Axon World Headquarters Campus

REZONING, GENERAL PLAN FUTURE LAND USE AMENDMENT, GREATER AIRPARK AREA PLAN AMENDMENT, AND AMENDED DEVELOPMENT STANDARDS

Revision Date:
October 24, 2024

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13-ZN-2020#2
10/24/2024

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EXECUTIVE SUMMARY OF CHANGES

At Axon, our goal continues to be to build our World Headquarters Campus in Scottsdale, Arizona. We are proud that Scottsdale has been our home base for over 30 years, and we think Scottsdale has been proud to have us as well. To that end, we have continued to refine our proposed Axon World Headquarters Campus. Our goal has been to create an innovation campus that people are excited to work, live, invent and entertain at.

We are proposing walkable shaded paths, treelined streets and sidewalks, a running path, a dog park and 64% additional open space than what is required by the Zoning Ordinance. We did these things to create quality spaces for our employees, residents, visitors and neighbors. We are working to create an inspiring, walkable place to live, work and play. In revising our campus design, we worked hard to consider and respond to comments from our neighbors and from the City of Scottsdale. As a result, the plan has evolved in important and impactful ways as the application has progressed, and again since our most recent hearing.

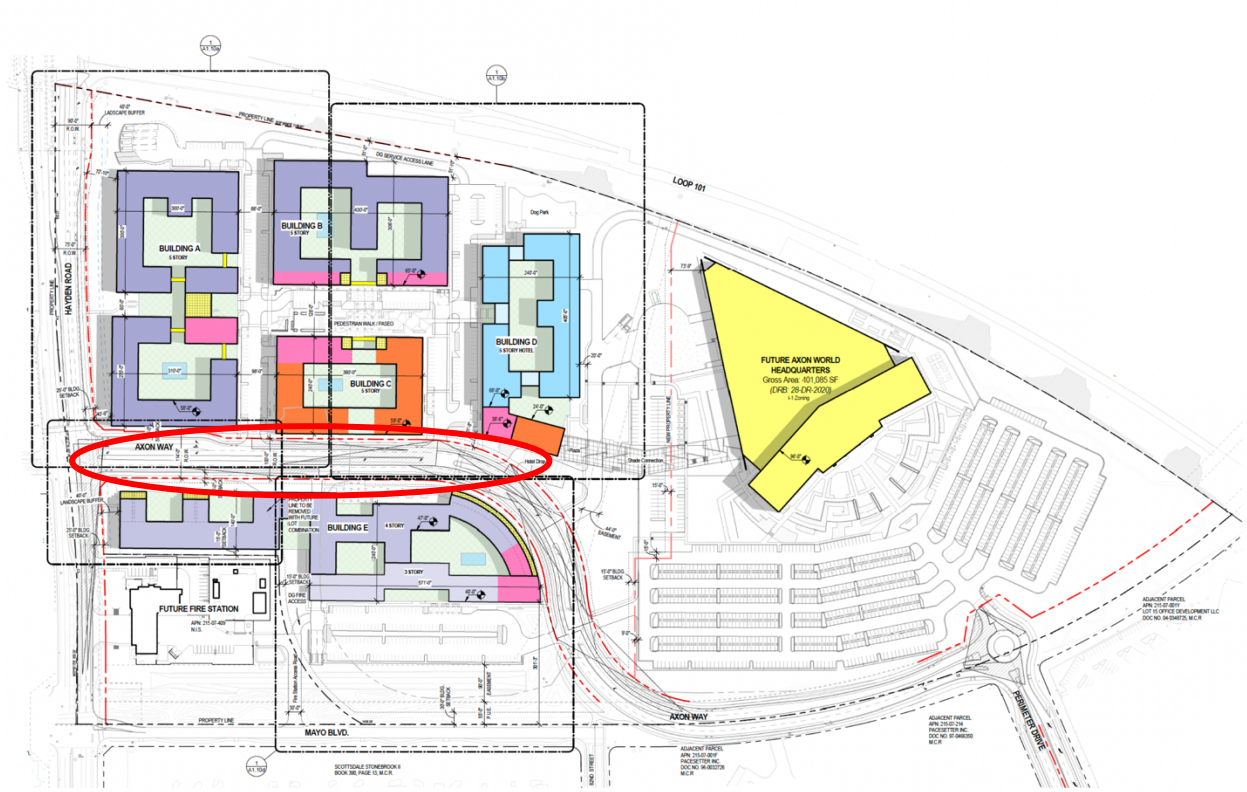
We have made a number of significant modifications including realigning roads, rerouting the existing traffic away from neighbors, relocating some of the proposed uses, moving buildings further from neighbors, reducing height near neighbors, enhancing the pedestrian experience for people who work or live in the building, adding landscaped areas and shade for those coming to stay in one of the buildings, and those in the neighborhood. Below is a list of some of the important changes and impacts contained in the most up to date submittal.

Traffic and Roadway Improvements

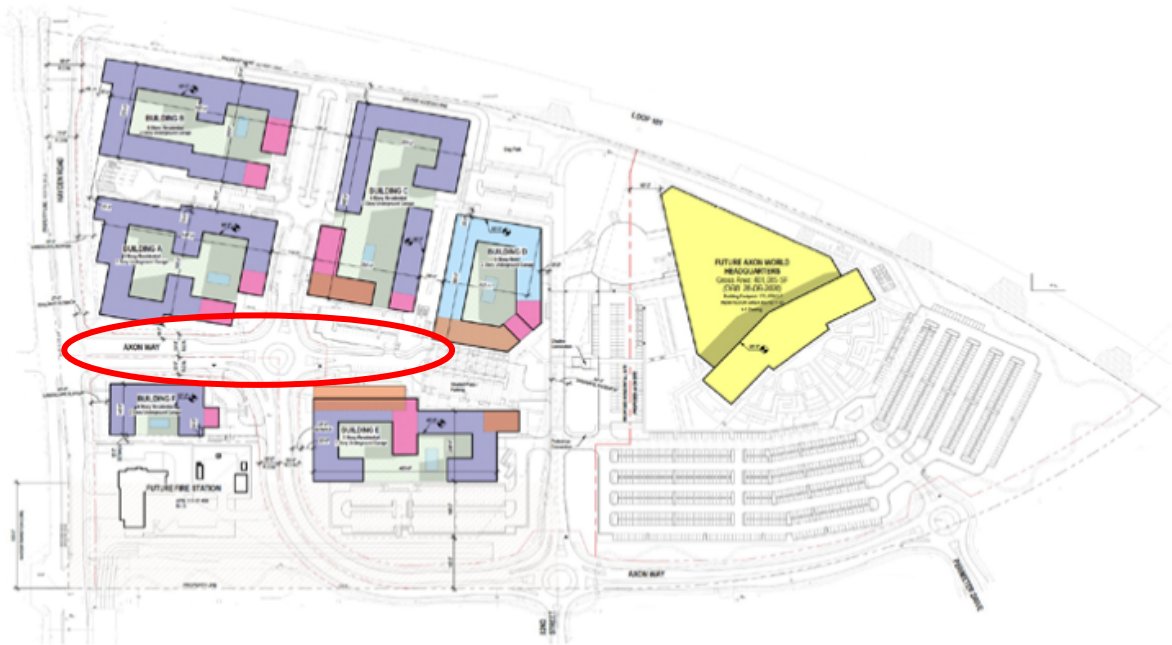
- We have realigned the streets within and around the entire campus to remove the vast majority of the industrial vehicular traffic that exists today from the neighborhood, and we realigned the traffic generated on the campus so that vehicles cannot go from the campus directly to the adjacent neighborhood (at the request of the neighbors).

- We redesigned traffic circulation and flow to improve traffic conditions from its current anticipated levels of service. These changes include relocating Axon Way, which now separates the vehicular traffic of the campus from the adjacent neighborhood, reactivated the original Mayo Boulevard to provide exclusive access for the neighborhood and removed the roundabout for better traffic flow.

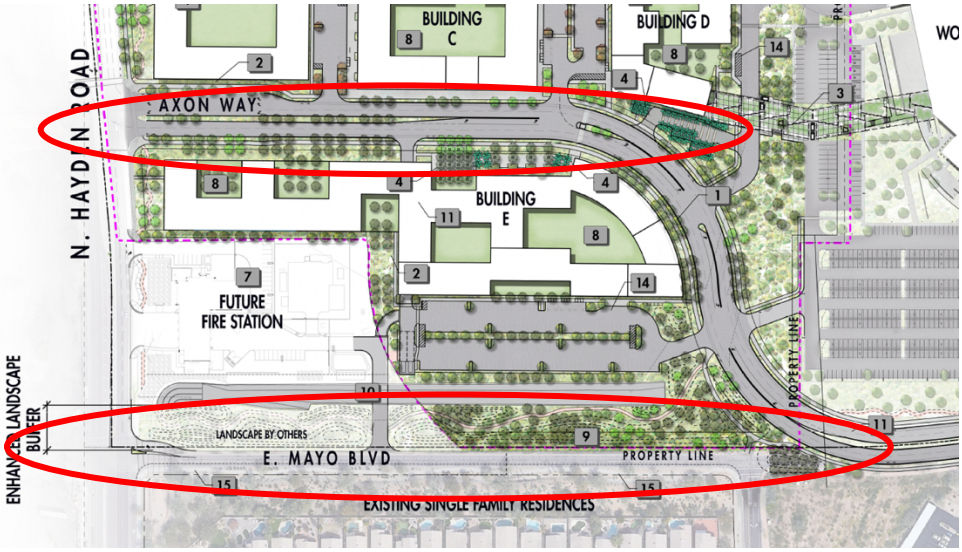
New Alignment



Old Alignment



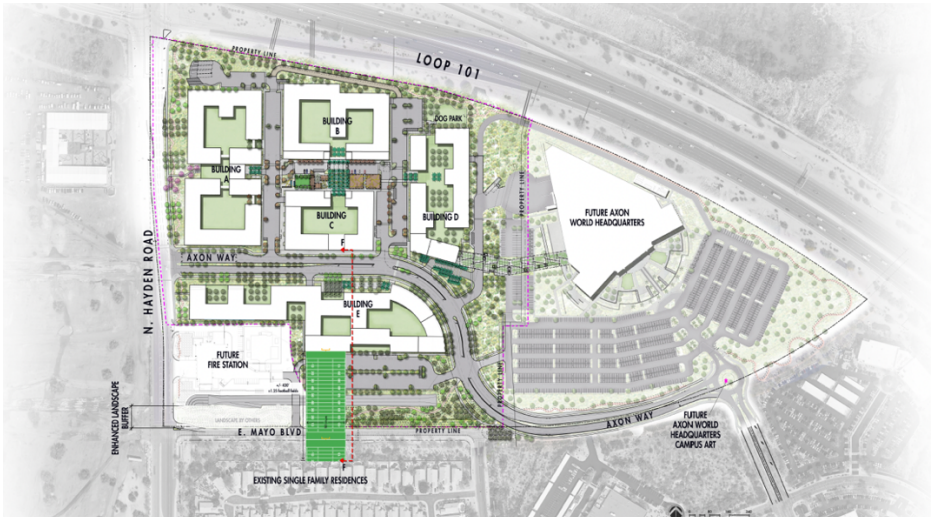
- We realigned Axon Way so that the original Mayo Boulevard provides exclusive access for the neighborhood to Hayden (at the request of the neighbors).



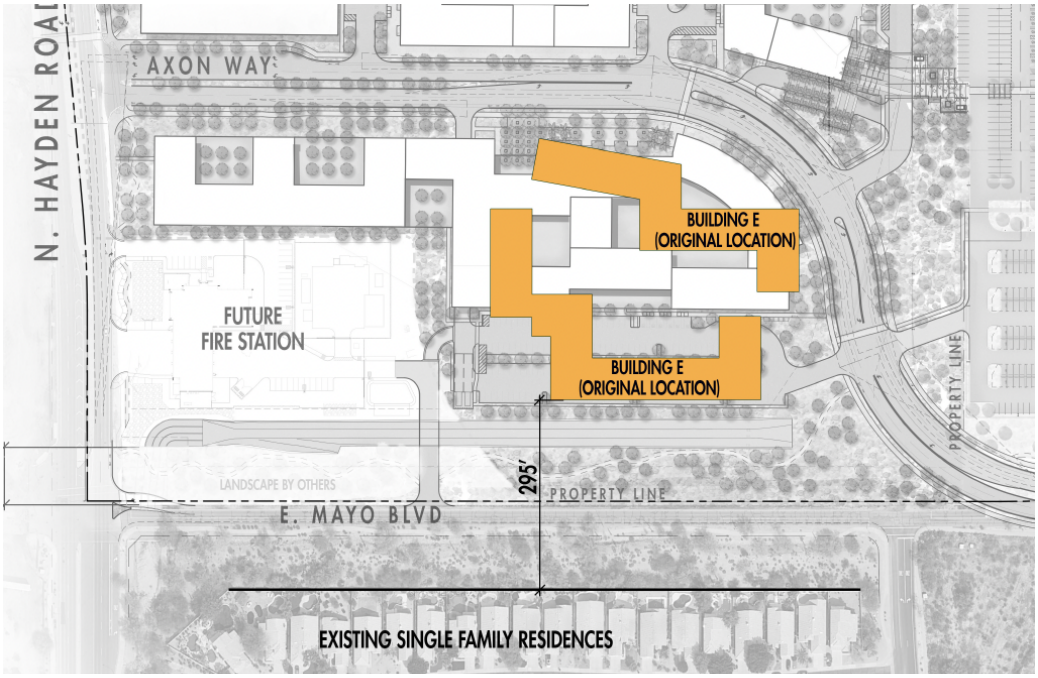
Building and Site Layout Adjustments

- We Increased the setback of our closest building to the neighbors back wall from 295′ to 420′; Building E is setback 301′ from the property line and the minimum building setback is 30′. The proposed setback is over 270′ beyond the required setback (or approximately 10 times the setback requirement).

New Building E Distance (+/- 420′)

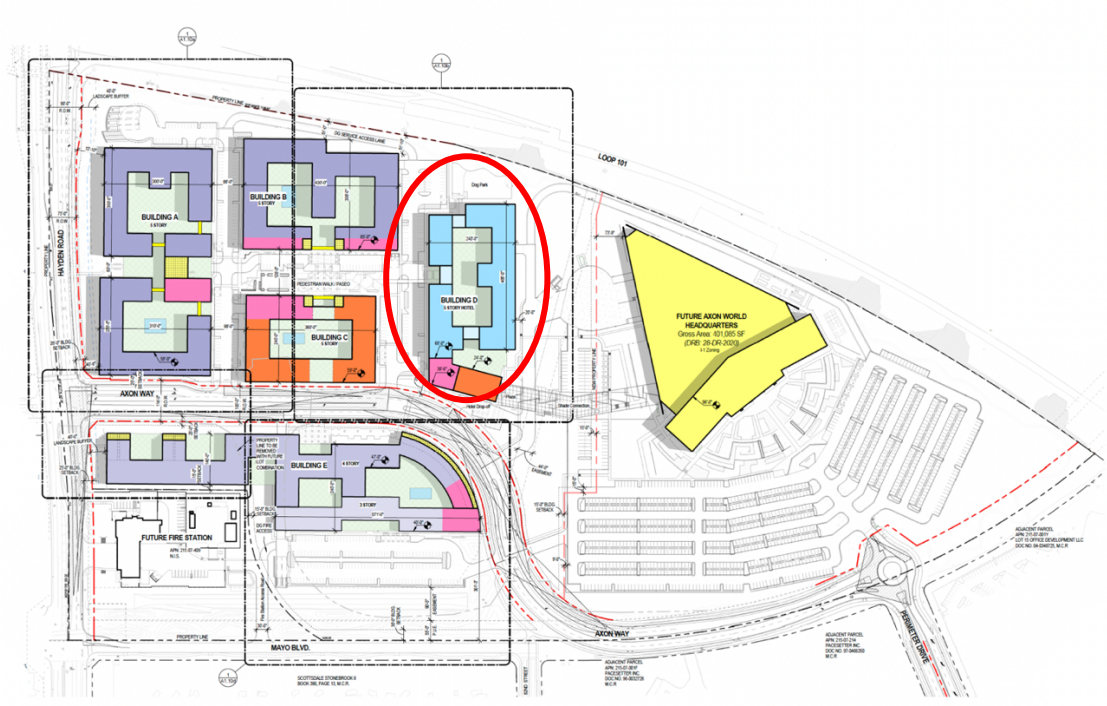


Old Building E Distance (+/- 295)

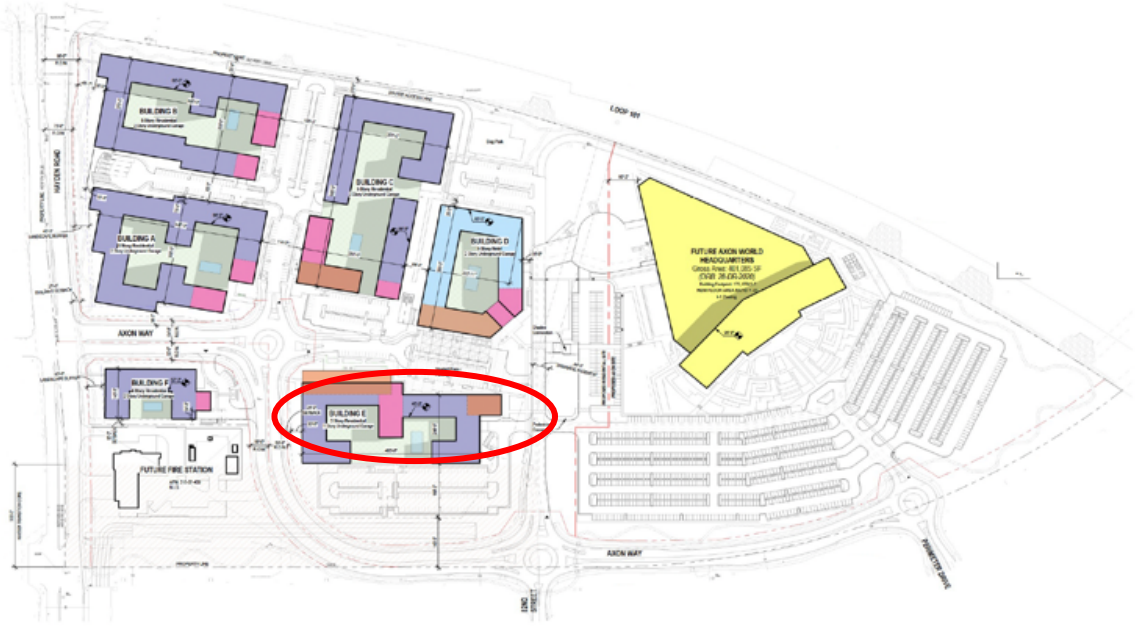


- We relocated the Hotel location from Building E (closest to neighbors) to Building D (at the request of the neighbors).

