗	↘	↙	↘	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖↖	↖	↖	↖↖↖	↖	↖	↖↖↖	↖	↖	↖↖↖	↖
Traffic Volume (vph)	197	843	8	49	810	120	48	604	118	142	379	196
Future Volume (vph)	197	843	8	49	810	120	48	604	118	142	379	196
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	5353	1474	1676	5353	1474	1676	3725	1477	1676	3517	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	5353	1474	1676	5353	1474	1676	3725	1477	1676	3517	
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.86	0.86	0.86	0.84	0.84	0.84
Adj. Flow (vph)	221	947	9	54	900	133	56	702	137	169	451	233
RTOR Reduction (vph)	0	0	5	0	0	74	0	0	0	0	58	0
Lane Group Flow (vph)	221	947	4	54	900	59	56	702	137	169	626	0
Conf. Peds. (#/hr)			4			4			7			3
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5 9	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	20.6	47.9	47.9	5.8	29.2	48.1	15.7	28.4	34.2	18.9	31.9	
Effective Green, g (s)	20.6	47.9	47.9	5.8	29.2	48.1	15.7	28.4	34.2	18.9	31.9	
Actuated g/C Ratio	0.17	0.39	0.39	0.05	0.24	0.39	0.13	0.23	0.28	0.15	0.26	
Clearance Time (s)		5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5	
Vehicle Extension (s)		1.0	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	281	2089	575	79	1273	577	214	862	475	258	914	
v/s Ratio Prot	c0.13	0.18		0.03	c0.17	0.02	0.03	c0.19	0.01	c0.10	0.18	
v/s Ratio Perm			0.00			0.02			0.08			
v/c Ratio	0.79	0.45	0.01	0.68	0.71	0.10	0.26	0.81	0.29	0.66	0.69	
Uniform Delay, d1	48.9	27.7	22.9	57.5	42.8	23.6	48.3	44.7	34.7	48.8	40.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.5	0.7	0.0	17.7	3.3	0.0	0.2	5.6	0.1	4.5	1.7	
Delay (s)	61.5	28.4	22.9	75.2	46.2	23.7	48.5	50.3	34.8	53.3	42.6	
Level of Service	E	C	C	E	D	C	D	D	C	D	D	
Approach Delay (s)		34.6			44.9			47.8			44.7	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	42.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	122.7	Sum of lost time (s)	25.6
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

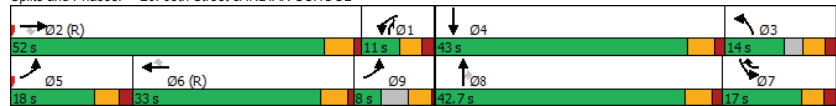
2032 Total AM
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	←		→		↙		↘		↖		↗	
Phase Number	1	2	3	4	5	6	7	8	9			
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT	EBL			
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead				
Lead-Lag Optimize												
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None			
Maximum Split (s)	11	52	14	43	18	33	17	42.7	8			
Maximum Split (%)	9.0%	42.4%	11.4%	35.0%	14.7%	26.9%	13.9%	34.8%	6.5%			
Minimum Split (s)	11	32.4	11	39.5	11	33	11	42.7	8			
Yellow Time (s)	3.3	4.4	3.3	4	3.6	4	3.3	4	3.5			
All-Red Time (s)	2	1	1.9	1.5	2	1	2	1.7	0.5			
Minimum Initial (s)	5	10	5	7	5	10	5	7	4			
Vehicle Extension (s)	2	1	2	2	2	1	2	2	2			
Minimum Gap (s)	1	1	1	1	1	1	1	1	1			
Time Before Reduce (s)	0	0	0	0	0	0	0	0	0			
Time To Reduce (s)	0	0	0	0	0	0	0	0	0			
Walk Time (s)		4		4		4		4				
Flash Dont Walk (s)		23		30		24		33				
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes	No			
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
Start Time (s)	64	12	118	75	12	30	117.7	75	63			
End Time (s)	75	64	12	118	30	63	12	117.7	75			
Yield/Force Off (s)	69.7	58.6	6.8	112.5	24.4	58	6.7	112	71			
Yield/Force Off 170(s)	69.7	35.6	6.8	82.5	24.4	34	6.7	79	71			
Local Start Time (s)	52	0	106	63	0	18	105.7	63	51			
Local Yield (s)	57.7	46.6	117.5	100.5	12.4	46	117.4	100	59			
Local Yield 170(s)	57.7	23.6	117.5	70.5	12.4	22	117.4	67	59			

Intersection Summary	
Cycle Length	122.7
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 12 (10%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	

Splits and Phases: 20: 68th Street & INDIAN SCHOOL



2032 Total AM
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	←		→		↙		↘		↖		↗	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	218	790	90	68	689	45	83	426	16	51	521	104
Future Volume (vph)	218	790	90	68	689	45	83	426	16	51	521	104
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	1000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.0	3.0	5.3	5.0		5.3	5.3		5.3	5.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		1.00	0.95		1.00	0.91	
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3317	3725	1510	3317	3692		1710	1854		1710	5224	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3317	3725	1510	3317	3692		1710	1854		1710	5224	
Peak-hour factor, PHF	0.87	0.87	0.87	0.89	0.89	0.89	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	251	908	103	76	774	51	101	520	20	62	635	127
RTOR Reduction (vph)	0	0	61	0	4	0	0	2	0	0	28	0
Lane Group Flow (vph)	251	908	42	76	821	0	101	538	0	62	734	0
Conf. Peds. (#/hr)			1				1					2
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	14.2	50.0	50.0	7.0	42.8		21.9	40.5		7.9	26.5	
Effective Green, g (s)	14.2	50.0	52.0	7.0	42.8		21.9	40.5		7.9	26.5	
Actuated g/C Ratio	0.11	0.40	0.41	0.06	0.34		0.17	0.32		0.06	0.21	
Clearance Time (s)	5.3	5.0	5.0	5.3	5.0		5.3	5.3		5.3	5.3	
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0		2.0	1.0		2.0	1.0	
Lane Grp Cap (vph)	372	1474	621	183	1251		296	594		106	1096	
v/s Ratio Prot	c0.08	0.24		0.02	c0.22		0.06	c0.29		c0.04	0.14	
v/s Ratio Perm			0.03									
v/c Ratio	0.67	0.62	0.07	0.42	0.66		0.34	0.91		0.58	0.67	
Uniform Delay, d1	53.8	30.5	22.5	57.7	35.5		45.9	41.1		57.6	45.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.8	1.9	0.2	0.6	2.7		0.3	17.0		5.2	1.3	
Delay (s)	57.6	32.4	22.7	58.2	38.2		46.1	58.1		62.8	47.2	
Level of Service	E	C	C	E	D		D	E		E	D	
Approach Delay (s)		36.6			39.9			56.2			48.3	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	43.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	126.3	Sum of lost time (s)	20.9
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

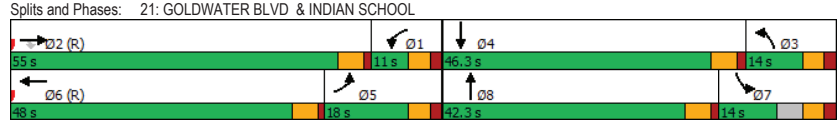
2032 Total AM
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	1	2	3	4	5	6	7	8
Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	11	55	14	46.3	18	48	14	42.3
Maximum Split (%)	8.7%	43.5%	11.1%	36.7%	14.3%	38.0%	11.1%	33.5%
Minimum Split (s)	11	37	11	46.3	11	35	11	42.3
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1	2	1.3	2	1	2	1.3
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	1	2	1	2	1	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		9		8		9
Flash Dont Walk (s)		24		32		22		28
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	75	20	6	86	68	20	2	86
End Time (s)	86	75	20	6	86	68	20	2
Yield/Force Off (s)	80.7	70	14.7	0.7	80.7	63	14.7	123
Yield/Force Off 170(s)	80.7	46	14.7	0.7	80.7	41	14.7	123
Local Start Time (s)	55	0	112.3	66	48	0	108.3	66
Local Yield (s)	60.7	50	121	107	60.7	43	121	103
Local Yield 170(s)	60.7	26	121	107	60.7	21	121	103

Intersection Summary

Cycle Length	126.3
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 20 (16%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	



2032 Total AM
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	32	775	15	78	804	37	5	5	10	4	5	16
Future Volume (vph)	32	775	15	78	804	37	5	5	10	4	5	16
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2			5.1				5.1
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00				1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99				0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00				1.00
Frt	1.00	1.00		1.00	0.99			0.93				0.91
Flt Protected	0.95	1.00		0.95	1.00			0.99				0.99
Satd. Flow (prot)	1676	3712		1676	3695			1790				1759
Flt Permitted	0.27	1.00		0.33	1.00			0.91				0.94
Satd. Flow (perm)	474	3712		589	3695			1653				1674
Peak-hour factor, PHF	0.94	0.94	0.94	0.81	0.81	0.81	0.86	0.86	0.86	0.80	0.80	0.80
Adj. Flow (vph)	34	824	16	96	993	46	6	6	12	5	6	20
RTOR Reduction (vph)	0	1	0	0	1	0	0	11	0	0	19	0
Lane Group Flow (vph)	34	839	0	96	1038	0	0	13	0	0	12	0
Conf. Peds. (#/hr)			4			3			4			2
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	102.0	102.0		102.0	102.0			7.8			7.8	
Effective Green, g (s)	102.0	102.0		102.0	102.0			7.8			7.8	
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.06			0.06	
Clearance Time (s)	5.2	5.2		5.2	5.2			5.1			5.1	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	402	3152		500	3138			107			108	
v/s Ratio Prot		0.23			0.28							
v/s Ratio Perm	0.07			0.16				0.01			0.01	
v/c Ratio	0.08	0.27		0.19	0.33			0.12			0.11	
Uniform Delay, d1	1.5	1.8		1.6	1.9			52.9			52.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.4	0.2		0.9	0.3			0.2			0.2	
Delay (s)	1.9	2.0		2.5	2.2			53.1			53.1	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		2.0			2.2			53.1			53.1	
Approach LOS		A			A			D			D	

Intersection Summary

HCM 2000 Control Delay	3.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	10.3
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Last Update: Sept 2017			

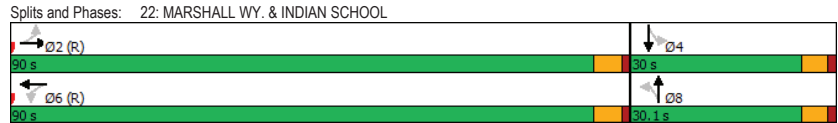
c Critical Lane Group

2032 Total AM
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	←	↓	→	↑
Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	90	30	90	30.1
Maximum Split (%)	74.9%	25.0%	74.9%	25.1%
Minimum Split (s)	16	29.1	16	30.1
Yellow Time (s)	4	3.6	4	3.6
All-Red Time (s)	1.2	1.5	1.2	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	8
Flash Dont Walk (s)	8	17	7	17
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	118	87.9	118	87.9
End Time (s)	87.9	118	87.9	118
Yield/Force Off (s)	82.7	112.9	82.7	112.9
Yield/Force Off 170(s)	74.7	95.9	75.7	95.9
Local Start Time (s)	0	90	0	90
Local Yield (s)	84.8	115	84.8	115
Local Yield 170(s)	76.8	98	77.8	98

Intersection Summary	
Cycle Length	120.1
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 118 (98%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green	



2032 Total AM
23: INDIAN SCHOOL & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↖	→	↘	↙	←	↖	↘	↙	↗	↓	↘	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↘	↖	↖↗	↘	↖	↖↗	↘	↖	↖↗	↘
Traffic Volume (vph)	130	637	65	5	882	147	69	421	82	103	330	80
Future Volume (vph)	130	637	65	5	882	147	69	421	82	103	330	80
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	3666		1676	3625		1676	3619		1676	3725	1456
Flt Permitted	0.15	1.00		0.29	1.00		0.39	1.00		0.18	1.00	1.00
Satd. Flow (perm)	257	3666		519	3625		686	3619		323	3725	1456
Peak-hour factor, PHF	0.94	0.94	0.94	0.91	0.91	0.91	0.83	0.83	0.83	0.86	0.86	0.86
Adj. Flow (vph)	138	678	69	5	969	162	83	507	99	120	384	93
RTOR Reduction (vph)	0	6	0	0	10	0	0	15	0	0	0	67
Lane Group Flow (vph)	138	741	0	5	1121	0	83	591	0	120	384	26
Confl. Peds. (#/hr)			8			21			11			20
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	66.4	59.3		66.4	59.3		33.7	26.9		33.7	26.9	34.0
Effective Green, g (s)	66.4	59.3		66.4	59.3		33.7	26.9		33.7	26.9	34.0
Actuated g/C Ratio	0.55	0.49		0.55	0.49		0.28	0.22		0.28	0.22	0.28
Clearance Time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	226	1811		355	1791		248	811		167	835	474
v/s Ratio Prot	c0.04	0.20		0.00	c0.31		0.02	c0.16		c0.04	0.10	0.00
v/s Ratio Perm	0.30			0.01			0.07			0.16		0.01
v/c Ratio	0.61	0.41		0.01	0.63		0.33	0.73		0.72	0.46	0.06
Uniform Delay, d1	37.1	19.2		18.0	22.2		39.8	43.2		48.5	40.3	31.3
Progression Factor	1.00	1.00		0.51	0.78		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.4	0.7		0.0	1.5		0.3	2.8		11.6	0.1	0.0
Delay (s)	40.5	19.9		9.2	18.8		40.1	46.0		60.1	40.4	31.3
Level of Service	D	B		A	B		D	D		E	D	C
Approach Delay (s)		23.1			18.8			45.3				43.0
Approach LOS		C			B			D				D

Intersection Summary	
HCM 2000 Control Delay	29.8
HCM 2000 Volume to Capacity ratio	0.66
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	75.3%
Analysis Period (min)	15
Description: Last Update: Sept 2017	
c Critical Lane Group	

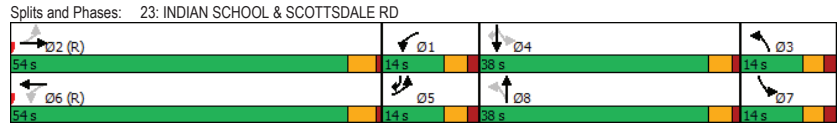
2032 Total AM
23: INDIAN SCHOOL & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	14	54	14	38	14	54	14	38
Maximum Split (%)	11.7%	45.0%	11.7%	31.7%	11.7%	45.0%	11.7%	31.7%
Minimum Split (s)	11	30	10	32.8	11	33	10	34.8
Yellow Time (s)	3.3	4	3	3.6	3.3	4	3	3.6
All-Red Time (s)	1.8	1	2	1.2	1.8	1	2	1.2
Minimum Initial (s)	5	10	5	10	5	10	5	10
Vehicle Extension (s)	2	1	2	2	2	1	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		8		8
Flash Dont Walk (s)		18		21		20		22
Dual Entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	54	0	106	68	54	0	106	68
End Time (s)	68	54	0	106	68	54	0	106
Yield/Force Off (s)	62.9	49	115	101.2	62.9	49	115	101.2
Yield/Force Off 170(s)	62.9	31	115	80.2	62.9	29	115	79.2
Local Start Time (s)	54	0	106	68	54	0	106	68
Local Yield (s)	62.9	49	115	101.2	62.9	49	115	101.2
Local Yield 170(s)	62.9	31	115	80.2	62.9	29	115	79.2

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green	



2032 Total AM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	↑
Traffic Volume (vph)	1028	25	27	1187	1	16
Future Volume (vph)	1028	25	27	1187	1	16
Ideal Flow (vphpl)	2000	1800	1800	2000	1800	1800
Total Lost time (s)		5.2		5.2		5.1
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frbp, ped/bikes	1.00		1.00	1.00	0.98	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.87	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3709		1676	3725	1508	
Flt Permitted	1.00		0.23	1.00	1.00	
Satd. Flow (perm)	3709		412	3725	1508	
Peak-hour factor, PHF	0.92	0.92	0.93	0.93	0.80	0.80
Adj. Flow (vph)	1117	27	29	1276	1	20
RTOR Reduction (vph)	1	0	0	0	18	0
Lane Group Flow (vph)	1143	0	29	1276	3	0
Conf. Peds. (#/hr)		4				5
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	98.0		98.0	98.0	11.7	
Effective Green, g (s)	98.0		98.0	98.0	11.7	
Actuated g/C Ratio	0.82		0.82	0.82	0.10	
Clearance Time (s)	5.2		5.2	5.2	5.1	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	3029		336	3042	147	
v/s Ratio Prot	0.31			c0.34	c0.00	
v/s Ratio Perm			0.07			
v/c Ratio	0.38		0.09	0.42	0.02	
Uniform Delay, d1	2.9		2.2	3.1	49.0	
Progression Factor	0.44		0.32	0.25	1.00	
Incremental Delay, d2	0.3		0.5	0.4	0.0	
Delay (s)	1.6		1.2	1.2	49.0	
Level of Service	A		A	A	D	
Approach Delay (s)	1.6			1.2	49.0	
Approach LOS	A			A	D	

Intersection Summary

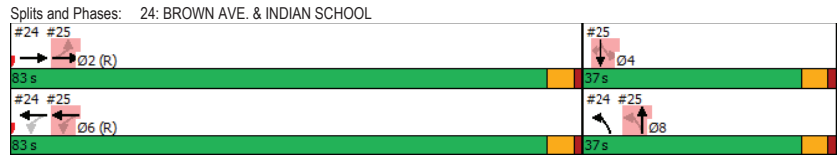
HCM 2000 Control Delay	1.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.3
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Total AM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

	→	↓	←	↖
Phase Number	2	4	6	8
Node Number	24	25	24	24
Movement	EBT	SBTL	WBTL	NBL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	83	37	83	37
Maximum Split (%)	69.2%	30.8%	69.2%	30.8%
Minimum Split (s)	23.2	12.1	27.2	36.1
Yellow Time (s)	4	3.6	4	3.6
All-Red Time (s)	1.2	1.5	1.2	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	11		15	24
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	106	69	106	69
End Time (s)	69	106	69	106
Yield/Force Off (s)	63.8	100.9	63.8	100.9
Yield/Force Off 170(s)	52.8	100.9	48.8	76.9
Local Start Time (s)	0	83	0	83
Local Yield (s)	77.8	114.9	77.8	114.9
Local Yield 170(s)	66.8	114.9	62.8	90.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 106 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	



2032 Total AM
25: BUCKBOARD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↖	→	↘	↙	←	↖	↘	↙	↗	↘	↙	↗	↘	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↖	↖↗		↖	↖↗		↖↗	↖↗		↖	↖	↖	↖	↖
Traffic Volume (vph)	137	901	11	49	1151	160	3	1	19	46	0	58		
Future Volume (vph)	137	901	11	49	1151	160	3	1	19	46	0	58		
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800		
Total Lost time (s)	5.2	5.2		5.2	5.2			5.1				5.1	5.1	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00				1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00				1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00				1.00	1.00	
Frt	1.00	1.00		1.00	0.98			0.89				1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.99				0.95	1.00	
Satd. Flow (prot)	1676	3718		1676	3642			1730				1863	1500	
Flt Permitted	0.17	1.00		0.27	1.00			0.96				0.74	1.00	
Satd. Flow (perm)	306	3718		479	3642			1674				1448	1500	
Peak-hour factor, PHF	0.90	0.90	0.90	0.94	0.94	0.94	0.80	0.80	0.80	0.80	0.80	0.80	0.80	
Adj. Flow (vph)	152	1001	12	52	1224	170	4	1	24	58	0	72		
RTOR Reduction (vph)	0	0	0	0	5	0	0	22	0	0	0	66		
Lane Group Flow (vph)	152	1013	0	52	1389	0	0	7	0	0	58	7		
Conf. Peds. (#/hr)			3			5								
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm	NA	Perm
Protected Phases		2			6			8			8		4	4
Permitted Phases	2			6			8			4			4	4
Actuated Green, G (s)	98.0	98.0		98.0	98.0			11.7				11.7	11.7	
Effective Green, g (s)	98.0	98.0		98.0	98.0			11.7				11.7	11.7	
Actuated g/C Ratio	0.82	0.82		0.82	0.82			0.10				0.10	0.10	
Clearance Time (s)	5.2	5.2		5.2	5.2			5.1				5.1	5.1	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0				2.0	2.0	
Lane Grp Cap (vph)	249	3036		391	2974			163				141	146	
v/s Ratio Prot		0.27			0.38									
v/s Ratio Perm	c0.50			0.11				0.00				c0.04	0.00	
v/c Ratio	0.61	0.33		0.13	0.47			0.05				0.41	0.05	
Uniform Delay, d1	4.0	2.8		2.3	3.3			49.1				50.9	49.1	
Progression Factor	0.55	0.10		1.00	1.00			1.00				1.00	1.00	
Incremental Delay, d2	10.2	0.3		0.7	0.5			0.0				0.7	0.1	
Delay (s)	12.4	0.6		3.0	3.8			49.1				51.6	49.2	
Level of Service	B	A		A	A			D				D	D	
Approach Delay (s)		2.1			3.8			49.1				50.2		
Approach LOS		A			A			D				D		

Intersection Summary	
HCM 2000 Control Delay	5.7
HCM 2000 Volume to Capacity ratio	0.59
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	65.7%
Analysis Period (min)	15
Sum of lost time (s)	10.3
ICU Level of Service	C
Description: Last Update: Sept 2017	
c Critical Lane Group	

2032 Total AM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

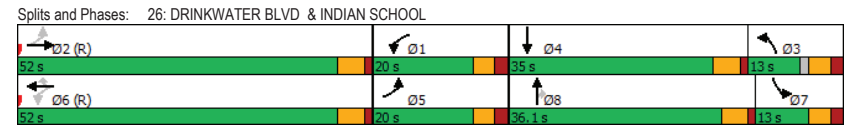
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	101	710	41	365	1325	245	71	429	209	106	165	20
Future Volume (vph)	101	710	41	365	1325	245	71	429	209	106	165	20
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.1	5.3	5.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1710	3696		1710	3725	1503	1710	3725	1498	3317	3666	
Flt Permitted	0.07	1.00		0.22	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	130	3696		394	3725	1503	1710	3725	1498	3317	3666	
Peak-hour factor, PHF	0.85	0.85	0.85	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	119	835	48	392	1425	263	79	477	232	118	183	22
RTOR Reduction (vph)	0	3	0	0	0	62	0	0	191	0	9	0
Lane Group Flow (vph)	119	880	0	392	1425	201	79	477	41	118	196	0
Confl. Peds. (#/hr)			4			4			8			6
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6			8			
Actuated Green, G (s)	70.0	55.3		70.0	55.3	55.3	15.6	21.2	21.2	9.0	14.6	
Effective Green, g (s)	70.0	55.3		70.0	55.3	55.3	15.6	21.2	21.2	9.0	14.6	
Actuated g/C Ratio	0.58	0.46		0.58	0.46	0.46	0.13	0.18	0.18	0.07	0.12	
Clearance Time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.1	5.3	5.1	
Vehicle Extension (s)	2.0	0.2		2.0	0.2	0.2	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	266	1687		387	1701	686	220	652	262	246	441	
v/s Ratio Prot	0.05	0.24		c0.12	0.38		0.05	c0.13		c0.04	0.05	
v/s Ratio Perm	0.20			c0.46		0.13			0.03			
v/c Ratio	0.45	0.52		1.01	0.84	0.29	0.36	0.73	0.16	0.48	0.44	
Uniform Delay, d1	41.5	23.5		33.4	29.0	20.6	48.2	47.3	42.4	53.8	49.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	1.2		49.0	5.1	1.1	0.4	3.7	0.1	0.5	0.3	
Delay (s)	42.0	24.6		82.5	34.1	21.7	48.5	50.9	42.5	54.3	49.7	
Level of Service	D	C		F	C	C	D	D	D	D	D	
Approach Delay (s)		26.7			41.6			48.2			51.4	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.0	HCM 2000 Level of Service	
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	
Intersection Capacity Utilization	80.9%	ICU Level of Service	
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Total AM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBT	EBL	WBTL	SBL	NBT
Lead/Lag			Lag	Lead			Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	20	52	13	35	20	52	13	36.1
Maximum Split (%)	16.5%	42.9%	10.7%	28.9%	16.5%	42.9%	10.7%	29.8%
Minimum Split (s)	11	33.2	11	34.1	11	31.2	11	36.1
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1.2	2	1.1	2	1.2	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	0.2	2	2	2	0.2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		9		7		11
Flash Dont Walk (s)		21		20		19		20
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	36.9	106	91.9	56.9	36.9	106	93	56.9
End Time (s)	56.9	36.9	106	91.9	56.9	36.9	106	93
Yield/Force Off (s)	51.6	31.7	100.7	86.8	51.6	31.7	100.7	87.9
Yield/Force Off 170(s)	51.6	10.7	100.7	86.8	51.6	12.7	100.7	87.9
Local Start Time (s)	52	0	107	72	52	0	108.1	72
Local Yield (s)	66.7	46.8	115.8	101.9	66.7	46.8	115.8	103
Local Yield 170(s)	66.7	25.8	115.8	101.9	66.7	27.8	115.8	103
Intersection Summary								
Cycle Length	121.1							
Control Type	Actuated-Coordinated							
Natural Cycle	145							
Offset: 106 (88%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green								



2032 Total AM
27: 70th St & GOLDWATER BLVD

Southbridge Expansion
HCM 6th WSC

Intersection							
Int Delay, s/veh	2.8						
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑		↑↑	↑↑	↑	↑	
Traffic Vol, veh/h	463	63	11	348	120	30	
Future Vol, veh/h	463	63	11	348	120	30	
Conflicting Peds, #/hr	0	4	0	0	0	1	
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized	-	None	-	None	-	None	
Storage Length	-	-	70	-	0	0	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	503	68	12	378	130	33	

Major/Minor	Major1	Major2	Minor1	
Conflicting Flow All	0	0	575	0 754 291
Stage 1	-	-	-	541 -
Stage 2	-	-	-	213 -
Critical Hdwy	-	-	5.34	- 6.29 7.14
Critical Hdwy Stg 1	-	-	-	6.64 -
Critical Hdwy Stg 2	-	-	-	5.84 -
Follow-up Hdwy	-	-	3.12	- 3.67 3.92
Pot Cap-1 Maneuver	-	-	624	- 377 602
Stage 1	-	-	-	470 -
Stage 2	-	-	-	772 -
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	622	- 369 599
Mov Cap-2 Maneuver	-	-	-	369 -
Stage 1	-	-	-	460 -
Stage 2	-	-	-	772 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	18.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	369	599	-	-	622	-
HCM Lane V/C Ratio	0.353	0.054	-	-	0.019	-
HCM Control Delay (s)	20	11.4	-	-	10.9	-
HCM Lane LOS	C	B	-	-	B	-
HCM 95th %tile Q(veh)	1.6	0.2	-	-	0.1	-

2032 Total AM
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	5	8	8	270	14	24	63	311	1	54	410	22
Future Volume (vph)	5	8	8	270	14	24	63	311	1	54	410	22
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		4.9		4.9		4.9		5.2		5.2		5.2
Lane Util. Factor		1.00		0.95		0.95		1.00		0.95		0.91
Frbp, ped/bikes		0.99		1.00		1.00		1.00		1.00		1.00
Flpb, ped/bikes		1.00		1.00		1.00		1.00		1.00		1.00
Frt		0.95		1.00		0.98		1.00		1.00		0.99
Fit Protected		0.99		0.95		0.96		0.95		1.00		0.95
Satd. Flow (prot)		1827		1593		1748		1676		3724		1676
Fit Permitted		0.99		0.95		0.96		0.46		1.00		0.52
Satd. Flow (perm)		1827		1593		1748		813		3724		924
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.82	0.82	0.82	0.87	0.87	0.87
Adj. Flow (vph)	6	10	10	310	16	28	77	379	1	62	471	25
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	26	0	180	169	0	77	380	0	62	494	0
Conf. Peds. (#/hr)			2			3			7			2
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4		6	6		2	2	
Permitted Phases							6			2		
Actuated Green, G (s)		9.3		21.5	21.5		99.0	99.0		99.0	99.0	
Effective Green, g (s)		9.3		21.5	21.5		99.0	99.0		99.0	99.0	
Actuated g/C Ratio		0.06		0.15	0.15		0.68	0.68		0.68	0.68	
Clearance Time (s)		4.9		4.9	4.9		5.2	5.2		5.2	5.2	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		117		236	259		555	2546		631	3627	
v/s Ratio Prot		c0.01		c0.11	0.10			c0.10			0.09	
v/s Ratio Perm							0.09			0.07		
v/c Ratio		0.22		0.76	0.65		0.14	0.15		0.10	0.14	
Uniform Delay, d1		64.3		59.2	58.1		8.0	8.1		7.8	8.0	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4		12.3	4.4		0.5	0.1		0.3	0.1	
Delay (s)		64.7		71.5	62.6		8.5	8.2		8.1	8.1	
Level of Service		E		E	E		A	A		A	A	
Approach Delay (s)		64.7		67.1			8.2			8.1		
Approach LOS		E		E			A			A		

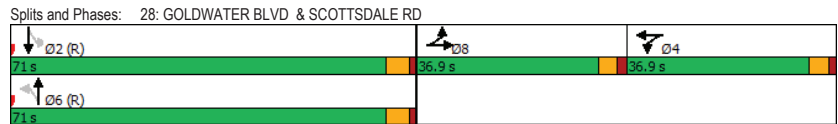
Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	144.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Total AM
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

	↓	↘	↑	↗
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	71	36.9	71	36.9
Maximum Split (%)	49.0%	25.5%	49.0%	25.5%
Minimum Split (s)	23.2	36.9	27.2	36.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	8	8	9
Flash Dont Walk (s)	11	24	14	23
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	24	131.9	24	95
End Time (s)	95	24	95	131.9
Yield/Force Off (s)	89.8	19.1	89.8	127
Yield/Force Off 170(s)	78.8	139.9	75.8	104
Local Start Time (s)	0	107.9	0	71
Local Yield (s)	65.8	139.9	65.8	103
Local Yield 170(s)	54.8	115.9	51.8	80

Intersection Summary	
Cycle Length	144.8
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 24 (17%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Total AM
29: SCOTTSDALE RD & OSBORN RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↖	→	↘	↙	←	↗	↖	→	↘	↙	←	↗	↖	→	↘	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗	↖	↖	↖↗	↖				
Traffic Volume (vph)	57	192	96	97	180	101	71	935	122	96	631	22				
Future Volume (vph)	57	192	96	97	180	101	71	935	122	96	631	22				
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800				
Total Lost time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.4					
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.91					
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	1.00					
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00					
Frt	1.00	0.95		1.00	0.95		1.00	1.00	0.85	1.00	0.99					
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00					
Satd. Flow (prot)	1676	3517		1676	3502		1676	3725	1473	1676	5321					
Flt Permitted	0.38	1.00		0.36	1.00		0.35	1.00	1.00	0.21	1.00					
Satd. Flow (perm)	664	3517		643	3502		619	3725	1473	367	5321					
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.92	0.92					
Adj. Flow (vph)	71	240	120	121	225	126	78	1027	134	104	686	24				
RTOR Reduction (vph)	0	60	0	0	73	0	0	0	59	0	2	0				
Lane Group Flow (vph)	71	300	0	121	278	0	78	1027	75	104	708	0				
Conf. Peds. (#/hr)			6			6			5			9				
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA					
Protected Phases	3	8		7	4		1	6	6	5	2					
Permitted Phases	8			4			6		6	2						
Actuated Green, G (s)	25.6	20.6		25.6	20.6		73.1	67.4	67.4	73.1	67.4					
Effective Green, g (s)	25.6	20.6		25.6	20.6		73.1	67.4	67.4	73.1	67.4					
Actuated g/C Ratio	0.21	0.17		0.21	0.17		0.61	0.56	0.56	0.61	0.56					
Clearance Time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.4					
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	1.0	1.0	2.0	1.0					
Lane Grp Cap (vph)	183	603		180	600		426	2090	826	285	2986					
v/s Ratio Prot	0.02	0.09		c0.03	0.08		0.01	c0.28		c0.02	0.13					
v/s Ratio Perm	0.07			c0.12			0.10		0.05	0.20						
v/c Ratio	0.39	0.50		0.67	0.46		0.18	0.49	0.09	0.36	0.24					
Uniform Delay, d1	45.7	45.1		48.5	44.8		12.1	16.0	12.2	21.8	13.3					
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00					
Incremental Delay, d2	0.5	0.2		7.5	0.2		0.1	0.8	0.2	0.3	0.2					
Delay (s)	46.2	45.3		56.0	45.0		12.1	16.8	12.4	22.1	13.5					
Level of Service	D	D		E	D		B	B	B	C	B					
Approach Delay (s)		45.4			47.8			16.0			14.6					
Approach LOS		D			D			B			B					

Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	21.4
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Sept 2017			

c Critical Lane Group

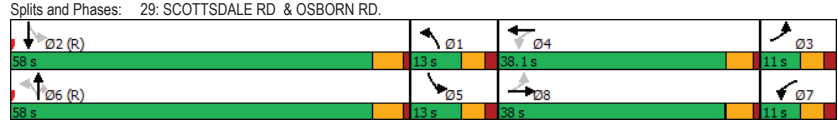
2032 Total AM
29: SCOTTSDALE RD & OSBORN RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	EBL	WBTL	SBL	NBTL	WBL	EBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	13	58	11	38.1	13	58	11	38
Maximum Split (%)	10.8%	48.3%	9.2%	31.7%	10.8%	48.3%	9.2%	31.6%
Minimum Split (s)	11	31.4	11	38.1	11	34.4	11	37.1
Yellow Time (s)	3.6	4.4	3.3	4	3.6	4.4	3.3	4
All-Red Time (s)	2	1	2	1.1	2	1	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	1	2	1	2	1	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		9		10		11
Flash Dont Walk (s)		18		24		19		21
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	58	0	109.1	71	58	0	109.1	71
End Time (s)	71	58	0	109.1	71	58	0	109.1
Yield/Force Off (s)	65.4	52.6	114.8	104	65.4	52.6	114.8	104
Yield/Force Off 170(s)	65.4	34.6	114.8	80	65.4	33.6	114.8	83
Local Start Time (s)	58	0	109.1	71	58	0	109.1	71
Local Yield (s)	65.4	52.6	114.8	104	65.4	52.6	114.8	104
Local Yield 170(s)	65.4	34.6	114.8	80	65.4	33.6	114.8	83