New Hotel Location



Old Hotel Location

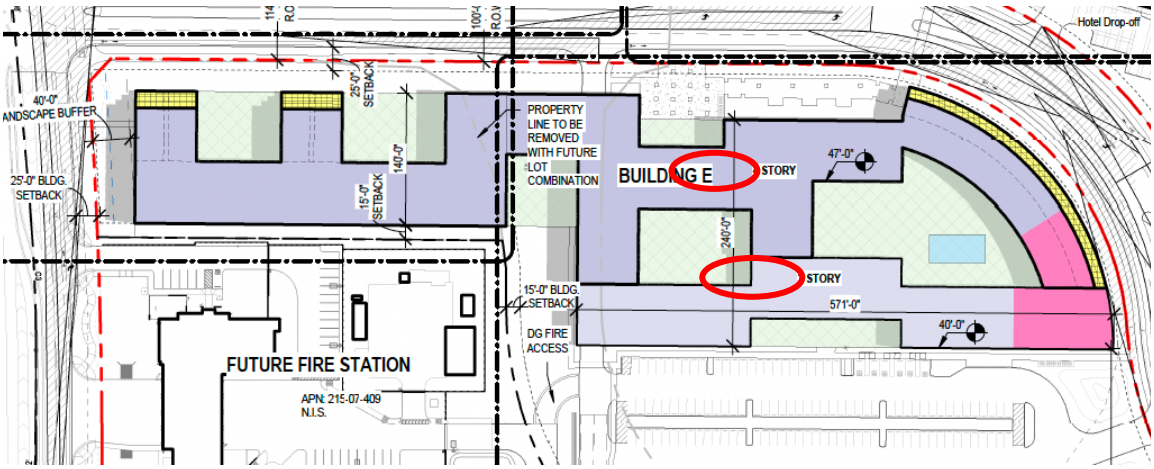


- We reduced the building closest to our neighbors from the proposed height of 5 stories as originally planned to the current proposal of 3 stories at its closest point and stepping up to 4 stores as it moves to the north), which is now approximately 420' further away from the back walls of the adjacent neighborhood.

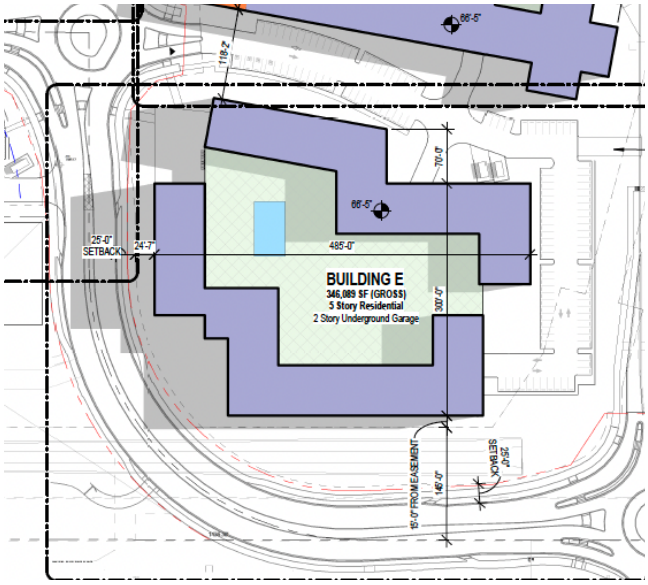
- Additionally, Building E now proposes approximately 365 owner occupied condos.

- Building E is approximately 420' feet away from the back wall of the neighbors to the south. The closest 5 story building to the neighbors to the south is approximately 841' away.

Reduced Building E Height



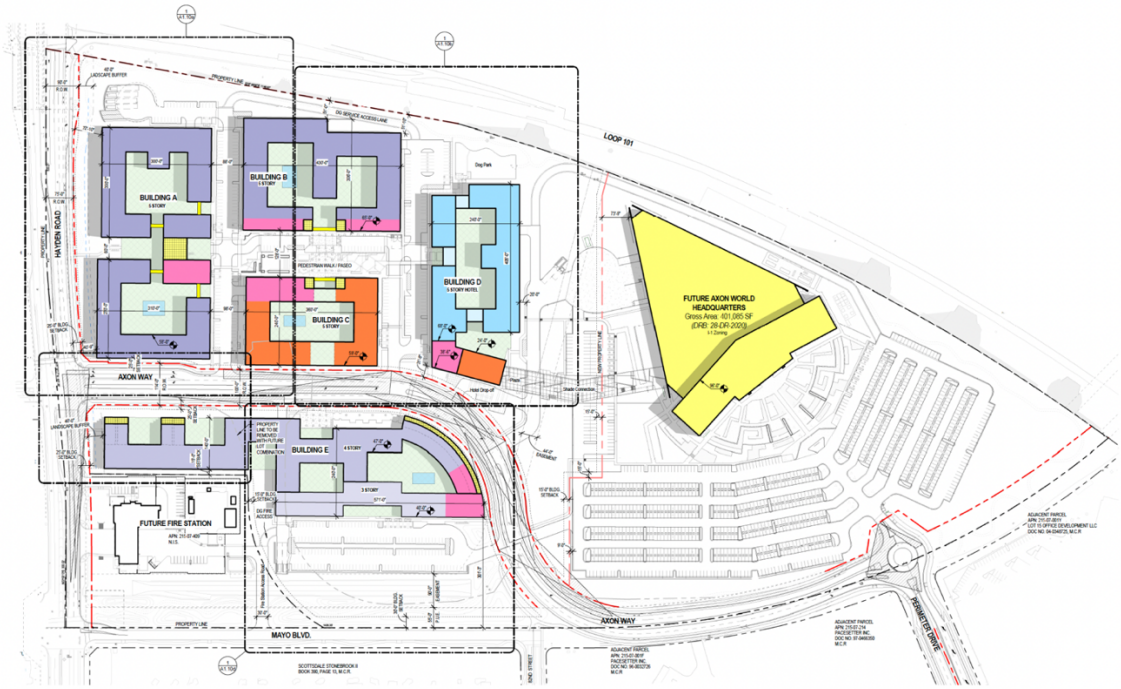
Old Building E Height



- The current plan has a reduced number of residential units from the original 2,552 units to 1,965 units – a 23 % reduction.

- Reorientated the buildings.

New Building Orientation

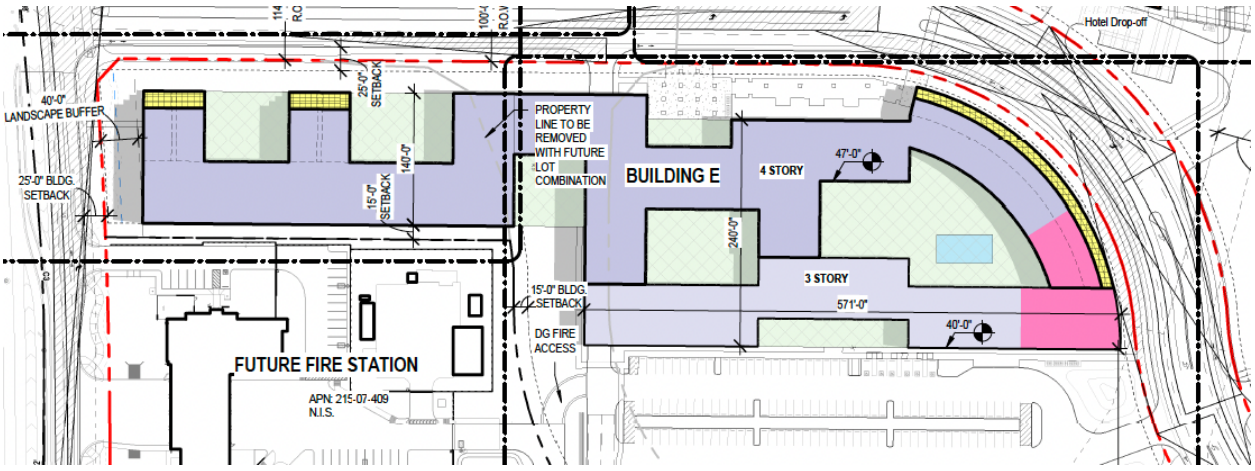


Old Building Orientation

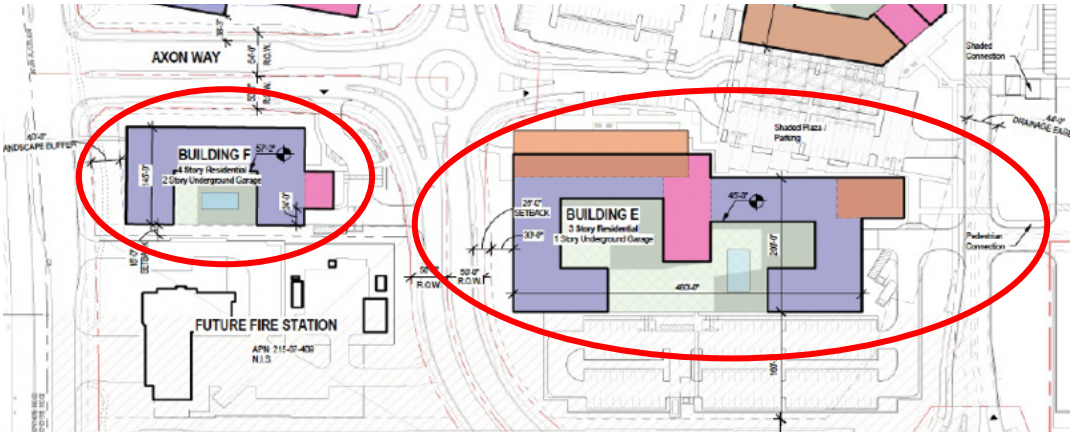


- The current design removed Building F and redesigned Building E to move further away from the neighborhood. Building E is now approximately 420' feet to the nearest neighbors back wall. Building E was originally proposed to be the hotel and at the direction of the neighbors its use is now residential and is being proposed to contain over 50% condos.

Redesigned Building E



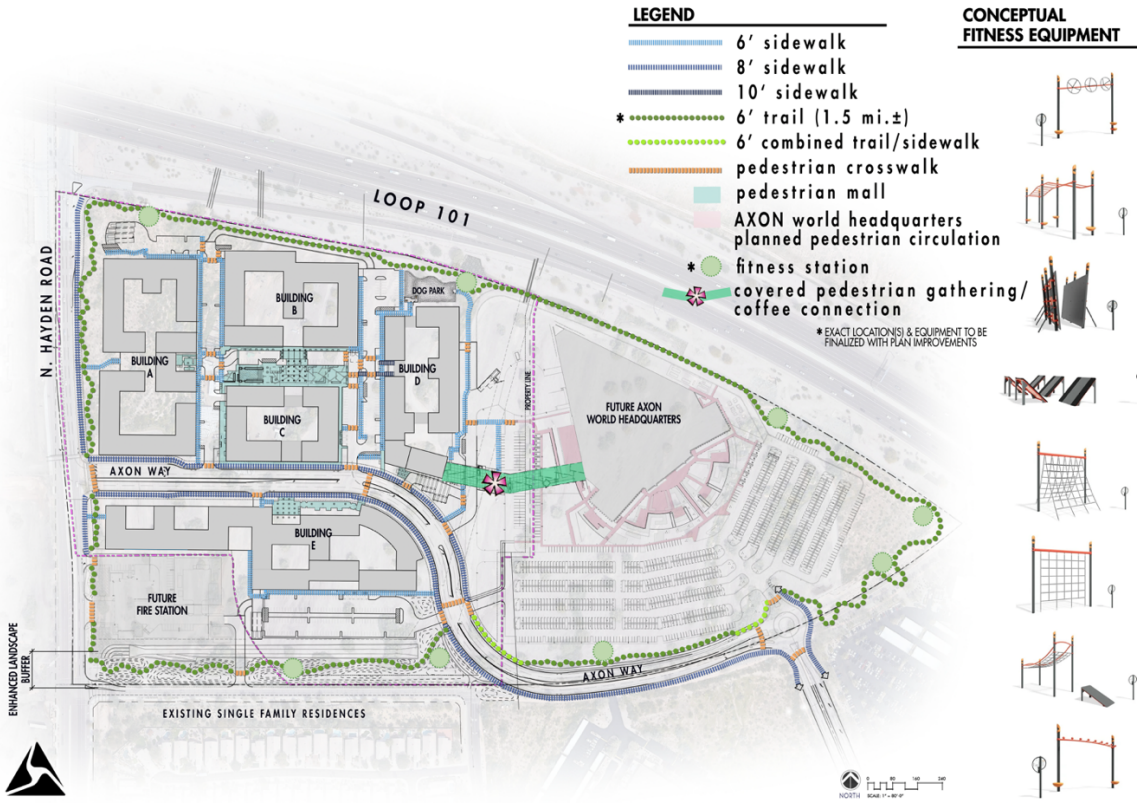
Old Location of Buildings E and F



Community and Environmental Enhancements

- The current design has been modified to increase the amenities to serve the surrounding neighborhoods such as increasing the commercial space including restaurant and retail from 44,800 square feet to 49,486 square feet, a 13,000 square foot dog park, a +/- 1.5 mile running track and shaded connections.

- Added 1.5 mile running trail with fitness equipment/fitness stations along the path.



- The proposed design now includes increased retail and restaurants offerings. Our goal is to have five to seven high-quality restaurants. Axon's vision for the World Headquarters Campus is a comprehensive environment in which budding tech employees can benefit from having a variety of activation in close proximity. This includes a hotel and conference center which will be a hub of activity for business operations as well as the supportive commercial opportunities to include restaurants and retail. Like a university environment, educational and professional growth and development are enhanced when they occur as part of a more vibrant ecosystem.

- We are proposing to provide a 13,000 square foot dog park that will be open to residents, employees and neighbors.



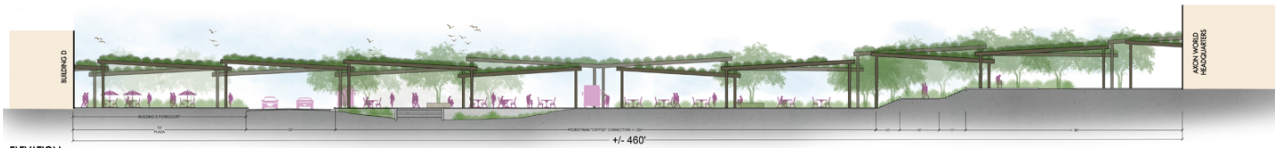
- We added enhanced shade offerings in a variety of configurations through the site to promote pedestrian connectivity between the various components of the Campus.