Intersection Summary

Cycle Length	120.1
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Total AM
30: 6TH ST. & A1

Southbridge Expansion
HCM 6th TWSC

Intersection

Int Delay, s/veh	1.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	8	52	84	74	32	6
Future Vol, veh/h	8	52	84	74	32	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	57	91	80	35	7

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	171	0	206
Stage 1	-	-	131
Stage 2	-	-	75
Critical Hdwy	4.12	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.218	-	3.518
Pot Cap-1 Maneuver	1406	-	782
Stage 1	-	-	895
Stage 2	-	-	948
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1406	-	777
Mov Cap-2 Maneuver	-	-	777
Stage 1	-	-	889
Stage 2	-	-	948

Approach	EB	WB	SB
HCM Control Delay, s	1	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1406	-	-	-	796
HCM Lane V/C Ratio	0.006	-	-	-	0.052
HCM Control Delay (s)	7.6	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	8	34	61	29	26	7
Future Vol, veh/h	8	34	61	29	26	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	37	66	32	28	8

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	98	0	137
Stage 1	-	-	82
Stage 2	-	-	55
Critical Hdwy	4.12	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2,218	-	3,318
Pot Cap-1 Maneuver	1495	-	856
Stage 1	-	-	941
Stage 2	-	-	968
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1495	-	851
Mov Cap-2 Maneuver	-	-	851
Stage 1	-	-	935
Stage 2	-	-	968

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1495	-	-	-	875
HCM Lane V/C Ratio	0.006	-	-	-	0.041
HCM Control Delay (s)	7.4	0	-	-	9.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	3.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕		↕
Traffic Vol, veh/h	60	6	76	131	0	46
Future Vol, veh/h	60	6	76	131	0	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	7	83	142	0	50

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	72	69
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	4.12	6.22
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	2,218	3,318
Pot Cap-1 Maneuver	-	1528	994
Stage 1	-	-	0
Stage 2	-	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1528	994
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.8	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	994	-	-	1528	-
HCM Lane V/C Ratio	0.05	-	-	0.054	-
HCM Control Delay (s)	8.8	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.2	-

2032 Total AM
33: Stetson Dr & C1

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↕	↕	
Traffic Vol, veh/h	3	25	12	137	53	3
Future Vol, veh/h	3	25	12	137	53	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	27	13	149	58	3

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	235	60	61
Stage 1	60	-	-
Stage 2	175	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	753	1005	1542
Stage 1	963	-	-
Stage 2	855	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	746	1005	1542
Mov Cap-2 Maneuver	746	-	-
Stage 1	954	-	-
Stage 2	855	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1542	-	969	-	-
HCM Lane V/C Ratio	0.008	-	0.031	-	-
HCM Control Delay (s)	7.4	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

2032 Total AM
34: 5th Ave & C2

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕			↕
Traffic Vol, veh/h	11	201	73	7	0	32
Future Vol, veh/h	11	201	73	7	0	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	218	79	8	0	35

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	87	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1509	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1509	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1509	-	-	-	976
HCM Lane V/C Ratio	0.008	-	-	-	0.036
HCM Control Delay (s)	7.4	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

2032 Total AM
35: 5TH AVE & D

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	13	34	130	8	18	29
Future Vol, veh/h	13	34	130	8	18	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	37	141	9	20	32

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	150	0	0	211	146
Stage 1	-	-	-	146	-
Stage 2	-	-	-	65	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	1431	-	-	777	901
Stage 1	-	-	-	881	-
Stage 2	-	-	-	958	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1431	-	-	769	901
Mov Cap-2 Maneuver	-	-	-	769	-
Stage 1	-	-	-	872	-
Stage 2	-	-	-	958	-

Approach	EB	WB	SB
HCM Control Delay, s	2.1	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1431	-	-	-	845
HCM Lane V/C Ratio	0.01	-	-	-	0.06
HCM Control Delay (s)	7.5	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

2032 Total AM
36: Vehicle Path & 6TH ST.

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Vol, veh/h	47	37	0	99	59	0
Future Vol, veh/h	47	37	0	99	59	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	51	40	0	108	64	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	91	0	179
Stage 1	-	-	-	-	71
Stage 2	-	-	-	-	108
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1504	-	811
Stage 1	-	-	-	-	952
Stage 2	-	-	-	-	916
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1504	-	811
Mov Cap-2 Maneuver	-	-	-	-	811
Stage 1	-	-	-	-	952
Stage 2	-	-	-	-	916

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	811	-	-	1504	-
HCM Lane V/C Ratio	0.079	-	-	-	-
HCM Control Delay (s)	9.8	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0	-


2032 Total AM
37: 5TH AVE. & Vehicle Path

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↖		↗	↗
Traffic Vol, veh/h	2	59	83	57	36	1
Future Vol, veh/h	2	59	83	57	36	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	64	90	62	39	1
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	152	0	0	189	121	
Stage 1	-	-	-	121	-	
Stage 2	-	-	-	68	-	
Critical Hdwy	4.12	-	-	6.42	6.22	
Critical Hdwy Stg 1	-	-	-	5.42	-	
Critical Hdwy Stg 2	-	-	-	5.42	-	
Follow-up Hdwy	2,218	-	-	3,518	3,318	
Pot Cap-1 Maneuver	1429	-	-	800	930	
Stage 1	-	-	-	904	-	
Stage 2	-	-	-	955	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	1429	-	-	799	930	
Mov Cap-2 Maneuver	-	-	-	799	-	
Stage 1	-	-	-	903	-	
Stage 2	-	-	-	955	-	
Approach	EB	WB	SB			
HCM Control Delay, s	0.2	0	9.7			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1429	-	-	-	802	
HCM Lane V/C Ratio	0.002	-	-	-	0.05	
HCM Control Delay (s)	7.5	0	-	-	9.7	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.2	

2032 Total AM Mitigated
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	68	127	47	578	222	323	18	1242	230	189	1612	97
Future Volume (vph)	68	127	47	578	222	323	18	1242	230	189	1612	97
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4	4.0	5.4		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	0.91		
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00		
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	0.99		
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00		
Satd. Flow (prot)	1676	1945	1478	3252	1945	1478	1676	5192	1676	5285		
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.06	1.00	0.06	1.00		
Satd. Flow (perm)	1676	1945	1478	3252	1945	1478	114	5192	114	5285		
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.89	0.89	0.89	0.88	0.88	0.88
Adj. Flow (vph)	72	134	49	635	244	355	20	1396	258	215	1832	110
RTOR Reduction (vph)	0	0	0	0	0	271	0	16	0	0	4	0
Lane Group Flow (vph)	72	134	49	635	244	84	20	1638	0	215	1938	0
Confl. Peds. (#/hr)			2			2			2			2
Bus Blockages (#/hr)	0	2	0	0	2	0	0	2	0	0	2	0
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	pm+pt	NA		
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases			8			4	6			2		
Actuated Green, G (s)	16.4	16.4	16.4	32.4	32.4	32.4	70.2	61.8		71.8	61.8	
Effective Green, g (s)	16.4	16.4	16.4	32.4	32.4	32.4	70.2	61.8		71.8	61.8	
Actuated g/C Ratio	0.12	0.12	0.12	0.23	0.23	0.23	0.50	0.44		0.51	0.44	
Clearance Time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4		4.0	5.4	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.2		3.0	0.2	
Lane Grp Cap (vph)	194	225	171	745	445	338	149	2270		168	2311	
v/s Ratio Prot	0.04	c0.07		c0.20	0.13		0.01	0.32		c0.09	0.37	
v/s Ratio Perm			0.03			0.06				c0.56		
v/c Ratio	0.37	0.60	0.29	0.85	0.55	0.25	0.13	0.72		1.28	0.84	
Uniform Delay, d1	57.7	59.3	57.1	52.2	48.0	44.5	51.2	32.7		51.8	35.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	2.8	0.3	9.0	0.7	0.1	0.1	2.0		163.6	3.8	
Delay (s)	58.1	62.1	57.4	61.1	48.7	44.7	51.3	34.7		215.4	39.2	
Level of Service	E	E	E	E	D	D	D	C		F	D	
Approach Delay (s)		60.1			53.9			34.9			56.7	
Approach LOS		E			D			C			E	
Intersection Summary												
HCM 2000 Control Delay				49.4	HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio	1.08											
Actuated Cycle Length (s)				141.3	Sum of lost time (s)			22.3				
Intersection Capacity Utilization				81.0%	ICU Level of Service			D				
Analysis Period (min)	15											
Description: Last Update: Feb 2018												
c Critical Lane Group												

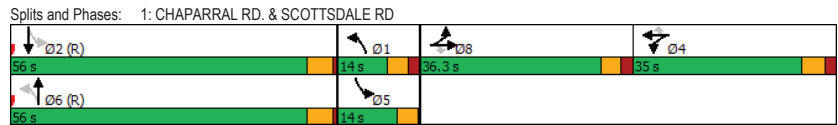
2032 Total AM Mitigated
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag			Lag			Lead
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	14	56	35	14	56	36.3
Maximum Split (%)	9.9%	39.6%	24.8%	9.9%	39.6%	25.7%
Minimum Split (s)	10.6	22.4	35	14	26.4	36.3
Yellow Time (s)	3.6	4.4	4	3.5	4.4	3.3
All-Red Time (s)	2	1	2	0.5	1	2
Minimum Initial (s)	5	10	7	4	10	7
Vehicle Extension (s)	2	0.2	2	3	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	9
Flash Dont Walk (s)		10	22		14	22
Dual Entry	No	Yes	No	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	106	50	15	106	50	120
End Time (s)	120	106	50	120	106	15
Yield/Force Off (s)	114.4	100.6	44	116	100.6	9.7
Yield/Force Off 170(s)	114.4	90.6	22	116	86.6	129
Local Start Time (s)	56	0	106.3	56	0	70
Local Yield (s)	64.4	50.6	135.3	66	50.6	101
Local Yield 170(s)	64.4	40.6	113.3	66	36.6	79

Intersection Summary

Cycle Length	141.3
Control Type	Actuated-Coordinated
Natural Cycle	145
Offset: 50 (35%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Total AM Mitigated
3: HIGHLAND AVE/Granada Ave & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	420	22	28	11	5	19	28	993	27	42	870	63
Future Volume (vph)	420	22	28	11	5	19	28	993	27	42	870	63
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.88		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3252	1781		1676	1728		1676	5327		1676	5293	
Flt Permitted	0.95	1.00		0.95	1.00		0.25	1.00		0.21	1.00	
Satd. Flow (perm)	3252	1781		1676	1728		450	5327		370	5293	
Peak-hour factor, PHF	0.91	0.91	0.91	0.81	0.81	0.81	0.88	0.88	0.88	0.93	0.93	0.93
Adj. Flow (vph)	462	24	31	14	6	23	32	1128	31	45	935	68
RTOR Reduction (vph)	0	25	0	0	22	0	0	2	0	0	5	0
Lane Group Flow (vph)	462	30	0	14	7	0	32	1157	0	45	998	0
Confl. Peds. (#/hr)			2						4			2
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4		6	6		2	2	
Permitted Phases							6			2		
Actuated Green, G (s)	22.8	22.8		4.3	4.3		78.1	78.1		78.1	78.1	
Effective Green, g (s)	22.8	22.8		4.3	4.3		78.1	78.1		78.1	78.1	
Actuated g/C Ratio	0.19	0.19		0.04	0.04		0.64	0.64		0.64	0.64	
Clearance Time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	612	335		59	61		290	3435		238	3413	
v/s Ratio Prot	c0.14	0.02		c0.01	0.00			c0.22			0.19	
v/s Ratio Perm							0.07			0.12		
v/c Ratio	0.75	0.09		0.24	0.11		0.11	0.34		0.19	0.29	
Uniform Delay, d1	46.5	40.6		56.8	56.6		8.2	9.8		8.7	9.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.7	0.0		0.8	0.3		0.8	0.3		1.8	0.2	
Delay (s)	51.2	40.6		57.6	56.8		9.0	10.0		10.4	9.6	
Level of Service	D	D		E	E		A	B		B	A	
Approach Delay (s)	50.1			57.1			10.0			9.7		
Approach LOS	D			E			A			A		

Intersection Summary

HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	15.9
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			

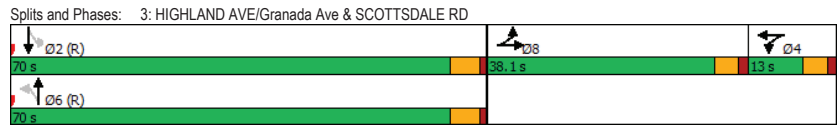
c Critical Lane Group

2032 Total AM Mitigated
3: HIGHLAND AVE/Granada Ave & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

	↓	↘	↑	↗
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	70	13	70	38.1
Maximum Split (%)	57.8%	10.7%	57.8%	31.5%
Minimum Split (s)	30.7	13	28.7	38.1
Yellow Time (s)	4.4	3.6	4.4	3.6
All-Red Time (s)	1.3	1.5	1.3	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	1	2	1	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8		7	9
Flash Dont Walk (s)	17		16	24
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	42	29	42	112
End Time (s)	112	42	112	29
Yield/Force Off (s)	106.3	36.9	106.3	23.9
Yield/Force Off 170(s)	89.3	36.9	90.3	121
Local Start Time (s)	0	108.1	0	70
Local Yield (s)	64.3	116	64.3	103
Local Yield 170(s)	47.3	116	48.3	79

Intersection Summary	
Cycle Length	121.1
Control Type	Actuated-Coordinated
Natural Cycle	85
Offset: 42 (35%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Total AM Mitigated
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↖	→	↘	↙	←	↗	↖	↗	↘	↙	↖	↗
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SEB
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	94	1370	117	188	1252	60	245	406	188	67	252	63
Future Volume (vph)	94	1370	117	188	1252	60	245	406	188	67	252	63
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	7.0	4.0	7.0	4.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.98
Ftpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5285		1676	5313		1676	1961	1479	1676	1961	1477
Flt Permitted	0.11	1.00		0.08	1.00		0.43	1.00	1.00	0.15	1.00	1.00
Satd. Flow (perm)	202	5285		142	5313		759	1961	1479	268	1961	1477
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	102	1489	127	204	1361	65	266	441	204	73	274	68
RTOR Reduction (vph)	0	9	0	0	4	0	0	0	96	0	0	51
Lane Group Flow (vph)	102	1607	0	204	1422	0	266	441	108	73	274	17
Conf. Peds. (#/hr)			1			5			2			3
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	3		4	3		2	1	2	1	2	1
Permitted Phases	3			3			1		1	1		1
Actuated Green, G (s)	55.1	50.1		55.1	50.1		31.1	27.1	27.1	31.1	27.1	27.1
Effective Green, g (s)	55.1	50.1		55.1	50.1		31.1	27.1	27.1	31.1	27.1	27.1
Actuated g/C Ratio	0.51	0.47		0.51	0.47		0.29	0.25	0.25	0.29	0.25	0.25
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	172	2469		144	2483		254	495	373	130	495	373
v/s Ratio Prot	0.03	0.30		c0.07	0.27		c0.04	0.22		0.02	0.14	
v/s Ratio Perm	0.28			c0.66			c0.26		0.07	0.14		0.01
v/c Ratio	0.59	0.65		1.42	0.57		1.05	0.89	0.29	0.56	0.55	0.05
Uniform Delay, d1	33.3	21.9		36.7	20.8		40.7	38.6	32.3	45.8	34.8	30.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.6	0.5		223.2	0.2		69.4	17.5	0.2	3.3	0.8	0.0
Delay (s)	36.9	22.3		259.9	21.0		110.1	56.2	32.5	49.1	35.6	30.3
Level of Service	D	C		F	C		F	E	C	D	D	C
Approach Delay (s)		23.2			50.9			66.6			37.1	
Approach LOS		C			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	42.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	107.2	Sum of lost time (s)	21.0
Intersection Capacity Utilization	98.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

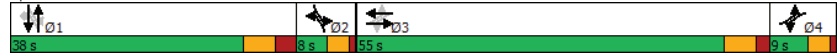
2032 Total AM Mitigated
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

	1	2	3	4
Phase Number	1	2	3	4
Movement	NBSB NBSBL	EBWB EBWBL		
Lead/Lag	Lead Lag	Lead Lag		
Lead-Lag Optimize				
Recall Mode	None	None	Ped	Min
Maximum Split (s)	38	8	55	9
Maximum Split (%)	34.5%	7.3%	50.0%	8.2%
Minimum Split (s)	37	8	56	8
Yellow Time (s)	4.2	3	4.2	3
All-Red Time (s)	2.8	1	1.8	1
Minimum Initial (s)	8	4	10	4
Vehicle Extension (s)	2	1	1	1
Minimum Gap (s)	3	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		33	
Flash Dont Walk (s)	23		17	
Dual Entry	No	No	No	No
Inhibit Max	No	Yes	No	Yes
Start Time (s)	0	38	46	101
End Time (s)	38	46	101	0
Yield/Force Off (s)	31	42	95	106
Yield/Force Off 170(s)	8	42	78	106
Local Start Time (s)	72	0	8	63
Local Yield (s)	103	4	57	68
Local Yield 170(s)	80	4	40	68

Intersection Summary	
Cycle Length	110
Control Type	Semi Act-Uncoord
Natural Cycle	110

Splits and Phases: 5: 68th Street & CAMELBACK RD.



2032 Total AM Mitigated
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔↔	↔↔	↔	↔↔	↔↔↔	↔
Traffic Volume (vph)	235	1098	207	63	858	49	166	292	44	18	426	615
Future Volume (vph)	235	1098	207	63	858	49	166	292	44	18	426	615
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	0.97	0.91	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5353	1479	1676	5305		3252	3725	1490	3252	5353	1491
Flt Permitted	0.15	1.00	1.00	0.10	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	269	5353	1479	172	5305		3252	3725	1490	3252	5353	1491
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	270	1262	238	74	1009	58	189	332	50	20	473	683
RTOR Reduction (vph)	0	0	80	0	5	0	0	0	31	0	0	44
Lane Group Flow (vph)	270	1262	158	74	1062	0	189	332	19	20	473	639
Conf. Peds. (#/hr)			2			2			5			3
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	3	8		7	4		1	6	7	5	2	3
Permitted Phases	8		8	4				6				2
Actuated Green, G (s)	70.5	41.1	41.1	70.5	41.1		10.5	17.3	46.7	11.6	18.4	47.8
Effective Green, g (s)	70.5	41.1	41.1	70.5	41.1		10.5	17.3	46.7	11.6	18.4	47.8
Actuated g/C Ratio	0.58	0.34	0.34	0.58	0.34		0.09	0.14	0.38	0.10	0.15	0.39
Clearance Time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Vehicle Extension (s)	2.0	0.2	0.2	2.0	0.2		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	496	1809	499	463	1793		280	529	640	310	809	654
v/s Ratio Prot	0.13	c0.24		0.04	0.20		c0.06	0.09	0.01	0.01	0.09	c0.24
v/s Ratio Perm	0.18		0.11	0.05					0.01			0.19
v/c Ratio	0.54	0.70	0.32	0.16	0.59		0.68	0.63	0.03	0.06	0.58	0.98
Uniform Delay, d1	27.9	34.9	29.8	27.5	33.3		53.9	49.1	23.3	50.1	48.0	36.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	1.0	0.1	0.1	0.4		5.0	5.6	0.0	0.0	3.1	29.2
Delay (s)	28.5	35.8	30.0	27.6	33.7		58.9	54.7	23.3	50.1	51.1	65.5
Level of Service	C	D	C	C	C		E	D	C	D	D	E
Approach Delay (s)	33.9			33.3			53.3				59.5	
Approach LOS	C			C			D				E	

Intersection Summary	
HCM 2000 Control Delay	42.6
HCM 2000 Volume to Capacity ratio	0.88
Actuated Cycle Length (s)	121.6
Intersection Capacity Utilization	92.2%
Analysis Period (min)	15
Description: Last Update: Sept 2017	
c Critical Lane Group	

2032 Total AM Mitigated
6: GOLDWATER BLVD & CAMELBACK RD.

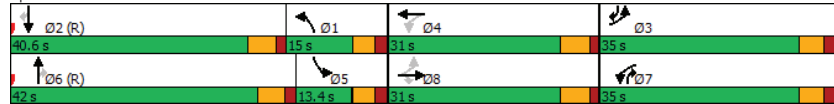
Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBTL	SBL	NBT	WBL	EBTL
Lead/Lag	Lag	Lead			Lag	Lead		
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Ped	Min	C-Min	None	Ped
Maximum Split (s)	15	40.6	35	31	13.4	42	35	31
Maximum Split (%)	12.3%	33.4%	28.8%	25.5%	11.0%	34.5%	28.8%	25.5%
Minimum Split (s)	11	40.6	11	31	11	35.6	11	33
Yellow Time (s)	3.3	4	3.6	4.4	3.3	4	3.6	4.4
All-Red Time (s)	2	1.6	2	1.3	2	1.6	2	1.3
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	0.2	2	2	2	0.2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		7		7		7
Flash Dont Walk (s)		27		24		23		26
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	40.6	0	86.6	55.6	42	0	86.6	55.6
End Time (s)	55.6	40.6	0	86.6	55.6	42	0	86.6
Yield/Force Off (s)	50.3	35	116	80.9	50.3	36.4	116	80.9
Yield/Force Off 170(s)	50.3	8	116	56.9	50.3	13.4	116	54.9
Local Start Time (s)	40.6	0	86.6	55.6	42	0	86.6	55.6
Local Yield (s)	50.3	35	116	80.9	50.3	36.4	116	80.9
Local Yield 170(s)	50.3	8	116	56.9	50.3	13.4	116	54.9

Intersection Summary

Cycle Length	121.6
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green	

Splits and Phases: 6: GOLDWATER BLVD & CAMELBACK RD.



2032 Total AM Mitigated
8: Stetson Dr/DRINKWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	17	23	16	52	370	23	495	18	253	545	133
Future Volume (vph)	66	17	23	16	52	370	23	495	18	253	545	133
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2	5.0	5.1	5.1		5.0	5.1	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1767		1676	1961	1445	1676	3702		3252	3555	
Flt Permitted	0.72	1.00		0.72	1.00	1.00	0.38	1.00		0.38	1.00	
Satd. Flow (perm)	1269	1767		1278	1961	1445	671	3702		1295	3555	
Peak-hour factor, PHF	0.80	0.80	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	82	21	29	18	58	411	26	550	20	266	574	140
RTOR Reduction (vph)	0	0	0	0	0	110	0	2	0	0	14	0
Lane Group Flow (vph)	83	50	0	18	58	301	26	568	0	266	700	0
Confl. Peds. (#/hr)			8			35			14			18
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		8			4	5		6			5	2
Permitted Phases	8			4		4	6				2	
Actuated Green, G (s)	25.6	25.6		25.6	25.6	35.5	69.2	69.2		84.1	84.1	
Effective Green, g (s)	25.6	25.6		25.6	25.6	35.5	69.2	69.2		84.1	84.1	
Actuated g/C Ratio	0.21	0.21		0.21	0.21	0.30	0.58	0.58		0.70	0.70	
Clearance Time (s)	5.2	5.2		5.2	5.2	5.0	5.1	5.1		5.0	5.1	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	270	376		272	418	427	386	2134		1069	2491	
v/s Ratio Prot		0.03			0.03	c0.06		0.15		0.02	c0.20	
v/s Ratio Perm	0.07			0.01		0.15	0.04			0.15		
v/c Ratio	0.31	0.13		0.07	0.14	0.71	0.07	0.27		0.25	0.28	
Uniform Delay, d1	39.7	38.2		37.7	38.3	37.6	11.2	12.7		6.4	6.7	
Progression Factor	1.00	1.00		0.92	0.95	1.48	1.00	1.00		0.34	0.27	
Incremental Delay, d2	0.2	0.1		0.0	0.1	4.3	0.3	0.3		0.0	0.2	
Delay (s)	40.0	38.3		34.6	36.4	60.1	11.5	13.0		2.2	2.1	
Level of Service	D	D		C	D	E	B	B		A	A	
Approach Delay (s)		39.3			56.3			12.9			2.1	
Approach LOS		D			E			B			A	

Intersection Summary

HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

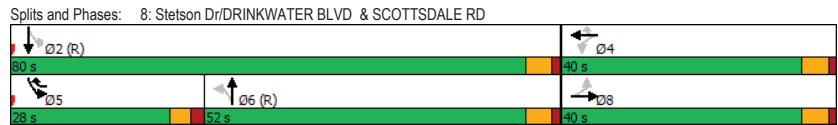
2032 Total AM Mitigated
8: Stetson Dr/DRINKWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

	2	4	5	6	8
Phase Number	2	4	5	6	8
Movement	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag			Lead	Lag	
Lead-Lag Optimize					
Recall Mode	C-Max	None	None	C-Max	None
Maximum Split (s)	80	40	28	52	40
Maximum Split (%)	66.7%	33.3%	23.3%	43.3%	33.3%
Minimum Split (s)	21.1	37.2	10	38.1	33.2
Yellow Time (s)	3.6	4	3	3.6	4
All-Red Time (s)	1.5	1.2	2	1.5	1.2
Minimum Initial (s)	10	7	5	10	7
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	9	9		9	7
Flash Dont Walk (s)	7	23		24	21
Dual Entry	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	93	53	93	1	53
End Time (s)	53	93	1	53	93
Yield/Force Off (s)	47.9	87.8	116	47.9	87.8
Yield/Force Off 170(s)	40.9	64.8	116	23.9	66.8
Local Start Time (s)	0	80	0	28	80
Local Yield (s)	74.9	114.8	23	74.9	114.8
Local Yield 170(s)	67.9	91.8	23	50.9	93.8

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 93 (78%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Total AM Mitigated
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑	↑	↑↑	↑↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	218	790	90	68	689	45	83	426	16	51	521	104
Future Volume (vph)	218	790	90	68	689	45	83	426	16	51	521	104
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	1000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.0	3.0	5.3	5.0		5.3	5.3		5.3	5.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		1.00	0.95		1.00	0.91	
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3317	3725	1510	3317	3692		1710	1854		1710	5224	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3317	3725	1510	3317	3692		1710	1854		1710	5224	
Peak-hour factor, PHF	0.87	0.87	0.87	0.89	0.89	0.89	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	251	908	103	76	774	51	101	520	20	62	635	127
RTOR Reduction (vph)	0	0	61	0	4	0	0	2	0	0	28	0
Lane Group Flow (vph)	251	908	42	76	821	0	101	538	0	62	734	0
Conf. Peds. (#/hr)			1			1						2
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	14.2	50.0	50.0	7.0	42.8		21.9	40.5		7.9	26.5	
Effective Green, g (s)	14.2	50.0	52.0	7.0	42.8		21.9	40.5		7.9	26.5	
Actuated g/C Ratio	0.11	0.40	0.41	0.06	0.34		0.17	0.32		0.06	0.21	
Clearance Time (s)	5.3	5.0	5.0	5.3	5.0		5.3	5.3		5.3	5.3	
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0		2.0	1.0		2.0	1.0	
Lane Grp Cap (vph)	372	1474	621	183	1251		296	594		106	1096	
v/s Ratio Prot	c0.08	0.24		0.02	c0.22		0.06	c0.29		c0.04	0.14	
v/s Ratio Perm			0.03									
v/c Ratio	0.67	0.62	0.07	0.42	0.66		0.34	0.91		0.58	0.67	
Uniform Delay, d1	53.8	30.5	22.5	57.7	35.5		45.9	41.1		57.6	45.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.8	1.9	0.2	0.6	2.7		0.3	17.0		5.2	1.3	
Delay (s)	57.6	32.4	22.7	58.2	38.2		46.1	58.1		62.8	47.2	
Level of Service	E	C	C	E	D		D	E		E	D	
Approach Delay (s)		36.6			39.9			56.2			48.3	
Approach LOS		D			D			E			D	

Intersection Summary

HCM 2000 Control Delay	43.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	126.3	Sum of lost time (s)	20.9
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Total AM Mitigated
 21: GOLDWATER BLVD & INDIAN SCHOOL

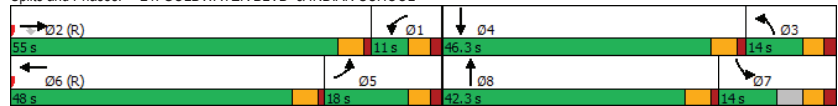
Southbridge Expansion
 Timing Report, Sorted By Phase

	←		→		↖		↗		↙		↘		↑	
Phase Number	1	2	3	4	5	6	7	8						
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT						
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead						
Lead-Lag Optimize														
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min						
Maximum Split (s)	11	55	14	46.3	18	48	14	42.3						
Maximum Split (%)	8.7%	43.5%	11.1%	36.7%	14.3%	38.0%	11.1%	33.5%						
Minimum Split (s)	11	37	11	46.3	11	35	11	42.3						
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4						
All-Red Time (s)	2	1	2	1.3	2	1	2	1.3						
Minimum Initial (s)	5	10	5	7	5	10	5	7						
Vehicle Extension (s)	2	1	2	1	2	1	2	1						
Minimum Gap (s)	1	1	1	1	1	1	1	1						
Time Before Reduce (s)	0	0	0	0	0	0	0	0						
Time To Reduce (s)	0	0	0	0	0	0	0	0						
Walk Time (s)		8		9		8		9						
Flash Dont Walk (s)		24		32		22		28						
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes						
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
Start Time (s)	75	20	6	86	68	20	2	86						
End Time (s)	86	75	20	6	86	68	20	2						
Yield/Force Off (s)	80.7	70	14.7	0.7	80.7	63	14.7	123						
Yield/Force Off 170(s)	80.7	46	14.7	0.7	80.7	41	14.7	123						
Local Start Time (s)	55	0	112.3	66	48	0	108.3	66						
Local Yield (s)	60.7	50	121	107	60.7	43	121	103						
Local Yield 170(s)	60.7	26	121	107	60.7	21	121	103						

Intersection Summary

Cycle Length	126.3
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 20 (16%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	

Splits and Phases: 21: GOLDWATER BLVD & INDIAN SCHOOL



2032 Total AM Mitigated
 28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
 HCM Signalized Intersection Capacity Analysis

	←		→		↖		↗		↙		↘		↑	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	↔		
Traffic Volume (vph)	5	8	8	270	14	24	63	311	1	54	410	22		
Future Volume (vph)	5	8	8	270	14	24	63	311	1	54	410	22		
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800		
Total Lost time (s)		4.9		4.9		4.9		5.2		5.2		5.2		
Lane Util. Factor		1.00		0.95		0.95		1.00		0.95		1.00		0.91
Frbp, ped/bikes		0.99		1.00		1.00		1.00		1.00		1.00		1.00
Flpb, ped/bikes		1.00		1.00		1.00		1.00		1.00		1.00		1.00
Frt		0.95		1.00		0.98		1.00		1.00		1.00		0.99
Flt Protected		0.99		0.95		0.96		0.95		1.00		0.95		1.00
Satd. Flow (prot)		1827		1593		1748		1676		3724		1676		5305
Flt Permitted		0.99		0.95		0.96		0.46		1.00		0.52		1.00
Satd. Flow (perm)		1827		1593		1748		813		3724		924		5305
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.82	0.82	0.82	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	6	10	10	310	16	28	77	379	1	62	471	25		
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	2	0		
Lane Group Flow (vph)	0	26	0	180	169	0	77	380	0	62	494	0		
Conf. Peds. (#/hr)			2			3		7				2		
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA			
Protected Phases	8	8		4	4			6		6		2		
Permitted Phases							6					2		
Actuated Green, G (s)		9.3		21.5	21.5		99.0	99.0		99.0		99.0		
Effective Green, g (s)		9.3		21.5	21.5		99.0	99.0		99.0		99.0		
Actuated g/C Ratio		0.06		0.15	0.15		0.68	0.68		0.68		0.68		
Clearance Time (s)		4.9		4.9	4.9		5.2	5.2		5.2		5.2		
Vehicle Extension (s)		2.0		2.0	2.0		2.0	2.0		2.0		2.0		
Lane Grp Cap (vph)		117		236	259		555	2546		631		3627		
v/s Ratio Prot		c0.01		c0.11	0.10			c0.10				0.09		
v/s Ratio Perm							0.09					0.07		
v/c Ratio		0.22		0.76	0.65		0.14	0.15		0.10		0.14		
Uniform Delay, d1		64.3		59.2	58.1		8.0	8.1		7.8		8.0		
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00		1.00		
Incremental Delay, d2		0.4		12.3	4.4		0.5	0.1		0.3		0.1		
Delay (s)		64.7		71.5	62.6		8.5	8.2		8.1		8.1		
Level of Service		E		E	E		A	A		A		A		
Approach Delay (s)		64.7			67.1			8.2				8.1		
Approach LOS		E			E			A				A		

Intersection Summary

HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	144.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		

Description: Last Update: Sept 2017

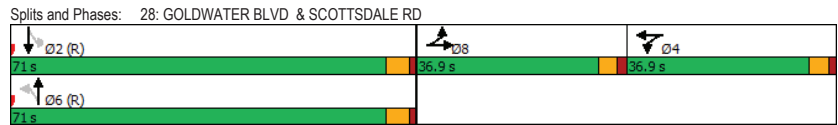
c Critical Lane Group

2032 Total AM Mitigated
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

	↓	↘	↑	↙
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	71	36.9	71	36.9
Maximum Split (%)	49.0%	25.5%	49.0%	25.5%
Minimum Split (s)	23.2	36.9	27.2	36.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	8	8	9
Flash Dont Walk (s)	11	24	14	23
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	24	131.9	24	95
End Time (s)	95	24	95	131.9
Yield/Force Off (s)	89.8	19.1	89.8	127
Yield/Force Off 170(s)	78.8	139.9	75.8	104
Local Start Time (s)	0	107.9	0	71
Local Yield (s)	65.8	139.9	65.8	103
Local Yield 170(s)	54.8	115.9	51.8	80

Intersection Summary	
Cycle Length	144.8
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 24 (17%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Total PM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↘	→	↙	↗	←	↖	↘	↗	↙	↖	↘	↗
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘
Traffic Volume (vph)	127	175	72	487	204	267	56	2095	439	246	2177	71
Future Volume (vph)	127	175	72	487	204	267	56	2095	439	246	2177	71
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4	4.0	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	0.95	1.00	1.00
Fr	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	1.00	1.00	0.85	1.00
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1676	1945	1500	3252	1945	1500	1676	5200	1676	3711	1500	1500
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.07	1.00	0.07	1.00	1.00	1.00
Satd. Flow (perm)	1676	1945	1500	3252	1945	1500	132	5200	120	3711	1500	1500
Peak-hour factor, PHF	0.85	0.85	0.85	0.83	0.83	0.83	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	206	85	587	246	322	59	2205	462	259	2292	75
RTOR Reduction (vph)	0	0	0	0	0	249	0	20	0	0	0	41
Lane Group Flow (vph)	149	206	85	587	246	73	59	2647	0	259	2292	34
Bus Blockages (#/hr)	0	2	0	0	2	0	0	2	0	0	2	0
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	Perm
Protected Phases	8	8		4	4		1	6	5	2		
Permitted Phases			8			4	6		2		2	
Actuated Green, G (s)	20.7	20.7	20.7	30.3	30.3	30.3	60.0	53.6	79.0	65.6	65.6	65.6
Effective Green, g (s)	20.7	20.7	20.7	30.3	30.3	30.3	60.0	53.6	79.0	65.6	65.6	65.6
Actuated g/C Ratio	0.14	0.14	0.14	0.21	0.21	0.21	0.41	0.37	0.54	0.45	0.45	0.45
Clearance Time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4	4.0	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.2	3.0	0.2	0.2	0.2
Lane Grp Cap (vph)	238	277	213	678	405	312	122	1918	279	1675	677	677
v/s Ratio Prot	0.09	c0.11		c0.18	0.13		0.02	0.51	c0.13	c0.62		
v/s Ratio Perm			0.06			0.05	0.18		0.38		0.02	
w/C Ratio	0.63	0.74	0.40	0.87	0.61	0.23	0.48	1.38	0.93	1.37	0.05	
Uniform Delay, d1	58.7	59.8	56.6	55.5	52.1	47.8	64.5	45.9	57.8	39.9	22.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.7	9.1	0.4	10.9	1.8	0.1	1.1	174.3	35.0	169.7	0.1	
Delay (s)	62.3	68.8	57.1	66.4	53.9	48.0	65.6	220.2	92.7	209.5	22.5	
Level of Service	E	E	E	E	D	D	E	F	F	F	C	
Approach Delay (s)		64.4			58.6		216.8			192.7		
Approach LOS		E			E		F			F		

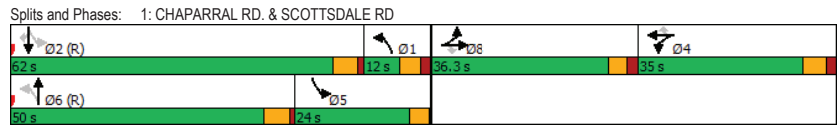
Intersection Summary	
HCM 2000 Control Delay	171.7
HCM 2000 Volume to Capacity ratio	1.15
Actuated Cycle Length (s)	145.3
Intersection Capacity Utilization	105.0%
Analysis Period (min)	15
Description: Last Update: April 2018	
c Critical Lane Group	

2032 Total PM
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

	1	2	4	5	6	8
Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag	Lag	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	12	62	35	24	50	36.3
Maximum Split (%)	8.3%	42.7%	24.1%	16.5%	34.4%	25.0%
Minimum Split (s)	12.6	22.4	35	11	26.4	36.3
Yellow Time (s)	3.6	4.4	4	3.5	4.4	3.3
All-Red Time (s)	2	1	2	0.5	1	2
Minimum Initial (s)	7	12	7	7	12	7
Vehicle Extension (s)	2	0.2	2	3	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7	7	7	9
Flash Dont Walk (s)		10	22		14	22
Dual Entry	No	Yes	No	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	4.7	88	53	138	88	16.7
End Time (s)	16.7	4.7	88	16.7	138	53
Yield/Force Off (s)	11.1	144.6	82	12.7	132.6	47.7
Yield/Force Off 170(s)	11.1	134.6	60	12.7	118.6	25.7
Local Start Time (s)	62	0	110.3	50	0	74
Local Yield (s)	68.4	56.6	139.3	70	44.6	105
Local Yield 170(s)	68.4	46.6	117.3	70	30.6	83

Intersection Summary	
Cycle Length	145.3
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 88 (61%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Total PM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	179	20	218	20	5	25	51	2467	67	16	1055	44
Future Volume (vph)	179	20	218	20	5	25	51	2467	67	16	1055	44
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1	5.1	5.6	5.6	5.6	5.6	5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	1.00	1.00	1.00	1.00	1.00	0.99	1.00
Flt Protected	0.95	1.00	1.00	0.96	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1961	1500	1886	1480	1676	5328	1676	5315	1676	5315	1676
Flt Permitted	0.74	1.00	1.00	0.82	1.00	0.18	1.00	0.04	1.00	0.04	1.00	1.00
Satd. Flow (perm)	1303	1961	1500	1610	1480	314	5328	78	5315	78	5315	1676
Peak-hour factor, PHF	0.81	0.81	0.81	0.86	0.86	0.86	0.90	0.90	0.90	0.83	0.83	0.83
Adj. Flow (vph)	221	25	269	23	6	29	57	2741	74	19	1271	53
RTOR Reduction (vph)	0	0	59	0	0	17	0	2	0	0	3	0
Lane Group Flow (vph)	221	25	210	0	29	12	57	2813	0	19	1321	0
Confl. Peds. (#/hr)						1			2			2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		8			4			6				2
Permitted Phases	8		8	4		4	6				2	
Actuated Green, G (s)	26.1	26.1	26.1		26.1	26.1	90.3	90.3			90.3	90.3
Effective Green, g (s)	26.1	26.1	26.1		26.1	26.1	90.3	90.3			90.3	90.3
Actuated g/C Ratio	0.21	0.21	0.21		0.21	0.21	0.71	0.71			0.71	0.71
Clearance Time (s)	5.1	5.1	5.1		5.1	5.1	5.6	5.6			5.6	5.6
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	267	402	308		330	303	223	3785			55	3776
v/s Ratio Prot		0.01						c0.53				0.25
v/s Ratio Perm	c0.17		0.14		0.02	0.01	0.18				0.24	
v/c Ratio	0.83	0.06	0.68		0.09	0.04	0.26	0.74			0.35	0.35
Uniform Delay, d1	48.3	40.6	46.7		40.9	40.4	6.5	11.3			7.1	7.1
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	17.8	0.0	4.9		0.0	0.0	2.7	1.4			16.4	0.3
Delay (s)	66.2	40.7	51.6		40.9	40.5	9.3	12.6			23.4	7.3
Level of Service	E	D	D		D	D	A	B			C	A
Approach Delay (s)		57.3			40.7			12.6				7.6
Approach LOS		E			D			B				A

Intersection Summary	
HCM 2000 Control Delay	16.3
HCM 2000 Volume to Capacity ratio	0.76
Actuated Cycle Length (s)	127.1
Intersection Capacity Utilization	76.9%
Analysis Period (min)	15
Sum of lost time (s)	10.7
ICU Level of Service	D
Description: Last Update: Sept 2017	

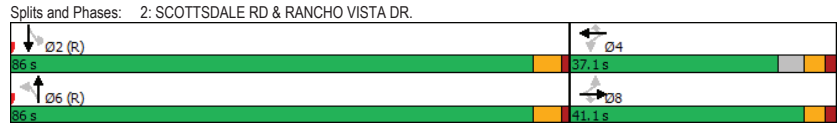
c Critical Lane Group

2032 Total PM
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
Timing Report, Sorted By Phase

	2	4	6	8
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	86	37.1	86	41.1
Maximum Split (%)	67.7%	29.2%	67.7%	32.3%
Minimum Split (s)	16	37.1	16	41.1
Yellow Time (s)	4.4	3.3	4.4	3.3
All-Red Time (s)	1.2	1.8	1.2	1.8
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	11
Flash Dont Walk (s)	18	25	13	25
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	76	34.9	76	34.9
End Time (s)	34.9	76	34.9	76
Yield/Force Off (s)	29.3	70.9	29.3	70.9
Yield/Force Off 170(s)	11.3	45.9	16.3	45.9
Local Start Time (s)	0	86	0	86
Local Yield (s)	80.4	122	80.4	122
Local Yield 170(s)	62.4	97	67.4	97

Intersection Summary	
Cycle Length	127.1
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 76 (60%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Total PM
3: SCOTTSDALE RD & HIGHLAND AVE/Granada Ave

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

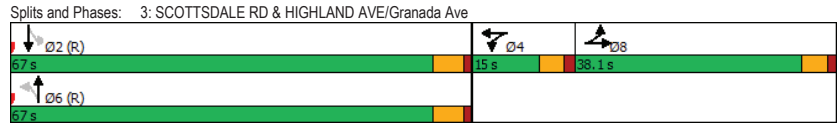
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔		↔	↔		↔↔↔	↔↔↔		↔↔	↔↔	↔↔
Traffic Volume (vph)	810	22	58	32	22	44	52	1674	37	15	1305	103
Future Volume (vph)	810	22	58	32	22	44	52	1674	37	15	1305	103
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.90		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3252	1730		1676	1766		1676	5333		1676	5289	
Flt Permitted	0.95	1.00		0.95	1.00		0.09	1.00		0.07	1.00	
Satd. Flow (perm)	3252	1730		1676	1766		154	5333		117	5289	
Peak-hour factor, PHF	0.85	0.85	0.85	0.80	0.80	0.80	0.91	0.91	0.91	0.87	0.87	0.87
Adj. Flow (vph)	953	26	68	40	28	55	57	1840	41	17	1500	118
RTOR Reduction (vph)	0	48	0	0	7	0	0	2	0	0	7	0
Lane Group Flow (vph)	953	46	0	40	76	0	57	1879	0	17	1611	0
Confl. Peds. (#/hr)			2						2			2
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6			2	
Permitted Phases							6				2	
Actuated Green, G (s)	35.8	35.8		7.9	7.9		60.5	60.5		60.5	60.5	
Effective Green, g (s)	35.8	35.8		7.9	7.9		60.5	60.5		60.5	60.5	
Actuated g/C Ratio	0.30	0.30		0.07	0.07		0.50	0.50		0.50	0.50	
Clearance Time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	969	515		110	116		77	2686		58	2664	
v/s Ratio Prot	c0.29	0.03		0.02	c0.04			0.35			0.30	
v/s Ratio Perm							c0.37				0.15	
v/c Ratio	0.98	0.09		0.36	0.65		0.74	0.70		0.29	0.60	
Uniform Delay, d1	41.9	30.4		53.7	54.8		23.6	22.8		17.4	21.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	24.7	0.0		0.7	9.6		47.4	1.5		12.4	1.0	
Delay (s)	66.5	30.4		54.4	64.3		71.0	24.4		29.7	22.3	
Level of Service	E	C		D	E		E	C		C	C	
Approach Delay (s)		63.3			61.1			25.7			22.4	
Approach LOS		E			E			C			C	

Intersection Summary	
HCM 2000 Control Delay	33.8
HCM 2000 Volume to Capacity ratio	0.81
Actuated Cycle Length (s)	120.1
Intersection Capacity Utilization	84.7%
Analysis Period (min)	15
Description: Last Update: Sept 2017	
c Critical Lane Group	

2032 Total PM
3: SCOTTSDALE RD & HIGHLAND AVE/Granada Ave

Southbridge Expansion
Timing Report, Sorted By Phase

	↓	↘	↑	↙
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	67	15	67	38.1
Maximum Split (%)	55.8%	12.5%	55.8%	31.7%
Minimum Split (s)	30.7	15.1	28.7	38.1
Yellow Time (s)	4.4	3.6	4.4	3.6
All-Red Time (s)	1.3	1.5	1.3	1.5
Minimum Initial (s)	10	10	10	10
Vehicle Extension (s)	1	2	1	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8		7	9
Flash Dont Walk (s)	17		16	24
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	94	40.9	94	55.9
End Time (s)	40.9	55.9	40.9	94
Yield/Force Off (s)	35.2	50.8	35.2	88.9
Yield/Force Off 170(s)	18.2	50.8	19.2	64.9
Local Start Time (s)	0	67	0	82
Local Yield (s)	61.3	76.9	61.3	115
Local Yield 170(s)	44.3	76.9	45.3	91
Intersection Summary				
Cycle Length	120.1			
Control Type	Actuated-Coordinated			
Natural Cycle	85			
Offset: 94 (78%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				



2032 Total PM
4: Fashion Square Dr & Goldwater Blvd

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

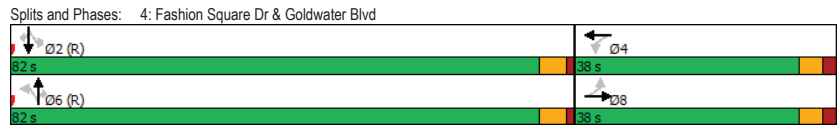
	↘	→	↙	↗	←	↖	↘	↗	↙	↘	↗	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	80	19	68	103	5	30	41	592	87	34	1029	22
Future Volume (vph)	80	19	68	103	5	30	41	592	87	34	1029	22
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		5.5		5.5	5.5		5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.91	1.00
Frbp, ped/bikes		0.99		1.00	0.98		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.95		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1798		1676	1678		1676	3725	1460	1676	5353	1466
Flt Permitted		0.83		0.61	1.00		0.22	1.00	1.00	0.38	1.00	1.00
Satd. Flow (perm)		1531		1073	1678		386	3725	1460	674	5353	1466
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	21	74	112	5	33	45	643	95	37	1118	24
RTOR Reduction (vph)	0	20	0	0	24	0	0	0	34	0	0	9
Lane Group Flow (vph)	0	162	0	112	14	0	45	643	61	37	1118	15
Confl. Peds. (#/hr)			2			3			2			1
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6		6	2		2
Actuated Green, G (s)		32.5		32.5	32.5		76.8	76.8	76.8	76.8	76.8	76.8
Effective Green, g (s)		32.5		32.5	32.5		76.8	76.8	76.8	76.8	76.8	76.8
Actuated g/C Ratio		0.27		0.27	0.27		0.64	0.64	0.64	0.64	0.64	0.64
Clearance Time (s)		5.5		5.5	5.5		5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		414		290	454		247	2384	934	431	3425	938
v/s Ratio Prot				0.01				0.17			c0.21	
v/s Ratio Perm		c0.11		0.10			0.12		0.04	0.05		0.01
v/c Ratio		0.39		0.39	0.03		0.18	0.27	0.07	0.09	0.33	0.02
Uniform Delay, d1		35.7		35.6	32.2		8.8	9.4	8.1	8.2	9.8	7.9
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.8		3.9	0.1		1.6	0.3	0.1	0.4	0.3	0.0
Delay (s)		38.4		39.5	32.3		10.4	9.7	8.2	8.6	10.1	7.9
Level of Service		D		D	C		B	A	A	A	B	A
Approach Delay (s)		38.4			37.7			9.5			10.0	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay	13.9		HCM 2000 Level of Service				B					
HCM 2000 Volume to Capacity ratio	0.35											
Actuated Cycle Length (s)	120.0				Sum of lost time (s)				10.7			
Intersection Capacity Utilization	56.6%		ICU Level of Service				B					
Analysis Period (min)	15											
c Critical Lane Group												

2032 Total PM
4: Fashion Square Dr & Goldwater Blvd

Southbridge Expansion
Timing Report, Sorted By Phase

	↓	←	↑	→
Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	Max	C-Max	Max
Maximum Split (s)	82	38	82	38
Maximum Split (%)	68.3%	31.7%	68.3%	31.7%
Minimum Split (s)	28.2	21.5	22.2	21.5
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	2.2	1.2	2.2
Minimum Initial (s)	10	10	10	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	5
Flash Dont Walk (s)	16	11	10	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	82	0	82
End Time (s)	82	0	82	0
Yield/Force Off (s)	76.8	114.5	76.8	114.5
Yield/Force Off 170(s)	60.8	103.5	66.8	103.5
Local Start Time (s)	0	82	0	82
Local Yield (s)	76.8	114.5	76.8	114.5
Local Yield 170(s)	60.8	103.5	66.8	103.5

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Total PM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↖	→	↘	↙	←	↗	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘	↖ ↗ ↘
Traffic Volume (vph)	128	1361	238	255	1884	99	236	385	236	128	235	91
Future Volume (vph)	128	1361	238	255	1884	99	236	385	236	128	235	91
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5223		1676	5309		1676	1961	1470	1676	1961	1500
Flt Permitted	0.12	1.00		0.12	1.00		0.39	1.00	1.00	0.23	1.00	1.00
Satd. Flow (perm)	219	5223		219	5309		682	1961	1470	410	1961	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	1479	259	277	2048	108	257	418	257	139	255	99
RTOR Reduction (vph)	0	21	0	0	5	0	0	0	127	0	0	81
Lane Group Flow (vph)	139	1717	0	277	2151	0	257	418	130	139	255	18
Conf. Peds. (#/hr)			1			2			5			
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	3		4	3		2	1		2	1	
Permitted Phases	3			3			1		1	1		1
Actuated Green, G (s)	47.3	32.3		47.3	32.3		28.5	17.2	17.2	28.5	17.2	17.2
Effective Green, g (s)	47.3	32.3		47.3	32.3		28.5	17.2	17.2	28.5	17.2	17.2
Actuated g/C Ratio	0.49	0.33		0.49	0.33		0.29	0.18	0.18	0.29	0.18	0.18
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	332	1742		332	1771		316	348	261	268	348	266
v/s Ratio Prot	0.06	0.33		c0.13	c0.41		c0.09	c0.21		0.06	0.13	
v/s Ratio Perm	0.14			0.28			0.14		0.09	0.09		0.01
v/c Ratio	0.42	0.99		0.83	1.21		0.81	1.20	0.50	0.52	0.73	0.07
Uniform Delay, d1	33.3	32.0		36.1	32.2		34.4	39.8	35.9	36.6	37.6	33.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	18.1		15.7	102.1		14.0	114.9	0.5	0.7	6.7	0.0
Delay (s)	33.7	50.1		51.8	134.3		48.4	154.7	36.5	37.3	44.3	33.2
Level of Service	C	D		D	F		D	F	D	D	D	C
Approach Delay (s)		48.9			124.9			92.8			40.1	
Approach LOS		D			F			F			D	

Intersection Summary	
HCM 2000 Control Delay	87.5
HCM 2000 Volume to Capacity ratio	1.08
Actuated Cycle Length (s)	96.8
Intersection Capacity Utilization	89.6%
Analysis Period (min)	15
c Critical Lane Group	

2032 Total PM
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

	1		2		3		4	
Phase Number	1	2	3	4	1	2	3	4
Movement	NBSB	NBSBL	EBWB	EBWBL				
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize								
Recall Mode	None	None	None	None				
Maximum Split (s)	24	19	38	31				
Maximum Split (%)	21.4%	17.0%	33.9%	27.7%				
Minimum Split (s)	15	8	56	31				
Yellow Time (s)	4.2	3	4.2	3				
All-Red Time (s)	2.8	1	1.8	1				
Minimum Initial (s)	8	4	10	4				
Vehicle Extension (s)	2	1	1	1				
Minimum Gap (s)	1	1	1	3				
Time Before Reduce (s)	0	0	0	0				
Time To Reduce (s)	0	0	0	0				
Walk Time (s)	0		33					
Flash Dont Walk (s)	0		17					
Dual Entry	No	No	No	No				
Inhibit Max	No	No	No	No				
Start Time (s)	0	24	43	81				
End Time (s)	24	43	81	0				
Yield/Force Off (s)	17	39	75	108				
Yield/Force Off 170(s)	17	39	58	108				
Local Start Time (s)	88	0	19	57				
Local Yield (s)	105	15	51	84				
Local Yield 170(s)	105	15	34	84				

Intersection Summary	
Cycle Length	112
Control Type	Actuated-Uncoordinated
Natural Cycle	140

Splits and Phases: 5: 68th Street & CAMELBACK RD.



2032 Total PM
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔↔	↔↔	↔	↔↔	↔↔	↔
Traffic Volume (vph)	290	1243	284	68	1308	127	324	289	125	95	538	619
Future Volume (vph)	290	1243	284	68	1308	127	324	289	125	95	538	619
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	0.97	0.91	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5353	1479	1676	5275		3252	3725	1490	3252	5353	1490
Flt Permitted	0.10	1.00	1.00	0.10	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	173	5353	1479	173	5275		3252	3725	1490	3252	5353	1490
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95	0.88	0.88	0.88
Adj. Flow (vph)	315	1351	309	74	1422	138	341	304	132	108	611	703
RTOR Reduction (vph)	0	0	114	0	9	0	0	0	50	0	0	81
Lane Group Flow (vph)	315	1351	195	74	1551	0	341	304	82	108	611	622
Conf. Peds. (#/hr)			2			3			2			1
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	3	8		7	4		1	6	7	5	2	3
Permitted Phases	8		8	4				6				2
Actuated Green, G (s)	61.5	40.9	40.9	61.5	40.9		16.1	16.7	37.3	20.2	20.8	41.4
Effective Green, g (s)	61.5	40.9	40.9	61.5	40.9		16.1	16.7	37.3	20.2	20.8	41.4
Actuated g/C Ratio	0.51	0.34	0.34	0.51	0.34		0.13	0.14	0.31	0.17	0.17	0.34
Clearance Time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	344	1815	501	344	1788		434	515	530	544	923	580
v/s Ratio Prot	0.16	0.25		0.04	0.29		c0.10	0.08	0.03	c0.03	0.11	c0.18
v/s Ratio Perm	c0.31		0.13	0.07				0.03				0.23
v/c Ratio	0.92	0.74	0.39	0.22	0.87		0.79	0.59	0.16	0.20	0.66	1.07
Uniform Delay, d1	43.3	35.2	30.3	34.7	37.3		50.6	48.7	30.2	43.2	46.6	39.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	27.6	1.5	0.2	0.1	4.6		8.4	4.9	0.0	0.1	3.7	58.4
Delay (s)	70.9	36.7	30.5	34.9	41.9		59.0	53.6	30.3	43.3	50.3	98.0
Level of Service	E	D	C	C	D		E	D	C	D	D	F
Approach Delay (s)		41.2			41.6			52.0				73.4
Approach LOS		D			D			D				E

Intersection Summary	
HCM 2000 Control Delay	50.6
HCM 2000 Volume to Capacity ratio	1.01
Actuated Cycle Length (s)	120.6
Intersection Capacity Utilization	101.1%
Analysis Period (min)	15
Sum of lost time (s)	22.2
ICU Level of Service	G
Description: Last Update: Sept 2017	
c Critical Lane Group	

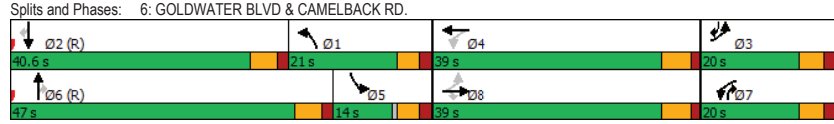
2032 Total PM
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

	↙		↓		↘		↖		↗		↙		↓		↘		↖	
Phase Number	1	2	3	4	5	6	7	8										
Movement	NBL	SBT	EBL	WBTL	SBL	NBT	WBL	EBTL										
Lead/Lag	Lag	Lead			Lag	Lead												
Lead-Lag Optimize																		
Recall Mode	None	C-Min	None	Ped	None	C-Min	None	Ped										
Maximum Split (s)	21	40.6	20	39	14	47	20	39										
Maximum Split (%)	17.4%	33.7%	16.6%	32.3%	11.6%	39.0%	16.6%	32.3%										
Minimum Split (s)	11	40.6	11	31	11	35.6	11	33										
Yellow Time (s)	3.3	4	3.6	4.4	3.3	4	3.6	4.4										
All-Red Time (s)	2	1.6	2	1.3	2	1.6	2	1.3										
Minimum Initial (s)	5	10	5	7	5	10	5	7										
Vehicle Extension (s)	2	2	2	1	2	2	2	1										
Minimum Gap (s)	1	1	1	1	1	1	1	1										
Time Before Reduce (s)	0	0	0	0	0	0	0	0										
Time To Reduce (s)	0	0	0	0	0	0	0	0										
Walk Time (s)		8		7		7		7										
Flash Dont Walk (s)		27		24		23		26										
Dual Entry	No	Yes	Yes	No	No	Yes	Yes	No										
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes										
Start Time (s)	88.6	48	28	109.6	95	48	28	109.6										
End Time (s)	109.6	88.6	48	28	109.6	95	48	28										
Yield/Force Off (s)	104.3	83	42.4	22.3	104.3	89.4	42.4	22.3										
Yield/Force Off 170(s)	104.3	56	42.4	118.9	104.3	66.4	42.4	116.9										
Local Start Time (s)	40.6	0	100.6	61.6	47	0	100.6	61.6										
Local Yield (s)	56.3	35	115	94.9	56.3	41.4	115	94.9										
Local Yield 170(s)	56.3	8	115	70.9	56.3	18.4	115	68.9										

Intersection Summary

Cycle Length	120.6
Control Type	Actuated-Coordinated
Natural Cycle	140
Offset: 48 (40%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green	



2032 Total PM
7: CAMELBACK RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

	↙		→		↘		↖		↗		↙		↓		↘		↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔						
Traffic Volume (vph)	238	736	328	126	751	222	394	1125	124	419	832	250						
Future Volume (vph)	238	736	328	126	751	222	394	1125	124	419	832	250						
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800						
Total Lost time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4						
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.91		0.97	0.95	1.00						
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	0.98						
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00						
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	1.00	0.85						
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00						
Satd. Flow (prot)	3252	3725	1480	1676	3578		3252	5260		3252	3725	1466						
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00						
Satd. Flow (perm)	3252	3725	1480	1676	3578		3252	5260		3252	3725	1466						
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.86	0.86	0.88	0.88	0.88	0.95	0.95	0.95						
Adj. Flow (vph)	259	800	357	147	873	258	448	1278	141	441	876	263						
RTOR Reduction (vph)	0	0	71	0	23	0	0	11	0	0	0	150						
Lane Group Flow (vph)	259	800	286	147	1108	0	448	1408	0	441	876	113						
Confl. Peds. (#/hr)			8			12			10			8						
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA		Prot	NA	Perm						
Protected Phases	3	8	1	7	4		1	6		5	2							
Permitted Phases			8									2						
Actuated Green, G (s)	12.7	30.5	49.4	18.2	36.0		18.9	31.8		18.6	31.7	31.7						
Effective Green, g (s)	12.7	30.5	49.4	18.2	36.0		18.9	31.8		18.6	31.7	31.7						
Actuated g/C Ratio	0.11	0.25	0.41	0.15	0.30		0.16	0.26		0.15	0.26	0.26						
Clearance Time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4						
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0						
Lane Grp Cap (vph)	342	942	668	253	1068		510	1388		501	979	385						
v/s Ratio Prot	c0.08	0.21	0.07	c0.09	c0.31		0.14	c0.27		0.14	c0.24							
v/s Ratio Perm			0.13									0.08						
v/c Ratio	0.76	0.85	0.43	0.58	1.04		0.88	1.01		0.88	0.89	0.29						
Uniform Delay, d1	52.4	42.8	25.4	47.6	42.2		49.7	44.4		49.9	42.8	35.4						
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00						
Incremental Delay, d2	8.2	7.0	0.2	2.2	37.7		15.3	27.8		16.0	12.4	1.9						
Delay (s)	60.6	49.8	25.6	49.8	79.9		64.9	72.1		65.8	55.2	37.4						
Level of Service	E	D	C	D	E		E	E		E	E	D						
Approach Delay (s)		45.7			76.5			70.4			55.2							
Approach LOS		D			E			E			E							

Intersection Summary

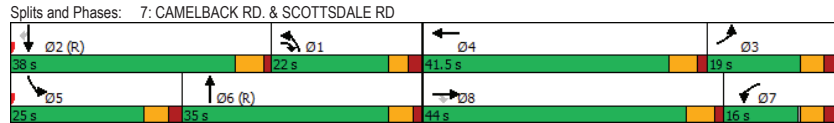
HCM 2000 Control Delay	62.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	120.5	Sum of lost time (s)	21.4
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Total PM
7: CAMELBACK RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBT	SBL	NBT	WBL	EBT
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	22	38	19	41.5	25	35	16	44
Maximum Split (%)	18.3%	31.5%	15.8%	34.4%	20.7%	29.0%	13.3%	36.5%
Minimum Split (s)	10	32.4	11	40.5	11	33	11	34.5
Yellow Time (s)	3	4.4	3.3	4	3.6	3.6	3.3	4
All-Red Time (s)	2	1	2	1.5	2	1.4	2	1.5
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		23		31		24		25
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	78	40	21	100	40	65	23.5	100
End Time (s)	100	78	40	21	65	100	40	23.5
Yield/Force Off (s)	95	72.6	34.7	15.5	59.4	95	34.7	18
Yield/Force Off 170(s)	95	49.6	34.7	105	59.4	71	34.7	113.5
Local Start Time (s)	38	0	101.5	60	0	25	104	60
Local Yield (s)	55	32.6	115.2	96	19.4	55	115.2	98.5
Local Yield 170(s)	55	9.6	115.2	65	19.4	31	115.2	73.5

Intersection Summary	
Cycle Length	120.5
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 40 (33%), Referenced to phase 2:SBT and 6:NBT, Start of 1st Green	



2032 Total PM
8: SCOTTSDALE RD & Stetson Dr/DRINKWATER BLVD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	31	40	115	45	567	22	953	32	295	836	132
Future Volume (vph)	137	31	40	115	45	567	22	953	32	295	836	132
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2	5.0	5.1	5.1		5.0	5.1	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		0.97	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1774		1676	1961	1439	1676	3703		3252	3585	
Flt Permitted	0.72	1.00		0.70	1.00	1.00	0.26	1.00		0.08	1.00	
Satd. Flow (perm)	1271	1774		1238	1961	1439	452	3703		271	3585	
Peak-hour factor, PHF	0.84	0.84	0.84	0.80	0.80	0.80	0.85	0.85	0.85	0.94	0.94	0.94
Adj. Flow (vph)	163	37	48	144	56	709	26	1121	38	314	889	140
RTOR Reduction (vph)	0	0	0	0	0	16	0	2	0	0	13	0
Lane Group Flow (vph)	163	85	0	144	56	693	26	1157	0	314	1016	0
Confl. Peds. (#/hr)			7			35			18			30
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		8			4	5		6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)	47.9	47.9		47.9	47.9	59.2	45.5	45.5		61.8	61.8	
Effective Green, g (s)	47.9	47.9		47.9	47.9	59.2	45.5	45.5		61.8	61.8	
Actuated g/C Ratio	0.40	0.40		0.40	0.40	0.49	0.38	0.38		0.51	0.51	
Clearance Time (s)	5.2	5.2		5.2	5.2	5.0	5.1	5.1		5.0	5.1	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	507	708		494	782	709	171	1404		420	1846	
v/s Ratio Prot		0.05			0.03	c0.09		c0.31		0.07	0.28	
v/s Ratio Perm	0.13			0.12		0.39	0.06			0.31		
v/c Ratio	0.32	0.12		0.29	0.07	0.98	0.15	0.82		0.75	0.55	
Uniform Delay, d1	24.8	22.8		24.5	22.3	29.8	24.5	33.6		27.7	19.7	
Progression Factor	1.00	1.00		0.44	0.45	0.77	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.3		1.5	0.2	27.5	1.9	5.6		6.3	1.2	
Delay (s)	26.5	23.1		12.2	10.1	50.4	26.4	39.2		34.0	20.9	
Level of Service	C	C		B	B	D	C	D		C	C	
Approach Delay (s)		25.3			41.8			38.9			23.9	
Approach LOS		C			D			D			C	

Intersection Summary	
HCM 2000 Control Delay	33.3
HCM 2000 Volume to Capacity ratio	0.91
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	88.4%
Analysis Period (min)	15
Description: Last Update: Sept 2017	
c Critical Lane Group	