Redesigned Shade Connection

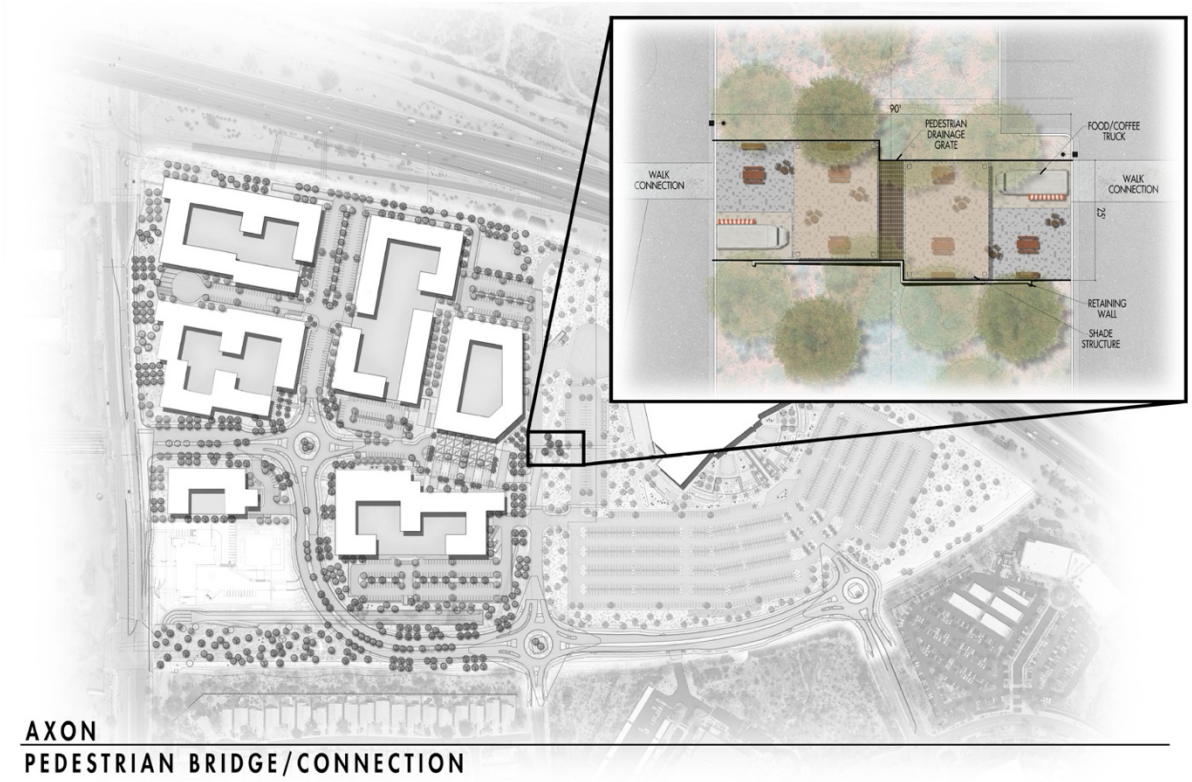




GREEN ROOF CHARACTER IMAGE

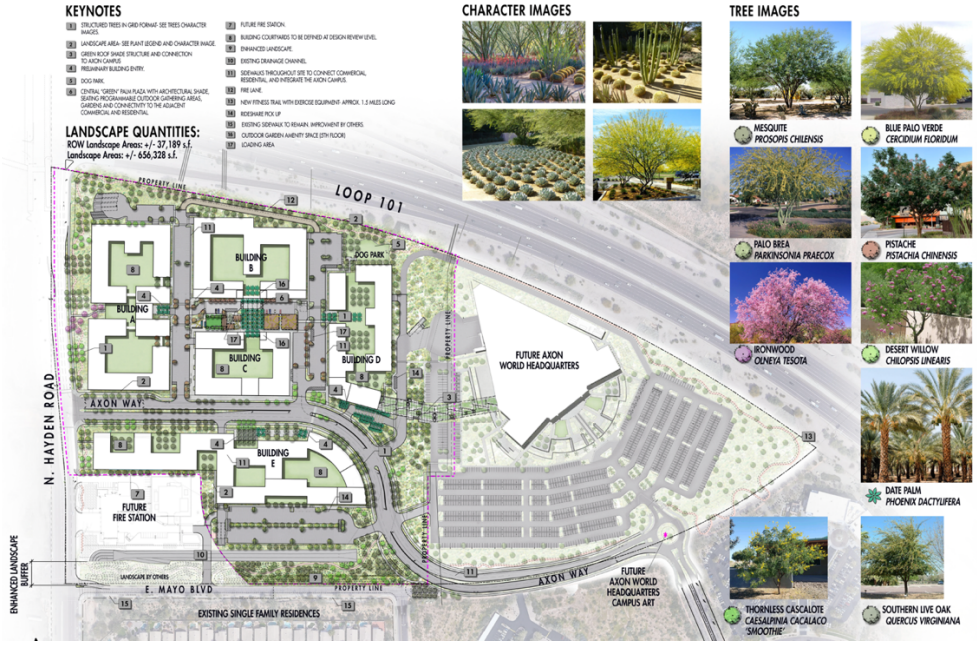


Previous Shade Connection



- The current plan shows a significantly increased landscape area from the original submittal, which had 488,800 square feet, to now 656,328 square feet (34% increase). The entire Axon World Headquarters Campus is providing 1,346,371 square feet of open space when 819,446 square feet is required, approximately 64% beyond the Zoning Ordinance requirement.

New Landscape Area



Old Landscape Area



PROJECT OVERVIEW

In 2020, Axon Enterprise, Inc. ("Axon") acquired from the Arizona State Land Department (ASLD) approximately 73.57 acres on the south side of the Loop 101 freeway at Hayden Road to expand its campus within the area shown below:



On October 15, 2020, the Development Review Board approved the design documents for Axon's headquarters building, and on November 10, 2020, in the midst of Covid-related challenges, the Scottsdale City Council approved Axon's requests for a Zoning District Map Amendment from Planned Community (P-C) to Planned Community District - Industrial Park (PCD I-1), and amended development standards for the new Axon headquarters building.

The site is subject to the large-scale Crossroads East PCD consisting of approximately 1,000 acres of land that was at one point owned entirely by ASLD but has since been partially sold in pieces to private property owners.

In keeping with the "Axon World Headquarters Campus" concept, and in addition to the already approved headquarters building, we are proposing to add a number of walkable and complementary uses to support the Axon World Headquarters Campus. These include: new residences, which – while not exclusive to Axon employees – are critical to serve our employees on an expanded campus; significant commercial experiences as part of a new mixed-use development that will include high end pedestrian oriented outdoor spaces; and a hotel for conference use related to the new Headquarters training component.

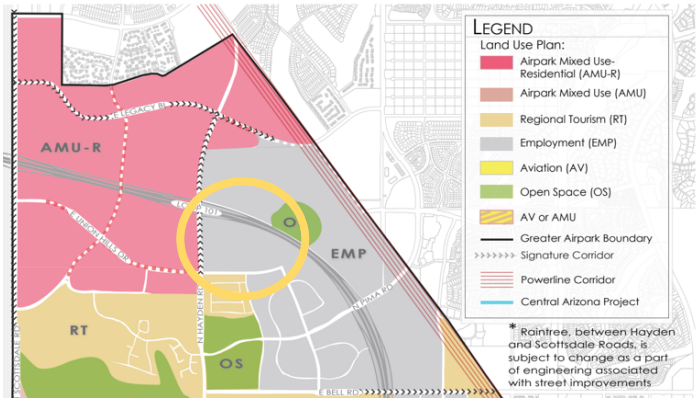
All of these uses together on one site create a true mixed-use campus. The previously approved office building will be Phase I of the Axon World Headquarters Campus and the supporting housing and commercial will be additional phases of the Axon World Headquarters Campus build out. As much as Axon wants to remain in Scottsdale, it is not feasible without a full campus, which includes residential, hotel, and commercial components to support the approved office building.

In order to create our World Headquarters Campus, we are requesting the following:

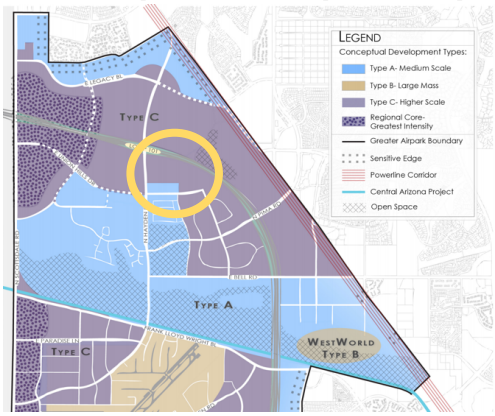
- An Amendment to the Greater Airpark Character Area Plan from Employment to Airpark Mixed-Use Residential
- A Minor General Plan Amendment from Employment: Light Industrial/Office to Mixed-Use Neighborhoods
- Rezoning of a portion of the site from the Planned Community District – Industrial Park (PCD I-1) to Planned Community District – Planned Airpark Core Development/Airpark Mixed-Use Residential (PCD – PCP/AMU-R)
- Amended Development standards for the amount of ground floor retail percentages and to clarify that maximum heights are exclusive of rooftop appurtenances (for example, mechanical equipment and screening)

The site's overall 2035 General Plan designation is Employment: Light Industrial/Office with a Regional Use District overlay and the Greater Airpark Growth Area. The Axon campus is located within the Greater Airpark Area Plan with an Employment designation projected to be mostly Type C – Higher Scale Development type with a small portion of the site designed as Type A – Medium Scale as shown on the maps below:

Land Use Plan



Conceptual Development Types

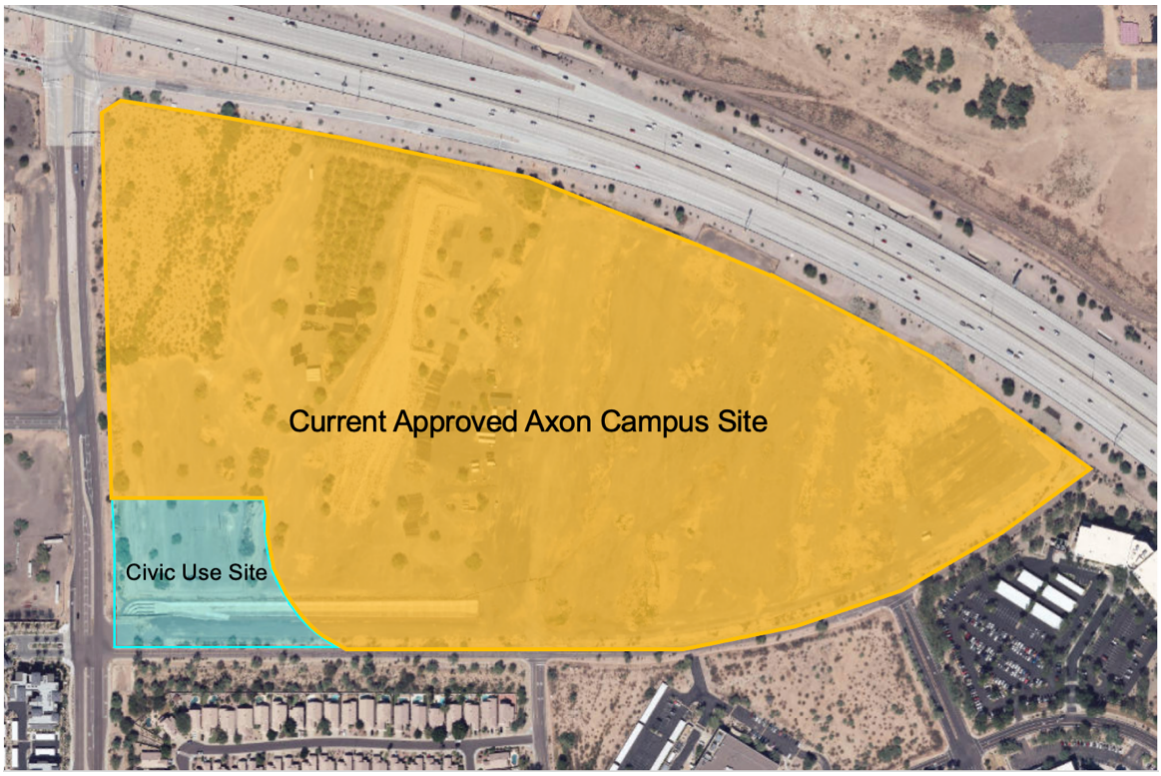


The approved Axon office/manufacturing building is an Industrial use at a scale designed to fit well with land use plans for this area. Rezoning the remaining portion of the site will allow this project to move forward as a true campus feel with the well-designed outdoor spaces, residential, hotel, commercial and industrial uses working cohesively with the adjacent municipal uses to create a genuinely mixed-use environment.

HISTORY

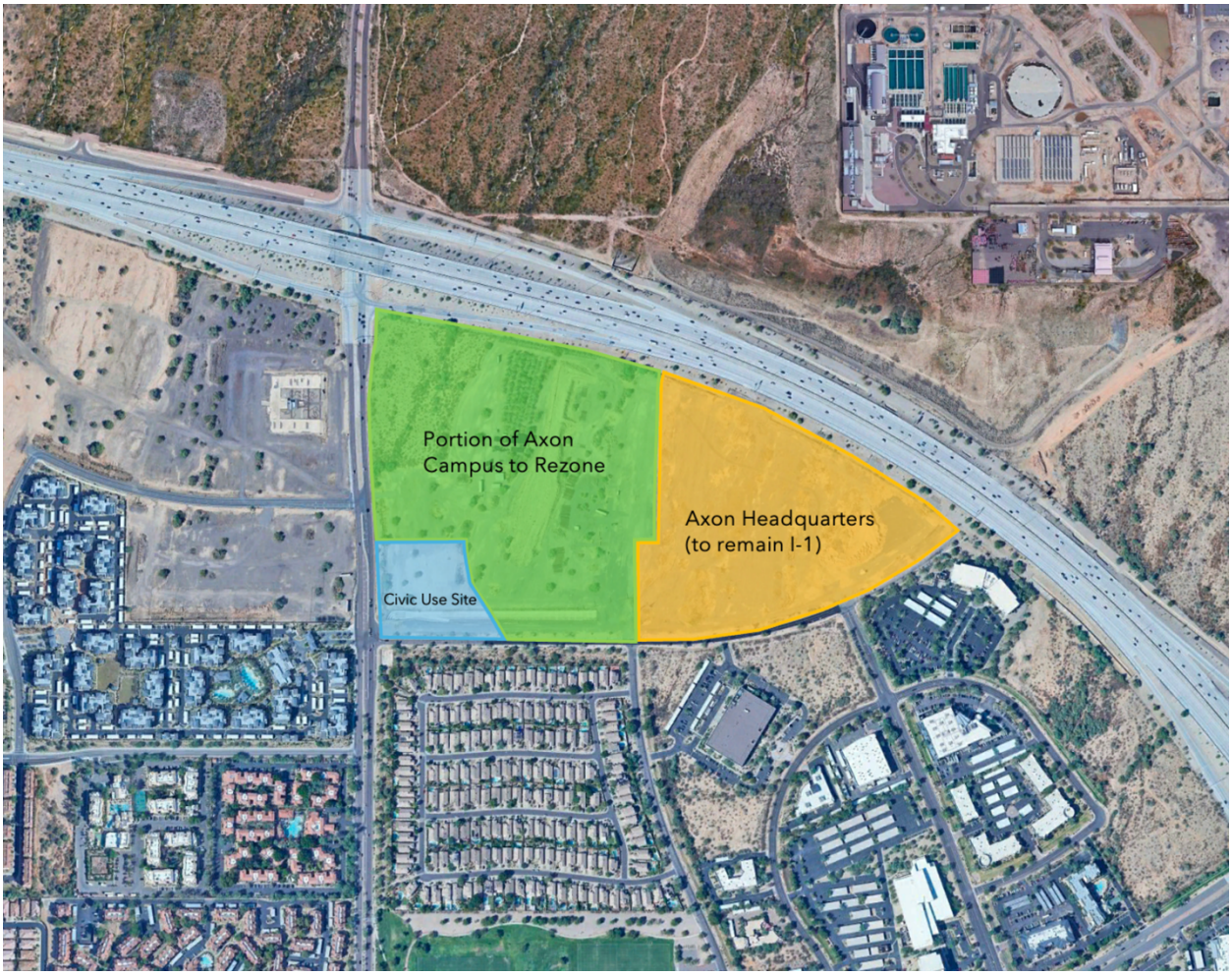
In 2020, Axon requested and received approval to rezone the approximately 74-acre site from PCD (Planned Community) to I-1 (Industrial Park) PCD, an amendment to the Development Standards for I-1 to accommodate an increased building height, and a Development Review (Major) for the proposed building design.

As part of an agreement with the City of Scottsdale, Axon dedicated an approximately 4.5-acre Civic Use Site to the City of Scottsdale highlighted in blue below. With the Civic Use Site dedicated to the City of Scottsdale and nearly 10 acres of land utilized for right-of-way improvements totaling nearly 15 acres, the remaining already approved Axon Campus site is approximately 58.9 net acres, as shown highlighted in yellow below:



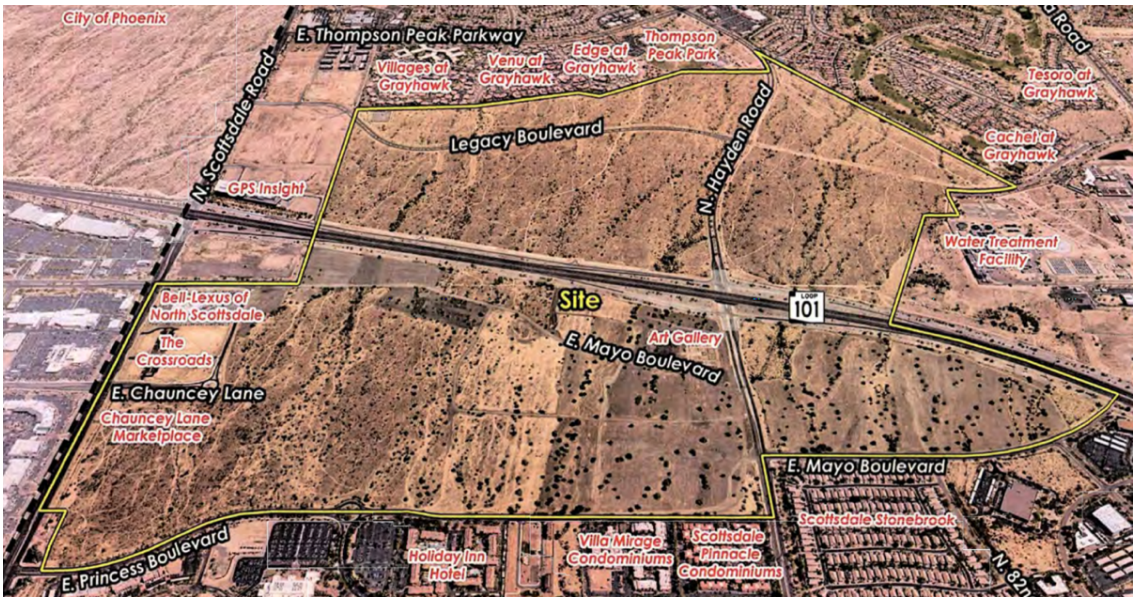
We have been working with the City for several years now to coordinate infrastructure improvement and installation of new infrastructure where necessary to not only support the proposed Axon World Headquarters Campus but also future development in the area. Part of the updated design includes moving Axon Way further away from the neighborhood which will create a much wider buffer from the Axon Campus and the nearby residential than originally planned and allow the Campus to be far more walkable. Large amounts of open space and abundant landscape plantings have been designed into the project to transition from the nearby residential use in addition to a landscape berm which provides an additional physical barrier.

In 2023, Axon requested to rezone approximately 44.7 gross acres (37.1 net acres) of the site to PCP PCD with an amendment to the Greater Airpark Area Plan to AMU-R to create a mixed-use site with an approximately equal amount of industrial and residential land. Below is an image that shows the City of Scottsdale's Civic Use Site (in blue), the Axon headquarters to remain I-1 PCD (in yellow), and the portion of the site that is included in this rezoning request (in green).

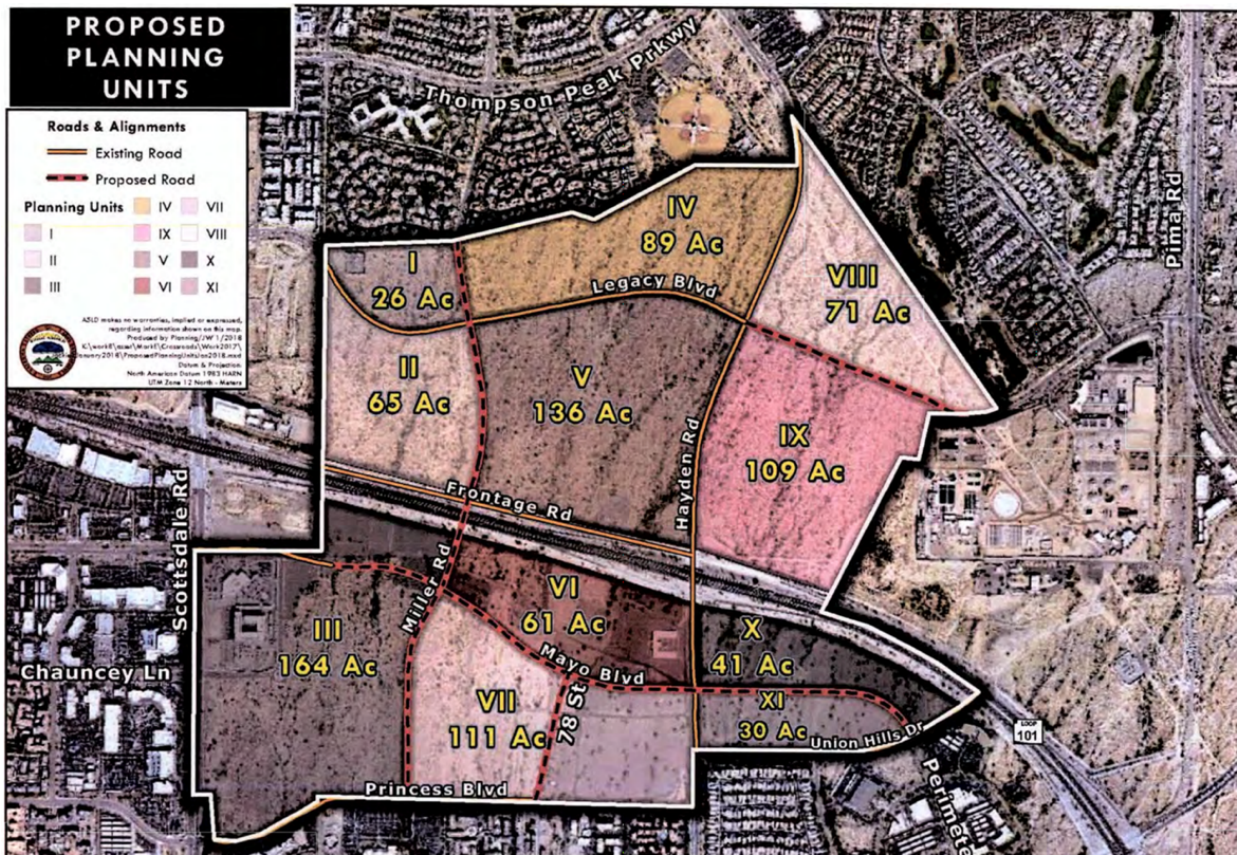


This request went before the City of Scottsdale Planning Commission on January 24, 2024, and was continued. Axon has taken the time since that hearing to refine the campus plans with the comments we heard along the way in mind.

The site is located within a larger planning area within the City of Scottsdale known as Crossroads East that has been subject to various Development Agreements, rezonings, and other entitlement cases over many years. The Crossroads East area is depicted below in the image below that was created by the City:



Crossroads East is divided into Planning Units, which have been broken up over time. The future Axon Campus is located in Planning Units X and XI as shown in the map below created by rezoning case 19-ZN-2002#6:



All of the land contained within the Crossroads East area was previously rezoned by the City to Planned Community (PCD) with a zoning bank allowance for various zoning categories to be permitted in the Planning Units as well as dictating the amount of land that could utilize each zoning category and placing restrictions on the number of residential units permitted.

Part of our request requires a modification to the Permitted Zoning Districts in Planning Units X and XI as well as a modification to the Land Use Budget to adjust the amount of acreage zoned I-1, PCP and to update the allowed dwelling units. These modifications are part of a case that will occur concurrently with this request but by a different applicant. Each of the various requests are detailed below in their respective sections.

The requested rezoning allows the Axon Campus and adjacent municipal fire station and water treatment facility to function in a true mixed-use environment with office, manufacturing, housing, hotels, and commercial on what was once a single vacant parcel.

REZONING NARRATIVE

Axon seeks to rezone a portion of the current I-1 (Industrial Park) PCD to PCP PCD to accommodate the mixed-use Phase II portion of the Axon World Headquarters Campus. In conjunction with this rezoning request, an amendment to the Crossroads East PCD is necessary to update the Zoning Allowances and Land Use Budget.

These modifications allow Axon to proceed with creating a mixed-use campus that blends well with the adjacent municipal fire station and water treatment facility.

Crossroads East PCD

The subject site is located within Planning Units X and XI (created by 19-ZN-2002#6) with the following zoning allowances:

Current Crossroads East Permitted Zoning Districts

Category	Zoning	Permitted Zoning Districts										
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI
Employment	I-1		•	•	•	•	•	•	•	•	•	•
Employment	C-O	•	•	•	•	•	•	•	•	•	•	•
Mixed Use	PRC & PCP		•	•		•	•	•		•		
Commercial	C-2/C-3		•	•	•	•	•	•	•	•	•	•
Residential	R-5	•	•	•	•	•	•	•	•			

Our request will require a modification to these allowances to add PRC & PCP (Mixed Use Zoning Districts) to the Permitted Zoning Districts for Planning Units X & XI as shown in the proposed updated chart below:

Proposed Crossroads East Permitted Zoning Districts

Category	Zoning	Permitted Zoning Districts										
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI
Employment	I-1		•	•	•	•	•	•	•	•	•	•
Employment	C-O	•	•	•	•	•	•	•	•	•	•	•
Mixed Use	PRC & PCP		•	•		•	•	•		•	•	•
Commercial	C-2/C-3		•	•	•	•	•	•	•	•	•	•
Residential	R-5	•	•	•	•	•	•	•	•			

In addition to the Permitted Zoning District modification requested, we are working with the State and the City to process a separate but related modification to various components of the Land Use Budget in the Crossroads East development agreement. The Land Use Budget provides for specific amounts of acreage to be zoned into a number of categories and also assigns a maximum number of dwelling units that is permitted in each zoning category.

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The subject site is currently within the 210-acre allotment of I-1 zoning, which does not allow dwelling units, as shown in the chart below:

Current Crossroads East Land Use Budget approved with case 19-ZN-2002#6

Category	Zoning	Gross Acreage by Zoning	Maximum Dwelling Unit per Gross Acre (DU/AC)	Maximum Allowable Dwelling Units
Employment	I-1	210	NP	NP
Employment	C-O	81	NP	NP
Mixed Use	PRC & PCP	407	See Schedule C	4,163
Commercial	C-2/C-3	170	NP	NP
Residential	R-5	132	23	2,806
Total		1,000		6,969

We are proposing to add 44 acres to the PRC & PCP allocation and increase the overall acreage accordingly while also increasing the maximum allowable dwelling units to accommodate the proposed 1,965 additional units for the Axon World Headquarters Campus.

Proposed Crossroads East Land Use Budget

Category	Zoning	Gross Acreage by Zoning	Maximum Dwelling Unit per Gross Acre (DU/AC)	Maximum Allowable Dwelling Units
Employment	I-1	~~210~~**166**	NP	NP
Employment	C-O	81	NP	NP
Mixed Use	PRC & PCP	~~407~~**451**	See Schedule C	~~4,163~~**6,128**
Commercial	C-2/C-3	170	NP	NP
Residential	R-5	132	23	2,806
Total		1,000		~~6,969~~**8,934**

Axon will continue to utilize approximately 30 net acres of the I-1 allotment in the Land Use Budget for the rezoning of Planning Units X and XI in Crossroads East. The 44 acres that Axon is proposing to add into the PRC & PCP allotment returns 44 acres of I-1 allotment into the land use bank, which is accounted for utilizing the land use budget.

Findings Required for Crossroads East Planned Community

Modifications to an approved P-C district require an applicant to demonstrate various findings, and Axon's proposed World Headquarters Campus development satisfies these findings as detailed below:

A. *That the development proposed is in substantial harmony with the General Plan, and can be coordinated with existing and planned development of surrounding areas.*

Axon's proposed World Headquarters Campus meets both the City's changing needs and Axon's changing needs. The requested modifications help further the goals set forth in the General Plan as well as the City's other vision documents including the Economic Development Five-Year Strategic Plan and Greater Airpark Character Area Plan. A detailed analysis of how the proposed development furthers the goals and objectives of the General Plan begins on page 25 of this narrative.

Additionally, the development is in harmony with the existing and planned development of the surrounding areas – both within and outside of the Crossroads East Planned Community – by providing high-quality tech jobs and supportive commercial and residential in this rapidly growing part of Scottsdale. Lastly, providing housing is a critical component of the job growth. It is not feasible to bring jobs without adequate housing and amenities to support them and the housing crisis in Arizona has been well documented in recent years.

B. *That the streets and thoroughfares proposed are suitable and adequate to serve the proposed uses and the anticipated traffic which will be generated thereby.*

Our redesign of the roadways and modifications to the buildings and uses were driven by feedback received from the adjacent neighborhood. Our revised proposal keeps Mayo Boulevard as a local access point for the neighbors but does not allow access onto Axon Way. This new configuration is designed to keep traffic from the Axon World Headquarters Campus separate from the streets the neighbors utilize. We have heard feedback from the neighbors that they currently have traffic from nearby industrial users. By reconfiguring the roadways, we will eliminate almost all industrial traffic through the neighborhood.

The improvements proposed and approved as part of Phase I, if built, would increase the capacity on Hayden Road to the City's desired standards and would an additional lane of travel and bicycle lanes. In the current proposal, and after working with Scottsdale and ADOT staff, Axon Way will be entirely reconfigured with two lanes of traffic in each direction plus the additional of bicycle lanes and a roundabout. Both roadways include substantial landscape additions, sidewalks that vary form 8' to 10', and a 6' trail/running path that spans the entire campus to create a 1.5-mile track.

The various improvements to the adjacent roadways are not only adequate to support the proposed uses and traffic for both vehicular and pedestrian needs but will be an improvement over the existing conditions for some of the problematic intersections nearby. A comprehensive TIMA is also included with this resubmittal.

C. *The Planning Commission and City Council shall further find that the facts submitted with the application and presented at the hearing establish beyond reasonable doubt that:*

1. *In the case of the proposed residential development, that such development will constitute a residential environment of sustained desirability and stability; that it will be in harmony with the character of the surrounding area; and that the sites proposed for public facilities, such as schools, playgrounds and parks, are adequate to serve the anticipated population. The Planning Commission and City Council shall be presented written acknowledgment of this from the appropriate school district, the Scottsdale Parks and Recreation Commission and any other responsible agency.*

   The proposed Axon World Headquarters Campus is a mixed-use development that includes thoughtfully designed outdoor spaces, office, hotel, and commercial components, and as well as multi-family housing. The housing component will support Axon's World Headquarters growth, as well as the retail, and it will help fulfill the growing need for housing diversity in the Airpark area. A variety of cohesive uses and well-designed connectivity intends to enhance the desirability of the residential development.

   Our team revised our plan to incorporate feedback related to roadway design from the neighborhood as well as the City's transportation staff. As a result, we have limited access on the existing Mayo Boulevard for residents of the adjacent neighborhood and separated that traffic from the circulation network that serves the Axon World Headquarters Campus. This revised roadway plan results in an improved condition for both the neighborhood and the future Axon World Headquarters Campus. By reconfiguring the roadways, we will eliminate a significant portion of the industrial traffic through the neighborhood.

   The proposed housing component is compatible with the surrounding area which features other multi-family developments. This is an ideal area to provide the critically needed housing within close proximity and easy access to outdoor recreational opportunities like the Scottsdale Sports Complex, nearby McDowell-Mountain Sonoran Preserve, and TPC Scottsdale.

   Adding to the desirability of the area for future residents are the quality public schools which have confirmed its schools have the capacity to accommodate the proposed multi-family development.

2. *In the case of proposed industrial or research uses, that such development will be appropriate in area, location and overall planning to the purpose intended;*

and that the design and development standards are such as to create an industrial environment of sustained desirability and stability.

The proposed industrial (Headquarters) component of Axon's World Headquarters Campus was previously approved and is not subject to further approval as part of this request. Therefore, this provision does not apply.

3. *In the case of proposed commercial, educational, cultural, recreational and other nonresidential uses, that such development will be appropriate in area, location and overall planning to the purpose intended; and that such development will be in harmony with the character of the surrounding areas.*

   The proposed Axon World Headquarters Campus is a true mixed-use development with cohesive outdoor spaces, civic uses, public safety uses, industrial, office space, hotel accommodations, commercial and multi-family housing that are designed specifically to complement each other. The commercial and office/industrial portions of the campus are supported by the multi-family housing options necessary to bring new jobs.

   The commercial space – a well-designed, pedestrian oriented combination of commercial uses – is located at the ground floor of each of the multi-family developments to provide amenities to hotel guests, employees and residents. These amenities include: a dog park, retail, restaurants, shaded connections, and a running path.

   Originally, Axon proposed the hotel location much closer to the neighborhood to the south. After feedback from the neighbors, we relocated the hotel between the multi-family housing and the Axon Corporate World Headquarters building. The hotel will support Axon's corporate, conference and training visitors and will also be available to host additional conferences and other events related to Axon's Headquarters building. The nearby recreational amenities geared to support future residents are also amenities that appeal to short term visitors to the area. Much of the surrounding area is multi-family residential (R-4 and R-5), mixed-use (PCP) and industrial (I-1) zoned, and the proposed Axon World Headquarters Campus is compatible with those uses.

Compliance with Goals and Policies of the General Plan

The proposed Axon Campus expansion is consistent with various goals and policies of the General Plan 2035 set forth below.

Character and Design Element

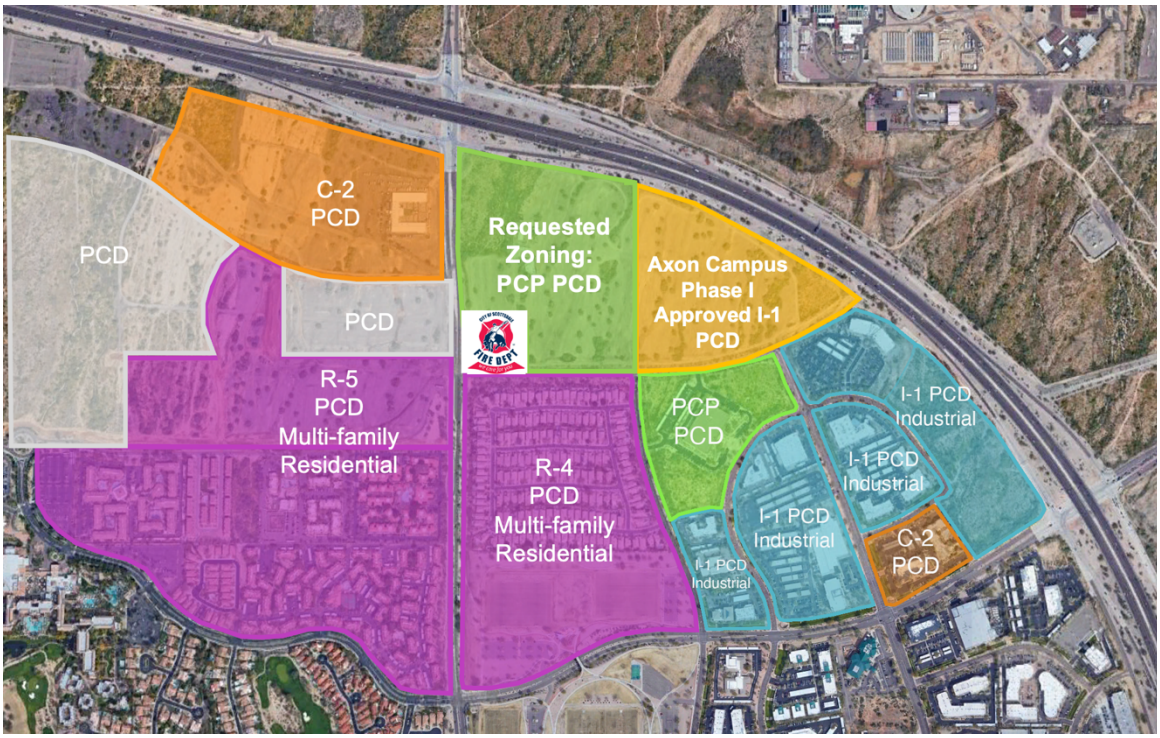
Goal CD1. Determine the appropriateness of all development in terms of community goals, surrounding area character, and context.