2032 Total PM
8: SCOTTSDALE RD & Stetson Dr/DRINKWATER BLVD

Southbridge Expansion
Timing Report, Sorted By Phase

	2	4	5	6	8
Phase Number	2	4	5	6	8
Movement	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag			Lead	Lag	
Lead-Lag Optimize					
Recall Mode	C-Min	Max	Min	C-Min	Max
Maximum Split (s)	78	42	20	58	42
Maximum Split (%)	65.0%	35.0%	16.7%	48.3%	35.0%
Minimum Split (s)	21.1	37.2	15	38.1	33.2
Yellow Time (s)	3.6	4	3	3.6	4
All-Red Time (s)	1.5	1.2	2	1.5	1.2
Minimum Initial (s)	10	7	10	10	7
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	9	9		9	7
Flash Dont Walk (s)	7	23		24	21
Dual Entry	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	44	2	44	64	2
End Time (s)	2	44	64	2	44
Yield/Force Off (s)	116.9	38.8	59	116.9	38.8
Yield/Force Off 170(s)	109.9	15.8	59	92.9	17.8
Local Start Time (s)	0	78	0	20	78
Local Yield (s)	72.9	114.8	15	72.9	114.8
Local Yield 170(s)	65.9	91.8	15	48.9	93.8

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 44 (37%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	

Splits and Phases: 8: SCOTTSDALE RD & Stetson Dr/DRINKWATER BLVD



2032 Total PM
9: GOLDWATER BLVD /GOLDWATER BLVD #2 & 5TH AVE HCM Signalized Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	41	20	31	78	51	106	21	743	70	68	800	91
Future Volume (vph)	41	20	31	78	51	106	21	743	70	68	800	91
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2	5.2	4.0	4.0	4.0	5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.91	1.00	0.91
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	1.00	0.98	1.00	0.98
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1676	1961	1478	1676	1961	1472	1676	3674	1676	3674	1676	5257
Flt Permitted	0.72	1.00	1.00	0.74	1.00	1.00	0.26	1.00	0.27	1.00	0.27	1.00
Satd. Flow (perm)	1273	1961	1478	1311	1961	1472	453	3674	483	5257	483	5257
Peak-hour factor, PHF	0.80	0.92	0.80	0.92	0.92	0.92	0.81	0.81	0.92	0.92	0.85	0.85
Adj. Flow (vph)	51	22	39	85	55	115	26	917	76	74	941	107
RTOR Reduction (vph)	0	0	34	0	0	100	0	3	0	0	7	0
Lane Group Flow (vph)	51	22	5	85	55	15	26	990	0	74	1041	0
Confl. Peds. (#/hr)			2			3			3			2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		8			4			6				2
Permitted Phases	8		8	4		4	6				2	
Actuated Green, G (s)	14.4	14.4	14.4	15.6	15.6	15.6	95.2	95.2	95.2	95.2	95.2	95.2
Effective Green, g (s)	14.4	14.4	14.4	15.6	15.6	15.6	95.2	95.2	95.2	95.2	95.2	95.2
Actuated g/C Ratio	0.12	0.12	0.12	0.13	0.13	0.13	0.79	0.79	0.79	0.79	0.79	0.79
Clearance Time (s)	5.2	5.2	5.2	4.0	4.0	4.0	5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	152	235	177	170	254	191	359	2914	383	4170	383	4170
v/s Ratio Prot		0.01			0.03			c0.27				0.20
v/s Ratio Perm	0.04		0.00	c0.06		0.01	0.06				0.15	
v/c Ratio	0.34	0.09	0.03	0.50	0.22	0.08	0.07	0.34	0.19	0.25	0.19	0.25
Uniform Delay, d1	48.4	47.0	46.6	48.6	46.7	45.9	2.7	3.5	3.0	3.2	3.0	3.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.87	2.08	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.1	0.0	2.3	0.4	0.2	0.4	0.3	1.1	0.1	1.1	0.1
Delay (s)	48.9	47.1	46.6	50.9	47.2	46.1	5.4	7.6	4.1	3.3	4.1	3.3
Level of Service	D	D	D	D	D	D	A	A	A	A	A	A
Approach Delay (s)	47.7				47.9			7.5				3.4
Approach LOS	D				D			A				A

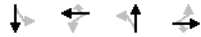
Intersection Summary

HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.4
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Last Update: Sept 2017			

c Critical Lane Group

2032 Total PM
9: GOLDWATER BLVD /GOLDWATER BLVD #2 & 5TH AVE

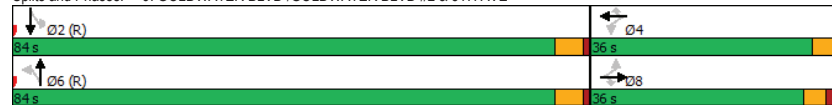
Southbridge Expansion
Timing Report, Sorted By Phase



Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	84	36	84	36
Maximum Split (%)	70.0%	30.0%	70.0%	30.0%
Minimum Split (s)	16	20	16	34.2
Yellow Time (s)	4	3.5	4	3.3
All-Red Time (s)	1.2	0.5	1.2	1.9
Minimum Initial (s)	10	4	10	7
Vehicle Extension (s)	2	3	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	8
Flash Dont Walk (s)	14	11	11	21
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	110	74	110	74
End Time (s)	74	110	74	110
Yield/Force Off (s)	68.8	106	68.8	104.8
Yield/Force Off 170(s)	54.8	95	57.8	83.8
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.8	116	78.8	114.8
Local Yield 170(s)	64.8	105	67.8	93.8

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 110 (92%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	

Splits and Phases: 9: GOLDWATER BLVD /GOLDWATER BLVD #2 & 5TH AVE



2032 Total PM
10: Marshall Way & 5th Ave

Southbridge Expansion
HCM 6th Roundabout

Intersection			
Intersection Delay, s/veh	3.6		
Intersection LOS	A		
Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	103	182	78
Demand Flow Rate, veh/h	106	185	79
Vehicles Circulating, veh/h	12	23	80
Vehicles Exiting, veh/h	196	136	37
Ped Vol Crossing Leg, #/h	0	2	3
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.3	3.8	3.4
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	106	185	79
Cap Entry Lane, veh/h	1363	1348	1272
Entry HV Adj Factor	0.976	0.982	0.987
Flow Entry, veh/h	103	182	78
Cap Entry, veh/h	1330	1323	1255
V/C Ratio	0.078	0.137	0.062
Control Delay, s/veh	3.3	3.8	3.4
LOS	A	A	A
95th %tile Queue, veh	0	0	0

2032 Total PM
10: Marshall Way & 5th Ave

Southbridge Expansion
HCM 6th AWSC

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	72	23	11	156	21	51
Future Vol, veh/h	72	23	11	156	21	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	78	25	12	170	23	55
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.7	8.3	7.6
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	29%	0%	7%
Vol Thru, %	0%	76%	93%
Vol Right, %	71%	24%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	72	95	167
LT Vol	21	0	11
Through Vol	0	72	156
RT Vol	51	23	0
Lane Flow Rate	78	103	182
Geometry Grp	1	1	1
Degree of Util (X)	0.091	0.117	0.21
Departure Headway (Hd)	4.188	4.065	4.165
Convergence, Y/N	Yes	Yes	Yes
Cap	861	868	853
Service Time	2.188	2.151	2.229
HCM Lane V/C Ratio	0.091	0.119	0.213
HCM Control Delay	7.6	7.7	8.3
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.3	0.4	0.8

2032 Total PM
11: 5th Ave & Stetson Dr

Southbridge Expansion
HCM 6th AWSC

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	67	69	58	37	54	97
Future Vol, veh/h	67	69	58	37	54	97
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	73	75	63	40	59	105
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left			WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	8.5	7.8	8.2
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	49%	0%	36%
Vol Thru, %	51%	61%	0%
Vol Right, %	0%	39%	64%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	136	95	151
LT Vol	67	0	54
Through Vol	69	58	0
RT Vol	0	37	97
Lane Flow Rate	148	103	164
Geometry Grp	1	1	1
Degree of Util (X)	0.185	0.121	0.191
Departure Headway (Hd)	4.504	4.227	4.188
Convergence, Y/N	Yes	Yes	Yes
Cap	798	850	860
Service Time	2.52	2.245	2.201
HCM Lane V/C Ratio	0.185	0.121	0.191
HCM Control Delay	8.5	7.8	8.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.7	0.4	0.7

2032 Total PM
12: Craftsman Ct & 5th Ave

Southbridge Expansion
HCM 6th WSC

Intersection						
Int Delay, s/veh	2.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Vol, veh/h	103	18	20	69	20	30
Future Vol, veh/h	103	18	20	69	20	30
Conflicting Peds, #/hr	0	14	0	0	0	6
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	112	20	22	75	22	33
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	146	0	255	142
Stage 1	-	-	-	-	136	-
Stage 2	-	-	-	-	119	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1436	-	734	906
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	906	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1419	-	713	891
Mov Cap-2 Maneuver	-	-	-	-	713	-
Stage 1	-	-	-	-	865	-
Stage 2	-	-	-	-	906	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	1.7	9.8			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	810	-	-	1419	-	
HCM Lane V/C Ratio	0.067	-	-	0.015	-	
HCM Control Delay (s)	9.8	-	-	7.6	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

2032 Total PM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔		↔	↔		↔	↔		↔	↔		
Traffic Volume (vph)	94	28	162	75	31	25	114	873	19	56	887	108	
Future Volume (vph)	94	28	162	75	31	25	114	873	19	56	887	108	
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800	
Total Lost time (s)	4.0			4.0			5.0			4.8			
Lane Util. Factor	1.00			1.00			1.00			0.95			
Frbp, ped/bikes	0.98			1.00			0.99			1.00			
Flpb, ped/bikes	1.00			1.00			1.00			1.00			
Frt	0.92			1.00			0.93			1.00			
Fit Protected	0.98			0.95			1.00			0.95			
Satd. Flow (prot)	1750			1676			1811			1676			
Fit Permitted	0.88			0.49			1.00			0.12			
Satd. Flow (perm)	1558			860			1811			212			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	102	30	176	82	34	27	124	949	21	61	964	117	
RTOR Reduction (vph)	0	23	0	0	14	0	0	1	0	0	4	0	
Lane Group Flow (vph)	0	285	0	82	47	0	124	969	0	61	1077	0	
Conf. Peds. (#/hr)	11			8			12			21			
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA		
Protected Phases	4			4			2	1		2	1		
Permitted Phases	4			4			1			1			
Actuated Green, G (s)	26.2			26.2			44.8	33.3		44.8	33.3		
Effective Green, g (s)	26.2			26.2			44.8	33.3		44.8	33.3		
Actuated g/C Ratio	0.31			0.31			0.53	0.39		0.53	0.39		
Clearance Time (s)	4.0			4.0			5.0	4.8		5.0	4.8		
Vehicle Extension (s)	3.0			3.0			1.0	0.2		1.0	0.2		
Lane Grp Cap (vph)	481			265			310	1456		336	1429		
v/s Ratio Prot				0.03			c0.05	0.26		0.02	c0.30		
v/s Ratio Perm	c0.18			0.10			0.16			0.07			
v/c Ratio	0.59			0.31			0.40	0.67		0.18	0.75		
Uniform Delay, d1	24.8			22.4			13.0	21.2		11.4	22.2		
Progression Factor	1.00			1.00			1.00	1.00		1.00	1.00		
Incremental Delay, d2	2.0			0.7			0.3	0.9		0.1	2.0		
Delay (s)	26.7			23.1			13.3	22.1		11.5	24.3		
Level of Service	C			C			B	C		B	C		
Approach Delay (s)	26.7			22.1			21.1			23.6			
Approach LOS	C			C			C			C			
Intersection Summary													
HCM 2000 Control Delay	22.8		HCM 2000 Level of Service					C					
HCM 2000 Volume to Capacity ratio	0.64												
Actuated Cycle Length (s)	84.8				Sum of lost time (s)				13.8				
Intersection Capacity Utilization	69.7%		ICU Level of Service					C					
Analysis Period (min)	15												
c Critical Lane Group													

2032 Total PM
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

	1	2	4
Phase Number	1	2	4
Movement	NBSB	NBSBL	EBWB
Lead/Lag	Lag	Lead	
Lead-Lag Optimize			
Recall Mode	Ped	None	None
Maximum Split (s)	68	68	58
Maximum Split (%)	35.1%	35.1%	29.9%
Minimum Split (s)	30	30	20
Yellow Time (s)	3.2	3.2	3.5
All-Red Time (s)	1.6	1.8	0.5
Minimum Initial (s)	10	10	4
Vehicle Extension (s)	0.2	1	3
Minimum Gap (s)	0.2	0.2	1
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)	10		5
Flash Dont Walk (s)	10		11
Dual Entry	No	No	Yes
Inhibit Max	No	No	Yes
Start Time (s)	68	0	136
End Time (s)	136	68	0
Yield/Force Off (s)	131.2	63	190
Yield/Force Off 170(s)	121.2	63	179
Local Start Time (s)	68	0	136
Local Yield (s)	131.2	63	190
Local Yield 170(s)	121.2	63	179

Intersection Summary		
Cycle Length		194
Control Type	Semi Act-Uncoord	
Natural Cycle		80

Splits and Phases: 13: SCOTTSDALE RD & 5TH AVE.



2032 Total PM
14: DRINKWATER BLVD/DRINKWATER BLVD & 5TH AVE./STATION DR

Southbridge Expansion
Intersection Capacity Analysis

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	27	49	57	132	90	115	64	604	94	52	309	35
Future Volume (vph)	27	49	57	132	90	115	64	604	94	52	309	35
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.95	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.92		1.00	0.92		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	1786		1676	1776		1676	3725	1424	1676	3660	
Flt Permitted	0.34	1.00		0.60	1.00		0.51	1.00	1.00	0.38	1.00	
Satd. Flow (perm)	593	1786		1065	1776		892	3725	1424	678	3660	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.95	0.95	0.95	0.84	0.84	0.84
Adj. Flow (vph)	34	61	71	165	112	144	67	636	99	62	368	42
RTOR Reduction (vph)	0	39	0	0	43	0	0	0	36	0	5	0
Lane Group Flow (vph)	34	93	0	165	214	0	67	636	63	62	405	0
Confl. Peds. (#/hr)			4			7			10			6
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	24.7	24.7		24.7	24.7		80.7	76.6	76.6	80.7	76.6	
Effective Green, g (s)	24.7	24.7		24.7	24.7		80.7	76.6	76.6	80.7	76.6	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.67	0.64	0.64	0.67	0.64	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.6	5.0	5.0	4.6	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	0.2	0.2	2.0	0.2	
Lane Grp Cap (vph)	122	367		219	365		626	2377	908	490	2336	
v/s Ratio Prot		0.05			0.12		0.00	c0.17		c0.00	0.11	
v/s Ratio Perm	0.06			c0.15			0.07		0.04	0.08		
v/c Ratio	0.28	0.25		0.75	0.59		0.11	0.27	0.07	0.13	0.17	
Uniform Delay, d1	40.1	39.9		44.8	43.0		7.3	9.5	8.2	8.9	8.8	
Progression Factor	1.00	1.00		1.00	1.00		1.22	1.04	2.12	0.86	0.85	
Incremental Delay, d2	0.5	0.1		12.2	1.6		0.0	0.3	0.1	0.0	0.1	
Delay (s)	40.6	40.1		57.0	44.6		8.9	10.1	17.5	7.7	7.6	
Level of Service	D	D		E	D		A	B	B	A	A	
Approach Delay (s)		40.2			49.4			10.9			7.6	
Approach LOS		D			D			B			A	

Intersection Summary		
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.38	C
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	56.8%	ICU Level of Service
Analysis Period (min)	15	B
Description: Last Update: Sept 2017		
c Critical Lane Group		

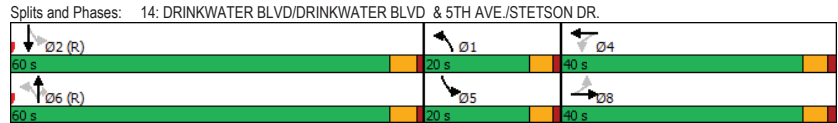
2032 Total PM Southbridge Expansion
 14: DRINKWATER BLVD/DRINKWATER BLVD & 5TH AVE./STETSON DR. Traffic Report, Sorted By Phase



Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag						
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	20	60	40	20	60	40
Maximum Split (%)	16.7%	50.0%	33.3%	16.7%	50.0%	33.3%
Minimum Split (s)	11	16	36	11	16	35
Yellow Time (s)	3.3	4	3.5	3.3	4	3.5
All-Red Time (s)	1.3	1	1.5	1.3	1	1.5
Minimum Initial (s)	5	10	7	5	10	7
Vehicle Extension (s)	2	0.2	2	2	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	8		7	7
Flash Dont Walk (s)		13	23		12	23
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	110	50	10	110	50	10
End Time (s)	10	110	50	10	110	50
Yield/Force Off (s)	5.4	105	45	5.4	105	45
Yield/Force Off 170(s)	5.4	92	22	5.4	93	22
Local Start Time (s)	60	0	80	60	0	80
Local Yield (s)	75.4	55	115	75.4	55	115
Local Yield 170(s)	75.4	42	92	75.4	43	92

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 50 (42%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Total PM Southbridge Expansion
 15: GOLDWATER BLVD & 3rd Ave HCM 6th TWSC

Intersection

Int Delay, s/veh	1.3
Movement	WBL WBR NBT NBR SBL SBT
Lane Configurations	↔ ↔ ↑↑ ↔ ↑↑↑
Traffic Vol, veh/h	36 99 745 17 22 893
Future Vol, veh/h	36 99 745 17 22 893
Conflicting Peds, #/hr	0 0 0 0 0 0
Sign Control	Stop Stop Free Free Free Free
RT Channelized	- None - None - None
Storage Length	0 - - - 75 -
Veh in Median Storage, #	0 - 0 - - 0
Grade, %	0 - 0 - - 0
Peak Hour Factor	92 92 92 92 92 92
Heavy Vehicles, %	2 2 2 2 2 2
Mvmt Flow	39 108 810 18 24 971

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1255	414	0 0 828 0
Stage 1	819	-	- - - -
Stage 2	436	-	- - - -
Critical Hdwy	6.29	6.94	- - 4.14 -
Critical Hdwy Stg 1	5.84	-	- - - -
Critical Hdwy Stg 2	6.04	-	- - - -
Follow-up Hdwy	3.67	3.32	- - 2.22 -
Pot Cap-1 Maneuver	194	587	- - 799 -
Stage 1	383	-	- - - -
Stage 2	585	-	- - - -
Platoon blocked, %	-	-	- - - -
Mov Cap-1 Maneuver	188	587	- - 799 -
Mov Cap-2 Maneuver	284	-	- - - -
Stage 1	372	-	- - - -
Stage 2	585	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	16.6	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	457	799
HCM Lane V/C Ratio	-	-	0.321	0.03
HCM Control Delay (s)	-	-	16.6	9.6
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	1.4	0.1

2032 Total PM
16: 3rd Ave & Marshall Way

Southbridge Expansion
HCM 6th AWSC

Intersection												
Intersection Delay, s/veh	8											
Intersection LOS	A											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕			↔			↔	
Traffic Vol, veh/h	4	43	11	42	102	6	11	43	27	6	21	13
Future Vol, veh/h	4	43	11	42	102	6	11	43	27	6	21	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	47	12	46	111	7	12	47	29	7	23	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.7	8.4	7.8	7.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	14%	7%	28%	15%
Vol Thru, %	53%	74%	68%	53%
Vol Right, %	33%	19%	4%	33%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	81	58	150	40
LT Vol	11	4	42	6
Through Vol	43	43	102	21
RT Vol	27	11	6	13
Lane Flow Rate	88	63	163	43
Geometry Grp	1	1	1	1
Degree of Util (X)	0.106	0.075	0.192	0.053
Departure Headway (Hd)	4.319	4.304	4.243	4.376
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	834	835	832	822
Service Time	2.325	2.316	2.342	2.384
HCM Lane V/C Ratio	0.106	0.075	0.196	0.052
HCM Control Delay	7.8	7.7	8.4	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.2	0.7	0.2

2032 Total PM
17: 3rd Ave & Craftsman Ct

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.7					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	30	69	111	20	25	29
Future Vol, veh/h	30	69	111	20	25	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	75	121	22	27	32

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	143	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1440	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1440	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1440	-	-	-	801
HCM Lane V/C Ratio	0.023	-	-	-	0.073
HCM Control Delay (s)	7.6	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

2032 Total PM
18: SCOTTSDALE RD & 3RD AVE.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	69	32	125	77	65	232	74	733	33	41	1001	62
Future Volume (vph)	69	32	125	77	65	232	74	733	33	41	1001	62
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.88		1.00	0.88		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1704		1676	1706		1676	3696		1676	3725	1461
Flt Permitted	0.38	1.00		0.65	1.00		0.22	1.00		0.32	1.00	1.00
Satd. Flow (perm)	670	1704		1145	1706		385	3696		557	3725	1461
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	35	136	84	71	252	80	797	36	45	1088	67
RTOR Reduction (vph)	0	36	0	0	82	0	0	4	0	0	0	20
Lane Group Flow (vph)	75	135	0	84	241	0	80	829	0	45	1088	47
Confl. Peds. (#/hr)			8			11			15			7
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		1
Actuated Green, G (s)	11.9	11.9		11.9	11.9		30.7	30.7		30.7	30.7	30.7
Effective Green, g (s)	11.9	11.9		11.9	11.9		30.7	30.7		30.7	30.7	30.7
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.58	0.58		0.58	0.58	0.58
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	151	385		259	385		224	2157		325	2174	852
v/s Ratio Prot		0.08			c0.14			0.22			c0.29	
v/s Ratio Perm	0.11			0.07			0.21			0.08		0.03
v/c Ratio	0.50	0.35		0.32	0.63		0.36	0.38		0.14	0.50	0.06
Uniform Delay, d1	17.7	17.1		17.0	18.3		5.8	5.9		5.0	6.4	4.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	0.2		0.3	2.3		0.4	0.0		0.1	0.1	0.0
Delay (s)	18.7	17.3		17.3	20.6		6.1	5.9		5.0	6.5	4.7
Level of Service	B	B		B	C		A	A		A	A	A
Approach Delay (s)		17.7			19.9			5.9			6.4	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	52.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

2032 Total PM
18: SCOTTSDALE RD & 3RD AVE.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	3
Movement	NBSB	EBWB
Lead/Lag		
Lead-Lag Optimize		
Recall Mode	Ped	None
Maximum Split (s)	36.9	31.1
Maximum Split (%)	54.3%	45.7%
Minimum Split (s)	35	31.1
Yellow Time (s)	3.2	3
All-Red Time (s)	1.8	2
Minimum Initial (s)	10	6
Vehicle Extension (s)	0.2	2
Minimum Gap (s)	1	2
Time Before Reduce (s)	0	0
Time To Reduce (s)	0	0
Walk Time (s)	18	5
Flash Dont Walk (s)	12	20
Dual Entry	No	No
Inhibit Max	No	No
Start Time (s)	0	36.9
End Time (s)	36.9	0
Yield/Force Off (s)	31.9	63
Yield/Force Off 170(s)	19.9	43
Local Start Time (s)	0	36.9
Local Yield (s)	31.9	63
Local Yield 170(s)	19.9	43
Intersection Summary		
Cycle Length		68
Control Type		Semi Act-Uncoord
Natural Cycle		70

Splits and Phases: 18: SCOTTSDALE RD & 3RD AVE.



2032 Total PM Southbridge Expansion
 19: DRINKWATER BLVD /DRINKWATER BLVD & 3RD AVE. HCM Signalized Intersection Capacity Analysis

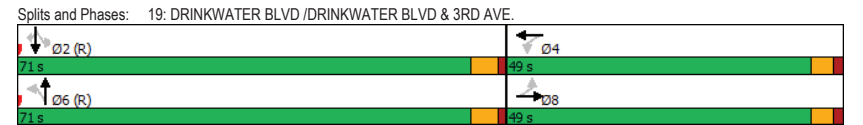
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	48	18	106	77	19	60	108	653	135	75	577	41
Future Volume (vph)	48	18	106	77	19	60	108	653	135	75	577	41
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99			0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87			0.95		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1690			1802		1676	5195		1676	3725	1454
Flt Permitted	0.56	1.00			0.62		0.39	1.00		0.30	1.00	1.00
Satd. Flow (perm)	990	1690			1140		697	5195		538	3725	1454
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.89	0.89	0.89	0.88	0.88	0.88
Adj. Flow (vph)	55	21	122	90	22	70	121	734	152	85	656	47
RTOR Reduction (vph)	0	0	0	0	25	0	0	14	0	0	0	11
Lane Group Flow (vph)	55	143	0	0	157	0	121	872	0	85	656	36
Confl. Peds. (#/hr)			1			5			1			3
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	19.1	19.1			19.1		90.8	90.8		90.8	90.8	90.8
Effective Green, g (s)	19.1	19.1			19.1		90.8	90.8		90.8	90.8	90.8
Actuated g/C Ratio	0.16	0.16			0.16		0.76	0.76		0.76	0.76	0.76
Clearance Time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Vehicle Extension (s)	2.0	2.0			2.0		0.2	0.2		2.0	2.0	2.0
Lane Grp Cap (vph)	157	268			181		527	3930		407	2818	1100
v/s Ratio Prot		0.08						0.17			c0.18	
v/s Ratio Perm	0.06				c0.14		0.17			0.16		0.02
v/c Ratio	0.35	0.53			0.87		0.23	0.22		0.21	0.23	0.03
Uniform Delay, d1	44.9	46.4			49.2		4.3	4.3		4.2	4.3	3.6
Progression Factor	1.00	1.00			1.00		2.30	2.73		0.96	0.86	1.29
Incremental Delay, d2	0.5	1.0			31.6		0.8	0.1		1.1	0.2	0.1
Delay (s)	45.4	47.4			80.8		10.7	11.8		5.2	3.9	4.7
Level of Service	D	D			F		B	B		A	A	A
Approach Delay (s)		46.8			80.8			11.6			4.1	
Approach LOS		D			F			B			A	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.1
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Total PM Southbridge Expansion
 19: DRINKWATER BLVD /DRINKWATER BLVD & 3RD AVE. Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	71	49	71	49
Maximum Split (%)	59.2%	40.8%	59.2%	40.8%
Minimum Split (s)	22.2	38.9	32.2	30.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	0.2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	9	7	7
Flash Dont Walk (s)	10	25	20	19
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	40	111	40	111
End Time (s)	111	40	111	40
Yield/Force Off (s)	105.8	35.1	105.8	35.1
Yield/Force Off 170(s)	95.8	10.1	85.8	16.1
Local Start Time (s)	0	71	0	71
Local Yield (s)	65.8	115.1	65.8	115.1
Local Yield 170(s)	55.8	90.1	45.8	96.1

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 40 (33%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Total PM
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔↔	↔	↔	↔↔	↔
Traffic Volume (vph)	289	925	24	130	847	213	85	592	139	157	499	216
Future Volume (vph)	289	925	24	130	847	213	85	592	139	157	499	216
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	5353	1472	1676	5353	1466	1676	3725	1480	1676	3538	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	5353	1472	1676	5353	1466	1676	3725	1480	1676	3538	
Peak-hour factor, PHF	0.95	0.95	0.95	0.85	0.85	0.85	0.85	0.85	0.85	0.94	0.94	0.94
Adj. Flow (vph)	304	974	25	153	996	251	100	696	164	167	531	230
RTOR Reduction (vph)	0	0	15	0	0	71	0	0	0	0	41	0
Lane Group Flow (vph)	304	974	10	153	996	180	100	696	164	167	720	0
Confl. Peds. (#/hr)			5			6			6			5
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5 10	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	21.8	51.7	51.7	10.7	35.1	51.2	13.9	27.5	38.2	16.1	30.0	
Effective Green, g (s)	21.8	51.7	51.7	10.7	35.1	51.2	13.9	27.5	38.2	16.1	30.0	
Actuated g/C Ratio	0.17	0.40	0.40	0.08	0.27	0.40	0.11	0.22	0.30	0.13	0.23	
Clearance Time (s)		5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5	
Vehicle Extension (s)		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	286	2167	595	140	1471	587	182	802	504	211	831	
v/s Ratio Prot	c0.18	0.18		c0.09	c0.19	0.04	0.06	0.19	0.03	c0.10	c0.20	
v/s Ratio Perm			0.01			0.08			0.08			
v/c Ratio	1.06	0.45	0.02	1.09	0.68	0.31	0.55	0.87	0.33	0.79	0.87	
Uniform Delay, d1	53.0	27.6	22.8	58.5	41.3	26.1	53.9	48.3	34.7	54.2	46.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	70.8	0.7	0.1	103.1	2.5	0.1	1.8	9.5	0.1	17.0	9.2	
Delay (s)	123.8	28.3	22.8	161.6	43.8	26.2	55.7	57.9	34.9	71.2	56.1	
Level of Service	F	C	C	F	D	C	E	E	C	E	E	
Approach Delay (s)		50.5			53.5			53.7			58.8	
Approach LOS		D			D			D			E	

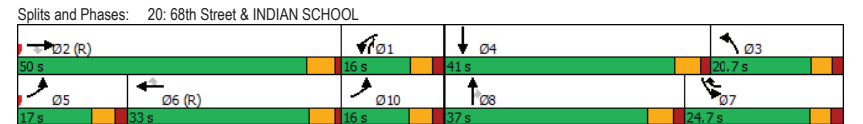
Intersection Summary			
HCM 2000 Control Delay	53.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	127.7	Sum of lost time (s)	27.2
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

2032 Total PM
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8	10
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT	EBL
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	
Lead-Lag Optimize									
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None
Maximum Split (s)	16	50	20.7	41	17	33	24.7	37	16
Maximum Split (%)	12.5%	39.2%	16.2%	32.1%	13.3%	25.8%	19.3%	29.0%	12.5%
Minimum Split (s)	11	32.4	11	39.5	11	33	11	42.7	11
Yellow Time (s)	3.3	4.4	3.3	4	3.6	4	3.3	4	3.6
All-Red Time (s)	2	1	1.9	1.5	2	1	2	1.7	2
Minimum Initial (s)	5	10	5	7	5	10	5	7	5
Vehicle Extension (s)	2	2	2	2	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4	
Flash Dont Walk (s)		23		30		24		33	
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes	Yes
Inhibit Max	No	No	No	No	No	No	No	No	No
Start Time (s)	70	20	127	86	20	37	123	86	70
End Time (s)	86	70	20	127	37	70	20	123	86
Yield/Force Off (s)	80.7	64.6	14.8	121.5	31.4	65	14.7	117.3	80.4
Yield/Force Off 170(s)	80.7	41.6	14.8	91.5	31.4	41	14.7	84.3	80.4
Local Start Time (s)	50	0	107	66	0	17	103	66	50
Local Yield (s)	60.7	44.6	122.5	101.5	11.4	45	122.4	97.3	60.4
Local Yield 170(s)	60.7	21.6	122.5	71.5	11.4	21	122.4	64.3	60.4

Intersection Summary	
Cycle Length	127.7
Control Type	Actuated-Coordinated
Natural Cycle	120
Offset: 20 (16%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	



2032 Total PM
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕	↔↔	↔↔	↕↕	↔↔	↔↔	↕↕	↔↔	↔↔	↕↕	↔↔
Traffic Volume (vph)	258	854	75	78	769	71	113	420	52	92	641	200
Future Volume (vph)	258	854	75	78	769	71	113	420	52	92	641	200
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.0	3.0	5.3	5.0		5.3	5.3		5.3	5.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		1.00	0.95		1.00	0.91	
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3317	3725	1510	3317	3684		1710	3672		1710	5168	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3317	3725	1510	3317	3684		1710	3672		1710	5168	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.90	0.90	0.90	0.89	0.89	0.89
Adj. Flow (vph)	280	928	82	87	854	79	126	467	58	103	720	225
RTOR Reduction (vph)	0	0	50	0	5	0	0	10	0	0	53	0
Lane Group Flow (vph)	280	928	32	87	928	0	126	515	0	103	892	0
Confl. Peds. (#/hr)			1									3
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	12.9	44.8	44.8	11.7	43.6		13.2	23.1		19.5	29.4	
Effective Green, g (s)	12.9	44.8	46.8	11.7	43.6		13.2	23.1		19.5	29.4	
Actuated g/C Ratio	0.11	0.37	0.39	0.10	0.36		0.11	0.19		0.16	0.24	
Clearance Time (s)	5.3	5.0	5.0	5.3	5.0		5.3	5.3		5.3	5.3	
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0		2.0	1.0		2.0	1.0	
Lane Grp Cap (vph)	356	1390	588	323	1338		188	706		277	1266	
v/s Ratio Prot	c0.08	0.25		0.03	c0.25		c0.07	0.14		0.06	c0.17	
v/s Ratio Perm			0.02									
v/c Ratio	0.79	0.67	0.05	0.27	0.69		0.67	0.73		0.37	0.70	
Uniform Delay, d1	52.2	31.4	22.8	50.2	32.5		51.3	45.5		44.8	41.3	
Progression Factor	1.00	1.00	1.00	0.82	0.68		1.00	1.00		1.12	1.01	
Incremental Delay, d2	10.1	2.6	0.2	0.2	2.8		7.2	3.2		0.3	1.5	
Delay (s)	62.3	33.9	23.0	41.3	24.9		58.5	48.7		50.4	43.2	
Level of Service	E	C	C	D	C		E	D		D	D	
Approach Delay (s)		39.4			26.3			50.6			43.9	
Approach LOS		D			C			D			D	

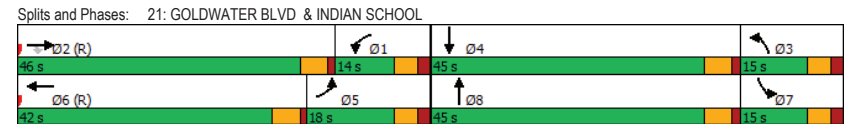
Intersection Summary			
HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