CD1.1: New and revitalized developments should respond to the regional, citywide, and neighborhood contexts.

Axon's proposed mixed-use World Headquarters Campus expansion is located on a vacant parcel within the Crossroads East PCD, an area geared at attracting regional headquarters for businesses as well as providing the multi-family housing for new residents to live. New residential units are necessary to support the economic growth the City envisions for this area. One of the reasons that this property location is appropriate for the proposed Axon World Headquarters Campus is because of its proximity to the freeway. Additionally, Axon is bringing high-quality jobs, and high-quality housing is an incentive for the type of talent that Axon intends to bring to Scottsdale.

Axon's Campus Expansion integrates well into the plans for this area including expansion of employment and industrial opportunities adjacent to the Loop 101 freeway. The uses and densities in the surrounding area tend to be more intense due to the regional focus of Crossroads East. The addition of a mixed-use campus component to support the employment component is critical and consistent with much of the surrounding development that is a combination of high-density multi-family housing, commercial, Planned Airpark Core (mixed-use) and industrial.

The map below demonstrates the zoning categories of the surrounding land:



The site is located within the Greater Airpark Character Area, which is designated as a growth area in the 2035 General Plan. The intent is to grow the City's crucial employment base and ensure attractive development happens in the area. Part of growing employment cores includes a mixed-use campus environment like those found on the north side of the Loop 101. The addition of the City's fire station and water treatment facility further contribute to the variety of uses present at this location.

In response to feedback we received from the adjacent neighbors and the City's transportation staff, Axon reconfigured its internal roadway system to move traffic away from the neighborhood. Our new design proposes to keep the existing Mayo Boulevard alignment as an access point for the neighborhood. Feedback from the neighbors also included concern over the existing industrial traffic. Reconfiguring the lanes and having the existing industrial traffic on Axon Way, instead of through the neighborhood, will significantly reduce the industrial traffic the neighborhood currently experiences.

Constructing the Axon World Headquarters Campus will have a total economic impact over the first 10 years of $35.6 billion, create more than 18,800 jobs, produce approximately $12.3 billion in labor income and will generate $106.9 million in Scottsdale tax revenue. By constructing the hotel, Axon will be able to host current and future conferences that are typically held in other cities. Nearly 18,200 annual business travelers would now come to Scottsdale to attend Axon's 1- to 5-day conferences. Hosting these conferences at the Campus will boost sales at local

restaurants, retailers, and other local businesses in Scottsdale by nearly $26.4 million per year. In addition to retaining and attracting high-quality jobs, the multi-family housing component will create additional tax revenue for the City.

CD 1.2: Consider the effects of building height, overall development density, and building orientation on adjacent neighborhood character, privacy, and viewsheds.

This area is bounded on two sides by the curve of the Loop 101 freeway, with the other portions of the site oriented towards a Major Arterial – Urban Street (Hayden Road) and a Major Collector – Urban Street (Axon Way, formerly Mayo Boulevard).

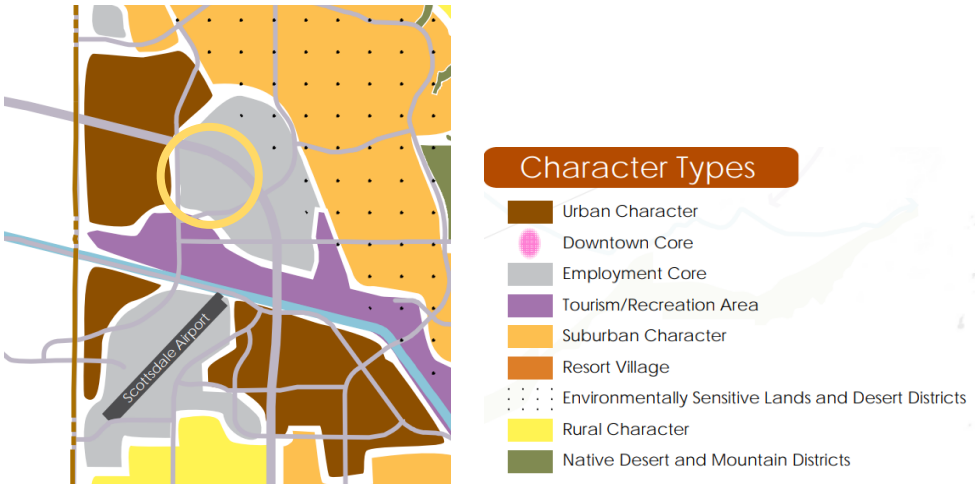
The parcel has been planned as an employment center of larger scale with associated intensity in relationship to its proximity to the Scottsdale Airpark and freeway. Accordingly, Axon designed and was approved for an appropriately scaled industrial building with a unique design that is oriented closer to the Loop 101. The remaining portion of the site that is the subject of this request will create an attractive and compatible development by building a site with an open campus feel.

The previous plans proposed Building E (the closest building to the neighbors) to be a 5-story hotel. Additionally, Building E was 160' from the neighbors. This resubmittal proposes a reconfigured Building E that is a combination of 3- and 4-stories, with the 3-story portion closest to the neighbors. The proposed use of Building E is now residential and has been moved north so that it is now +/- 420' from the neighbors.

The proposed mixed-use development consists of a residential density consistent with the adjacent developments on the west side of Hayden Road. This submittal proposes four 5-story buildings, one stepped back building with a mix of 3- and 4-stories. This resubmittal proposes four 5-story buildings and Building E will be a combination of 3- and 4-stories. The new buildings are proposed to be consistent with the approved height for the Axon building that will occupy the eastern portion of the site. Building E was originally proposed as a 5-story hotel. We have implemented the neighbors feedback and have changed the use and reduced the height of this building. The portion of Building E closest to the adjacent neighborhood will be 3 stories and will step up to 4 stories on the northern portion of the building.

CD 1.3: Ensure that all development is part of and contributes to established Character Types.

As depicted in the image below from the 2035 General Plan, Axon is located within the Employment Core Character Type and much of the surrounding land is Urban and Suburban Character.



Employment Core areas are planned as "primary employment centers for the city" and are "predominately concentrated in the Greater Airpark Character Area, a mixed-use employment core with primary freeway access, as well as around other major employment campuses . . ." and "support a wide range of activities, such as aviation, light-industrial, and regional- and community-level employment uses. These areas consist of multi-functional buildings with an emphasis on technology and corporate character."

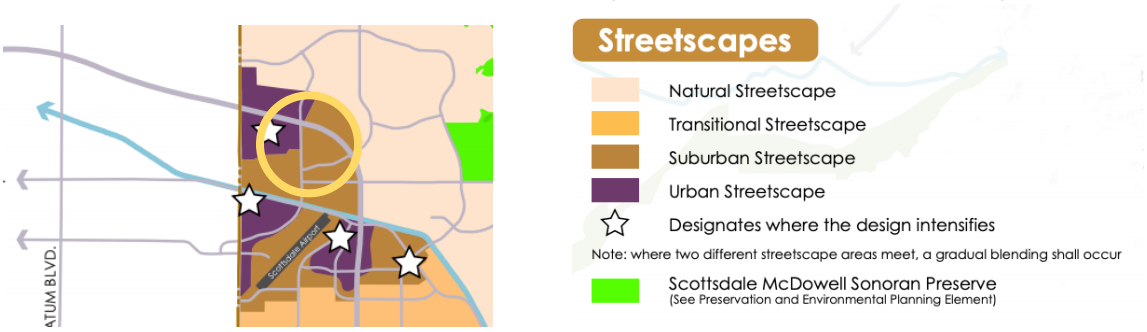
Consistent with the vision the City has for this area, Axon is proposing an expansion of its facilities into a true corporate campus including the approved world-class employment center and requested mixed-use component. Its location off of the Hayden Road exit for the Loop 101 freeway creates a regional presence with easy access throughout the Valley that will be home to highly sought-after technology jobs.

Attracting quality candidates for employment includes providing conveniently located housing and commercial amenities like restaurants and retail. By adding the additional uses to the already approved industrial component, Axon will be contributing to the Employment Core Character Type by supporting a wide range of activities with multi-functional buildings that support the headquarters and its emphasis on technology. Axon's goal to create an open campus that supports different types of uses and allows for a cohesive environment of outdoor spaces, office, retail, residential, and hotel in addition to the municipal development consisting of a fire station and water treatment facility on the southwest corner.

Goal CD 4. Enhance the design of streets and public spaces to improve Scottsdale's visual quality, experience, Sonoran Desert context, and social life.

CD 4.1: Promote contextually compatible streetscapes that correspond with the following classifications: Suburban Streetscapes strive to achieve compatibility and safety between automobile traffic, neighborhood amenities (schools and parks),

pedestrians, bicyclists, and recreational activities through the use of landscape areas, consideration of sidewalk alignment, and incorporation of a broad tree canopy.



The streetscapes have been designed based on the goals of and consistent with the guidelines for Suburban Streetscapes including large landscape buffers and berms, a roundabout to control speed and make the streets safer for pedestrians and cyclists, as well as native landscaping. Additionally, the Mayo Boulevard alignment will remain in place to help mitigate potential traffic through the neighborhood.

The open space requirement for the entire Axon World Headquarters Campus is 819,446 square feet. Axon has designed the site to have 1,346,371 square feet of open space – 64% more than what is required. Below is a table of the proposed and required open space for the site.

Total Open Space for Entire Site		**Total Open Space Required**	
Axon	415,189 s.f.	Axon	415,189 s.f.
Residential	890,101 s.f.	Residential	404,257 s.f.
Total	1,346,371 s.f.	Total	819,446 s.f.

The approved and proposed landscape palettes feature Palo Brea, Blue Palo Verde, Mesquite, Pistache, Desert Willow, Date Palm and Ironwood trees as well as native groundcover including – but not limited to – creosote, jojoba, various species of agave, desert milkweed, ocotillo and various species of yucca. The site includes bike lanes and a running path, all through the Sonoran landscape.

Goal CD 5. Promote the value and visual significance landscaping has on the character of the community.

CD 5.1: Employ appropriate heat island reduction techniques to reduce the effects of reflective heat and glare on buildings and paved surfaces.

Phase II of Axon World Headquarters Campus proposes almost all of the parking to be located in garages to reduce the impact of the heat island effect. Axon is also

proposing a robust landscape plan with plantings that in addition to the parking garages will help reduce the heat island effect.

Land Use Element

Goal LU 1. Enhance Scottsdale's economic viability by encouraging land uses that reinforce the city's reputation as the premier international tourist destination in the Southwest and sustain the city's role as a regional cultural center and economic hub. Land uses should be compatible with Scottsdale's character and physical appearance.

LU1.1: Encourage land uses that preserve a high quality of life and further define Scottsdale's sense of place within the region.

Axon's campus expansion will further the City's goal to increase its economic base beyond tourism and recreation. The approved Axon Campus office brings high-quality technology jobs including those in programing engineering, and research and development which significantly contribute to the City's desire for economic diversity. The proposed Campus Expansion supports the Axon office and industrial building with the addition of outdoor amenities, retail, residential, and hotel uses on the same site. Additional residential development is necessary for the desired job growth.

The residential component of the campus expansion is vital to creating a balanced and sustainable community that meets the needs of Axon's employees and recruiting efforts. High-paying jobs typically require highly skilled professionals who expect a certain standard of living, which includes quality housing.

By offering suitable housing and a vibrant ecosystem close to the workplace, Axon plans to enhance its employer appeal to relocate and expand high-wage positions in Scottsdale. This will also contribute to a better work-life balance, increasing the overall well-being of the local community.

Furthermore, cities thrive when their residents both live and work within their boundaries. By having more people who work in the city also live in the city, local businesses experience a steady customer base, which bolsters the economy. Residents are more likely to shop local and frequent restaurants and stores in their neighborhood, which helps keep economic benefits within the city.

The Axon Campus Expansion is located with the Greater Airpark Character Area, which seeks to attract and retain desirable regional corporate headquarters within this part of the City of Scottsdale. Keeping Axon in Scottsdale and providing an open campus environment further cements this area's growing reputation as a corporate hub with regional economic significance.

Goal LU 2: Sensitively transition and integrate land uses with the surrounding natural and built environments.

LU 2.3: Locate employment and major non-residential uses along major transportation networks to limit impacts on residential areas and provide citywide and regional access.

The subject site is located along the contours of the Loop 101 freeway with easy access from the Hayden Road exit. This configuration is purposeful and allows for mitigation of the impact of traffic on adjacent residential areas. This site is the right place for the Axon World Headquarters Campus and its associated uses. Companies such as Nationwide and ASM have all chosen the area around this site for their headquarters. The approved Axon office, hotel and commercial components further this goal by locating employment and major non-residential uses along the Loop 101.

Goal LU 3: Maintain a balance of land uses to support a high quality of life.

LU3.1: Allow for the diversity and innovative development patterns of residential uses and supporting services to provide for the needs of the community.

The proposed Axon Campus Expansion proposes a diverse pattern of development by incorporating residential uses along with outdoor space, commercial, hotel, and office/industrial uses as well as the adjacent municipal uses with a fire station and water treatment facility. This diversity of land use serves the needs of the community in several ways. The commercial components of the site will be able to provide supporting services for not just residents of the multi-family housing on site but also for other nearby residents. And the multi-family itself is supportive of the Axon Headquarters Campus building that will serve as the anchor to the Campus Expansion.

LU 3.2: Integrate housing, employment, and supporting infrastructure, primarily in mixed-use neighborhoods and Growth and Activity Areas, to support a jobs/housing balance.

Axon is proposing an open mixed-use campus that includes a residential component to support the approved office/industrial phase. The residential buildings provide a crucial piece of the overall Campus Expansion that promotes a balance between jobs and housing. Because the Greater Airpark Character Area emphasizes employment in this area, nearby housing is needed to provide an increased harmony between these important needs. Simply put, the desired jobs can't happen without the housing.

LU 3.3: Maintain a citywide balance of land uses, and consider modifications to the land use mix to accommodate changes in community vision, demographic needs, and economic sustainability.

Crossroads East demonstrates a clear change in community vision for this part of Scottsdale, which is rapidly growing and attracting highly sought after major employers and luxury multi-family. Consistent with the Policy LU 3.2, the balance between attracting employers and providing housing for their workforce furthers the City's overall goal for this area as a regional hub.

Axon's proposed Campus Expansion furthers this goal and is requesting a modification to several land use classifications to respond to this changing demand. A challenge that Axon and its workforce faces is a lack of nearby high-quality housing options, which has made it difficult for Axon to recruit highly skilled workers and for current workers to find adequate housing near their workplaces. Axon would like to bring the needed housing for the increase in jobs. To support the housing and jobs, Axon is proposing high quality retail and restaurant space.

Goal LU 6: Attract and retain diverse employment, business, and retail land uses to improve the economic well-being of Scottsdale's residents.

LU 6.1: Promote opportunities for the expansion and revitalization of employment and commercial uses within the city.

Axon is a homegrown success story with existing offices and manufacturing just across Axon Way from the proposed Campus Expansion. While a larger office and manufacturing facility are approved on the easternmost portion of the site, the current proposal is to develop the remaining +/- 30 acres to serve as a campus for the business operations expansion.

The Axon Campus Expansion proposal allows this Scottsdale-based global company to continue to grow within the City of Scottsdale. The multi-family component will provide Axon the opportunity to expand employment by bringing more high-quality employees to the company and to the City. Additionally, the proposed buildings include a commercial component, which expands commercial uses within the City.

Conservation Element

Goal CONSV 2: Protect and manage Sonoran Desert biodiversity and native ecosystems.

CONSV 2.2: Encourage landscaping that limits the amount of grass and makes optimal use of native desert plants.

Axon is proposing a varied palette of native plantings which were discussed in detail above. However, in addition to those plantings, the Axon Campus Expansion will utilize several iconic Sonoran Desert plant species – some of which are protected by statute due to their importance to the Sonoran Desert – including Saguaro cactus and Golden Barrel cactus. Other native plants include cholla, prickly pear and desert spoon.

Community Involvement Element

Goal CI 1: Seek early and ongoing community involvement through broad public input in project and policy-making discussions.

CI 1.1: Maximize opportunities for early notification of proposed projects using a variety of methods.

Axon began early outreach with various stakeholders in the community that included phone calls and meetings. This outreach has continued, and we have spoken with several nearby property owners and/or their representatives to notify them of Axon's plans prior to formal notification of the Open House.

In addition to this early outreach, we hosted a Neighborhood Open House for property owners and interested parties the opportunity to provide feedback on the draft plans.

We have continued to welcome any questions, comments or concerns from neighbors and other interested parties.

CI 1.2: Use public involvement plans to identify and engage interested parties, and provide opportunities for information exchange.

When notifying for the Neighborhood Open House, we included an expanded notification area and notified neighbors within 1,250'. In addition to the neighbors, we also notified all interested parties in the list provided by the City. As detailed above, we also engaged in early outreach with interested parties from the Axon Campus original case in 2020.