2032 Total PM
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	14	46	15	45	18	42	15	45
Maximum Split (%)	11.7%	38.3%	12.5%	37.5%	15.0%	35.0%	12.5%	37.5%
Minimum Split (s)	11	44	11	44.3	11	40	11	40.3
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1	2	1.3	2	1	2	1.3
Minimum Initial (s)	5	10	5	10	5	10	5	10
Vehicle Extension (s)	2	1	2	1	2	1	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		32		32		28		28
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	96	50	35	110	92	50	35	110
End Time (s)	110	96	50	35	110	92	50	35
Yield/Force Off (s)	104.7	91	44.7	29.7	104.7	87	44.7	29.7
Yield/Force Off 170(s)	104.7	59	44.7	29.7	104.7	59	44.7	29.7
Local Start Time (s)	46	0	105	60	42	0	105	60
Local Yield (s)	54.7	41	114.7	99.7	54.7	37	114.7	99.7
Local Yield 170(s)	54.7	9	114.7	99.7	54.7	9	114.7	99.7

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	115
Offset: 50 (42%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	



2032 Total PM
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

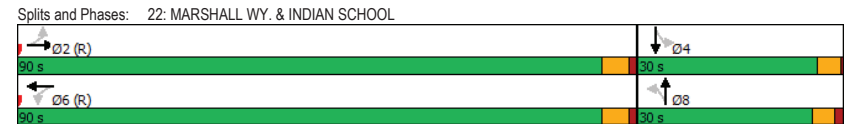
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	37	948	37	68	925	69	22	22	37	14	42	57
Future Volume (vph)	37	948	37	68	925	69	22	22	37	14	42	57
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2			4.7			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.94			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1676	3700		1676	3679			1800			1795	
Flt Permitted	0.23	1.00		0.25	1.00			0.74			0.97	
Satd. Flow (perm)	413	3700		435	3679			1353			1747	
Peak-hour factor, PHF	0.92	0.90	0.90	0.87	0.87	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	1053	41	78	1063	75	24	24	40	15	46	62
RTOR Reduction (vph)	0	2	0	0	3	0	0	29	0	0	35	0
Lane Group Flow (vph)	40	1092	0	78	1135	0	0	59	0	0	88	0
Confl. Peds. (#/hr)			4			5			5			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	97.4	97.4		97.4	97.4			12.7			13.4	
Effective Green, g (s)	97.4	97.4		97.4	97.4			12.7			13.4	
Actuated g/C Ratio	0.81	0.81		0.81	0.81			0.11			0.11	
Clearance Time (s)	5.2	5.2		5.2	5.2			4.7			4.0	
Vehicle Extension (s)	0.2	0.2		0.2	0.2			2.0			3.0	
Lane Grp Cap (vph)	335	3003		353	2986			143			195	
v/s Ratio Prot		0.30			0.31							
v/s Ratio Perm	0.10			0.18				0.04			0.05	
v/c Ratio	0.12	0.36		0.22	0.38			0.42			0.45	
Uniform Delay, d1	2.4	3.0		2.6	3.1			50.2			49.9	
Progression Factor	0.86	1.74		2.16	2.19			1.00			1.00	
Incremental Delay, d2	0.6	0.3		1.0	0.2			0.7			1.7	
Delay (s)	2.6	5.5		6.6	7.0			50.9			51.5	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		5.4			7.0			50.9			51.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.9
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

2032 Total PM
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	90	30	90	30
Maximum Split (%)	75.0%	25.0%	75.0%	25.0%
Minimum Split (s)	16	20	16	12
Yellow Time (s)	4	3.5	4	3.3
All-Red Time (s)	1.2	0.5	1.2	1.4
Minimum Initial (s)	10	4	10	7
Vehicle Extension (s)	0.2	3	0.2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	5	7	8
Flash Dont Walk (s)	8	11	7	17
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	70	40	70	40
End Time (s)	40	70	40	70
Yield/Force Off (s)	34.8	66	34.8	65.3
Yield/Force Off 170(s)	26.8	55	27.8	48.3
Local Start Time (s)	0	90	0	90
Local Yield (s)	84.8	116	84.8	115.3
Local Yield 170(s)	76.8	105	77.8	98.3
Intersection Summary				
Cycle Length	120			
Control Type	Actuated-Coordinated			
Natural Cycle	50			
Offset: 70 (58%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green				



2032 Total PM
23: SCOTTSDALE RD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↔	↔	↔	↕↔	↔	↔	↕↔	↔	↔	↕↔	↔
Traffic Volume (vph)	144	780	128	191	795	206	70	522	132	257	763	193
Future Volume (vph)	144	780	128	191	795	206	70	522	132	257	763	193
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	3634		1676	3597		1676	3600		1676	3725	1474
Flt Permitted	0.10	1.00		0.10	1.00		0.13	1.00		0.15	1.00	1.00
Satd. Flow (perm)	176	3634		184	3597		223	3600		263	3725	1474
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	152	821	135	210	874	226	78	580	147	286	848	214
RTOR Reduction (vph)	0	11	0	0	19	0	0	20	0	0	0	120
Lane Group Flow (vph)	152	945	0	210	1081	0	78	707	0	286	848	94
Confl. Peds. (#/hr)			9			5			4			9
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	51.5	40.0		51.5	40.0		48.6	31.6		48.6	31.6	43.1
Effective Green, g (s)	51.5	40.0		51.5	40.0		48.6	31.6		48.6	31.6	43.1
Actuated g/C Ratio	0.43	0.33		0.43	0.33		0.41	0.26		0.41	0.26	0.36
Clearance Time (s)	5.1	5.0		5.1	5.0		5.0	4.8		5.0	4.8	5.1
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	219	1211		221	1199		296	948		306	980	592
v/s Ratio Prot	0.07	0.26		c0.09	0.30		0.04	0.20		c0.13	0.23	0.02
v/s Ratio Perm	0.23			c0.31			0.07			c0.25		0.05
v/c Ratio	0.69	0.78		0.95	0.90		0.26	0.75		0.93	0.87	0.16
Uniform Delay, d1	47.5	36.0		46.0	38.1		41.2	40.5		43.6	42.2	26.1
Progression Factor	1.29	1.14		0.73	0.95		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.1	4.8		43.0	10.0		0.2	2.8		34.1	7.8	0.0
Delay (s)	68.5	46.0		76.4	46.3		41.3	43.3		77.6	50.0	26.2
Level of Service	E	D		E	D		D	D		E	D	C
Approach Delay (s)		49.1			51.2			43.2			52.1	
Approach LOS		D			D			D			D	

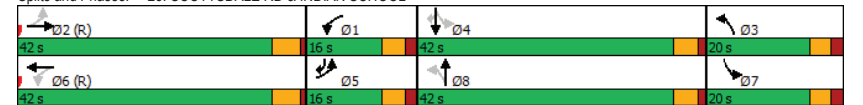
Intersection Summary			
HCM 2000 Control Delay	49.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Total PM
23: SCOTTSDALE RD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	16	42	20	42	16	42	20	42
Maximum Split (%)	13.3%	35.0%	16.7%	35.0%	13.3%	35.0%	16.7%	35.0%
Minimum Split (s)	11	30	10	32.8	11	33	10	34.8
Yellow Time (s)	3.3	4	3	3.6	3.3	4	3	3.6
All-Red Time (s)	1.8	1	2	1.2	1.8	1	2	1.2
Minimum Initial (s)	5	10	5	10	5	10	5	10
Vehicle Extension (s)	2	1	2	2	2	1	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		8		8
Flash Dont Walk (s)		18		21		20		22
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	42	0	100	58	42	0	100	58
End Time (s)	58	42	0	100	58	42	0	100
Yield/Force Off (s)	52.9	37	115	95.2	52.9	37	115	95.2
Yield/Force Off 170(s)	52.9	19	115	74.2	52.9	17	115	73.2
Local Start Time (s)	42	0	100	58	42	0	100	58
Local Yield (s)	52.9	37	115	95.2	52.9	37	115	95.2
Local Yield 170(s)	52.9	19	115	74.2	52.9	17	115	73.2
Intersection Summary								
Cycle Length	120							
Control Type	Actuated-Coordinated							
Natural Cycle	90							
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green, Master Intersection								

Splits and Phases: 23: SCOTTSDALE RD & INDIAN SCHOOL



2032 Total PM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔		↔	↔↔	↔	↔
Traffic Volume (vph)	1143	67	104	1205	68	115
Future Volume (vph)	1143	67	104	1205	68	115
Ideal Flow (vphpl)	2000	1800	1800	2000	1800	1800
Total Lost time (s)	5.2		5.2	5.2	4.8	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frpb, ped/bikes	1.00		1.00	1.00	0.99	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.91	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	3688		1676	3725	1567	
Flt Permitted	1.00		0.19	1.00	0.98	
Satd. Flow (perm)	3688		327	3725	1567	
Peak-hour factor, PHF	0.95	0.95	0.89	0.89	0.88	0.88
Adj. Flow (vph)	1203	71	117	1354	77	131
RTOR Reduction (vph)	3	0	0	0	57	0
Lane Group Flow (vph)	1271	0	117	1354	151	0
Confl. Peds. (#/hr)		3				6
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	88.8		88.8	88.8	21.2	
Effective Green, g (s)	88.8		88.8	88.8	21.2	
Actuated g/C Ratio	0.74		0.74	0.74	0.18	
Clearance Time (s)	5.2		5.2	5.2	4.8	
Vehicle Extension (s)	0.2		0.2	0.2	2.0	
Lane Grp Cap (vph)	2729		241	2756	276	
v/s Ratio Prot	0.34			c0.36	c0.10	
v/s Ratio Perm			0.36			
v/c Ratio	0.47		0.49	0.49	0.55	
Uniform Delay, d1	6.2		6.3	6.4	45.0	
Progression Factor	1.18		0.57	0.41	1.00	
Incremental Delay, d2	0.3		6.1	0.6	1.2	
Delay (s)	7.6		9.7	3.2	46.2	
Level of Service	A		A	A	D	
Approach Delay (s)	7.6			3.7	46.2	
Approach LOS	A			A	D	

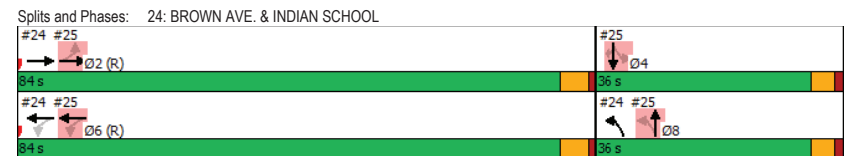
Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

2032 Total PM
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Node Number	24	25	24	24
Movement	EBT	SBTL	WBTL	NBL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	84	36	84	36
Maximum Split (%)	70.0%	30.0%	70.0%	30.0%
Minimum Split (s)	23.2	12	27.2	35.8
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.5	1.2	1.5
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	0.2	2	0.2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	11		15	24
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	98	62	98	62
End Time (s)	62	98	62	98
Yield/Force Off (s)	56.8	93.2	56.8	93.2
Yield/Force Off 170(s)	45.8	93.2	41.8	69.2
Local Start Time (s)	0	84	0	84
Local Yield (s)	78.8	115.2	78.8	115.2
Local Yield 170(s)	67.8	115.2	63.8	91.2

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 98 (82%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	



2032 Total PM
25: BUCKBOARD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	41	1198	9	73	1196	30	11	5	54	135	4	94
Future Volume (vph)	41	1198	9	73	1196	30	11	5	54	135	4	94
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.2	5.2		5.2	5.2			4.8			4.8	4.8
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.98			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1676	3720		1676	3708			1709			1870	1500
Flt Permitted	0.16	1.00		0.19	1.00			0.94			0.66	1.00
Satd. Flow (perm)	284	3720		329	3708			1625			1291	1500
Peak-hour factor, PHF	0.95	0.95	0.95	0.89	0.89	0.89	0.88	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	43	1261	9	82	1344	34	12	6	61	150	4	104
RTOR Reduction (vph)	0	0	0	0	1	0	0	50	0	0	0	57
Lane Group Flow (vph)	43	1270	0	82	1377	0	0	30	0	0	154	47
Confl. Peds. (#/hr)			9			8			13			
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	88.8	88.8		88.8	88.8			21.2			21.2	21.2
Effective Green, g (s)	88.8	88.8		88.8	88.8			21.2			21.2	21.2
Actuated g/C Ratio	0.74	0.74		0.74	0.74			0.18			0.18	0.18
Clearance Time (s)	5.2	5.2		5.2	5.2			4.8			4.8	4.8
Vehicle Extension (s)	0.2	0.2		0.2	0.2			2.0			2.0	2.0
Lane Grp Cap (vph)	210	2752		243	2743			287			228	265
v/s Ratio Prot		0.34			c0.37							
v/s Ratio Perm	0.15			0.25				0.02			c0.12	0.03
v/c Ratio	0.20	0.46		0.34	0.50			0.10			0.68	0.18
Uniform Delay, d1	4.8	6.2		5.4	6.5			41.4			46.2	42.0
Progression Factor	0.37	0.38		0.70	1.15			1.00			1.00	1.00
Incremental Delay, d2	2.0	0.5		2.3	0.4			0.1			6.1	0.1
Delay (s)	3.8	2.9		6.1	7.8			41.5			52.3	42.1
Level of Service	A	A		A	A			D			D	D
Approach Delay (s)		2.9			7.7			41.5			48.2	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

2032 Total PM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	99	1306	70	338	1027	255	100	558	496	382	311	67
Future Volume (vph)	99	1306	70	338	1027	255	100	558	496	382	311	67
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.2		5.3	5.2			5.3	5.1		5.3	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	0.95		1.00	0.95
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00			0.85	1.00		1.00	0.97
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1710	3698		1710	3725			1510	1710		1505	3317
Flt Permitted	0.09	1.00		0.09	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	168	3698		168	3725			1510	1710		1505	3317
Peak-hour factor, PHF	0.94	0.94	0.94	0.89	0.89	0.89	0.90	0.90	0.90	0.90	0.80	0.80
Adj. Flow (vph)	105	1389	74	380	1154	287	111	620	551	478	389	84
RTOR Reduction (vph)	0	3	0	0	0	106	0	0	164	0	15	0
Lane Group Flow (vph)	105	1460	0	380	1154	181	111	620	387	478	458	0
Confl. Peds. (#/hr)			2			1			4			3
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8			7	4
Permitted Phases	2			6		6		8			7	4
Actuated Green, G (s)	56.5	42.8		56.5	42.8	42.8	9.4	25.9	25.9	16.7	33.2	
Effective Green, g (s)	56.5	42.8		56.5	42.8	42.8	9.4	25.9	25.9	16.7	33.2	
Actuated g/C Ratio	0.47	0.36		0.47	0.36	0.36	0.08	0.22	0.22	0.14	0.28	
Clearance Time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.1	5.3	5.1	
Vehicle Extension (s)	2.0	0.2		2.0	0.2	0.2	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	255	1318		255	1328	538	133	803	324	461	1004	
v/s Ratio Prot	0.05	0.39		c0.17	0.31		0.06	0.17		c0.14	0.13	
v/s Ratio Perm	0.15			c0.53		0.12			c0.26			
v/c Ratio	0.41	1.11		1.49	0.87	0.34	0.83	0.77	1.19	1.04	0.46	
Uniform Delay, d1	43.7	38.6		49.8	36.0	28.2	54.5	44.3	47.0	51.6	35.9	
Progression Factor	1.22	1.15		1.00	1.00	1.00	1.00	1.00	1.00	1.11	1.18	
Incremental Delay, d2	0.4	59.1		240.3	7.9	1.7	32.9	7.1	113.9	51.5	1.5	
Delay (s)	53.6	103.5		290.1	43.9	29.9	87.4	51.4	160.9	108.7	43.7	
Level of Service	D	F		F	D	C	F	D	F	F	D	
Approach Delay (s)		100.2			93.1			101.6			76.4	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	94.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9
Intersection Capacity Utilization	110.9%	ICU Level of Service	H
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

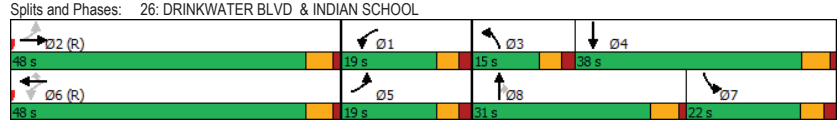
2032 Total PM
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBT	EBL	WBTL	SBL	NBT
Lead/Lag			Lead	Lag			Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	Max	None	C-Max	None	Max
Maximum Split (s)	19	48	15	38	19	48	22	31
Maximum Split (%)	15.8%	40.0%	12.5%	31.7%	15.8%	40.0%	18.3%	25.8%
Minimum Split (s)	11	16	11	13	11	16	11	13
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1.2	2	1.1	2	1.2	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	0.2	2	2	2	0.2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		9		7		11
Flash Dont Walk (s)		21		20		19		20
Dual Entry	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	18	90	37	52	18	90	68	37
End Time (s)	37	18	52	90	37	18	90	68
Yield/Force Off (s)	31.7	12.8	46.7	84.9	31.7	12.8	84.7	62.9
Yield/Force Off 170(s)	31.7	111.8	46.7	64.9	31.7	113.8	84.7	42.9
Local Start Time (s)	48	0	67	82	48	0	98	67
Local Yield (s)	61.7	42.8	76.7	114.9	61.7	42.8	114.7	92.9
Local Yield 170(s)	61.7	21.8	76.7	94.9	61.7	23.8	114.7	72.9

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 90 (75%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green	



2032 Total PM
27: 70th St & GOLDWATER BLVD

Southbridge Expansion
HCM 6th TWSC

Intersection

Int Delay, s/veh	3.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑	↑↑	↑	↑
Traffic Vol, veh/h	854	192	37	371	85	16
Future Vol, veh/h	854	192	37	371	85	16
Conflicting Peds, #/hr	0	8	0	0	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	70	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	928	209	40	403	92	17

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	1323
Stage 1	-	-	1041
Stage 2	-	-	282
Critical Hdwy	-	5.34	6.29
Critical Hdwy Stg 1	-	-	6.64
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	-	3.12	3.67
Pot Cap-1 Maneuver	-	333	177
Stage 1	-	-	233
Stage 2	-	-	714
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	331	155
Mov Cap-2 Maneuver	-	-	155
Stage 1	-	-	203
Stage 2	-	-	714

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	50.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	155	390	-	-	331	-
HCM Lane V/C Ratio	0.596	0.045	-	-	0.122	-
HCM Control Delay (s)	57.7	14.7	-	-	17.4	-
HCM Lane LOS	F	B	-	-	C	-
HCM 95th %tile Q(veh)	3.2	0.1	-	-	0.4	-

2032 Total PM Southbridge Expansion
 28: GOLDWATER BLVD & SCOTTSDALE RD HCM Signalized Intersection Capacity Analysis

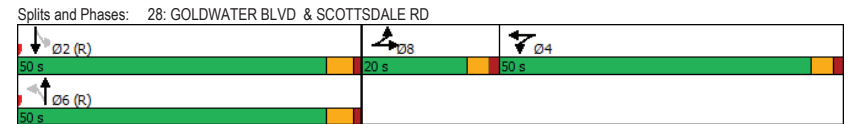
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	22	18	27	734	29	22	29	356	5	32	748	22
Future Volume (vph)	22	18	27	734	29	22	29	356	5	32	748	22
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		4.9		4.9	4.9		5.2	5.2		5.2	5.2	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95		1.00	0.91	
Frbp, ped/bikes		0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.95		1.00	0.99		1.00	1.00		1.00	1.00	
Flt Protected		0.98		0.95	0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1804		1593	1768		1676	3716		1676	5327	
Flt Permitted		0.98		0.95	0.96		0.29	1.00		0.47	1.00	
Satd. Flow (perm)		1804		1593	1768		517	3716		828	5327	
Peak-hour factor, PHF	0.80	0.80	0.80	0.88	0.88	0.88	0.84	0.84	0.84	0.95	0.95	0.95
Adj. Flow (vph)	28	22	34	834	33	25	35	424	6	34	787	23
RTOR Reduction (vph)	0	0	0	0	2	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	85	0	450	440	0	35	429	0	34	808	0
Confl. Peds. (#/hr)			4			4			4			3
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6			2	
Permitted Phases							6			2		
Actuated Green, G (s)		8.8		38.5	38.5		57.7	57.7		57.7	57.7	
Effective Green, g (s)		8.8		38.5	38.5		57.7	57.7		57.7	57.7	
Actuated g/C Ratio		0.07		0.32	0.32		0.48	0.48		0.48	0.48	
Clearance Time (s)		4.9		4.9	4.9		5.2	5.2		5.2	5.2	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		132		511	567		248	1786		398	2561	
v/s Ratio Prot		c0.05		c0.28	0.25			0.12			c0.15	
v/s Ratio Perm							0.07			0.04		
v/c Ratio		0.64		0.88	0.78		0.14	0.24		0.09	0.32	
Uniform Delay, d1		54.1		38.6	36.8		17.3	18.3		16.9	19.1	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		7.8		15.8	6.0		1.2	0.3		0.4	0.3	
Delay (s)		61.9		54.3	42.9		18.5	18.6		17.3	19.4	
Level of Service		E		D	D		B	B		B	B	
Approach Delay (s)		61.9			48.6			18.6			19.3	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Last Update: Sept 2017			

c Critical Lane Group

2032 Total PM Southbridge Expansion
 28: GOLDWATER BLVD & SCOTTSDALE RD Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	50	50	50	20
Maximum Split (%)	41.7%	41.7%	41.7%	16.7%
Minimum Split (s)	16	13	16	13
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	88	38	88	18
End Time (s)	18	88	18	38
Yield/Force Off (s)	12.8	83.1	12.8	33.1
Yield/Force Off 170(s)	12.8	83.1	12.8	33.1
Local Start Time (s)	0	70	0	50
Local Yield (s)	44.8	115.1	44.8	65.1
Local Yield 170(s)	44.8	115.1	44.8	65.1
Intersection Summary				
Cycle Length				120
Control Type	Actuated-Coordinated			
Natural Cycle	60			
Offset: 88 (73%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				



2032 Total PM
29: OSBORN RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	30	253	86	214	387	148	153	830	71	154	1362	34
Future Volume (vph)	30	253	86	214	387	148	153	830	71	154	1362	34
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	3559		1676	3552		1676	3725	1467	1676	5330	
Flt Permitted	0.15	1.00		0.37	1.00		0.08	1.00	1.00	0.16	1.00	
Satd. Flow (perm)	263	3559		649	3552		141	3725	1467	277	5330	
Peak-hour factor, PHF	0.83	0.83	0.83	0.80	0.80	0.80	0.84	0.84	0.84	0.88	0.88	0.88
Adj. Flow (vph)	36	305	104	268	484	185	182	988	85	175	1548	39
RTOR Reduction (vph)	0	30	0	0	36	0	0	0	50	0	2	0
Lane Group Flow (vph)	36	379	0	268	633	0	182	988	35	175	1585	0
Confl. Peds. (#/hr)			13			7			8			10
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	38.5	26.8		38.5	26.8		60.1	49.9	49.9	60.5	50.3	
Effective Green, g (s)	38.5	26.8		38.5	26.8		60.1	49.9	49.9	60.5	50.3	
Actuated g/C Ratio	0.32	0.22		0.32	0.22		0.50	0.42	0.42	0.50	0.42	
Clearance Time (s)	5.3	5.1		5.3	5.1		5.6	5.4	5.4	5.6	5.0	
Vehicle Extension (s)	2.0	1.0		2.0	1.0		2.0	1.0	1.0	2.0	1.0	
Lane Grp Cap (vph)	222	794		308	793		201	1548	610	258	2234	
v/s Ratio Prot	0.02	0.11		c0.08	0.18		c0.08	0.27		0.06	0.30	
v/s Ratio Perm	0.04			c0.19			c0.38		0.02	0.28		
v/c Ratio	0.16	0.48		0.87	0.80		0.91	0.64	0.06	0.68	0.71	
Uniform Delay, d1	42.9	40.5		41.8	44.0		43.0	27.9	21.0	38.3	28.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.2		21.8	5.3		37.4	2.0	0.2	5.5	1.9	
Delay (s)	43.0	40.7		63.6	49.3		80.4	29.9	21.2	43.8	30.8	
Level of Service	D	D		E	D		F	C	C	D	C	
Approach Delay (s)		40.9			53.4			36.6			32.0	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	38.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.4
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		

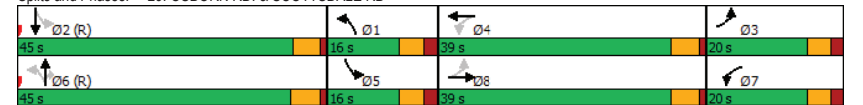
Description: Last Update: Sept 2017
c Critical Lane Group

2032 Total PM
29: OSBORN RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	EBL	WBTL	SBL	NBTL	WBL	EBTL
Lead/Lag								
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	16	45	20	39	16	45	20	39
Maximum Split (%)	13.3%	37.5%	16.7%	32.5%	13.3%	37.5%	16.7%	32.5%
Minimum Split (s)	11	31	11	38.1	11	34.4	11	37.1
Yellow Time (s)	3.6	4	3.3	4	3.6	4.4	3.3	4
All-Red Time (s)	2	1	2	1.1	2	1	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	1	2	1	2	1	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		9		10		11
Flash Dont Walk (s)		18		24		19		21
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	5	80	60	21	5	80	60	21
End Time (s)	21	5	80	60	21	5	80	60
Yield/Force Off (s)	15.4	0	74.7	54.9	15.4	119.6	74.7	54.9
Yield/Force Off 170(s)	15.4	102	74.7	30.9	15.4	100.6	74.7	33.9
Local Start Time (s)	45	0	100	61	45	0	100	61
Local Yield (s)	55.4	40	114.7	94.9	55.4	39.6	114.7	94.9
Local Yield 170(s)	55.4	22	114.7	70.9	55.4	20.6	114.7	73.9
Intersection Summary								
Cycle Length	120							
Control Type	Actuated-Coordinated							
Natural Cycle	95							
Offset: 80 (67%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green								

Splits and Phases: 29: OSBORN RD. & SCOTTSDALE RD



2032 Total PM
30: 6th Ave & A1

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	7	89	154	69	70	12
Future Vol, veh/h	7	89	154	69	70	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	97	167	75	76	13

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	242	0	0	318	205
Stage 1	-	-	-	205	-
Stage 2	-	-	-	113	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2,218	-	-	3,518	3,318
Pot Cap-1 Maneuver	1324	-	-	675	836
Stage 1	-	-	-	829	-
Stage 2	-	-	-	912	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1324	-	-	671	836
Mov Cap-2 Maneuver	-	-	-	671	-
Stage 1	-	-	-	824	-
Stage 2	-	-	-	912	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1324	-	-	-	691
HCM Lane V/C Ratio	0.006	-	-	-	0.129
HCM Control Delay (s)	7.7	0	-	-	11
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.4

2032 Total PM
31: 6th Ave & A2

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	7	39	139	27	57	15
Future Vol, veh/h	7	39	139	27	57	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	42	151	29	62	16

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	180	0	0	224	166
Stage 1	-	-	-	166	-
Stage 2	-	-	-	58	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2,218	-	-	3,518	3,318
Pot Cap-1 Maneuver	1396	-	-	764	878
Stage 1	-	-	-	863	-
Stage 2	-	-	-	965	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1396	-	-	759	878
Mov Cap-2 Maneuver	-	-	-	759	-
Stage 1	-	-	-	858	-
Stage 2	-	-	-	965	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1396	-	-	-	781
HCM Lane V/C Ratio	0.005	-	-	-	0.1
HCM Control Delay (s)	7.6	0	-	-	10.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

2032 Total PM
32: A3 & Stetson Dr

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	3.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		↔
Traffic Vol, veh/h	109	5	72	127	0	100
Future Vol, veh/h	109	5	72	127	0	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	118	5	78	138	0	109
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	123	0	-	121
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.12	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.218	-	-	3.318
Pot Cap-1 Maneuver	-	-	1464	-	0	930
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1464	-	-	930
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	2.7	9.4			
HCM LOS				A		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	930	-	-	1464	-	
HCM Lane V/C Ratio	0.117	-	-	0.053	-	
HCM Control Delay (s)	9.4	-	-	7.6	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.4	-	-	0.2	-	

2032 Total PM
33: Stetson Dr & C1

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	3	29	28	119	148	6
Future Vol, veh/h	3	29	28	119	148	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	32	30	129	161	7
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	354	165	168	0	-	0
Stage 1	165	-	-	-	-	-
Stage 2	189	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	644	879	1410	-	-	-
Stage 1	864	-	-	-	-	-
Stage 2	843	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	629	879	1410	-	-	-
Mov Cap-2 Maneuver	629	-	-	-	-	-
Stage 1	844	-	-	-	-	-
Stage 2	843	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	9.4	1.4	0			
HCM LOS				A		
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1410	-	847	-	-	
HCM Lane V/C Ratio	0.022	-	0.041	-	-	
HCM Control Delay (s)	7.6	0	9.4	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

2032 Total PM
34: 5th Ave & C2

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	26	168	230	16	0	36
Future Vol, veh/h	26	168	230	16	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	183	250	17	0	39
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	267	0	0	498	259	
Stage 1	-	-	-	259	-	
Stage 2	-	-	-	239	-	
Critical Hdwy	4.12	-	-	6.42	6.22	
Critical Hdwy Stg 1	-	-	-	5.42	-	
Critical Hdwy Stg 2	-	-	-	5.42	-	
Follow-up Hdwy	2.218	-	-	3.518	3.318	
Pot Cap-1 Maneuver	1297	-	-	532	780	
Stage 1	-	-	-	784	-	
Stage 2	-	-	-	801	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	1297	-	-	519	780	
Mov Cap-2 Maneuver	-	-	-	519	-	
Stage 1	-	-	-	765	-	
Stage 2	-	-	-	801	-	
Approach	EB	WB	SB			
HCM Control Delay, s	1.1	0	9.9			
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1297	-	-	-	780	
HCM Lane V/C Ratio	0.022	-	-	-	0.05	
HCM Control Delay (s)	7.8	0	-	-	9.9	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	

2032 Total PM
35: 5TH AVE & D

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	35	82	136	22	16	27
Future Vol, veh/h	35	82	136	22	16	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	89	148	24	17	29
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	172	0	0	325	160	
Stage 1	-	-	-	160	-	
Stage 2	-	-	-	165	-	
Critical Hdwy	4.12	-	-	6.42	6.22	
Critical Hdwy Stg 1	-	-	-	5.42	-	
Critical Hdwy Stg 2	-	-	-	5.42	-	
Follow-up Hdwy	2.218	-	-	3.518	3.318	
Pot Cap-1 Maneuver	1405	-	-	669	885	
Stage 1	-	-	-	869	-	
Stage 2	-	-	-	864	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	1405	-	-	650	885	
Mov Cap-2 Maneuver	-	-	-	650	-	
Stage 1	-	-	-	845	-	
Stage 2	-	-	-	864	-	
Approach	EB	WB	SB			
HCM Control Delay, s	2.3	0	9.9			
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1405	-	-	-	780	
HCM Lane V/C Ratio	0.027	-	-	-	0.06	
HCM Control Delay (s)	7.6	0	-	-	9.9	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	

2032 Total PM
36: Vehicle Path & 6th Ave

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	78	81	0	168	55	0
Future Vol, veh/h	78	81	0	168	55	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	85	88	0	183	60	0
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	173	0	312	129
Stage 1	-	-	-	-	129	-
Stage 2	-	-	-	-	183	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1404	-	681	921
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	848	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1404	-	681	921
Mov Cap-2 Maneuver	-	-	-	-	681	-
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	848	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	10.8			
HCM LOS				B		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	681	-	-	1404	-	
HCM Lane V/C Ratio	0.088	-	-	-	-	
HCM Control Delay (s)	10.8	-	-	0	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.3	-	-	0	-	

2032 Total PM
37: Vehicle Path

Southbridge Expansion
HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	2	205	199	54	78	2
Future Vol, veh/h	2	205	199	54	78	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	223	216	59	85	2
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	275	0	0	473	246	
Stage 1	-	-	-	246	-	
Stage 2	-	-	-	227	-	
Critical Hdwy	4.12	-	-	6.42	6.22	
Critical Hdwy Stg 1	-	-	-	5.42	-	
Critical Hdwy Stg 2	-	-	-	5.42	-	
Follow-up Hdwy	2.218	-	-	3.518	3.318	
Pot Cap-1 Maneuver	1288	-	-	550	793	
Stage 1	-	-	-	795	-	
Stage 2	-	-	-	811	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	1288	-	-	549	793	
Mov Cap-2 Maneuver	-	-	-	549	-	
Stage 1	-	-	-	793	-	
Stage 2	-	-	-	811	-	
Approach	EB	WB	SB			
HCM Control Delay, s	0.1	0	12.7			
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1288	-	-	-	553	
HCM Lane V/C Ratio	0.002	-	-	-	0.157	
HCM Control Delay (s)	7.8	0	-	-	12.7	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.6	