Housing Element

Goal H1: Support diverse, safe, resource-efficient, and high-quality housing options.

H1.3: Ensure community dialogue during zoning and the development review processes to encourage context-appropriate development designs.

We hosted an early Neighborhood Open House on June 21, 2023, to provide surrounding property owners and interested parties the opportunity to provide feedback on the draft site plan, listen to concerns and feedback, and answer questions they had. As a result, some portions of the project were modified prior to formal submittal to address those comments. Since then, we have received more feedback from neighbors and staff and have continued to make revisions to address those comments.

H1.4: Support the creation of mixed-use projects, primarily in Growth and Activity Areas, to increase housing supply within walking distance of employment, transportation options, and services.

This proposal is for a mixed-use project within the Greater Airpark Growth Area that provides multi-family residential housing within walking distance to various employment opportunities – mainly, the Axon World Headquarters Campus. In addition to housing and employment, this project will provide retail and commercial opportunities for the residents that live on site, as well as the residents that live in the surrounding area and the public.

H1.5: Encourage a variety of housing densities in context-appropriate locations throughout Scottsdale to accommodate projected population growth.

Much of the surrounding residential density is zoned for multi-family and is in densities similar to the proposed Axon Campus Expansion residential portion. In several instances, the surrounding residential density is nearly double what is proposed at the Axon Campus. Scottsdale is continuing to grow and with the current housing shortage, this site provides a context-appropriate location for a denser mixed-use development.

Goal H4: Abide by regulations that prevent housing discrimination practices towards any person, as required by local, State, and Federal laws.

H4.1: Comply with local, State, and Federal laws prohibiting discrimination in housing and support fair and equal access to housing regardless of race, color, sex, creed, familial status, economic level, or ability.

Axon is an equal opportunity employer and values diversity at their company. Axon does not discriminate on the basis of race, religion, color, national origin, gender, sexual orientation, age, marital status, veteran status, or disability status.

Axon is looking forward to providing individuals the same level of equal opportunity to the future residents of this site. All housing within the Axon Campus Expansion will comply with all local, State, and Federal laws to prohibit discrimination in housing.

Circulation Element

Goal C1: Design and improve transportation corridors to safely and efficiently move people and goods.

C1.3: Reduce conflict points between various modes of travel, for example, where the paths of vehicles and bicycles, pedestrians, or equestrians, cross, diverge, or merge.

As shown in the Pedestrian Circulation Plan and Vehicular Circulation Plan, Axon will be providing sidewalks that will assist pedestrians in getting around the site with reduced conflict with vehicles and bicycles. This includes detached sidewalks to buffer residents from the street, bike lanes and a multi-use running trail as well as a roundabout to reduce vehicular speeds at intersections.

Axon has reconfigured the surrounding roadways to mitigate the impact of traffic on the adjacent neighborhood and reduce conflicts related to traffic from the Axon World Headquarters Campus. Axon proposes to maintain the current alignment of Mayo Boulevard as a resident only access point. Based on feedback from the adjacent neighborhood, we have reconfigured the roadways to reroute a significant portion of the industrial traffic onto Axon Way instead of through the neighborhood.

Goal C2: Reduce the number, length, and frequency of automobile trips to improve air quality, reduce traffic congestion, and enhance quality of life and the environment.

C2.1: Encourage a mix of land uses that will reduce the distance and frequency of automobile trips and support mobility choices.

Axon is proposing a mixed-use development that will complement the approved Axon Campus office. The purpose of the Campus Expansion is to provide an environment that promotes walkability and reduces reliance on the automobile for Axon employees. Having employees live and work on the same campus will significantly reduce daily trips in the area.

Growth Area Element

Goal GA1: Direct growth in areas of the city that can support a concentration of development density and intensity, as well as a broad mix of uses.

GA1.5: Identify Growth and Activity Area "edges," and incorporate context-appropriate transitions between these "edges" and adjacent neighborhoods to maximize the impacts of higher-intensity development.

The proposed Axon Campus Expansion is located within the Greater Airpark Growth Area. According to the General Plan, in the Greater Airpark Growth Area, "[b]uilding heights generally range between three and six stories and may exceed six stories in certain areas identified in the Greater Airpark Character Area Plan."

The Axon Campus Expansion is proposed to be in this height range with buildings proposed at three, four and five stories. Our original proposal included all buildings at 5 stories with the hotel closest to the neighbors. Based on feedback from the neighbors, we reduced the building height of the building closest to them, moved the building back an additional 260' and changed the use from a hotel to residential. Additionally, all the proposed building heights are significantly lower than the Axon office building which is approved at 96' to the top of the mechanical screening.

Goal GA5: Recognize and build on the character and diversity of Scottsdale's various Growth and Activity Areas.

GA5.4: Promote new development, revitalization, and redevelopment within Growth and Activity Areas that maintains fiscal sustainability, promotes long-term economic development goals, and enhances quality of life.

Axon is a leader in technology and innovation with its existing global headquarters located in Scottsdale. Providing Axon the opportunity to expand and increase its operations in Scottsdale with this Campus Expansion promotes long-term economic growth within the City and the addition of housing brings new Scottsdale residents to an area experiencing significant growth.

Economic Vitality Element

Goal EV 1: Foster Scottsdale's resiliency to economic change through support of our core industries (e.g., tourism, healthcare, bio/life sciences, advanced business services), assets, regional competitiveness, and economic diversity.

EV1.3: Diversify Scottsdale's businesses, focusing on industries that add value to the existing economic environment.

Axon (formerly Taser International), has been based in Scottsdale for over 30 years and provides diversity of employment in the desirable technology sector. Providing Axon the opportunity to grow its operations in Scottsdale through approval of the Campus Expansion furthers the goal of supporting a diverse economic environment within the City.

Goal EV3: Sensitively manage land uses to provide and enhance economic development, fiscal health and job growth, while simultaneously protecting the integrity and lifestyle of

neighborhoods.

EV3.5: Ensure neighborhoods are adequately protected from major development through design sensitivity, buffering, and traffic management.

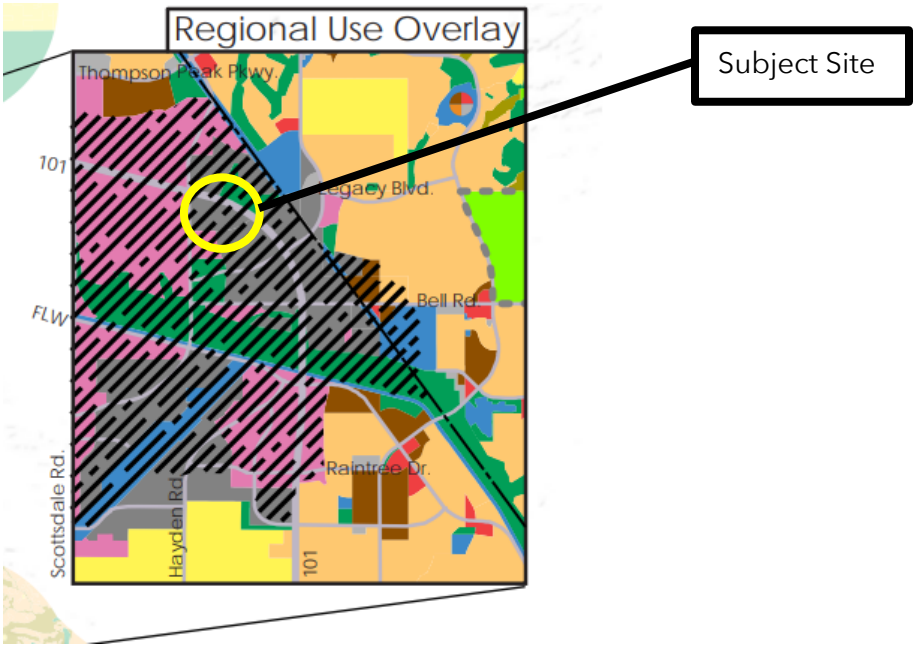
Axon's proposed Campus Expansion provides a number of buffers to reduce the impact of the Campus Expansion on the nearby residential. These include the realignment of Axon Way away from the neighborhood as well as a generous landscape buffer and berm to separate vehicles from the pedestrian circulation. The neighborhood is approximately 440' south of the closest proposed building. We have realigned the roadways to remove a significant amount of industrial traffic that the neighbors get today by routing that traffic on Axon Way and away from the neighborhood.

GENERAL PLAN AND GREATER AIRPARK CHARACTER AREA PLAN AMENDMENT NARRATIVE

General Plan Minor Amendment Justification

This request is to amend an area that consists of approximately 44 acres from Employment to Mixed-Use Neighborhoods. This request is considered a Minor General Plan Amendment due to the Axon Campus's employment significance through application of the Regional Use Overlay under the Exceptions to the General Plan Amendment Criteria set forth in Criterion #8 (*See page 58 of the General Plan 2035*).

The Axon Campus is located within the Regional Use Overlay area of the General Plan Future Land Use Map as shown below:



The exception set forth in Section 8 Exceptions to the General Plan Amendment Criteria:

> "Certain exceptions to the General Plan Amendment Criteria are considered in the best interest of the general public and in keeping with the vision, values, and goals of the community. The following exceptions to the General Plan Amendment Criteria will apply . . . Regional uses [see Regional Use Overlay Category description] within the Regional Use Overlay area on the General Plan Future Land Use Map are determined as already planned land uses for that area and will be processed as a minor amendment."

The Axon Campus is located within a Regional Use Overlay area, which:

> ". . . provides flexibility for land uses when it can be shown that new land uses are viable in serving a regional market. Regional uses include, but are not limited to, corporate office, region-serving retail, major medical, educational

campus, community service facilities, tourism, and destination attractions. In determining whether proposed land uses are regional in nature, the city will consider whether the use has a regional draw, fulfills current economic development policies, enhances the employment core and the city's attractiveness to regional markets, benefits from good freeway access, and complements the established character for the area."

Axon is currently one of the City of Scottsdale's 10 largest employers but has long-since outgrown its existing Scottsdale-based building. As a result, Axon has had to temporarily move various components of its operations and employment outside of the City of Scottsdale into other jurisdictions. Axon fits into the Regional Use definition as a corporate campus – part corporate office, part campus environment. This allows supporting uses – like the hotel to host conventions or residential for its employees – to be located in an environment that helps establish this area as a World Headquarters facility for Axon instead of a new manufacturing building.

In addition to meeting the minor criteria under the Regional Use category, the chart below demonstrates that modification to the Land Use category from Employment to Mixed-Use Neighborhoods is also to be treated as a minor amendment:

CHANGE IN LAND USE CATEGORY

From Category:		To Category: A: Natural Open Space	B: Developed Open Space	C: Rural Neighborhoods	D: Suburban Neighborhoods / Cultural/Institutional or Public Use	E: Urban Neighborhoods	F: Resorts/Tourism	G: Commercial / Employment / Mixed-Use Neighborhoods
A	Natural Open Space	-	**Major**	**Major**	**Major**	**Major**	**Major**	**Major**
B	Developed Open Space	Minor	-	**Major**	**Major**	**Major**	**Major**	**Major**
C	Rural Neighborhoods	Minor	**Major**	-	**Major**	**Major**	**Major**	**Major**
D	Suburban Neighborhoods / Cultural/Institutional or Public Use	Minor	Minor	Minor	Minor	**Major**	**Major**	**Major**
E	Urban Neighborhoods	**Major**	Minor	**Major**	Minor	-	Minor	**Major**
F	Resorts/Tourism	**Major**	Minor	**Major**	Minor	**Major**	-	**Major**
G	Commercial / Employment / Mixed-Use Neighborhoods	**Major**	**Major**	**Major**	**Major**	Minor	Minor	Minor

The Axon Campus consists of Axon's new World Headquarters building with supportive retail, multi-family and hotel uses. In considering whether to apply the Regional Use Overlay, it is important to note that the site is located along Hayden Road directly adjacent to the Loop 101 Freeway. Furthermore, the economic development significance cannot be overstated – by allowing Axon to expand its current nearby facility, which it has long since outgrown, Scottsdale is able to bring Axon's World Headquarters Campus to the City and consolidate functions and uses from other locations outside of Scottsdale.

The new World Headquarters will allow Axon to consolidate its various Valley-wide facilities into the Scottsdale location and Axon will be able to grow its employment base in the City. Employees are increasingly seeking housing and commercial opportunities near their places of employment, and Axon's desire to create an open campus makes it a more attractive employer to bring in specialized talent from all over the country.

The presence of a high-tech hub not only creates a highly skilled talent pool but also catalyzes economic growth across various sectors of the community. Benefits of developing a tech hub include: the development of a concentration of talent, enhanced local branding, fostering a business ecosystem, providing educational opportunities, and creating an innovative culture and community.

It is well documented that corporate expansions have stimulated growth in the surrounding areas and lead to increased property values as the area becomes more desirable and high-wage individuals relocate to the area. For instance, the expansion of Amazon in Long Island City, Hulu in Santa Monica, and Google in Los Angeles have all resulted in an upsurge of real estate prices in their respective regions ("How Big Companies Impact the Value and Dynamics of a Local Housing Market." U.S. News, 4 Mar. 2019, realestate.usnews.com/real-estate/articles/how-big-companies-impact-the-value-and-dynamics-of-a-local-housing-market). The establishment of a local hub serves to effectively attract high-skilled workers and, in turn, supports the development of a robust labor pool and sustainable economy.

One study used the Zillow Home Value Index (ZHVI) and found that property values in all cases increased in the years following the announcements of new tech company campuses, indicating that such developments have a favorable impact on residential home values. In Cupertino (Apple), Menlo Park (Meta) and Redmond (Microsoft), property values grew faster post-announcement than their respective Metropolitan Statistical Areas (MSA), counties and states.

Allowing Axon to expand and operate its Corporate World Headquarters in Scottsdale furthers many of the City's goals in the Economic Development Five-Year Strategic Plan. Axon provides 2 of the 6 target industry goals related to technology and software/IT – both hardware devices (such as the TASER, body worn cameras, etc.) and software solutions (such as Axon Evidence). Scottsdale's goal of growing existing industries is served by providing an environment where Axon can continue to grow within the City. A detailed analysis of the

proposed World Headquarters Campus and how it helps the City implement the Economic Development Five-Year Strategic Plan begins on page 47 of this narrative.

General Plan 2035 Discussion

Axon is proposing to amend the Land Use designation for a portion of the proposed World Headquarters Campus from Light Industrial/Office to Mixed-Use Neighborhoods. Mixed-Use Neighborhoods are defined as having a " . . . focus on human-scale development and are located in areas with strong access to multiple modes of transportation and major regional services. These areas accommodate higher-density housing combined with complementary office or retail uses. . . "

The subject site is located along Hayden Road at the Loop 101, providing for excellent freeway access and major regional services. Additionally, Axon plans to provide enhanced roadways on Hayden Road and Axon Way (formerly Mayo Boulevard) that include additional lanes of travel and dedicated bicycle lanes.

Axon's proposal includes multi-family residential at a density of just under 44 dwelling units per acre consistent with the surrounding residential developments that average approximately 50 dwelling units per acre. The multi-family residential and hotel uses are supportive of the anchor headquarters building with light manufacturing and office space, and the multi-family buildings have supportive commercial space consisting of retail and restaurant uses. Considered together, the various uses act as a mixed-use neighborhood consistent with the proposed amendment to the General Plan Land Use designation.

Greater Airpark Character Area Plan

The Axon Campus Expansion is located within the Employment Land Use in the Greater Airpark Character Area Plan. While the portion of the Campus that was approved for the office/industrial building in 2020 will remain Employment, the Campus Expansion requires an amendment to the Greater Airpark Character Area Plan Land Use from Employment to Airpark Mixed Use – Residential to accommodate the mix of multi-family residential, commercial and hotel proposed.

The Greater Airpark Character Area Plan defines AMU-R as " . . . areas are appropriate for the greatest variety of land uses in the Greater Airpark. Appropriate uses may include a combination of personal and business services, employment, office, institutional, cultural amenities, retail, hotel, and higher density residential. Developments in AMU-R areas should be pedestrian-oriented, have access to multiple modes of transportation, and should be located outside of the Airport's 55 DNL contour." Axon's proposed World Headquarters Campus has been thoughtfully designed to incorporate a variety of compatible uses that include the corporate office and industrial space (approved in 2020) as well as a hotel, multi-family residential, and ground floor commercial space within the multi-family residential buildings.

Axon's proposed World Headquarters Campus is designed with pedestrian connectivity throughout with enhanced open spaces between the hotel and office/industrial portions as well as a multi-use trail that spans the perimeter of the property. As part of its development plans, Axon will reconfigure Axon Way (formerly Mayo Boulevard) and Hayden Road to include additional lanes of traffic and dedicated bicycle lanes to facilitate efficient circulation of transportation in the area. We have also realigned the roadways to divert the industrial traffic currently going through the neighborhood onto Axon Way. This diversion significantly decreases the amount of industrial traffic the neighbors have expressed concerns about. The multi-family residential portions of the site are not located within the Airport's 55 DNL contour.

Additionally, the proposed Axon World Headquarters Campus is located along a Signature Corridor (Hayden Road). Signature Corridors are defined as: " . . . areas with the greatest potential for activity, new development, revitalization, and enhanced multi-modal connections. In employment and aviation areas, this designation provides flexibility for support uses, such as shops, restaurants, and fitness centers. In regional tourism and mixed-use areas, it seeks to encourage active uses, such as restaurants, entertainment, and retail, on the ground floor and/or closer to the street or pedestrian ways." Because the approved portion of the World Headquarters Campus consisting of the office/industrial building will remain as an Employment designation while the supportive multi-family residential, hotel and commercial are proposed as Mixed-Use, both portions are discussed below.