2032 Total PM Mitigated
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
Traffic Volume (vph)	127	175	72	487	204	267	56	2095	439	246	2177	71
Future Volume (vph)	127	175	72	487	204	267	56	2095	439	246	2177	71
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4	4.0	5.4		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	0.91		
Fr	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	1.00	1.00		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00		
Satd. Flow (prot)	1676	1945	1500	3252	1945	1500	1676	5200	1676	5313		
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.06	1.00	0.07	1.00		
Satd. Flow (perm)	1676	1945	1500	3252	1945	1500	107	5200	116	5313		
Peak-hour factor, PHF	0.85	0.85	0.85	0.83	0.83	0.83	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	206	85	587	246	322	59	2205	462	259	2292	75
RTOR Reduction (vph)	0	0	0	0	0	183	0	21	0	0	2	0
Lane Group Flow (vph)	149	206	85	587	246	139	59	2646	0	259	2365	0
Bus Blockages (#/hr)	0	2	0	0	2	0	0	2	0	0	2	0
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	pm+pt	NA		
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases			8			4	6		2			
Actuated Green, G (s)	18.3	18.3	18.3	28.3	28.3	28.3	86.1	66.0	77.7	61.0		
Effective Green, g (s)	18.3	18.3	18.3	28.3	28.3	28.3	86.1	66.0	77.7	61.0		
Actuated g/C Ratio	0.12	0.12	0.12	0.19	0.19	0.19	0.57	0.44	0.52	0.41		
Clearance Time (s)	5.3	5.3	5.3	6.0	6.0	6.0	5.6	5.4	4.0	5.4		
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.2	3.0	0.2		
Lane Grp Cap (vph)	204	237	183	613	366	283	271	2288	233	2160		
v/s Ratio Prot	0.09	c0.11		c0.18	0.13		c0.03	c0.51	c0.12	0.45		
v/s Ratio Perm			0.06			0.09	0.10		0.45			
v/c Ratio	0.73	0.87	0.46	0.96	0.67	0.49	0.22	1.16	1.11	1.09		
Uniform Delay, d1	63.5	64.7	61.3	60.3	56.5	54.4	54.1	42.0	63.2	44.5		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	11.0	26.1	0.7	25.7	3.8	0.5	0.1	75.8	92.1	50.7		
Delay (s)	74.4	90.8	62.0	86.0	60.3	54.9	54.3	117.8	155.3	95.2		
Level of Service	E	F	E	F	E	D	D	F	F	F		
Approach Delay (s)		79.7			71.9			116.4		101.2		
Approach LOS		E			E			F		F		

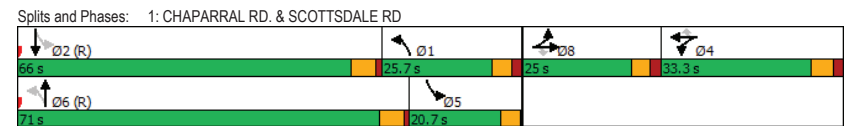
Intersection Summary			
HCM 2000 Control Delay	100.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	22.3
Intersection Capacity Utilization	102.8%	ICU Level of Service	G
Analysis Period (min)	15		
Description: Last Update: April 2018			
c Critical Lane Group			

2032 Total PM Mitigated
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	WBTL	SBL	NBTL	EBTL
Lead/Lag	Lag	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize						
Recall Mode	None	C-Min	None	None	C-Min	None
Maximum Split (s)	25.7	66	33.3	20.7	71	25
Maximum Split (%)	17.1%	44.0%	22.2%	13.8%	47.3%	16.7%
Minimum Split (s)	12.6	22.4	35	8	26.4	36.3
Yellow Time (s)	3.6	4.4	4	3.5	4.4	3.3
All-Red Time (s)	2	1	2	0.5	1	2
Minimum Initial (s)	7	12	7	4	12	7
Vehicle Extension (s)	2	0.2	2	3	0.2	2
Minimum Gap (s)	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	9
Flash Dont Walk (s)		10	22		14	22
Dual Entry	No	Yes	No	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	66	0	116.7	71	0	91.7
End Time (s)	91.7	66	0	91.7	71	116.7
Yield/Force Off (s)	86.1	60.6	144	87.7	65.6	111.4
Yield/Force Off 170(s)	86.1	50.6	122	87.7	51.6	89.4
Local Start Time (s)	66	0	116.7	71	0	91.7
Local Yield (s)	86.1	60.6	144	87.7	65.6	111.4
Local Yield 170(s)	86.1	50.6	122	87.7	51.6	89.4

Intersection Summary	
Cycle Length	150
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Total PM Mitigated
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	179	20	218	20	5	25	51	2467	67	16	1055	44
Future Volume (vph)	179	20	218	20	5	25	51	2467	67	16	1055	44
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1	5.1	5.1	5.1	5.1	5.6	5.6	5.6	5.6	5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00	0.91
Frbp, ped/bikes	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	1.00	1.00	1.00	1.00	0.99	1.00	0.99
Flt Protected	0.95	1.00	1.00	0.96	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	1961	1500	1886	1480	1676	5328	1676	5315	1676	5315	1676
Flt Permitted	0.74	1.00	1.00	0.82	1.00	0.18	1.00	0.04	1.00	0.04	1.00	1.00
Satd. Flow (perm)	1303	1961	1500	1610	1480	314	5328	78	5315	78	5315	1303
Peak-hour factor, PHF	0.81	0.81	0.81	0.86	0.86	0.86	0.90	0.90	0.90	0.83	0.83	0.83
Adj. Flow (vph)	221	25	269	23	6	29	57	2741	74	19	1271	53
RTOR Reduction (vph)	0	0	59	0	0	17	0	2	0	0	3	0
Lane Group Flow (vph)	221	25	210	0	29	12	57	2813	0	19	1321	0
Confl. Peds. (#/hr)						1			2			2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4		4	6		2			
Actuated Green, G (s)	26.1	26.1	26.1		26.1	26.1	90.3	90.3		90.3	90.3	
Effective Green, g (s)	26.1	26.1	26.1		26.1	26.1	90.3	90.3		90.3	90.3	
Actuated g/C Ratio	0.21	0.21	0.21		0.21	0.21	0.71	0.71		0.71	0.71	
Clearance Time (s)	5.1	5.1	5.1		5.1	5.1	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	267	402	308		330	303	223	3785		55	3776	
v/s Ratio Prot		0.01						c0.53			0.25	
v/s Ratio Perm	c0.17		0.14		0.02	0.01	0.18		0.24			
v/c Ratio	0.83	0.06	0.68		0.09	0.04	0.26	0.74		0.35	0.35	
Uniform Delay, d1	48.3	40.6	46.7		40.9	40.4	6.5	11.3		7.1	7.1	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	17.8	0.0	4.9		0.0	0.0	2.7	1.4		16.4	0.3	
Delay (s)	66.2	40.7	51.6		40.9	40.5	9.3	12.6		23.4	7.3	
Level of Service	E	D	D		D	D	A	B		C	A	
Approach Delay (s)		57.3			40.7		12.6			7.6		
Approach LOS		E			D		B			A		

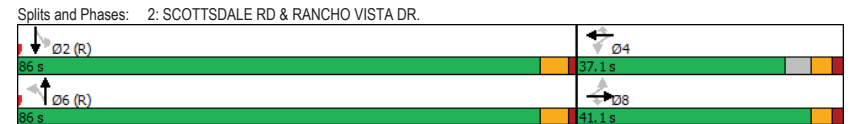
Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	127.1	Sum of lost time (s)	10.7
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Total PM Mitigated
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	86	37.1	86	41.1
Maximum Split (%)	67.7%	29.2%	67.7%	32.3%
Minimum Split (s)	16	37.1	16	41.1
Yellow Time (s)	4.4	3.3	4.4	3.3
All-Red Time (s)	1.2	1.8	1.2	1.8
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	11
Flash Dont Walk (s)	18	25	13	25
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	76	34.9	76	34.9
End Time (s)	34.9	76	34.9	76
Yield/Force Off (s)	29.3	70.9	29.3	70.9
Yield/Force Off 170(s)	11.3	45.9	16.3	45.9
Local Start Time (s)	0	86	0	86
Local Yield (s)	80.4	122	80.4	122
Local Yield 170(s)	62.4	97	67.4	97

Intersection Summary	
Cycle Length	127.1
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 76 (60%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Total PM Mitigated Southbridge Expansion
 3: SCOTTSDALE RD & HIGHLAND AVE/Granada Ave HCM Signalized Intersection Capacity Analysis

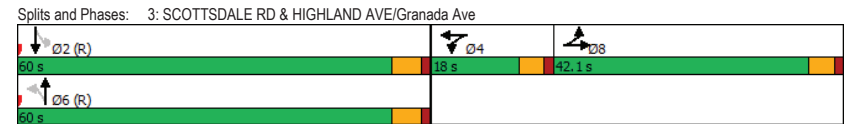
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	810	22	58	32	22	44	52	1674	37	15	1305	103
Future Volume (vph)	810	22	58	32	22	44	52	1674	37	15	1305	103
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.90		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3252	1730		1676	1766		1676	5333		1676	5289	
Flt Permitted	0.95	1.00		0.95	1.00		0.08	1.00		0.07	1.00	
Satd. Flow (perm)	3252	1730		1676	1766		143	5333		122	5289	
Peak-hour factor, PHF	0.85	0.85	0.85	0.80	0.80	0.80	0.91	0.91	0.91	0.87	0.87	0.87
Adj. Flow (vph)	953	26	68	40	28	55	57	1840	41	17	1500	118
RTOR Reduction (vph)	0	47	0	0	8	0	0	2	0	0	7	0
Lane Group Flow (vph)	953	47	0	40	75	0	57	1879	0	17	1611	0
Confl. Peds. (#/hr)			2						2			2
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6			2	
Permitted Phases							6			2		
Actuated Green, G (s)	37.7	37.7		8.8	8.8		57.7	57.7		57.7	57.7	
Effective Green, g (s)	37.7	37.7		8.8	8.8		57.7	57.7		57.7	57.7	
Actuated g/C Ratio	0.31	0.31		0.07	0.07		0.48	0.48		0.48	0.48	
Clearance Time (s)	5.1	5.1		5.1	5.1		5.7	5.7		5.7	5.7	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	1020	543		122	129		68	2562		58	2541	
v/s Ratio Prot	c0.29	0.03		0.02	c0.04			0.35			0.30	
v/s Ratio Perm							c0.40			0.14		
v/c Ratio	0.93	0.09		0.33	0.58		0.84	0.73		0.29	0.63	
Uniform Delay, d1	40.0	29.1		52.8	53.9		27.1	25.0		18.9	23.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.7	0.0		0.6	3.9		69.9	1.9		12.4	1.2	
Delay (s)	54.7	29.1		53.4	57.7		97.1	26.9		31.3	24.5	
Level of Service	D	C		D	E		F	C		C	C	
Approach Delay (s)		52.4			56.3			29.0			24.6	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	15.9
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Total PM Mitigated Southbridge Expansion
 3: SCOTTSDALE RD & HIGHLAND AVE/Granada Ave Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lead		Lag
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	60	18	60	42.1
Maximum Split (%)	50.0%	15.0%	50.0%	35.1%
Minimum Split (s)	30.7	15.1	28.7	38.1
Yellow Time (s)	4.4	3.6	4.4	3.6
All-Red Time (s)	1.3	1.5	1.3	1.5
Minimum Initial (s)	10	10	10	10
Vehicle Extension (s)	1	2	1	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8		7	9
Flash Dont Walk (s)	17		16	24
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	94	33.9	94	51.9
End Time (s)	33.9	51.9	33.9	94
Yield/Force Off (s)	28.2	46.8	28.2	88.9
Yield/Force Off 170(s)	11.2	46.8	12.2	64.9
Local Start Time (s)	0	60	0	78
Local Yield (s)	54.3	72.9	54.3	115
Local Yield 170(s)	37.3	72.9	38.3	91

Intersection Summary	
Cycle Length	120.1
Control Type	Actuated-Coordinated
Natural Cycle	85
Offset: 94 (78%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green	



2032 Total PM Mitigated
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	128	1361	238	255	1884	99	236	385	236	128	235	91
Future Volume (vph)	128	1361	238	255	1884	99	236	385	236	128	235	91
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5223		1676	5309		1676	1961	1472	1676	1961	1500
Flt Permitted	0.09	1.00		0.09	1.00		0.43	1.00	1.00	0.16	1.00	1.00
Satd. Flow (perm)	164	5223		164	5309		761	1961	1472	282	1961	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	1479	259	277	2048	108	257	418	257	139	255	99
RTOR Reduction (vph)	0	22	0	0	5	0	0	0	131	0	0	77
Lane Group Flow (vph)	139	1716	0	277	2151	0	257	418	126	139	255	22
Confl. Peds. (#/hr)			1			2			5			
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	3		4	3		2	1	2	1	1	1
Permitted Phases	3			3			1		1			1
Actuated Green, G (s)	58.2	43.1		58.2	43.1		31.0	25.0	25.0	31.0	25.0	25.0
Effective Green, g (s)	58.2	43.1		58.2	43.1		31.0	25.0	25.0	31.0	25.0	25.0
Actuated g/C Ratio	0.53	0.39		0.53	0.39		0.28	0.23	0.23	0.28	0.23	0.23
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	293	2042		293	2076		263	444	333	155	444	340
v/s Ratio Prot	0.06	0.33		c0.13	c0.41		c0.05	0.21		0.05	0.13	
v/s Ratio Perm	0.19			0.37			c0.22		0.09	0.20		0.01
v/c Ratio	0.47	0.84		0.95	1.04		0.98	0.94	0.38	0.90	0.57	0.07
Uniform Delay, d1	40.1	30.4		40.1	33.5		41.6	41.9	36.0	47.5	37.9	33.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	3.2		37.5	29.8		48.5	28.1	0.3	42.3	1.1	0.0
Delay (s)	40.6	33.6		77.6	63.4		90.1	70.0	36.3	89.8	39.0	33.5
Level of Service	D	C		E	E		F	E	D	F	D	C
Approach Delay (s)		34.1			65.0			66.2			52.2	
Approach LOS		C			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	54.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	110.2	Sum of lost time (s)	21.0
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		
c	Critical Lane Group		

2032 Total PM Mitigated
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4
Movement	NBSB	NBSBL	EBWB	EBWBL
Lead/Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	33	10	49	20
Maximum Split (%)	29.5%	8.9%	43.8%	17.9%
Minimum Split (s)	15	8	56	31
Yellow Time (s)	4.2	3	4.2	3
All-Red Time (s)	2.8	1	1.8	1
Minimum Initial (s)	8	4	10	4
Vehicle Extension (s)	2	1	1	1
Minimum Gap (s)	1	1	1	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	0		33	
Flash Dont Walk (s)	0		17	
Dual Entry	No	No	No	No
Inhibit Max	No	No	No	No
Start Time (s)	0	33	43	92
End Time (s)	33	43	92	0
Yield/Force Off (s)	26	39	86	108
Yield/Force Off 170(s)	26	39	69	108
Local Start Time (s)	79	0	10	59
Local Yield (s)	105	6	53	75
Local Yield 170(s)	105	6	36	75

Intersection Summary	
Cycle Length	112
Control Type	Actuated-Uncoordinated
Natural Cycle	140

Splits and Phases: 5: 68th Street & CAMELBACK RD.



2032 Total PM Mitigated
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔↔	↔↔	↔	↔↔	↔↔↔	↔
Traffic Volume (vph)	290	1243	284	68	1308	127	324	289	125	95	538	619
Future Volume (vph)	290	1243	284	68	1308	127	324	289	125	95	538	619
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	0.97	0.91	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1676	5353	1479	1676	5275		3252	3725	1490	3252	5353	1490
Flt Permitted	0.10	1.00	1.00	0.10	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	173	5353	1479	173	5275		3252	3725	1490	3252	5353	1490
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95	0.88	0.88	0.88
Adj. Flow (vph)	315	1351	309	74	1422	138	341	304	132	108	611	703
RTOR Reduction (vph)	0	0	114	0	9	0	0	0	50	0	0	81
Lane Group Flow (vph)	315	1351	195	74	1551	0	341	304	82	108	611	622
Conf. Peds. (#/hr)			2			3			2			1
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	3	8		7	4		1	6	7	5	2	3
Permitted Phases	8		8	4					6			2
Actuated Green, G (s)	61.5	40.9	40.9	61.5	40.9		16.1	16.7	37.3	20.2	20.8	41.4
Effective Green, g (s)	61.5	40.9	40.9	61.5	40.9		16.1	16.7	37.3	20.2	20.8	41.4
Actuated g/C Ratio	0.51	0.34	0.34	0.51	0.34		0.13	0.14	0.31	0.17	0.17	0.34
Clearance Time (s)	5.6	5.7	5.7	5.6	5.7		5.3	5.6	5.6	5.3	5.6	5.6
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	344	1815	501	344	1788		434	515	530	544	923	580
v/s Ratio Prot	0.16	0.25		0.04	0.29		c0.10	0.08	0.03	c0.03	0.11	c0.18
v/s Ratio Perm	c0.31		0.13	0.07					0.03			0.23
v/c Ratio	0.92	0.74	0.39	0.22	0.87		0.79	0.59	0.16	0.20	0.66	1.07
Uniform Delay, d1	43.3	35.2	30.3	34.7	37.3		50.6	48.7	30.2	43.2	46.6	39.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	27.6	1.5	0.2	0.1	4.6		8.4	4.9	0.0	0.1	3.7	58.4
Delay (s)	70.9	36.7	30.5	34.9	41.9		59.0	53.6	30.3	43.3	50.3	98.0
Level of Service	E	D	C	C	D		E	D	C	D	D	F
Approach Delay (s)		41.2			41.6			52.0				73.4
Approach LOS		D			D			D				E

Intersection Summary			
HCM 2000 Control Delay	50.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	120.6	Sum of lost time (s)	22.2
Intersection Capacity Utilization	101.1%	ICU Level of Service	G
Analysis Period (min)	15		

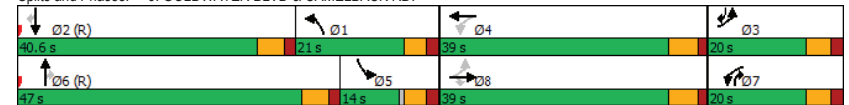
Description: Last Update: Sept 2017
c Critical Lane Group

2032 Total PM Mitigated
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBTL	SBL	NBT	WBL	EBTL
Lead/Lag	Lag	Lead			Lag	Lead		
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	Ped	None	C-Min	None	Ped
Maximum Split (s)	21	40.6	20	39	14	47	20	39
Maximum Split (%)	17.4%	33.7%	16.6%	32.3%	11.6%	39.0%	16.6%	32.3%
Minimum Split (s)	11	40.6	11	31	11	35.6	11	33
Yellow Time (s)	3.3	4	3.6	4.4	3.3	4	3.6	4.4
All-Red Time (s)	2	1.6	2	1.3	2	1.6	2	1.3
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	1	2	2	2	1
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		8		7		7		7
Flash Dont Walk (s)		27		24		23		26
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	88.6	48	28	109.6	95	48	28	109.6
End Time (s)	109.6	88.6	48	28	109.6	95	48	28
Yield/Force Off (s)	104.3	83	42.4	22.3	104.3	89.4	42.4	22.3
Yield/Force Off 170(s)	104.3	56	42.4	118.9	104.3	66.4	42.4	116.9
Local Start Time (s)	40.6	0	100.6	61.6	47	0	100.6	61.6
Local Yield (s)	56.3	35	115	94.9	56.3	41.4	115	94.9
Local Yield 170(s)	56.3	8	115	70.9	56.3	18.4	115	68.9

Splits and Phases: 6: GOLDWATER BLVD & CAMELBACK RD.



2032 Total PM Mitigated
7: CAMELBACK RD. & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	238	736	328	126	751	222	394	1125	124	419	832	250
Future Volume (vph)	238	736	328	126	751	222	394	1125	124	419	832	250
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.91		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3252	3725	1482	1676	3578		3252	5260		3252	3725	1466
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3252	3725	1482	1676	3578		3252	5260		3252	3725	1466
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.86	0.86	0.88	0.88	0.88	0.95	0.95	0.95
Adj. Flow (vph)	259	800	357	147	873	258	448	1278	141	441	876	263
RTOR Reduction (vph)	0	0	67	0	23	0	0	11	0	0	0	142
Lane Group Flow (vph)	259	800	290	147	1108	0	448	1408	0	441	876	121
Confl. Peds. (#/hr)			8			12			10			8
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8	1	7	4		1	6		5	2	
Permitted Phases			8									2
Actuated Green, G (s)	10.2	29.8	53.4	15.9	35.5		23.6	33.6		19.8	30.0	30.0
Effective Green, g (s)	10.2	29.8	53.4	15.9	35.5		23.6	33.6		19.8	30.0	30.0
Actuated g/C Ratio	0.08	0.25	0.44	0.13	0.29		0.20	0.28		0.16	0.25	0.25
Clearance Time (s)	5.3	5.5	5.0	5.3	5.5		5.0	5.0		5.6	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	275	921	718	221	1054		636	1466		534	927	364
v/s Ratio Prot	c0.08	0.21	0.08	0.09	c0.31		0.14	c0.27		0.14	c0.24	
v/s Ratio Perm			0.12									0.08
v/c Ratio	0.94	0.87	0.40	0.67	1.05		0.70	0.96		0.83	0.94	0.33
Uniform Delay, d1	54.9	43.5	22.8	49.8	42.5		45.2	42.8		48.7	44.4	37.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	38.3	8.5	0.1	5.7	42.3		2.9	15.8		9.6	18.9	2.4
Delay (s)	93.2	51.9	22.9	55.5	84.8		48.1	58.6		58.3	63.3	39.5
Level of Service	F	D	C	E	F		D	E		E	E	D
Approach Delay (s)		52.2			81.5			56.1				58.0
Approach LOS		D			F			E				E

Intersection Summary			
HCM 2000 Control Delay	60.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	120.5	Sum of lost time (s)	21.4
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		

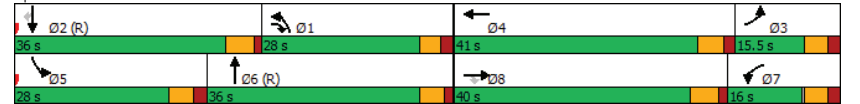
Description: Last Update: Sept 2017
c Critical Lane Group

2032 Total PM Mitigated
7: CAMELBACK RD. & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	EBL	WBT	SBL	NBT	WBL	EBT
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	28	36	15.5	41	28	36	16	40
Maximum Split (%)	23.2%	29.9%	12.9%	34.0%	23.2%	29.9%	13.3%	33.2%
Minimum Split (s)	10	32.4	11	40.5	11	33	11	34.5
Yellow Time (s)	3	4.4	3.3	4	3.6	3.6	3.3	4
All-Red Time (s)	2	1	2	1.5	2	1.4	2	1.5
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	2	2	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		23		31		24		25
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	76	40	24.5	104	40	68	23.5	104
End Time (s)	104	76	40	24.5	68	104	40	23.5
Yield/Force Off (s)	99	70.6	34.7	19	62.4	99	34.7	18
Yield/Force Off 170(s)	99	47.6	34.7	108.5	62.4	75	34.7	113.5
Local Start Time (s)	36	0	105	64	0	28	104	64
Local Yield (s)	59	30.6	115.2	99.5	22.4	59	115.2	98.5
Local Yield 170(s)	59	7.6	115.2	68.5	22.4	35	115.2	73.5

Splits and Phases: 7: CAMELBACK RD. & SCOTTSDALE RD



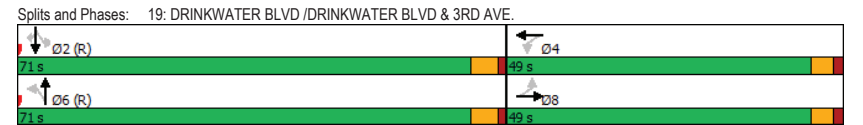
2032 Total PM Mitigated Southbridge Expansion
 19: DRINKWATER BLVD /DRINKWATER BLVD & 3RD AVE. HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	48	18	106	77	19	60	108	653	135	75	577	41
Future Volume (vph)	48	18	106	77	19	60	108	653	135	75	577	41
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99			0.99		1.00	1.00		1.00	1.00	0.97
Ftpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87			0.95		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1676	1690			1802		1676	5195		1676	3725	1454
Flt Permitted	0.56	1.00			0.62		0.39	1.00		0.30	1.00	1.00
Satd. Flow (perm)	990	1690			1140		697	5195		538	3725	1454
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.89	0.89	0.89	0.88	0.88	0.88
Adj. Flow (vph)	55	21	122	90	22	70	121	734	152	85	656	47
RTOR Reduction (vph)	0	0	0	0	25	0	0	14	0	0	0	11
Lane Group Flow (vph)	55	143	0	0	157	0	121	872	0	85	656	36
Confl. Peds. (#/hr)			1			5			1			3
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	19.1	19.1			19.1		90.8	90.8		90.8	90.8	90.8
Effective Green, g (s)	19.1	19.1			19.1		90.8	90.8		90.8	90.8	90.8
Actuated g/C Ratio	0.16	0.16			0.16		0.76	0.76		0.76	0.76	0.76
Clearance Time (s)	4.9	4.9			4.9		5.2	5.2		5.2	5.2	5.2
Vehicle Extension (s)	2.0	2.0			2.0		0.2	0.2		2.0	2.0	2.0
Lane Grp Cap (vph)	157	268			181		527	3930		407	2818	1100
v/s Ratio Prot		0.08						0.17			c0.18	
v/s Ratio Perm	0.06				c0.14		0.17			0.16		0.02
v/c Ratio	0.35	0.53			0.87		0.23	0.22		0.21	0.23	0.03
Uniform Delay, d1	44.9	46.4			49.2		4.3	4.3		4.2	4.3	3.6
Progression Factor	1.00	1.00			1.00		1.00	1.00		0.96	0.86	1.29
Incremental Delay, d2	0.5	1.0			31.6		1.0	0.1		1.1	0.2	0.1
Delay (s)	45.4	47.4			80.8		5.3	4.4		5.2	3.9	4.7
Level of Service	D	D			F		A	A		A	A	A
Approach Delay (s)		46.8			80.8			4.5			4.1	
Approach LOS		D			F			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.1
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Last Update: Sept 2017			
c Critical Lane Group			

2032 Total PM Mitigated Southbridge Expansion
 19: DRINKWATER BLVD /DRINKWATER BLVD & 3RD AVE. Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	71	49	71	49
Maximum Split (%)	59.2%	40.8%	59.2%	40.8%
Minimum Split (s)	22.2	38.9	32.2	30.9
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	0.2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	9	7	7
Flash Dont Walk (s)	10	25	20	19
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	40	111	40	111
End Time (s)	111	40	111	40
Yield/Force Off (s)	105.8	35.1	105.8	35.1
Yield/Force Off 170(s)	95.8	10.1	85.8	16.1
Local Start Time (s)	0	71	0	71
Local Yield (s)	65.8	115.1	65.8	115.1
Local Yield 170(s)	55.8	90.1	45.8	96.1
Intersection Summary				
Cycle Length	120			
Control Type	Actuated-Coordinated			
Natural Cycle	75			
Offset: 40 (33%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				



2032 Total PM Mitigated
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

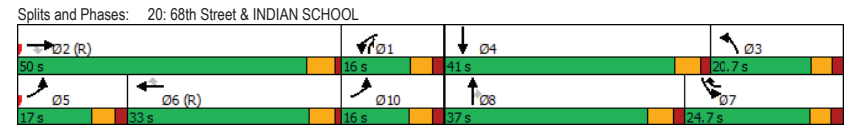
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔↔	↔	↔	↔↔	↔
Traffic Volume (vph)	289	925	24	130	847	213	85	592	139	157	499	216
Future Volume (vph)	289	925	24	130	847	213	85	592	139	157	499	216
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.6	5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1676	5353	1472	1676	5353	1466	1676	3725	1480	1676	3538	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1676	5353	1472	1676	5353	1466	1676	3725	1480	1676	3538	
Peak-hour factor, PHF	0.95	0.95	0.95	0.85	0.85	0.85	0.85	0.85	0.85	0.94	0.94	0.94
Adj. Flow (vph)	304	974	25	153	996	251	100	696	164	167	531	230
RTOR Reduction (vph)	0	0	15	0	0	71	0	0	0	0	41	0
Lane Group Flow (vph)	304	974	10	153	996	180	100	696	164	167	720	0
Confl. Peds. (#/hr)			5			6			6			5
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5 10	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	21.8	51.7	51.7	10.7	35.1	51.2	13.9	27.5	38.2	16.1	30.0	
Effective Green, g (s)	21.8	51.7	51.7	10.7	35.1	51.2	13.9	27.5	38.2	16.1	30.0	
Actuated g/C Ratio	0.17	0.40	0.40	0.08	0.27	0.40	0.11	0.22	0.30	0.13	0.23	
Clearance Time (s)		5.4	5.4	5.3	5.0	5.3	5.2	5.7	5.3	5.3	5.5	
Vehicle Extension (s)		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	286	2167	595	140	1471	587	182	802	504	211	831	
v/s Ratio Prot	c0.18	0.18		c0.09	c0.19	0.04	0.06	0.19	0.03	c0.10	c0.20	
v/s Ratio Perm			0.01			0.08			0.08			
v/c Ratio	1.06	0.45	0.02	1.09	0.68	0.31	0.55	0.87	0.33	0.79	0.87	
Uniform Delay, d1	53.0	27.6	22.8	58.5	41.3	26.1	53.9	48.3	34.7	54.2	46.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	70.8	0.7	0.1	103.1	2.5	0.1	1.8	9.5	0.1	17.0	9.2	
Delay (s)	123.8	28.3	22.8	161.6	43.8	26.2	55.7	57.9	34.9	71.2	56.1	
Level of Service	F	C	C	F	D	C	E	E	C	E	E	
Approach Delay (s)		50.5			53.5			53.7			58.8	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	53.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	127.7	Sum of lost time (s)	27.2
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

2032 Total PM Mitigated
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8	10
Movement	WBL	EBT	NBL	SBT	EBL	WBT	SBL	NBT	EBL
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	
Lead-Lag Optimize									
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None
Maximum Split (s)	16	50	20.7	41	17	33	24.7	37	16
Maximum Split (%)	12.5%	39.2%	16.2%	32.1%	13.3%	25.8%	19.3%	29.0%	12.5%
Minimum Split (s)	11	32.4	11	39.5	11	33	11	42.7	11
Yellow Time (s)	3.3	4.4	3.3	4	3.6	4	3.3	4	3.6
All-Red Time (s)	2	1	1.9	1.5	2	1	2	1.7	2
Minimum Initial (s)	5	10	5	7	5	10	5	7	5
Vehicle Extension (s)	2	2	2	2	2	2	2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4	
Flash Dont Walk (s)		23		30		24		33	
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes	Yes
Inhibit Max	No	No	No	No	No	No	No	No	No
Start Time (s)	70	20	127	86	20	37	123	86	70
End Time (s)	86	70	20	127	37	70	20	123	86
Yield/Force Off (s)	80.7	64.6	14.8	121.5	31.4	65	14.7	117.3	80.4
Yield/Force Off 170(s)	80.7	41.6	14.8	91.5	31.4	41	14.7	84.3	80.4
Local Start Time (s)	50	0	107	66	0	17	103	66	50
Local Yield (s)	60.7	44.6	122.5	101.5	11.4	45	122.4	97.3	60.4
Local Yield 170(s)	60.7	21.6	122.5	71.5	11.4	21	122.4	64.3	60.4



2032 Total PM Mitigated
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

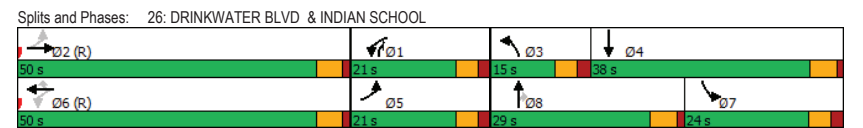
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	99	1306	70	338	1027	255	100	558	496	382	311	67
Future Volume (vph)	99	1306	70	338	1027	255	100	558	496	382	311	67
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.3	5.3	5.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1710	3698		1710	3725	1509	1710	3725	1515	3317	3629	
Flt Permitted	0.09	1.00		0.09	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	161	3698		161	3725	1509	1710	3725	1515	3317	3629	
Peak-hour factor, PHF	0.94	0.94	0.94	0.89	0.89	0.89	0.90	0.90	0.80	0.80	0.80	0.80
Adj. Flow (vph)	105	1389	74	380	1154	287	111	620	551	478	389	84
RTOR Reduction (vph)	0	3	0	0	0	101	0	0	45	0	15	0
Lane Group Flow (vph)	105	1460	0	380	1154	186	111	620	506	478	458	0
Confl. Peds. (#/hr)			2			1			4			3
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	2%	0%	0%	2%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases	2			6		6			8			
Actuated Green, G (s)	60.5	44.8		60.5	44.8	44.8	9.5	23.9	39.6	18.7	33.1	
Effective Green, g (s)	60.5	44.8		60.5	44.8	44.8	9.5	23.9	39.6	18.7	33.1	
Actuated g/C Ratio	0.49	0.36		0.49	0.36	0.36	0.08	0.19	0.32	0.15	0.27	
Clearance Time (s)	5.3	5.2		5.3	5.2	5.2	5.3	5.1	5.3	5.3	5.1	
Vehicle Extension (s)	2.0	0.2		2.0	0.2	0.2	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	274	1336		274	1345	545	131	717	548	500	968	
v/s Ratio Prot	0.05	0.39		c0.18	0.31		0.06	0.17	c0.12	c0.14	0.13	
v/s Ratio Perm	0.14			c0.50		0.12			0.22			
v/c Ratio	0.38	1.09		1.39	0.86	0.34	0.85	0.86	0.92	0.96	0.47	
Uniform Delay, d1	43.5	39.6		50.7	36.7	28.9	56.5	48.5	40.7	52.2	38.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	54.0		195.1	7.3	1.7	35.7	13.2	21.1	28.9	1.7	
Delay (s)	43.9	93.6		245.8	43.9	30.6	92.3	61.7	61.8	81.2	39.8	
Level of Service	D	F		F	D	C	F	E	E	F	D	
Approach Delay (s)		90.2			83.9			64.4			60.6	
Approach LOS		F			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	77.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	20.9
Intersection Capacity Utilization	110.9%	ICU Level of Service	H
Analysis Period (min)	15		
Description: Last Update: Nov 2017			
c Critical Lane Group			