Land Use

Goal LU1: Maintain and expand the Greater Airpark's role as a national and international economic destination through appropriate land uses, development, and revitalization.

Policy LU 1.1: Maintain and expand the diversity of land uses in the Greater Airpark.

When Axon purchased the subject site from ASLD in 2020, the entire 70+ acre parcel was required to be rezoned to I-1 PCD consistent with the Employment designation in the Greater Airpark Character Area Plan. Since that time, the first phase of the Axon Campus consisting of the office/manufacturing building was approved, Axon dedicated a Civic Use Site and significant Right-of-Way. In keeping with Axon's employment growth goals, we seek this Campus expansion to accommodate supporting uses such as commercial, residential, and hotel. In addition to the Axon Campus, the southwest corner of the original parcel will consist of municipal uses including a fire station and water treatment facility.

These supporting uses are necessary for the success of Axon's Campus and to promote the City's goal for employment in this area. However, although these uses

support the Employment Land Use Designation, they require an amendment to the Greater Airpark Character Area Plan Land Use Designation.

Policy LU 1.2: Support a mix of uses within the Greater Airpark that promote a sense of community and economic efficiency, such as clustering similar/supportive uses and incorporating residential intended for the area's workforce, where appropriate.

Axon's proposed Campus seeks to balance the City's desire for additional economic growth in this area with the need for additional housing and supportive commercial, which is necessary to support the additional jobs Axon will bring. The residential component of this proposal intends, first and foremost, to serve Axon's employees, while the hotel provides opportunities for Axon to host events and visitors in close proximately to its office and manufacturing facility.

Policy LU1.4: Encourage the redevelopment of underutilized land to more productive uses.

This site is a prominent vacant piece of land in a critical growth area and sits directly south of the Loop 101 and east of Hayden Road. Axon plans to develop this parcel into its Campus with a variety of uses that will put this land to a more productive use, including the public benefits associated with the new fire station and water treatment facility.

Policy LU1.5: Maintain and continue to foster dialogue between the City of Scottsdale and Arizona State Land Department to facilitate innovative use and development of State-owned land.

The Axon site is part of the Crossroads East PCD, which originally consisted of approximately 1,000 acres of ASLD owned land. Over time portions of Crossroads East have been purchased by private property owners, including the subject Axon Campus Expansion parcel. We continue to have conversations with the City and ASLD regarding the Axon Campus Expansion.

Goal LU4: Utilize development types to guide the physical and built form of the Greater Airpark

Policy LU 4.3: Encourage higher-scale Type C development in areas with access to major transportation corridors and where lower-scale residential areas will be buffered from higher-scale development.

A majority of the Axon site falls within the Type C development designation and accordingly, both the approved office and proposed Expansion place higher intensity development in these areas adjacent to the Loop 101 and along Hayden Road. A

small portion of the site is within the Type A development type. The Type A portion of the site will feature shorter buildings that buffer the neighborhood from the higher scale of the Type C portion of the site. The building on the Type A portion will consist of a 3- and 4-story building. That building, at its furthest closest point, will be approximately 440 feet from the neighbors to the south. Additionally, there will be a significant landscape buffer between the neighbors to the south and Building E.

Goal LU5: Encourage Greater Airpark development flexibility.

Policy LU 5.1: Update and provide greater flexibility in development regulations to achieve the goals of the Greater Airpark Character Area Plan and encourage revitalization in the area.

Axon is requesting a number of development regulation modifications to allow the proposed Campus Expansion in furtherance of the City's goal for growth in this area. This flexibility achieves various City goals including economic development and appropriate residential expansion near employment hubs and allows Axon the opportunity to remain in Scottsdale as it continues to grow.

Policy LU 5.5: Promote flexibility of land uses when it can be demonstrated that new land uses are viable in serving a regional market, such as corporate headquarters, tourism, and educational campuses.

Axon's Campus Expansion proposes a variety of land uses, including the approved office. The proposed land uses aim to promote flexibility on this site by providing a variety of uses that support the office building and create more of a campus environment. The new land uses being proposed are viable and necessary in serving a regional market – the Axon World Headquarters.

Goal LU7: Develop an interconnected network of Signature Corridors (See Land Use Plan Map, pg 11) to support the Greater Airpark as a place for meeting, creating, shopping, learning, as well as working.

Policy LU 7.1: Encourage growth along corridors with the greatest potential for activity, new development, revitalization, tourist attractions, and enhanced multi-modal connections.

Axon's proposed World Headquarters Campus is located along Hayden Road at the Loop 101. The site is located in close proximity to TPC Scottsdale, which attracts hundreds of thousands of visitors each year; however, the site itself is a vacant area with great potential to enhance the surrounding amenities. Axon is proposing to relocate and reconfigure Axon Way (formerly Mayo Boulevard but approved to the currently shown configuration) to include additional lanes of traffic and dedicated

bicycle lanes as well as enhancements to Hayden Road that include an additional lane of travel and dedicated bicycle lanes.

Hayden Road can accommodate the proposed growth and was envisioned for many years by the City and ASLD to be an area of significant expansion. Additionally, the Greater Airpark Character Area Plan envisions this specific site as an area of Higher Intensity development (Type C).

Axon's proposed World Headquarters Campus helps further LU Goal 7 through this policy by locating growth along an area that has tourist attractions, is undergoing and planned for continued development, and includes a plan for enhanced multi-modal connections.

Policy LU 7.2: Promote a greater mix of uses along identified Signature Corridors, which complement and are compatible with each respective land use designation.

Much of the development along Hayden Road, a Signature Corridor in this area, consists of purely residential development. The proposed Axon World Headquarters Campus includes a multi-family residential component complete with ground floor commercial, a hotel and will operate as a gateway to Axon's World Headquarters building. These uses are compatible to the surrounding uses and consistent with the proposed land use designation of Mixed-Use Neighborhoods and Airpark Mixed Use-Residential.

Policy LU 7.3: Encourage and incentivize revitalization along Signature Corridors, particularly south of the Central Arizona Project Aqueduct.

The proposed Axon World Headquarters Campus is located on a currently vacant site within the Crossroads East Planned Community, a large area along the north and south sides of the Loop 101 between Scottsdale and Pima/Princess that has long been slated for significant growth. The subject site is located along Hayden Road, a Signature Corridor, that is experiencing a variety of new development along the west side of the street. Axon's World Headquarters Campus proposes to complete the Hayden Road Signature Corridor on the east side of the street to Loop 101.

Axon is requesting this rezoning, minor General Plan amendment, Greater Airpark Character Area Plan amendment and amended development standards and seeks the City's approval.

Neighborhoods and Housing

Goal NH2: Create complete neighborhoods within the Greater Airpark, through the development of urban dwelling types and mixed- use developments, while being respectful of the Greater Airpark as an aviation-based employment center.

> *Policy NH 2.2: Encourage a variety of urban dwelling types and mixed-use development in areas designated Airpark Mixed Use-Residential in the Greater Airpark Character Area Future Land Use Plan that are compatible with and support the aviation and employment uses of the Greater Airpark.*
>
> Axon is requesting to modify its Land Use Designation from Employment to Airpark Mixed Use-Residential in order to offer a mixed-use campus with a residential component. The Airpark Mixed-Use Residential designation is appropriate on this site as it supports the approved office/manufacturing building. Axon's proposal consists of a mixed-use development, while also respecting the Greater Airpark as an aviation-based employment center. The current proposal will contain residential, hotel and commercial uses that will support the approved Axon World Headquarters.

Economic Vitality

Goal EV3: Preserve and enhance tourism and visitor experiences of the Greater Airpark.

> *Policy EV 3.2: Encourage complementary uses, such as specialty retail and hotels, to locate in the Greater Airpark in order to support tourist attractions.*
>
> Axon's Campus Expansion includes a hotel component within the mixed-use portion of the site. Part of Axon's growth plans is to host conferences and training events for its customers within close proximity to the approved office building. While Axon does not plan to host events year-round, there are many high-profile events that occur close to the site that are well served by the addition of more hotel rooms. Additional hotel rooms also prevent proliferation of short-term rentals in nearby single-family neighborhoods.

Environmental Planning

Goal EP1: Reduce energy consumption through environmentally sensitive land use practices and design policies.

> *Policy EP 1.3: Promote landscape design and irrigation methods that contribute to water and energy conservation.*

All of the landscaping proposed for the Axon Campus Expansion are low-water, drought tolerant species, many of which are native Sonoran Desert plants. Using appropriate landscaping will reduce water usage in the large open spaces provided on the site. Axon is also proposing water harvesting on the site. These approaches may include the reuse of condensate water, bio basins and pours pavements.

Economic Development Five-Year Strategic Plan

The Axon World Headquarters Campus helps the City further its goals, values and guiding principles set forth in the Five-Year Strategic Plan as detailed below.

Goals
Goal 1: Grow Scottsdale's existing industries to foster economic vitality. Scottsdale must support existing businesses in an effort to maintain competitiveness and foster prosperity.

- *Objective 1.2: Ready and promote commercial sites to support business expansion.*

  Axon is proud to have originated and grown out of a small space in a Scottsdale garage to a leader in innovative technology and one of Scottsdale's top 10 employers. But in order to remain in Scottsdale, Axon requires a larger headquarters building and a corporate campus with housing options to attract and retain the best talent.

  As the Strategic Plan notes, ". . . most business growth in cities like Scottsdale comes from the expansion of existing businesses…understanding their needs and supporting their growth . . . " The plan is unique in that it was created in 2021 and developed during COVID so it makes specific mention of the challenges that are presented with the way COVID has changed office and employee demands. Axon is proud to have growth that requires additional space, but is not immune to the way COVID has changed its business.

  Axon's plan to create a holistic corporate campus reflects the changing employee desires to live close to work and have a variety of retail/restaurant/commercial amenities located nearby. This proposed Axon World Headquarters Campus is just a few hundred feet from its existing headquarters building and staying in this area is desirable to the company. For us to create the World Headquarters Campus we need to grow, we require the City of Scottsdale to adapt with us to the changing needs of businesses to include a campus environment with a mix of supportive uses, including a residential component.

  Appendix B of the Strategic Plan notes the key items that were important in shaping the plan after receiving feedback including: making development along the 101 Corridor an economic development priority, leveraging the Airpark, establishing a

quality of place to attract headquarters, and revaluating the office in light of the COVID pandemic.

Axon's Campus meets many of the objectives of the Strategic Plan by keeping an existing business in Scottsdale while promoting development within the Airpark and along the Loop 101 Corridor. Creating a corporate headquarters campus makes Axon an attractive employer to future employees who are looking for high quality, flexible jobs in areas that provide a diverse set of activities in close proximity.

Goal 2: Attract investment to diversify Scottsdale's economy. Scottsdale must attract new investment into the local economy to ensure resiliency.

- *Objective 2.1: Execute a site-selector engagement strategy for Scottsdale's core industries.*

  This objective aims to attract businesses with an emphasis on global headquarters and working with the Greater Phoenix Economic Council to bring desirable employers to the City. Axon has been working with GPEC to create a World Headquarters Campus on this site within the City of Scottsdale and Axon's desire is to remain in Scottsdale. Without the corporate campus in Scottsdale, however, Axon will likely turn to locations outside of Arizona to develop.

- *Objective 2.2: Lead, in partnership with Experience Scottsdale, Canada Arizona Business Council, and others, a robust effort to attract high-value regional and national HQs.*

  Axon is a publicly traded S&P 500 company expected to generate $1.88 to $1.94 billion in 2024 – a 20% to 24% annual growth. Axon is a desirable company to have as a local employer and keeping Axon's headquarters in Scottsdale and providing it the opportunity to grow into a world headquarters within a corporate campus environment fulfills this objective and keeps a high-value employer in the City.

Goal 4: Make inclusion and diversity an economic development priority. Scottsdale must ensure that all residences and businesses have the opportunity to thrive.

- *Objective 4.1: Evaluate the needs of Scottsdale's diverse businesses.*

  This objective encourages the City to engage with businesses to understand their needs and what the City can do to help these businesses grow. Axon has let the City know about the challenges in attracting and retaining high-quality employees, and Axon is proposing to create a mixed-use campus to complement its new headquarters to remain competitive in hiring skilled workers. Scottsdale has diverse businesses and Axon is committed to continue contributing to that diversity.

- *Objective 4.2: Advance, in concert with local partners, an initiative to support Scottsdale's diverse businesses.*

  Axon values diversity and strives to create an inclusive environment and is proud to provide a workplace in Arizona that far exceeds industry norms for women in tech. For example, according to Deloitte, women comprise approximately 33% of employees at technology companies whereas more than 41% of Axon's employees in Arizona are female.

Goal 5: Build the premier destination for talent in the Southwest. Scottsdale's economic development success today hinges on talent attraction and retention.

- *Objective 5.3: Develop a remote worker campaign to draw tech-savvy and skilled talent to Scottsdale.*

  While we will continue to allow remote work where we can, much of our work is based in law enforcement or research and design which can't be done from home. Axon's unique needs require a protected office environment. However, we are proposing a residential component to the World Headquarters Campus to help provide for the desire many employees have to work near home.

- *Objective 5.4: Invest in placemaking efforts to enhance Scottsdale as an inviting destination for local talent.*

  This objective most accurately captures the importance of creating a corporate campus environment for Axon. Axon has outgrown its current headquarters and needs a bigger space where it can continue to expand its operations. With the competitive nature of the job market – particularly in the tech industry – potential future employees are increasingly seeking employment opportunities that come with lifestyle amenities nearby.

  By establishing Axon's World Headquarters Campus with a variety of mixed-uses that are located close to many of Scottsdale's most desirable amenities, Axon is able to make itself a more attractive employer and bring new residents to Scottsdale to be a part of its growth. The proposed World Headquarters Campus is a placemaking effort that aims to establish Scottsdale as a destination for local talent and encourage new residents to call Scottsdale home while building up the City's diverse employment base.

Goal 6: Enhance the Scottsdale brand for business, capital and talent. Scottsdale must broaden its reputation as a city to grow a business and launch a career.

- *Objective 6.1: Develop a competitive identity/marketing campaign to support Scottsdale's economic development efforts.*

  Providing an opportunity for Axon to remain in Scottsdale and grow its operations with the World Headquarters Campus creates an opportunity for the City to establish itself as a competitive destination for employers and employees.

- *Objective 6.2: Ensure that community collaborators, and economic development partners utilize consistent messages about investment and talent attraction.*

  Axon worked with the City's Economic Development Department for several years to find opportunities for Axon to remain in Scottsdale while continuing to grow. Axon's ability to attract and retain employees includes the desirability of Scottsdale as a place to live, work and play, and the City's messaging about its flexibility to encourage employers to remain in Scottsdale should include considerations about mixed-use developments given changing employee needs.

Values

Economic Prosperity for All*. The City will advance economic prosperity for all Scottsdale residents and enterprises, by supporting wealth creation and economic mobility. This can be achieved by supporting a robust business attraction and expansion effort, as well as providing support to Scottsdale entrepreneurs to grow and scale their enterprises.*

Attracting businesses to Scottsdale and ensuring that existing employers can grow in the City requires collaboration between all facets of the City government. To put this value into action, the City must consider the changing needs of employers and employees and remain flexible in its planning efforts. This flexibility demonstrates to Scottsdale entrepreneurs that the City is committed to helping them expand and adapt to changing employment environments. Providing a supportive infrastructure for employers allows for wealth creation and increased economic opportunities for employees.

Future-Defining Innovation*. Scottsdale will invest in an entrepreneurial ecosystem that solves tomorrow's most pressing challenges. Already a growing center for venture capital investment and startups, Scottsdale's startups and scaleups are helping to ensure the city's traditional industries are relevant for the future.*

We hope the City sees Axon an example of Scottsdale's tech success. Axon has grown from a small startup in a Scottsdale garage to one of the City's top 10 employers being a part of the S&P 500. Our goal is to continue to grow with the City. Axon remains committed to helping solve the challenges facing the world utilizing its state-of-the-art technology, an industry that helps diversify Scottsdale's economy and broaden its workforce.

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A Healthy Economy for Tomorrow. *The City will foster resiliency through industry diversification, upskilling, talent attraction and responsible revitalization. A more resilient Scottsdale will ensure a faster economic recovery in the future.*

Axon's technology and manufacturing jobs provide economic diversity to the City that can help soften the effects of economic downturns that impact tourism and service industry jobs which have historically constituted a significant portion of the economy. Axon's highly skilled workforce provides additional diversification and upskilling to the City's employee base consistent with this value.

A Sonoran Desert Way of Life. *Economic development efforts will prioritize Scottsdale's quality of place and promote the City's authenticity, character and values. Scottsdale's high quality of place is a central offering as it looks to attract and retain skilled residents.*

The City has invested significantly in the recreational amenities surrounding Axon's proposed World Headquarters Campus including the McDowell Mountain Sonoran Preserve and the Scottsdale Sports Complex. These demonstrate Scottsdale's commitment to establishing the quality of place and Axon chose this specific site due to its proximity to the many recreational opportunities nearby that are reflective of Scottsdale's desert character. Axon's employees increasingly seek amenities close to work and offering the World Headquarters Campus is designed to attract and retain its highly skilled workforce.