2032 Total PM Mitigated
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBT	EBL	WBTL	SBL	NBT
Lead/Lag			Lead	Lag			Lag	Lead
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	Max	None	C-Max	None	Max
Maximum Split (s)	21	50	15	38	21	50	24	29
Maximum Split (%)	16.9%	40.3%	12.1%	30.6%	16.9%	40.3%	19.4%	23.4%
Minimum Split (s)	11	16	11	13	11	16	11	13
Yellow Time (s)	3.3	4	3.3	4	3.3	4	3.3	4
All-Red Time (s)	2	1.2	2	1.1	2	1.2	2	1.1
Minimum Initial (s)	5	10	5	7	5	10	5	7
Vehicle Extension (s)	2	0.2	2	2	2	0.2	2	2
Minimum Gap (s)	1	1	1	1	1	1	1	1
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		9		7		11
Flash Dont Walk (s)		21		20		19		20
Dual Entry	No	Yes	No	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	16	90	37	52	16	90	66	37
End Time (s)	37	16	52	90	37	16	90	66
Yield/Force Off (s)	31.7	10.8	46.7	84.9	31.7	10.8	84.7	60.9
Yield/Force Off 170(s)	31.7	113.8	46.7	64.9	31.7	115.8	84.7	40.9
Local Start Time (s)	50	0	71	86	50	0	100	71
Local Yield (s)	65.7	44.8	80.7	118.9	65.7	44.8	118.7	94.9
Local Yield 170(s)	65.7	23.8	80.7	98.9	65.7	25.8	118.7	74.9



2032 Total PM Mitigated
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	22	18	27	734	29	22	29	356	5	32	748	22
Future Volume (vph)	22	18	27	734	29	22	29	356	5	32	748	22
Ideal Flow (vphpl)	1800	2000	1800	1800	2000	1800	1800	2000	1800	1800	2000	1800
Total Lost time (s)		4.9		4.9	4.9		5.2	5.2		5.2	5.2	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95		1.00	0.91	
Frbp, ped/bikes		0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.95		1.00	0.99		1.00	1.00		1.00	1.00	
Flt Protected		0.98		0.95	0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1804		1593	1768		1676	3716		1676	5327	
Flt Permitted		0.98		0.95	0.96		0.29	1.00		0.47	1.00	
Satd. Flow (perm)		1804		1593	1768		517	3716		828	5327	
Peak-hour factor, PHF	0.80	0.80	0.80	0.88	0.88	0.88	0.84	0.84	0.84	0.95	0.95	0.95
Adj. Flow (vph)	28	22	34	834	33	25	35	424	6	34	787	23
RTOR Reduction (vph)	0	0	0	0	2	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	85	0	450	440	0	35	429	0	34	808	0
Confl. Peds. (#/hr)			4			4			4			3
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6			2	
Permitted Phases							6			2		
Actuated Green, G (s)		8.8		38.5	38.5		57.7	57.7		57.7	57.7	
Effective Green, g (s)		8.8		38.5	38.5		57.7	57.7		57.7	57.7	
Actuated g/C Ratio		0.07		0.32	0.32		0.48	0.48		0.48	0.48	
Clearance Time (s)		4.9		4.9	4.9		5.2	5.2		5.2	5.2	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		132		511	567		248	1786		398	2561	
v/s Ratio Prot		c0.05		c0.28	0.25			0.12			c0.15	
v/s Ratio Perm							0.07			0.04		
v/c Ratio		0.64		0.88	0.78		0.14	0.24		0.09	0.32	
Uniform Delay, d1		54.1		38.6	36.8		17.3	18.3		16.9	19.1	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		7.8		15.8	6.0		1.2	0.3		0.4	0.3	
Delay (s)		61.9		54.3	42.9		18.5	18.6		17.3	19.4	
Level of Service		E		D	D		B	B		B	B	
Approach Delay (s)		61.9			48.6			18.6			19.3	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

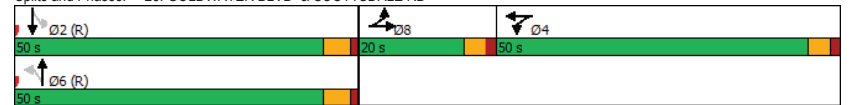
Description: Last Update: Sept 2017
c Critical Lane Group

2032 Total PM Mitigated
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
Timing Report, Sorted By Phase

Phase Number	2	4	6	8
Movement	SBTL	WBTL	NBTL	EBTL
Lead/Lag		Lag		Lead
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	50	50	50	20
Maximum Split (%)	41.7%	41.7%	41.7%	16.7%
Minimum Split (s)	16	13	16	13
Yellow Time (s)	4	3.3	4	3.3
All-Red Time (s)	1.2	1.6	1.2	1.6
Minimum Initial (s)	10	7	10	7
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	1	1	1	1
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	No	Yes	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	88	38	88	18
End Time (s)	18	88	18	38
Yield/Force Off (s)	12.8	83.1	12.8	33.1
Yield/Force Off 170(s)	12.8	83.1	12.8	33.1
Local Start Time (s)	0	70	0	50
Local Yield (s)	44.8	115.1	44.8	65.1
Local Yield 170(s)	44.8	115.1	44.8	65.1
Intersection Summary				
Cycle Length				120
Control Type	Actuated-Coordinated			
Natural Cycle	60			
Offset: 88 (73%), Referenced to phase 2:SBTL and 6:NBTL, Start of 1st Green				

Split and Phases: 28: GOLDWATER BLVD & SCOTTSDALE RD



APPENDIX J

QUEUE STORAGE ANALYSIS

2032 Total AM Mitigated
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	72	134	49	635	244	355	20	1654	215	1942
v/c Ratio	0.37	0.60	0.29	0.85	0.55	0.58	0.15	0.72	1.27	0.84
Control Delay	60.5	68.5	58.1	63.7	53.2	8.9	30.7	35.6	201.9	40.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.5	68.5	58.1	63.7	53.2	8.9	30.7	35.6	201.9	40.2
Queue Length 50th (ft)	63	121	43	282	194	3	8	448	~200	576
Queue Length 95th (ft)	100	168	74	#419	301	96	26	569	#375	#755
Internal Link Dist (ft)		2534			347			161		1097
Turn Bay Length (ft)	90		90	250			210		160	
Base Capacity (vph)	367	426	324	748	447	610	149	2286	169	2315
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.31	0.15	0.85	0.55	0.58	0.13	0.72	1.27	0.84

Intersection Summary

Description: Last Update: Feb 2018

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

2032 Total AM Mitigated
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
Queues

Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	125	4	56	50	25	141	1442	17	973
v/c Ratio	0.64	0.01	0.21	0.22	0.10	0.38	0.36	0.08	0.24
Control Delay	62.9	38.0	11.1	44.6	13.7	10.9	6.1	7.5	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.9	38.0	11.1	44.6	13.7	10.9	6.1	7.5	5.4
Queue Length 50th (ft)	99	3	0	37	0	30	107	3	64
Queue Length 95th (ft)	127	11	27	61	21	114	235	16	146
Internal Link Dist (ft)		264		580			549		162
Turn Bay Length (ft)			170		230	245		140	
Base Capacity (vph)	367	564	465	433	449	372	4061	214	4061
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.01	0.12	0.12	0.06	0.38	0.36	0.08	0.24

Intersection Summary

Description: Last Update: Sept 2017

2032 Total AM Mitigated

3: HIGHLAND AVE/Granada Ave & SCOTTSDALE RD

Southbridge Expansion

Queues

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	462	55	14	29	32	1159	45	1003
v/c Ratio	0.75	0.15	0.14	0.24	0.11	0.33	0.18	0.29
Control Delay	54.1	20.8	57.5	29.7	12.4	10.6	14.1	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	20.8	57.5	29.7	12.4	10.6	14.1	10.1
Queue Length 50th (ft)	179	16	11	5	9	145	14	119
Queue Length 95th (ft)	211	47	30	30	30	216	45	187
Internal Link Dist (ft)		534		552		1280		549
Turn Bay Length (ft)	275		100		225		100	
Base Capacity (vph)	886	507	109	134	297	3524	245	3506
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.11	0.13	0.22	0.11	0.33	0.18	0.29

Intersection Summary

Description: Last Update: Sept 2017

2032 Total AM Mitigated

4: Fashion Square Drive

Southbridge Expansion

Queues

Lane Group	EBT	WBL	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	23	5	5	572	16	29	1225	48
v/c Ratio	0.20	0.06	0.02	0.18	0.01	0.04	0.27	0.04
Control Delay	28.1	54.4	1.6	1.7	0.4	1.6	1.9	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	54.4	1.6	1.7	0.4	1.6	1.9	0.5
Queue Length 50th (ft)	2	4	0	28	0	2	47	0
Queue Length 95th (ft)	29	17	2	41	2	7	61	5
Internal Link Dist (ft)	436			946			596	
Turn Bay Length (ft)								
Base Capacity (vph)	446	357	322	3168	1249	656	4553	1253
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.01	0.02	0.18	0.01	0.04	0.27	0.04

Intersection Summary

2032 Total AM Mitigated
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
Queues

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	102	1616	204	1426	266	441	204	73	274	68
v/c Ratio	0.58	0.65	1.40	0.57	0.97	0.89	0.43	0.53	0.55	0.15
Control Delay	40.1	23.7	245.1	22.3	82.4	59.7	15.8	48.1	39.2	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	23.7	245.1	22.3	82.4	59.7	15.8	48.1	39.2	2.3
Queue Length 50th (ft)	33	317	~147	267	138	293	41	33	164	0
Queue Length 95th (ft)	#65	376	#300	319	#259	#446	107	66	247	12
Internal Link Dist (ft)		2553		1149		2644			189	
Turn Bay Length (ft)	200		250		140		140	165		185
Base Capacity (vph)	176	2475	146	2484	275	567	519	137	567	505
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.65	1.40	0.57	0.97	0.78	0.39	0.53	0.48	0.13

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2032 Total AM Mitigated
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	270	1262	238	74	1067	189	332	50	20	473	683
v/c Ratio	0.55	0.70	0.41	0.19	0.59	0.67	0.63	0.09	0.06	0.58	1.09
Control Delay	33.3	38.6	19.4	22.4	36.3	66.0	53.5	1.8	49.2	50.1	90.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	38.6	19.4	22.4	36.3	66.0	53.5	1.8	49.2	50.1	90.1
Queue Length 50th (ft)	97	304	64	20	244	74	133	0	7	132	~440
Queue Length 95th (ft)	217	#489	159	53	#357	#122	154	10	20	138	#530
Internal Link Dist (ft)		1149			1284		230			946	
Turn Bay Length (ft)	240		130	115		205		130	140		245
Base Capacity (vph)	495	1807	579	463	1796	290	1115	616	310	1540	629
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.70	0.41	0.16	0.59	0.65	0.30	0.08	0.06	0.31	1.09

Intersection Summary

- Description: Last Update: Sept 2017
- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2032 Total AM Mitigated
7: SCOTTSDALE RD & CAMELBACK RD.

Southbridge Expansion
Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	189	998	315	96	946	283	960	176	803	139
v/c Ratio	0.62	0.89	0.47	0.72	0.90	0.70	0.63	0.36	0.68	0.25
Control Delay	61.6	50.4	18.5	82.0	51.8	52.7	42.6	47.4	40.2	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.6	50.4	18.5	82.0	51.8	52.7	42.6	47.4	40.2	6.4
Queue Length 50th (ft)	72	385	114	72	359	86	281	61	307	0
Queue Length 95th (ft)	102	387	160	#170	427	#182	312	100	362	47
Internal Link Dist (ft)		1284		2561		784		1280		
Turn Bay Length (ft)	160			110		215		145		
Base Capacity (vph)	315	1257	677	138	1172	412	1676	502	1234	573
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.79	0.47	0.70	0.81	0.69	0.57	0.35	0.65	0.24

Intersection Summary

Description: Last Update: Sept 2017

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

2032 Total AM Mitigated
8: Stetson Dr/DRINKWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	83	50	18	58	411	26	570	266	714
v/c Ratio	0.29	0.13	0.06	0.13	0.76	0.07	0.26	0.25	0.28
Control Delay	38.8	34.3	30.8	32.9	39.4	14.6	14.2	2.9	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	34.3	30.8	32.9	39.4	14.6	14.2	2.9	2.3
Queue Length 50th (ft)	51	29	12	40	261	9	121	8	14
Queue Length 95th (ft)	84	55	28	71	356	26	163	21	44
Internal Link Dist (ft)		207		406			236		784
Turn Bay Length (ft)			150			95		210	
Base Capacity (vph)	368	512	370	568	685	392	2170	1294	2566
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.10	0.05	0.10	0.60	0.07	0.26	0.21	0.28

Intersection Summary

Description: Last Update: Sept 2017

2032 Total AM Mitigated
9: GOLDWATER BLVD & 5TH AVE

Southbridge Expansion
Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	34	13	21	41	30	36	21	712	109	844
v/c Ratio	0.26	0.07	0.13	0.28	0.14	0.18	0.05	0.24	0.20	0.20
Control Delay	51.1	44.3	17.0	50.4	45.7	14.5	4.3	3.4	5.0	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.1	44.3	17.0	50.4	45.7	14.5	4.3	3.4	5.0	3.1
Queue Length 50th (ft)	26	10	0	31	22	0	2	36	11	29
Queue Length 95th (ft)	44	25	17	56	43	27	14	129	59	97
Internal Link Dist (ft)		277			241			254		1000
Turn Bay Length (ft)	45		85	40		95	110		225	
Base Capacity (vph)	334	503	394	352	522	419	461	2943	542	4251
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.03	0.05	0.12	0.06	0.09	0.05	0.24	0.20	0.20
Intersection Summary										
Description: Last Update: Sept 2017										

2032 Total AM Mitigated
13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion
Queues

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	104	20	28	96	621	27	617
v/c Ratio	0.38	0.10	0.09	0.17	0.40	0.05	0.40
Control Delay	21.7	20.6	15.1	5.3	13.7	4.6	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	20.6	15.1	5.3	13.7	4.6	13.6
Queue Length 50th (ft)	25	6	4	10	77	3	76
Queue Length 95th (ft)	61	21	22	26	127	11	126
Internal Link Dist (ft)	109		450		484		159
Turn Bay Length (ft)		70		85		80	
Base Capacity (vph)	1180	897	1329	1676	3697	1676	3674
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.02	0.02	0.06	0.17	0.02	0.17
Intersection Summary							

2032 Total AM Mitigated
14: 5TH AVE./STETSON DR. & DRINKWATER BLVD

Southbridge Expansion
Queues

	↖	→	↙	←	↘	↑	↗	↖	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	8	74	21	70	48	438	226	82	265
v/c Ratio	0.04	0.21	0.09	0.20	0.06	0.17	0.21	0.12	0.10
Control Delay	33.8	36.1	36.3	12.9	5.8	7.9	1.2	3.6	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.8	36.1	36.3	12.9	5.8	7.9	1.2	3.6	4.2
Queue Length 50th (ft)	5	41	12	7	10	66	0	11	25
Queue Length 95th (ft)	15	71	34	44	19	81	14	26	37
Internal Link Dist (ft)		450		543		1076			406
Turn Bay Length (ft)	85		80		185			115	
Base Capacity (vph)	324	499	323	479	800	2608	1087	684	2596
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.15	0.07	0.15	0.06	0.17	0.21	0.12	0.10
Intersection Summary									
Description: Last Update: Sept 2017									









2032 Total AM Mitigated
18: SCOTTSDALE RD & 3RD AVE.

Southbridge Expansion
Queues

	↖	→	↙	←	↘	↑	↗	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	5	35	29	78	83	678	84	528	26
v/c Ratio	0.03	0.14	0.17	0.28	0.14	0.25	0.16	0.19	0.02
Control Delay	17.6	14.7	20.4	9.6	4.0	3.3	4.3	3.2	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.6	14.7	20.4	9.6	4.0	3.3	4.3	3.2	1.4
Queue Length 50th (ft)	1	5	7	2	6	30	7	22	0
Queue Length 95th (ft)	8	24	24	29	20	51	21	40	5
Internal Link Dist (ft)		366		1226		590		484	
Turn Bay Length (ft)	45		50		105		110		75
Base Capacity (vph)	741	1009	741	943	601	2760	519	2784	1100
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.03	0.04	0.08	0.14	0.25	0.16	0.19	0.02
Intersection Summary									













2032 Total AM Mitigated
19: DRINKWATER BLVD & 3RD AVE.

Southbridge Expansion
Queues

								
Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	11	30	186	131	740	28	254	28
v/c Ratio	0.08	0.12	0.70	0.16	0.18	0.06	0.09	0.03
Control Delay	38.8	40.2	51.4	6.0	4.8	2.2	1.6	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	40.2	51.4	6.0	4.8	2.2	1.6	0.5
Queue Length 50th (ft)	8	21	114	21	44	1	4	0
Queue Length 95th (ft)	19	36	155	63	92	7	18	0
Internal Link Dist (ft)		1226	707		734		1076	
Turn Bay Length (ft)	40			150		215		140
Base Capacity (vph)	269	476	459	800	4050	483	2840	1107
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.06	0.41	0.16	0.18	0.06	0.09	0.03
Intersection Summary								
Description: Last Update: Sept 2017								

2032 Total AM Mitigated
20: 68th Street & INDIAN SCHOOL

Southbridge Expansion
Queues

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	
Lane Group Flow (vph)	221	947	9	54	900	133	56	702	137	169	684	
v/c Ratio	0.86	0.44	0.01	0.70	0.68	0.21	0.25	0.82	0.33	0.69	0.70	
Control Delay	58.3	28.1	0.0	100.0	45.5	4.4	49.1	52.6	33.6	65.9	41.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	58.3	28.1	0.0	100.0	45.5	4.4	49.1	52.6	33.6	65.9	41.5	
Queue Length 50th (ft)	103	202	0	43	244	4	38	281	81	126	246	
Queue Length 95th (ft)	#230	243	0	#112	294	36	80	300	114	#262	265	
Internal Link Dist (ft)		2879			223			1089			2644	
Turn Bay Length (ft)	350		185	130		100	115		80	215		
Base Capacity (vph)	263	2138	659	77	1320	648	245	1123	414	244	1181	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.84	0.44	0.01	0.70	0.68	0.21	0.23	0.63	0.33	0.69	0.58	
Intersection Summary												
Description: Last Update: Sept 2017												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												

2032 Total AM Mitigated
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	251	908	103	76	825	101	540	62	762
v/c Ratio	0.73	0.59	0.15	0.36	0.63	0.36	0.91	0.52	0.68
Control Delay	67.5	32.8	4.2	61.4	37.4	51.9	61.5	70.6	46.3
Queue Delay	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0
Total Delay	67.5	32.8	4.2	61.4	37.9	51.9	61.5	70.6	46.3
Queue Length 50th (ft)	103	342	0	30	318	68	209	50	208
Queue Length 95th (ft)	144	366	28	57	366	#163	#302	85	187
Internal Link Dist (ft)		905			387		555		424
Turn Bay Length (ft)	275		180	180		135		220	
Base Capacity (vph)	359	1635	747	214	1371	281	595	171	1719
Starvation Cap Reductn	0	0	0	0	221	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.56	0.14	0.36	0.72	0.36	0.91	0.36	0.44

Intersection Summary

Description: Last Update: Sept 2017

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

2032 Total AM Mitigated
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
Queues

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	34	840	96	1039	24	31
v/c Ratio	0.08	0.26	0.18	0.32	0.15	0.19
Control Delay	3.7	2.7	4.0	2.9	31.6	27.0
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	3.7	2.9	4.0	2.9	31.6	27.0
Queue Length 50th (ft)	3	44	9	59	9	8
Queue Length 95th (ft)	19	144	41	161	29	29
Internal Link Dist (ft)		387		763	161	431
Turn Bay Length (ft)	115		130			
Base Capacity (vph)	417	3280	520	3265	353	364
Starvation Cap Reductn	0	1587	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.50	0.18	0.32	0.07	0.09

Intersection Summary

Description: Last Update: Sept 2017

2032 Total AM Mitigated
23: INDIAN SCHOOL & SCOTTSDALE RD

Southbridge Expansion
Queues



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	138	747	5	1131	83	606	120	384	93
v/c Ratio	0.58	0.42	0.01	0.64	0.34	0.74	0.72	0.46	0.19
Control Delay	37.9	21.9	6.4	20.9	34.2	47.3	66.3	41.6	6.1
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Total Delay	37.9	21.9	6.4	21.1	34.2	47.3	66.3	41.6	6.1
Queue Length 50th (ft)	45	195	1	342	46	221	68	134	0
Queue Length 95th (ft)	87	271	m1	316	71	252	101	170	32
Internal Link Dist (ft)		763		403		606		590	
Turn Bay Length (ft)	175		175		140		350		180
Base Capacity (vph)	247	1772	373	1758	282	1014	202	1030	492
Starvation Cap Reductn	0	0	0	144	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.42	0.01	0.70	0.29	0.60	0.59	0.37	0.19

Intersection Summary

Description: Last Update: Sept 2017

m Volume for 95th percentile queue is metered by upstream signal.

2032 Total AM Mitigated
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
Queues



Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	1144	29	1276	21
v/c Ratio	0.37	0.08	0.41	0.12
Control Delay	2.0	2.0	1.5	17.4
Queue Delay	0.1	0.0	0.1	0.0
Total Delay	2.0	2.0	1.5	17.4
Queue Length 50th (ft)	30	1	24	1
Queue Length 95th (ft)	118	m4	47	18
Internal Link Dist (ft)	403		114	417
Turn Bay Length (ft)		55		
Base Capacity (vph)	3092	342	3105	415
Starvation Cap Reductn	507	0	522	0
Spillback Cap Reductn	94	0	57	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.44	0.08	0.49	0.05

Intersection Summary

Description: Last Update: Sept 2017

m Volume for 95th percentile queue is metered by upstream signal.

2032 Total AM Mitigated
25: BUCKBOARD & INDIAN SCHOOL

Southbridge Expansion
Queues

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	152	1013	52	1394	29	58	73
v/c Ratio	0.60	0.33	0.13	0.46	0.14	0.37	0.32
Control Delay	16.8	0.7	5.4	5.1	19.1	52.9	12.8
Queue Delay	0.0	0.1	0.0	0.3	0.0	0.0	0.0
Total Delay	16.8	0.8	5.4	5.4	19.1	52.9	12.8
Queue Length 50th (ft)	21	5	6	108	4	44	0
Queue Length 95th (ft)	#224	15	33	344	22	63	28
Internal Link Dist (ft)		114		576	464	255	
Turn Bay Length (ft)	55		200				90
Base Capacity (vph)	254	3099	398	3042	462	384	452
Starvation Cap Reductn	0	842	0	872	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.45	0.13	0.64	0.06	0.15	0.16

Intersection Summary

Description: Last Update: Sept 2017

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

2032 Total AM Mitigated
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	119	883	392	1425	263	79	477	232	118	205
v/c Ratio	0.45	0.51	1.01	0.82	0.35	0.33	0.73	0.51	0.54	0.45
Control Delay	38.0	25.0	81.2	34.1	13.9	48.7	53.7	9.0	64.2	51.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	25.0	81.2	34.1	13.9	48.7	53.7	9.0	64.2	51.8
Queue Length 50th (ft)	34	245	136	492	67	56	190	0	46	78
Queue Length 95th (ft)	97	330	#419	#743	153	98	222	63	79	116
Internal Link Dist (ft)		576		546			1246			734
Turn Bay Length (ft)	180		180		55	115		110		170
Base Capacity (vph)	267	1723	390	1733	760	244	953	556	227	912
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.51	1.01	0.82	0.35	0.32	0.50	0.42	0.52	0.22

Intersection Summary

Description: Last Update: Sept 2017

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

2032 Total AM Mitigated
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
Queues

	→	↘	←	↙	↑	↗	↓
Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	180	174	77	380	62	496
v/c Ratio	0.17	0.76	0.66	0.14	0.15	0.10	0.13
Control Delay	59.8	78.7	67.1	13.5	10.8	13.1	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.8	78.7	67.1	13.5	10.8	13.1	10.3
Queue Length 50th (ft)	24	174	161	22	56	17	50
Queue Length 95th (ft)	41	233	216	73	134	63	121
Internal Link Dist (ft)	74		248		235		988
Turn Bay Length (ft)				120		200	
Base Capacity (vph)	403	352	390	567	2598	645	3700
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.51	0.45	0.14	0.15	0.10	0.13
Intersection Summary							
Description: Last Update: Sept 2017							

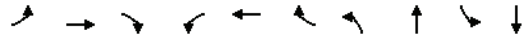
2032 Total AM Mitigated
29: SCOTTSDALE RD & OSBORN RD.

Southbridge Expansion
Queues

	↘	→	↙	←	↗	↑	↘	↓	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	71	360	121	351	78	1027	134	104	710
v/c Ratio	0.39	0.54	0.68	0.52	0.18	0.49	0.15	0.37	0.24
Control Delay	40.9	37.6	58.0	34.8	12.3	18.7	3.5	18.6	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	37.6	58.0	34.8	12.3	18.7	3.5	18.6	14.9
Queue Length 50th (ft)	43	107	75	97	20	240	0	27	95
Queue Length 95th (ft)	63	117	97	108	52	387	36	66	157
Internal Link Dist (ft)			1225		1227		676		193
Turn Bay Length (ft)	60		140		195		485	185	
Base Capacity (vph)	240	1018	235	1025	449	2087	884	308	2985
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.35	0.51	0.34	0.17	0.49	0.15	0.34	0.24
Intersection Summary									
Description: Last Update: Sept 2017									

2032 Total PM Mitigated
1: CHAPARRAL RD. & SCOTTSDALE RD

Southbridge Expansion
Queues



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	149	206	85	587	246	322	59	2667	259	2367
v/c Ratio	0.73	0.87	0.46	0.96	0.67	0.69	0.22	1.15	1.11	1.09
Control Delay	84.1	97.2	69.6	87.3	67.1	26.0	36.3	112.5	140.5	91.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.1	97.2	69.6	87.3	67.1	26.0	36.3	112.5	140.5	91.8
Queue Length 50th (ft)	141	199	78	299	228	88	25	~1124	~238	~961
Queue Length 95th (ft)	207	#297	128	#369	298	165	49	#1205	#425	#1049
Internal Link Dist (ft)		2534		416				161		1097
Turn Bay Length (ft)	90		90	250			210		160	
Base Capacity (vph)	220	255	197	612	366	465	271	2312	234	2165
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.81	0.43	0.96	0.67	0.69	0.22	1.15	1.11	1.09

Intersection Summary

Description: Last Update: April 2018

~ Volume exceeds capacity, queue is theoretically infinite.


Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

2032 Total PM Mitigated
2: SCOTTSDALE RD & RANCHO VISTA DR.

Southbridge Expansion
Queues



Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	221	25	269	29	29	57	2815	19	1324
v/c Ratio	0.83	0.06	0.73	0.09	0.09	0.26	0.74	0.35	0.35
Control Delay	72.0	37.2	45.1	37.9	17.5	12.1	14.0	31.9	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Total Delay	72.0	37.2	45.1	37.9	17.5	12.1	17.0	31.9	8.0
Queue Length 50th (ft)	176	17	153	20	5	15	467	5	136
Queue Length 95th (ft)	215	34	195	40	26	49	683	33	189
Internal Link Dist (ft)		264		580			549		162
Turn Bay Length (ft)			170		230	245		140	
Base Capacity (vph)	368	555	477	456	434	223	3787	55	3780
Starvation Cap Reductn	0	0	0	0	0	0	841	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.05	0.56	0.06	0.07	0.26	0.96	0.35	0.35

Intersection Summary

Description: Last Update: Sept 2017

2032 Total PM Mitigated

3: SCOTTSDALE RD & HIGHLAND AVE/Granada Ave

Southbridge Expansion

Queues

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	953	94	40	83	57	1881	17	1618
v/c Ratio	0.93	0.16	0.26	0.50	0.83	0.72	0.29	0.62
Control Delay	56.3	11.4	55.2	56.7	102.1	27.4	37.1	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	56.3	11.4	55.2	56.7	102.1	27.4	37.1	25.1
Queue Length 50th (ft)	358	14	30	56	39	441	8	351
Queue Length 95th (ft)	#453	48	58	93	#130	503	32	385
Internal Link Dist (ft)		534		552		1280		549
Turn Bay Length (ft)	275		100		225		100	
Base Capacity (vph)	1035	596	180	197	69	2607	59	2590
Starvation Cap Reductn	0	0	0	0	0	0	0	339
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.16	0.22	0.42	0.83	0.72	0.29	0.72

Intersection Summary

Description: Last Update: Sept 2017

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

2032 Total PM Mitigated

4: Fashion Square Dr & Goldwater Blvd

Southbridge Expansion

Queues

Lane Group	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	182	112	38	45	643	95	37	1118	24
v/c Ratio	0.42	0.39	0.08	0.18	0.27	0.10	0.09	0.33	0.03
Control Delay	33.7	40.4	13.1	11.1	9.8	1.8	8.9	10.1	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.7	40.4	13.1	11.1	9.8	1.8	8.9	10.1	3.0
Queue Length 50th (ft)	98	71	3	13	105	0	10	133	0
Queue Length 95th (ft)	168	127	30	33	135	19	24	158	10
Internal Link Dist (ft)	328		659		941			627	
Turn Bay Length (ft)									
Base Capacity (vph)	435	290	478	247	2384	968	431	3425	946
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.39	0.08	0.18	0.27	0.10	0.09	0.33	0.03

Intersection Summary

2032 Total PM Mitigated
5: 68th Street & CAMELBACK RD.

Southbridge Expansion
Queues

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	139	1738	277	2156	257	418	257	139	255	99
v/c Ratio	0.47	0.84	0.94	1.04	0.90	0.94	0.55	0.86	0.57	0.23
Control Delay	35.7	34.8	78.2	63.7	71.4	72.8	18.2	83.2	43.8	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	34.8	78.2	63.7	71.4	72.8	18.2	83.2	43.8	7.3
Queue Length 50th (ft)	43	408	146	~623	141	295	51	71	163	0
Queue Length 95th (ft)	103	474	#306	#720	#238	#481	136	#171	248	38
Internal Link Dist (ft)		2553		1149		2644			189	
Turn Bay Length (ft)	200		250		140		140	165		185
Base Capacity (vph)	311	2064	311	2079	284	463	478	162	463	436
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.84	0.89	1.04	0.90	0.90	0.54	0.86	0.55	0.23

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2032 Total PM Mitigated
6: GOLDWATER BLVD & CAMELBACK RD.

Southbridge Expansion
Queues

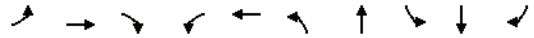
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	315	1351	309	74	1560	341	304	132	108	611	703
v/c Ratio	0.91	0.74	0.50	0.21	0.87	0.79	0.59	0.26	0.20	0.66	1.19
Control Delay	74.2	38.9	17.4	29.6	43.7	64.3	52.5	13.8	43.7	49.5	128.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.2	38.9	17.4	29.6	43.7	64.3	52.5	13.8	43.7	49.5	128.7
Queue Length 50th (ft)	189	336	78	25	409	132	121	32	37	168	~420
Queue Length 95th (ft)	#457	#459	185	63	#587	#204	144	70	62	172	#738
Internal Link Dist (ft)		1149			1284		230				941
Turn Bay Length (ft)	240		130	115		205		130	140		245
Base Capacity (vph)	345	1815	616	345	1797	450	1278	510	545	1553	592
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.74	0.50	0.21	0.87	0.76	0.24	0.26	0.20	0.39	1.19

Intersection Summary

- Description: Last Update: Sept 2017
- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2032 Total PM Mitigated
7: CAMELBACK RD. & SCOTTSDALE RD

Southbridge Expansion
Queues



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	259	800	357	147	1131	448	1419	441	876	263
v/c Ratio	0.94	0.87	0.49	0.67	1.05	0.70	0.96	0.83	0.94	0.52
Control Delay	96.3	54.1	15.0	66.7	82.1	52.2	58.6	62.1	63.6	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.3	54.1	15.0	66.7	82.1	52.2	58.6	62.1	63.6	15.5
Queue Length 50th (ft)	105	313	114	111	~495	170	399	171	351	45
Queue Length 95th (ft)	#188	372	178	#230	#583	222	#511	226	#472	129
Internal Link Dist (ft)		1284			2561		784		1280	
Turn Bay Length (ft)	160			110		215		145		
Base Capacity (vph)	275	1066	729	220	1076	636	1477	604	945	513
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.75	0.49	0.67	1.05	0.70	0.96	0.73	0.93	0.51

Intersection Summary

Description: Last Update: Sept 2017

~ Volume exceeds capacity, queue is theoretically infinite.


Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

2032 Total PM Mitigated
8: SCOTTSDALE RD & Stetson Dr/DRINKWATER BLVD

Southbridge Expansion
Queues



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	163	85	144	56	709	26	1159	314	1029
v/c Ratio	0.32	0.12	0.29	0.07	0.98	0.15	0.82	0.75	0.55
Control Delay	28.9	25.5	19.4	17.2	49.9	25.5	38.9	34.2	19.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	49.8	0.0	0.0
Total Delay	28.9	25.5	19.4	17.2	49.9	25.5	88.7	34.2	19.9
Queue Length 50th (ft)	85	41	49	19	498	13	418	74	268
Queue Length 95th (ft)	148	79	78	36	#531	31	432	113	276
Internal Link Dist (ft)		267		406			186		784
Turn Bay Length (ft)			150			95		210	
Base Capacity (vph)	506	707	494	782	727	199	1634	512	2189
Starvation Cap Reductn	0	0	0	0	0	0	694	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.12	0.29	0.07	0.98	0.13	1.23	0.61	0.47

Intersection Summary

Description: Last Update: Sept 2017

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

2032 Total PM Mitigated

9: GOLDWATER BLVD /GOLDWATER BLVD #2 & 5TH AVE

Southbridge Expansion

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	51	22	39	85	55	115	26	993	74	1048
v/c Ratio	0.34	0.09	0.19	0.50	0.22	0.40	0.07	0.34	0.19	0.25
Control Delay	51.1	43.4	14.0	56.5	45.4	11.1	9.1	9.2	6.0	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.1	43.4	14.0	56.5	45.4	11.1	9.1	9.2	6.0	3.9
Queue Length 50th (ft)	38	16	0	64	40	0	9	215	10	52
Queue Length 95th (ft)	59	35	22	99	68	47	m15	166	44	119
Internal Link Dist (ft)		363			177			369		1000
Turn Bay Length (ft)	45		85	40		95	110		225	
Base Capacity (vph)	326	503	408	349	522	476	360	2920	384	4181
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.04	0.10	0.24	0.11	0.24	0.07	0.34	0.19	0.25

Intersection Summary

Description: Last Update: Sept 2017

m Volume for 95th percentile queue is metered by upstream signal.

2032 Total PM Mitigated

13: SCOTTSDALE RD & 5TH AVE.

Southbridge Expansion

Queues

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	308	82	61	124	970	61	1081
v/c Ratio	0.62	0.31	0.11	0.40	0.67	0.18	0.77
Control Delay	30.0	28.9	17.8	14.5	24.7	10.5	27.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	30.0	28.9	17.8	14.5	24.7	10.5	27.3
Queue Length 50th (ft)	119	32	15	27	212	13	247
Queue Length 95th (ft)	266	90	53	72	370	38	429
Internal Link Dist (ft)	158		450		484		209
Turn Bay Length (ft)		70		85		80	
Base Capacity (vph)	1035	571	1204	1288	2853	1289	2785
Starvation Cap Reductn	0	0	0	0	88	0	561
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.14	0.05	0.10	0.35	0.05	0.49

Intersection Summary

2032 Total PM Mitigated
 14: DRINKWATER BLVD/DRINKWATER BLVD & 5TH AVE./STETSON DR. Southbridge Expansion
Queues

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	
Lane Group Flow (vph)	34	132	165	257	67	636	99	62	410	
v/c Ratio	0.28	0.33	0.75	0.63	0.10	0.26	0.10	0.12	0.17	
Control Delay	42.9	25.2	64.7	39.8	6.2	9.5	1.9	6.8	8.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	42.9	25.2	64.7	39.8	6.2	9.6	1.9	6.8	8.4	
Queue Length 50th (ft)	21	50	113	134	22	148	0	15	67	
Queue Length 95th (ft)	46	88	164	185	21	97	5	m21	68	
Internal Link Dist (ft)		450		543		1076			406	
Turn Bay Length (ft)	85		80		185			115		
Base Capacity (vph)	172	555	310	556	793	2405	954	655	2368	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	3	0	258	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.20	0.24	0.53	0.46	0.08	0.30	0.10	0.09	0.17	

Intersection Summary
 Description: Last Update: Sept 2017
 m Volume for 95th percentile queue is metered by upstream signal.

2032 Total PM Mitigated
 18: SCOTTSDALE RD & 3RD AVE. Southbridge Expansion
Queues

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	
Lane Group Flow (vph)	75	171	84	323	80	833	45	1088	67	
v/c Ratio	0.50	0.41	0.33	0.69	0.36	0.39	0.14	0.50	0.08	
Control Delay	29.0	15.4	19.9	20.3	13.7	7.4	8.2	8.5	3.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	29.0	15.4	19.9	20.3	13.7	7.4	8.2	8.5	3.7	
Queue Length 50th (ft)	20	32	21	59	11	58	5	85	2	
Queue Length 95th (ft)	55	75	53	129	54	135	25	190	19	
Internal Link Dist (ft)		359		1226		590		484		
Turn Bay Length (ft)	45		50		105		110		75	
Base Capacity (vph)	336	875	573	906	235	2267	341	2281	911	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.22	0.20	0.15	0.36	0.34	0.37	0.13	0.48	0.07	

Intersection Summary

2032 Total PM Mitigated
19: DRINKWATER BLVD /DRINKWATER BLVD & 3RD AVE. Southbridge Expansion
Queues

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	55	143	182	121	886	85	656	47
v/c Ratio	0.35	0.53	0.88	0.23	0.22	0.21	0.23	0.04
Control Delay	47.5	51.5	77.4	7.3	4.9	7.4	4.7	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.5	51.5	77.4	7.3	4.9	7.4	4.7	2.7
Queue Length 50th (ft)	39	105	120	22	53	5	21	0
Queue Length 95th (ft)	66	139	165	72	115	66	164	m16
Internal Link Dist (ft)		1226	707		734		1076	
Turn Bay Length (ft)	40			150		215		140
Base Capacity (vph)	363	621	437	527	3943	407	2817	1111
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.23	0.42	0.23	0.22	0.21	0.23	0.04

Intersection Summary
Description: Last Update: Sept 2017
m Volume for 95th percentile queue is metered by upstream signal.

2032 Total PM Mitigated
20: 68th Street & INDIAN SCHOOL Southbridge Expansion
Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	304	974	25	153	996	251	100	696	164	167	761
v/c Ratio	1.06	0.45	0.04	1.09	0.68	0.38	0.55	0.87	0.37	0.79	0.87
Control Delay	102.8	29.6	0.1	156.6	45.3	10.4	64.9	60.2	33.4	79.4	55.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.8	29.6	0.1	156.6	45.3	10.4	64.9	60.2	33.4	79.4	55.1
Queue Length 50th (ft)	~156	216	0	~142	274	49	79	292	99	135	300
Queue Length 95th (ft)	#335	278	0	#261	323	92	130	330	143	211	357
Internal Link Dist (ft)		2879			223			2520			2644
Turn Bay Length (ft)	350		185	130		100	115		80	215	
Base Capacity (vph)	286	2165	664	140	1469	691	207	913	448	254	1022
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.06	0.45	0.04	1.09	0.68	0.36	0.48	0.76	0.37	0.66	0.74

Intersection Summary
Description: Last Update: Nov 2017
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2032 Total PM Mitigated
21: GOLDWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	280	928	82	87	933	126	525	103	945
v/c Ratio	0.79	0.67	0.12	0.27	0.69	0.67	0.73	0.37	0.72
Control Delay	68.7	35.1	2.2	44.2	26.0	69.3	50.2	54.8	41.3
Queue Delay	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	68.7	35.6	2.2	44.2	26.5	69.3	50.2	54.8	41.3
Queue Length 50th (ft)	108	328	0	35	241	93	202	75	235
Queue Length 95th (ft)	#176	407	16	56	393	#209	226	138	253
Internal Link Dist (ft)		905			387		555		413
Turn Bay Length (ft)	275		180	180		135		220	
Base Capacity (vph)	366	1389	659	323	1344	188	1222	278	1755
Starvation Cap Reductn	0	0	0	0	123	0	0	0	0
Spillback Cap Reductn	0	145	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.75	0.12	0.27	0.76	0.67	0.43	0.37	0.54

Intersection Summary

Description: Last Update: Nov 2017

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

2032 Total PM Mitigated
22: MARSHALL WY. & INDIAN SCHOOL

Southbridge Expansion
Queues

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	40	1094	78	1138	88	123
v/c Ratio	0.12	0.36	0.22	0.38	0.51	0.53
Control Delay	3.9	6.6	9.9	8.2	41.7	41.1
Queue Delay	0.0	1.6	0.0	0.0	0.7	0.6
Total Delay	3.9	8.2	9.9	8.2	42.5	41.7
Queue Length 50th (ft)	1	5	25	203	42	63
Queue Length 95th (ft)	m19	511	m39	262	85	110
Internal Link Dist (ft)		387		763	161	415
Turn Bay Length (ft)	115		130			
Base Capacity (vph)	334	3001	351	2987	310	409
Starvation Cap Reductn	0	1648	0	0	0	0
Spillback Cap Reductn	0	0	0	6	78	104
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.81	0.22	0.38	0.38	0.40

Intersection Summary

Description: Last Update: Nov 2017

m Volume for 95th percentile queue is metered by upstream signal.

2032 Total PM Mitigated
23: SCOTTSDALE RD & INDIAN SCHOOL

Southbridge Expansion
Queues

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	152	956	210	1100	78	727	286	848	214
v/c Ratio	0.69	0.78	0.95	0.90	0.29	0.75	0.94	0.87	0.33
Control Delay	70.0	46.5	87.8	49.4	33.1	44.1	81.7	52.0	5.8
Queue Delay	0.0	0.0	0.0	8.7	0.0	0.0	0.0	0.0	0.0
Total Delay	70.0	46.5	87.8	58.1	33.1	44.1	81.7	52.0	5.8
Queue Length 50th (ft)	108	403	~108	473	32	263	155	330	12
Queue Length 95th (ft)	#205	476	#283	#367	62	312	#336	383	57
Internal Link Dist (ft)		763		403		606		590	
Turn Bay Length (ft)	175		175		140		350		180
Base Capacity (vph)	219	1223	222	1218	299	1135	309	1154	646
Starvation Cap Reductn	0	0	0	106	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.78	0.95	0.99	0.26	0.64	0.93	0.73	0.33

Intersection Summary

Description: Last Update: Sept 2017

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

2032 Total PM Mitigated
24: BROWN AVE. & INDIAN SCHOOL

Southbridge Expansion
Queues

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	1274	117	1354	208
v/c Ratio	0.47	0.49	0.49	0.63
Control Delay	9.0	10.0	2.5	37.0
Queue Delay	0.9	0.3	0.1	2.7
Total Delay	9.9	10.3	2.6	39.7
Queue Length 50th (ft)	366	7	42	103
Queue Length 95th (ft)	m103	115	60	159
Internal Link Dist (ft)	403		114	417
Turn Bay Length (ft)		55		
Base Capacity (vph)	2734	241	2757	458
Starvation Cap Reductn	1087	10	264	0
Spillback Cap Reductn	2	0	189	153
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.77	0.51	0.54	0.68

Intersection Summary

Description: Last Update: Nov 2017

m Volume for 95th percentile queue is metered by upstream signal.

2032 Total PM Mitigated
25: BUCKBOARD & INDIAN SCHOOL

Southbridge Expansion
Queues

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	43	1270	82	1378	80	154	104
v/c Ratio	0.20	0.46	0.34	0.50	0.24	0.68	0.32
Control Delay	4.9	3.3	12.4	8.3	14.7	59.4	17.7
Queue Delay	0.0	0.1	0.0	0.5	0.0	0.0	0.0
Total Delay	4.9	3.4	12.4	8.8	14.7	59.4	17.7
Queue Length 50th (ft)	4	64	17	177	13	116	24
Queue Length 95th (ft)	7	53	64	330	49	169	67
Internal Link Dist (ft)		114		576	464	255	
Turn Bay Length (ft)	55		200				90
Base Capacity (vph)	210	2754	242	2745	467	335	321
Starvation Cap Reductn	0	393	0	805	0	0	0
Spillback Cap Reductn	0	0	0	49	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.54	0.34	0.71	0.17	0.46	0.32
Intersection Summary							
Description: Last Update: Nov 2017							

2032 Total PM Mitigated
26: DRINKWATER BLVD & INDIAN SCHOOL

Southbridge Expansion
Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	105	1463	380	1154	287	111	620	551	478	473
v/c Ratio	0.38	1.09	1.39	0.86	0.44	0.85	0.86	1.05	0.96	0.48
Control Delay	38.3	91.9	231.4	44.3	15.3	104.0	62.0	87.1	83.1	38.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	91.9	231.4	44.3	15.3	104.0	62.0	87.1	83.1	38.5
Queue Length 50th (ft)	41	~696	~358	447	73	89	255	~415	198	161
Queue Length 95th (ft)	84	#838	#548	531	149	#195	#349	#668	#247	186
Internal Link Dist (ft)		576		546			1246			734
Turn Bay Length (ft)	180		180		55	115		110		170
Base Capacity (vph)	274	1338	274	1345	646	133	717	526	500	983
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	1.09	1.39	0.86	0.44	0.83	0.86	1.05	0.96	0.48
Intersection Summary										
Description: Last Update: Nov 2017										
~ Volume exceeds capacity, queue is theoretically infinite.										
Queue shown is maximum after two cycles.										
# 95th percentile volume exceeds capacity, queue may be longer.										
Queue shown is maximum after two cycles.										

2032 Total PM Mitigated
28: GOLDWATER BLVD & SCOTTSDALE RD

Southbridge Expansion
Queues

	→	↘	←	↙	↑	↗	↓
Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	85	450	442	35	430	34	810
v/c Ratio	0.55	0.88	0.78	0.14	0.24	0.08	0.31
Control Delay	65.6	57.0	45.7	24.9	20.9	23.0	21.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.6	57.0	45.7	24.9	20.9	23.0	21.2
Queue Length 50th (ft)	64	344	321	15	102	14	140
Queue Length 95th (ft)	100	422	388	43	155	43	210
Internal Link Dist (ft)	74		248		235		933
Turn Bay Length (ft)				120		200	
Base Capacity (vph)	227	605	674	254	1827	406	2620
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.74	0.66	0.14	0.24	0.08	0.31
Intersection Summary							
Description: Last Update: Sept 2017							

2032 Total PM Mitigated
29: OSBORN RD. & SCOTTSDALE RD

Southbridge Expansion
Queues

	↘	→	↙	←	↗	↑	↘	↓	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	36	409	268	669	182	988	85	175	1587
v/c Ratio	0.18	0.50	0.88	0.81	0.91	0.64	0.13	0.68	0.71
Control Delay	29.2	38.0	67.5	48.8	86.5	31.9	2.5	47.3	32.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	38.0	67.5	48.8	86.5	31.9	2.5	47.3	32.4
Queue Length 50th (ft)	18	132	155	243	93	318	0	66	369
Queue Length 95th (ft)	33	152	174	247	#220	407	12	#145	474
Internal Link Dist (ft)			1225		1227		676		193
Turn Bay Length (ft)	60		140		195		485	185	
Base Capacity (vph)	263	1033	349	1036	203	1549	679	259	2235
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.40	0.77	0.65	0.90	0.64	0.13	0.68	0.71
Intersection Summary									
Description: Last Update: Sept 2017									
# 95th percentile volume exceeds capacity, queue may be longer.									
Queue shown is maximum after two cycles.									

Southbridge Expansion

Queue Length Analysis

Signalized Intersection
2032

Average Vehicle Length (ft): 25 Cycles: 2
 Intersection Cycle Length (sec): 120
 Equation Used: storage length = 2 x (vehicles/hour)/(cycles/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	Midday Peak	PM Peak (veh/hr)	Max vehs per 2 cycles	Max trucks per 2 cycles	Storage Length
Scottsdale Rd & Chaparral Rd	NB Left	18	0	56	4	0	100'
	SB Left	189	0	246	17	0	425'
	EB Left	68	0	127	9	0	225'
	WB Left	578	0	487	39	0	975'
	NB Right	230	0	439	30	0	750'
	SB Right	97	0	71	7	0	175'
	EB Right	47	0	72	5	0	125'
	WB Right	323	0	267	22	0	550'
Scottsdale Rd & Rancho Vista Dr	NB Left	127	0	51	9	0	225'
	SB Left	16	0	16	2	0	50'
	EB Left	105	0	179	12	0	300'
	WB Left	38	0	20	3	0	75'
	NB Right	35	0	67	5	0	125'
	SB Right	27	0	44	3	0	75'
	EB Right	47	0	218	15	0	375'
	WB Right	22	0	25	2	0	50'
Scottsdale Rd & Highland Ave/Granada Ave	NB Left	28	0	52	4	0	100'
	SB Left	42	0	15	3	0	75'
	EB Left	420	0	810	54	0	1350'
	WB Left	11	0	32	3	0	75'
	NB Right	27	0	37	3	0	75'
	SB Right	63	0	103	7	0	175'
	EB Right	28	0	58	4	0	100'
	WB Right	19	0	44	3	0	75'
Goldwater Blvd & Fashion Square Dr	NB Left	5	0	41	3	0	75'
	SB Left	27	0	34	3	0	75'
	EB Left	6	0	80	6	0	150'
	WB Left	5	0	103	7	0	175'
	NB Right	15	0	87	6	0	150'
	SB Right	44	0	22	3	0	75'
	EB Right	15	0	68	5	0	125'
	WB Right	0	0	30	2	0	50'
68th St & Camelback Rd	NB Left	245	0	236	17	0	425'
	SB Left	67	0	128	9	0	225'
	EB Left	94	0	128	9	0	225'
	WB Left	188	0	255	17	0	425'
	NB Right	188	0	236	16	0	400'
	SB Right	63	0	91	7	0	175'
	EB Right	117	0	238	16	0	400'
	WB Right	60	0	99	7	0	175'
Goldwater Blvd & Camelback Rd	NB Left	166	0	324	22	0	550'
	SB Left	18	0	95	7	0	175'
	EB Left	235	0	290	20	0	500'
	WB Left	63	0	68	5	0	125'
	NB Right	44	0	125	9	0	225'
	SB Right	615	0	619	42	0	1050'
	EB Right	207	0	284	19	0	475'
	WB Right	49	0	127	9	0	225'
NB Left	260	0	394	27	0	675'	

Southbridge Expansion

Queue Length Analysis

Signalized Intersection
2032

Average Vehicle Length (ft): 25 Cycles: 2
 Intersection Cycle Length (sec): 120
 Equation Used: storage length = 2 x (vehicles/hour)/(cycles/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	Midday Peak	PM Peak (veh/hr)	Max vehs per 2 cycles	Max trucks per 2 cycles	Storage Length
Scottsdale Rd & Camelback Rd	SB Left	167	0	419	28	0	700'
	EB Left	153	0	238	16	0	400'
	WB Left	88	0	126	9	0	225'
	NB Right	55	0	124	9	0	225'
	SB Right	132	0	250	17	0	425'
	EB Right	255	0	328	22	0	550'
	WB Right	153	0	222	15	0	375'
	NB Left	23	0	22	2	0	50'
Scottsdale Rd & Stetson Dr/Drinkwater Blvd	SB Left	253	0	295	20	0	500'
	EB Left	66	0	137	10	0	250'
	WB Left	16	0	115	8	0	200'
	NB Right	18	0	32	3	0	75'
	SB Right	133	0	132	9	0	225'
	EB Right	23	0	40	3	0	75'
	WB Right	370	0	567	38	0	950'
	NB Left	19	0	21	2	0	50'
Goldwater Blvd & 5th Ave	SB Left	100	0	68	7	0	175'
	EB Left	27	0	41	3	0	75'
	WB Left	38	0	78	6	0	150'
	NB Right	113	0	70	8	0	200'
	SB Right	108	0	91	8	0	200'
	EB Right	17	0	31	3	0	75'
	WB Right	33	0	106	8	0	200'
	NB Left	88	0	114	8	0	200'
Scottsdale Rd & 5th Ave	SB Left	25	0	56	4	0	100'
	EB Left	32	0	94	7	0	175'
	WB Left	18	0	75	5	0	125'
	NB Right	23	0	19	2	0	50'
	SB Right	36	0	108	8	0	200'
	EB Right	43	0	162	11	0	275'
	WB Right	11	0	25	2	0	50'
	NB Left	42	0	64	5	0	125'
Drinkwater Blvd & 5th Ave	SB Left	73	0	52	5	0	125'
	EB Left	6	0	27	2	0	50'
	WB Left	19	0	132	9	0	225'
	NB Right	197	0	94	14	0	350'
	SB Right	6	0	35	3	0	75'
	EB Right	8	0	57	4	0	100'
	WB Right	52	0	115	8	0	200'
	NB Left	0	0	0	0	0	0'
Goldwater Blvd & 3rd Ave	SB Left	38	0	22	3	0	75'
	EB Left	0	0	0	0	0	0'
	WB Left	6	0	36	3	0	75'
	NB Right	28	0	17	2	0	50'
	SB Right	0	0	0	0	0	0'
	EB Right	0	0	0	0	0	0'
	WB Right	19	0	99	7	0	175'
	NB Left	76	0	74	6	0	150'
SB Left	77	0	41	6	0	150'	

Southbridge Expansion

Queue Length Analysis

Signalized Intersection
2032

Average Vehicle Length (ft): 25 Cycles: 2
 Intersection Cycle Length (sec): 120
 Equation Used: storage length = 2 x (vehicles/hour)/(cycles/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	Midday Peak	PM Peak (veh/hr)	Max vehs per 2 cycles	Max trucks per 2 cycles	Storage Length
Scottsdale Rd & 3rd Ave	EB Left	5	0	69	5	0	125'
	WB Left	27	0	77	6	0	150'
	NB Right	33	0	33	3	0	75'
	SB Right	24	0	62	5	0	125'
	EB Right	12	0	125	9	0	225'
	WB Right	65	0	232	16	0	400'
Drinkwater Blvd & 3rd Ave	NB Left	109	0	108	8	0	200'
	SB Left	23	0	75	5	0	125'
	EB Left	9	0	48	4	0	100'
	WB Left	76	0	77	6	0	150'
	NB Right	29	0	135	9	0	225'
	SB Right	23	0	41	3	0	75'
	EB Right	23	0	106	8	0	200'
	WB Right	75	0	60	5	0	125'
68th St & Indian School Rd	NB Left	48	0	85	6	0	150'
	SB Left	142	0	157	11	0	275'
	EB Left	197	0	289	20	0	500'
	WB Left	49	0	130	9	0	225'
	NB Right	118	0	139	10	0	250'
	SB Right	196	0	216	15	0	375'
	EB Right	8	0	24	2	0	50'
	WB Right	120	0	213	15	0	375'
Goldwater Blvd & Indian School Rd	NB Left	83	0	113	8	0	200'
	SB Left	51	0	92	7	0	175'
	EB Left	218	0	258	18	0	450'
	WB Left	68	0	78	6	0	150'
	NB Right	16	0	52	4	0	100'
	SB Right	104	0	200	14	0	350'
	EB Right	90	0	75	6	0	150'
	WB Right	45	0	71	5	0	125'
Marshall Way & Indian School Rd	NB Left	5	0	22	2	0	50'
	SB Left	4	0	14	1	0	25'
	EB Left	32	0	37	3	0	75'
	WB Left	78	0	68	6	0	150'
	NB Right	10	0	37	3	0	75'
	SB Right	16	0	57	4	0	100'
	EB Right	15	0	37	3	0	75'
	WB Right	37	0	69	5	0	125'
Scottsdale Rd & Indian School Rd	NB Left	69	0	70	5	0	125'
	SB Left	103	0	257	18	0	450'
	EB Left	130	0	144	10	0	250'
	WB Left	5	0	191	13	0	325'
	NB Right	82	0	132	9	0	225'
	SB Right	80	0	193	13	0	325'
	EB Right	65	0	128	9	0	225'
	WB Right	147	0	206	14	0	350'
	NB Left	3	0	11	1	0	25'
	SB Left	46	0	135	9	0	225'
	EB Left	137	0	41	10	0	250'



Southbridge Expansion

Queue Length Analysis

Signalized Intersection
2032

Average Vehicle Length (ft): 25 Cycles: 2
 Intersection Cycle Length (sec): 120
 Equation Used: storage length = 2 x (vehicles/hour)/(cycles/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	Midday Peak	PM Peak (veh/hr)	Max vehs per 2 cycles	Max trucks per 2 cycles	Storage Length
Buckboard Trail & Indian School Rd	WB Left	49	0	73	5	0	125'
	NB Right	19	0	54	4	0	100'
	SB Right	58	0	94	7	0	175'
	EB Right	11	0	9	1	0	25'
	WB Right	160	0	30	11	0	275'



Southbridge Expansion

Queue Length Analysis

Unsignalized Intersection
2032

Average Vehicle Length (ft): 25

Equation Used: storage length = 2 x (vehicles/hour)/(60 minutes/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	Midday Peak	PM Peak (veh/hr)	Veh per 2 minutes	Trucks per 2 minutes	Storage Length
Marshall Way & 5th Ave	NB Left	10	0	21	1	0	25'
	SB Left	0	0	0	0	0	0'
	EB Left	0	0	0	0	0	0'
	WB Left	23	0	11	1	0	25'
	NB Right	46	0	51	2	0	50'
	SB Right	0	0	0	0	0	0'
	EB Right	39	0	23	2	0	50'
	WB Right	0	0	0	0	0	0'
Stetson Dr & 5th Ave	NB Left	0	0	0	0	0	0'
	SB Left	13	0	54	2	0	50'
	EB Left	100	0	67	4	0	100'
	WB Left	0	0	0	0	0	0'
	NB Right	0	0	0	0	0	0'
	SB Right	60	0	97	4	0	100'
	EB Right	0	0	0	0	0	0'
	WB Right	44	0	37	2	0	50'
Craftsman Ct & 5th Ave	NB Left	1	0	20	1	0	25'
	SB Left	0	0	0	0	0	0'
	EB Left	0	0	0	0	0	0'
	WB Left	22	0	20	1	0	25'
	NB Right	1	0	30	1	0	25'
	SB Right	0	0	0	0	0	0'
	EB Right	4	0	18	1	0	25'
	WB Right	0	0	0	0	0	0'
Marshall Way & 3rd Ave	NB Left	22	0	11	1	0	25'
	SB Left	4	0	6	1	0	25'
	EB Left	10	0	4	1	0	25'
	WB Left	11	0	42	2	0	50'
	NB Right	41	0	27	2	0	50'
	SB Right	9	0	13	1	0	25'
	EB Right	8	0	11	1	0	25'
	WB Right	8	0	6	1	0	25'
Craftsman Ct & 3rd Ave	NB Left	0	0	0	0	0	0'
	SB Left	19	0	25	1	0	25'
	EB Left	13	0	30	1	0	25'
	WB Left	0	0	0	0	0	0'
	NB Right	0	0	0	0	0	0'
	SB Right	3	0	29	1	0	25'
	EB Right	0	0	0	0	0	0'
	WB Right	13	0	20	1	0	25'

Southbridge Expansion

Queue Length Analysis

Signalized Intersection
2032

Average Vehicle Length (ft): 25 Cycles:

Intersection Cycle Length (sec): 120

Equation Used: storage length = 2 x (vehicles/hour)/(cycles/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	PM Peak (veh/hr)	Max vehs per 2 cycles	Storage Length
Drinkwater Blvd & Indian School Rd	NB Left	71	100	7	175'
	SB Left	106	382	26	650'
	EB Left	101	99	7	175'
	WB Left	365	338	25	625'
	NB Right	209	496	34	850'
	SB Right	20	67	5	125'
	EB Right	41	70	5	125'
	WB Right	245	255	17	425'
Goldwater Blvd & Scottsdale Rd	NB Left	63	29	5	125'
	SB Left	54	32	4	100'
	EB Left	5	22	2	50'
	WB Left	270	734	49	1225'
	NB Right	1	5	1	25'
	SB Right	22	22	2	50'
	EB Right	8	27	2	50'
	WB Right	24	22	2	50'
Scottsdale Rd & Osborn Rd	NB Left	71	153	11	275'
	SB Left	96	154	11	275'
	EB Left	57	30	4	100'
	WB Left	97	214	15	375'
	NB Right	122	71	9	225'
	SB Right	22	34	3	75'
	EB Right	96	86	7	175'
	WB Right	101	148	10	250'

Southbridge Expansion

Queue Length Analysis

Unsignalized Intersection
2032

Average Vehicle Length (ft): 25

Equation Used: storage length = 2 x (vehicles/hour)/(60 minutes/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	Midday Peak	PM Peak (veh/hr)	Veh per 2 minutes	Trucks per 2 minutes	Storage Length
70th St & Goldwater Blvd	NB Left	120	0	85	4	0	100'
	SB Left	0	0	0	0	0	0'
	EB Left	0	0	0	0	0	0'
	WB Left	11	0	37	2	0	50'
	NB Right	30	0	16	1	0	25'
	SB Right	0	0	0	0	0	0'
	EB Right	63	0	192	7	0	175'
	WB Right	0	0	0	0	0	0'
	Access A1 & 6th Ave	NB Left	0	0	0	0	0
SB Left		32	0	70	3	0	75'
EB Left		8	0	7	1	0	25'
WB Left		0	0	0	0	0	0'
NB Right		0	0	0	0	0	0'
SB Right		6	0	12	1	0	25'
EB Right		0	0	0	0	0	0'
WB Right		74	0	69	3	0	75'
Access A2 & 6th Ave		NB Left	0	0	0	0	0
	SB Left	26	0	57	2	0	50'
	EB Left	8	0	7	1	0	25'
	WB Left	0	0	0	0	0	0'
	NB Right	0	0	0	0	0	0'
	SB Right	7	0	15	1	0	25'
	EB Right	0	0	0	0	0	0'
	WB Right	29	0	27	1	0	25'
	Access A3 & Stetson Dr	NB Left	0	0	0	0	0
SB Left		0	0	0	0	0	0'
EB Left		0	0	0	0	0	0'
WB Left		76	0	72	3	0	75'
NB Right		46	0	100	4	0	100'
SB Right		0	0	0	0	0	0'
EB Right		6	0	5	1	0	25'
WB Right		0	0	0	0	0	0'
Stetson Dr & Access C1		NB Left	12	0	28	1	0
	SB Left	0	0	0	0	0	0'
	EB Left	3	0	3	1	0	25'
	WB Left	0	0	0	0	0	0'
	NB Right	0	0	0	0	0	0'
	SB Right	3	0	6	1	0	25'
	EB Right	25	0	29	1	0	25'
	WB Right	0	0	0	0	0	0'
	Access C2 & 5th Ave	NB Left	0	0	0	0	0
SB Left		0	0	0	0	0	0'
EB Left		11	0	26	1	0	25'
WB Left		0	0	0	0	0	0'
NB Right		0	0	0	0	0	0'
SB Right		32	0	36	2	0	50'
EB Right		0	0	0	0	0	0'
WB Right		7	0	16	1	0	25'
NB Left		0	0	0	0	0	0'

Southbridge Expansion

Queue Length Analysis

Unsignalized Intersection
2032

Average Vehicle Length (ft): 25

Equation Used: storage length = 2 x (vehicles/hour)/(60 minutes/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	Midday Peak	PM Peak (veh/hr)	Veh per 2 minutes	Trucks per 2 minutes	Storage Length
Access D & 5th Ave	SB Left	18	0	16	1	0	25'
	EB Left	13	0	35	2	0	50'
	WB Left	0	0	0	0	0	0'
	NB Right	0	0	0	0	0	0'
	SB Right	29	0	27	1	0	25'
	EB Right	0	0	0	0	0	0'
	WB Right	8	0	22	1	0	25'
Vehicle Path & 6th Ave	NB Left	59	0	55	2	0	50'
	SB Left	0	0	0	0	0	0'
	EB Left	0	0	0	0	0	0'
	WB Left	0	0	0	0	0	0'
	NB Right	0	0	0	0	0	0'
	SB Right	0	0	0	0	0	0'
	EB Right	37	0	81	3	0	75'
Vehicle Path & 5th Ave	WB Right	0	0	0	0	0	0'
	NB Left	0	0	0	0	0	0'
	SB Left	36	0	78	3	0	75'
	EB Left	2	0	2	1	0	25'
	WB Left	0	0	0	0	0	0'
	NB Right	0	0	0	0	0	0'
	SB Right	1	0	2	1	0	25'
EB Right	0	0	0	0	0	0'	
WB Right	57	0	54	2	0	50'	

APPENDIX K

SIGHT DISTANCE ANALYSIS

SITE DISTANCE

SIX LANE ROADWAY¹

SIGHT DISTANCE						
DESIGN SPEED	PASSENGER CAR		SINGLE-UNIT TRUCK		COMBINATION TRUCK	
	TH	LT	TH	LT	TH	LT
25	304	340	403	440	476	513
30	364	408	483	527	572	616
35	425	476	564	615	667	718
40	486	544	644	703	762	821
45	546	612	725	791	857	923
50	607	680	805	879	952	1026
55	668	748	886	967	1048	1128

FOUR LANE ROADWAY¹

SIGHT DISTANCE						
DESIGN SPEED	PASSENGER CAR		SINGLE-UNIT TRUCK		COMBINATION TRUCK	
	TH	LT	TH	LT	TH	LT
25	285	322	377	414	451	487
30	342	386	453	497	541	585
35	399	451	528	579	631	682
40	456	515	603	662	721	780
45	513	579	679	745	811	877
50	570	644	754	827	901	974
55	627	708	829	910	991	1072

THREE LANE ROADWAY¹

SIGHT DISTANCE						
DESIGN SPEED	PASSENGER CAR		SINGLE-UNIT TRUCK		COMBINATION TRUCK	
	TH	LT	TH	LT	TH	LT
25	267	304	351	388	425	462
30	320	364	422	466	510	554
35	374	425	492	543	595	646
40	427	486	562	621	680	738
45	480	546	632	698	765	831
50	267	304	351	388	425	462
55	320	364	422	466	510	554

SITE DISTANCE

TWO LANE ROADWAY¹

SIGHT DISTANCE						
DESIGN SPEED	PASSENGER CAR		SINGLE-UNIT TRUCK		COMBINATION TRUCK	
	TH	LT	TH	LT	TH	LT
25	239	276	313	350	386	423
30	287	331	375	419	464	508
35	335	386	438	489	541	592
40	383	441	500	559	618	677
45	430	497	563	629	695	761
50	478	552	625	699	772	846
55	526	607	688	769	849	930

Notes: ¹

Cross section assumed to include a 12' median/center lane and 6' bike lane

TH = Through Movement, LT = Turn Movement

All distances given in feet

Design speed by roadway classification is shown in Appendix 5-3A

For cross sections deviating from the tabulated configurations, refer to the AASHTO Geometric Design of Highways and Streets (current editions) for additional information