Guiding Principles

Balanced Development. *Consistent with the values in the City's General Plan, Scottsdale will advance economic development initiatives that balance prosperity and livability. Staff across the City's economic development and planning departments will collaborate to develop a framework for evaluating the "highest and best" use of future redevelopment efforts.*

Axon's proposed World Headquarters Campus reflects a balance between light industrial/office uses and residential-focused mixed-use uses. The residential and commercial components of the World Headquarters Campus buffer the more intense industrial and office uses from the nearby residential while creating a harmonious and cohesive development within the campus. A more in-depth discussion of how the Axon World Headquarters Campus furthers the values in the General Plan is located on page 25 of this narrative.

Export Industry-Driven. *Scottsdale will pursue a data-driven export industry approach to drive economic diversification. Research shows that growing sectors that sell goods and services outside of the city accelerate job creation.*

Axon's operations include design, engineering and manufacturing of advanced hardware (such as the TASER and Axon body worn cameras) as well as development and maintenance

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of software solutions (such as the Axon Evidence platform). Much of Axon's sales come from outside of the state and country while manufacturing, engineering, and other jobs remain in Scottsdale. However, Axon has far outgrown its current headquarters and needs to create a holistic World Headquarters Campus to remain in the City.

Existing Businesses First. *The City will focus on business expansion and retention to grow Scottsdale's economic base and attract investment. Generally, more than 70% of the new jobs created in a city come from existing businesses.*

Axon is a local success story and proud to be one of the City's top 10 employers after its humble beginnings in a Scottsdale garage over 30 years ago. Axon desires to stay in Scottsdale and continue to grow, but it is constrained by its current facilities. The World Headquarters Campus will allow Axon to remain in the City with a major investment that will provide additional jobs and increase the City's economic base with commercial and hotel components.

If Axon is approved to build its World Headquarters Campus, Axon's impact on the local economy is projected to increase by roughly 600%, as the company expands from 800 to 5,000 employees. This growth is anticipated to result in an annual net-gain of $9,500,000 in additional tax revenue for the City of Scottsdale – 13x more than what the current net-revenues generated by Axon each year. As an international tech leader, Axon pays its employees well above the State's average wage, generating more than $1,000,000,000 in economic activity in 2023 alone – an impact equivalent to hosting a Super Bowl every year.

The Axon World Headquarters Campus would allow Axon to host its conferences, normally held in other cities and states, which would bring in approximately 18,200 business travelers and generating an estimated $26,000,000 in sales at local restaurants, retailers, hotels and other travel-related businesses each year. Construction of the World Headquarters Campus would create 3,500 construction-related jobs, $3,000,000,000 in economic activity and $145,100,000 in state and local tax revenues.

The large labor pool of skilled workers will help attract additional high-tech businesses to Scottsdale, raising local incomes and creating a vibrant business ecosystem. The additional wealth and development of the area will also enhance the desirability of the community, enhancing the value of neighboring property.

The potential economic impact of Axon's planned expansion is significant for the local economy. Once complete and fully operational, Axon's annual day-to-day business activities and employee/business-traveler spending will support:

- 18,800 jobs with $1,200,000,000 in labor income
- $3,600,000,000 in economic output
- $57,200,000 in state tax revenues
- $17,200,000 in county taxes

- $11,500,000 in Scottsdale tax revenues
- $1,600,000 in commercial property tax revenues for local jurisdictions

These combined income, output and tax revenues equal $4.88 billion dollars per year. These tax collections can be used to fund local infrastructure improvements, enhance public safety, improve the quality of education, and contribute to the overall quality of life of residents. If built, the Axon World Headquarters Campus will have an impact equivalent to hosting almost five Super Bowls per year.

Focus on Entrepreneurship. *Scottsdale will foster an inclusive startup ecosystem as a means of wealth creation for residents. A supportive startup environment is also essential for creating a more resilient, shock-resistant economy.*

While Axon is now an integral and important part of Scottsdale's economy, it was once a small startup. As Axon continues to grow, the City's supportive environment for tech industry jobs will provide additional opportunities for innovation that will diversify Scottsdale's economy to protect against challenging economic conditions.

Private Sector and Partner Engagement. *To achieve success with this plan, Scottsdale's private sector and economic development partners will be critical to advance the City's economic development priorities.*

The City must remain adaptable in order to achieve success in implementing its Economic Development Five-Year Strategic Plan. The plan was adopted in 2021 when the world was still adapting and changing as a result of the COVID-19 pandemic. A few years later, the long-term impacts of the pandemic are now more apparent – not the least of which is the shifting demands for employees. Axon's proposed World Headquarters Campus is reflective of the changing employment environment and has shared with representatives of the City the importance of flexibility in planning to accommodate continued growth within Scottsdale.

Equitable Approach. *The City will apply an equity lens to all economic development efforts, ensuring all Scottsdale residents and businesses can thrive. This is essential for attracting and retaining businesses and residents that want to operate and live in more inclusive communities.*

Axon's dedication to inclusivity is a core part of its values and Axon understands that diversity of thought provides the greatest opportunities for innovation. By providing unique mixed-use developments centered around corporate campuses and headquarters, Scottsdale can support Axon's expansion within the City while attracting the type of highly sought after tech employees Axon needs moving forward.

AMENDED DEVELOPMENT STANDARDS

Axon proposes to modify the standards of the PCP zoning district and P-C standards as shown below in legislative edit. Language proposed to be removed is noted in ~~strikethrough~~ and additions are noted in **BOLD UNDERLINED CAPS**.

Section 5.4000 – Planned Airpark Core Development (PCP)

Sec. 5.4001. - Purpose.
The purpose of the PCP District is to promote, encourage, and accommodate innovatively designed and master-planned mixed-use developments within the Greater Airpark Character Area. The PCP District should:

A. Accommodate mixed-use commerce and employment centers.

B. Provide a dynamic complement to employment cores with support retail, service, tourism, cultural, and residential uses.

C. Promote an efficient and safe traffic circulation system through the inclusion of a mix of complementary uses and provisions for multiple modes of travel.

D. Promote architectural excellence and creative design through development standards that create high quality character for structures, site plans, and streetscapes.

E. Protect adjacent neighborhoods through strict development standards while encouraging innovative site planning and environmental sensitivity throughout the PCP District.

F. Provide an open space framework of enhanced streetscapes, functional pedestrian spaces, enhanced view corridors and other public environmental amenities.

G. Promote environmental stewardship and sustainability through the application of recognized and established environmentally responsible building techniques and desert appropriate design approaches.

Sec. 5.4002. - Applicability.
The PCP District is only applicable to properties within the Greater Airpark Character Area Plan.

Sec. 5.4003. - Application requirements.
A. Development Plan size requirement. Minimum: 2 acres of gross lot area.

B. Zoning District Map Amendment Applications. An application for PCP zoning shall be accompanied by a Development Plan as required in Article VII.

C. Development Master Plans. Developments within the PCP District that are developed in more than one phase shall submit Development Master Plans, as required in Article VII.

Sec. 5.4004. – Reserved

Sec. 5.4005. - Conformance to approved plans.

A. A PCP District shall be developed in conformance with the approved Development Plan and other required Development Master Plans as provided in Article VII.

Sec. 5.4006. - Use Regulations.

A. The uses allowed in the PCP District are shown in Table 5.4006.A. with additional limitations on uses as listed. The land uses that correspond for each of the land use designations in the Greater Airpark Character Area Plan are as set forth in the sub-districts below in Table 5.4006.A. The land use designations depicted on the Greater Airpark Future Land Use Plan Map are:

1. Airpark Mixed Use Residential (AMU-R)

2. Airpark Mixed Use (AMU)

3. Employment (EMP)

4. Aviation (AV), and

5. Regional Tourism (RT).

B. Drive-through and drive-in services are not allowed in the PCP-AMU-R, PCP-EMP, PCP-AV and PCP-RT sub-districts. Drive-in services are not allowed in the PCP-AMU sub-district. Only drive-through services associated with a restaurant are allowed in the PCP-AMU subdistrict.

Table 5.4006.A. Use Table					
Land Uses	Sub-Districts				
(P is a Permitted use.)	PCP-AMU-R	PCP-AMU	PCP-EMP	PCP-AV	PCP-RT
1. Aeronautical use				P (3)	
2. Bar	P	P			P
3. Civic and social organization	P (2)	P (2)	P (2)		P (2)
4. Cultural institution	P (2)	P (2)	P (2)		P (2)
5. Day care center	P (2, 6)	P (2, 6)			P (2, 6)
6. Dwelling	P (2, 4, 6)				P (2, 6)
7. Educational service, elementary and secondary school	P (2, 6)	P (2, 6)	P (1, 2, 6)		P (1, 2, 6)
8. Educational service, other than elementary and secondary school	P (2, 6)	P (2, 6)	P (2, 6)	P (1, 2, 6)	P (2, 6)
9. Financial institution	P	P	P (1)		P (1)
10. Health and fitness studio	P	P	P		P
11. Internalized Community Storage		P	P	P	
12. Light manufacturing		P	P	P	
13. Live entertainment	P	P			P
14. Medical and diagnostic laboratory	P	P	P		
15. Medical recovery or therapy center	P (2, 4, 6)	P (2, 4, 6)	P (2, 6)		P (1, 2, 6)

Table 5.4006.A. Use Table					
Land Uses	Sub-Districts				
(P is a Permitted use.)	PCP-AMU-R	PCP-AMU	PCP-EMP	PCP-AV	PCP-RT
16. Multimedia production without communication tower	P (4)	P	P		P
17. Municipal use	P	P	P	P	P
18. Office	P (4)	P	P		P
19. Personal care service	P	P	P (1)		P
20. Place of worship	P (2, 6)	P (2, 6)	P (1, 2, 6)		P (1, 2, 6)
21. Recreation facility					P
22. Residential health care facility	P (2, 4, 5, 6)				P (1, 2, 5, 6)
23. Restaurant	P	P	P (1)		P
24. Restaurant, including drive-through restaurant but excluding drive-in restaurant		P (7)			
25. Retail	P	P			P
26. Scientific research and development		P (4)	P	P	
27. Sports arena		P (1, 2)	P (1, 2)		P (2)
28. Theater	P (2, 6)	P (2, 6)			P (2, 6)
29. Travel accommodations	P (2, 6)	P (2, 6)	P (1, 2, 6)		P (2, 6)
30. Vehicle leasing, rental, or sales	P (4)	P (1, 4)	P (1, 4)	P	P (4)

Table 5.4006.A. Use Table					
Land Uses	Sub-Districts				
(P is a Permitted use.)	PCP-AMU-R	PCP-AMU	PCP-EMP	PCP-AV	PCP-RT
31. Veterinary and pet care service	P	P			P
32. Wholesale, warehousing and distribution			P	P	
33. Wireless communications facility, Type 1, 2, and 3.	P	P	P	P	P
34. Wireless communications facility, Type 4.	CU	CU	CU	CU	CU

Use Limitations:

(1) Limited to a site with frontage on a major collector or arterial street.

(2) Limited to areas outside of the AC-3 area as described in the City's procedures for development near the Scottsdale Airport and in the Scottsdale Revised Code, Chapter 5 - Aviation, as amended.

(3) Limited to a site with frontage onto an airport taxilane or taxiway.

(4) Limited to a maximum of ~~50~~**58** percent of the ground floor building area of the Development Plan.

(5) Limited to a maximum density of 40 dwelling units per acre of gross lot area of the Development Plan.

(6) Limited to a sound transmission class of not less than 50 (45 if field tested) as provided in the International Building Code (IBC), and subject to fair disclosure requirements to notify property owners and tenants within the Airport Influence Area.

(7) Restaurant, including drive-through restaurant but excluding drive-in restaurant, are subject to the following standards:

a. Any drive-through lane shall be screened by a minimum four (4) foot tall solid wall or combination of wall and dense landscaping. Any drive-through lane shall have a shade canopy provided over the drive-through at the restaurant pick-up window.

b. Any drive-through lane shall have a minimum setback of 75 feet from the street line along designated Scenic Corridors or Buffered Roadways as defined in the General Plan, or along designated Signature Corridors as defined within the Greater Airpark Character Area Plan, with a minimum 25-foot landscape buffer provided between the drive-through lane and the street line.

c. Any drive-through lane shall have a minimum setback of 150 feet from a single-family residential district shown on Table 4.100.A., or the portion of a Planned Community (P-C) with an underlying zoning district comparable to the single-family residential districts shown on Table 4.100.A., or any Planned Residential Development (PRD) District.

d. Any drive-through lane shall have a minimum 50-foot landscape buffer provided between any property line that abuts a residential district shown on Table 4.100.A., or the portion of a Planned Community (P-C) with an underlying zoning district comparable to the single-family residential districts shown on Table 4.100.A., or any Planned Residential Development (PRD) District.

Sec. 5.4007. - Development standards.

A. Floor area ratio. Maximum: 0.8 for the Development Plan.

B. Building height (~~including~~**EXCLUDING** all rooftop appurtenances).

1. Maximum:

   a. 54 feet if the Development Plan area is between 2.00 and 5.00 acres,

   b. 62 feet if the Development Plan area is between 5.01 and 10.00 acres, and

   c. 84 feet if the Development Plan area is more than 10.00 acres, except as provided below.

2. Maximum near single family residential:

   a. 42 feet within 300 feet of any single-family residential districts shown on Table 4.100. A., or the portion of a Planned Community (P-C) with an underlying zoning district comparable to the single-family residential districts shown on Table 4.100.A., or any Planned Residential Development (PRD) District.3.Rooftop appurtenances. These structures including the screening of

them shall not cover more than 35 percent of the roof area of the building(s) in the Development Plan.

C. Required open space.

1. Total open space.

a. Minimum: 25 percent of net lot area of the Development Plan.

2. Parking areas and parking lot landscaping are not included in the required open space.

D. Building setbacks.

1. Front setback.

a. Minimum: 25 feet along arterial and major collector streets.

b. Minimum: 30 feet along minor collector and local streets.

2. Measuring setbacks along streets. All setbacks shall be measured from the curb line along streets.

3. Signature intersections. At the intersection of two streets, when both streets are classified as a major collector or arterial, there shall be a building setback triangle. The two equal sides of the triangle shall be 70 feet, starting from the point of intersection of the extension of the property lines at the corner. Within the triangle at least 50 percent of the area shall be shaded by structural or landscape materials.

4. Side and rear setbacks.

a. Abutting residential districts (as shown on Table 4.100.A., or the portion of a Planned Community (P-C) with an underlying zoning district comparable to the residential districts shown on Table 4.100.A., or a Planned Residential Development (PRD) District). (See Example 5.4007.E.1.)

i. Minimum: 60 feet from any single-family residential district, and

ii. Minimum: 30 feet from all other residential districts.

b. Abutting nonresidential districts. (See Example 5.4007.E.2)

i. Minimum: 15 feet.

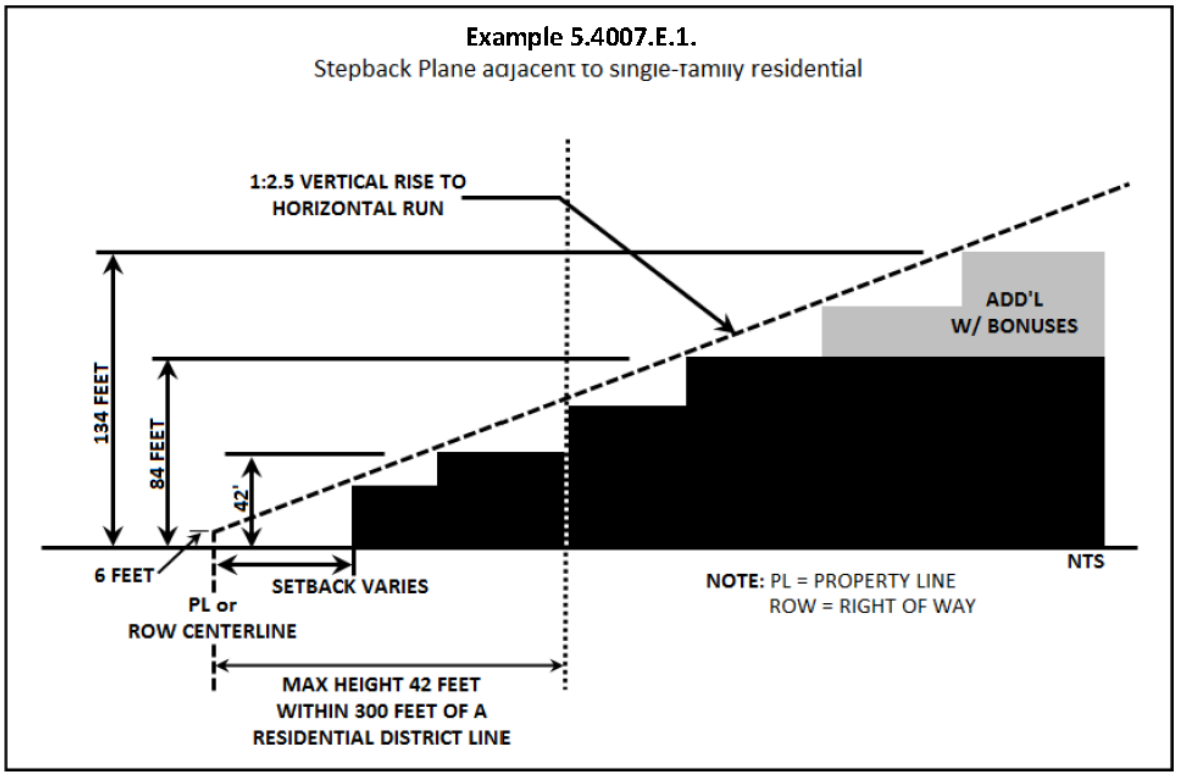
E. Stepback plane:

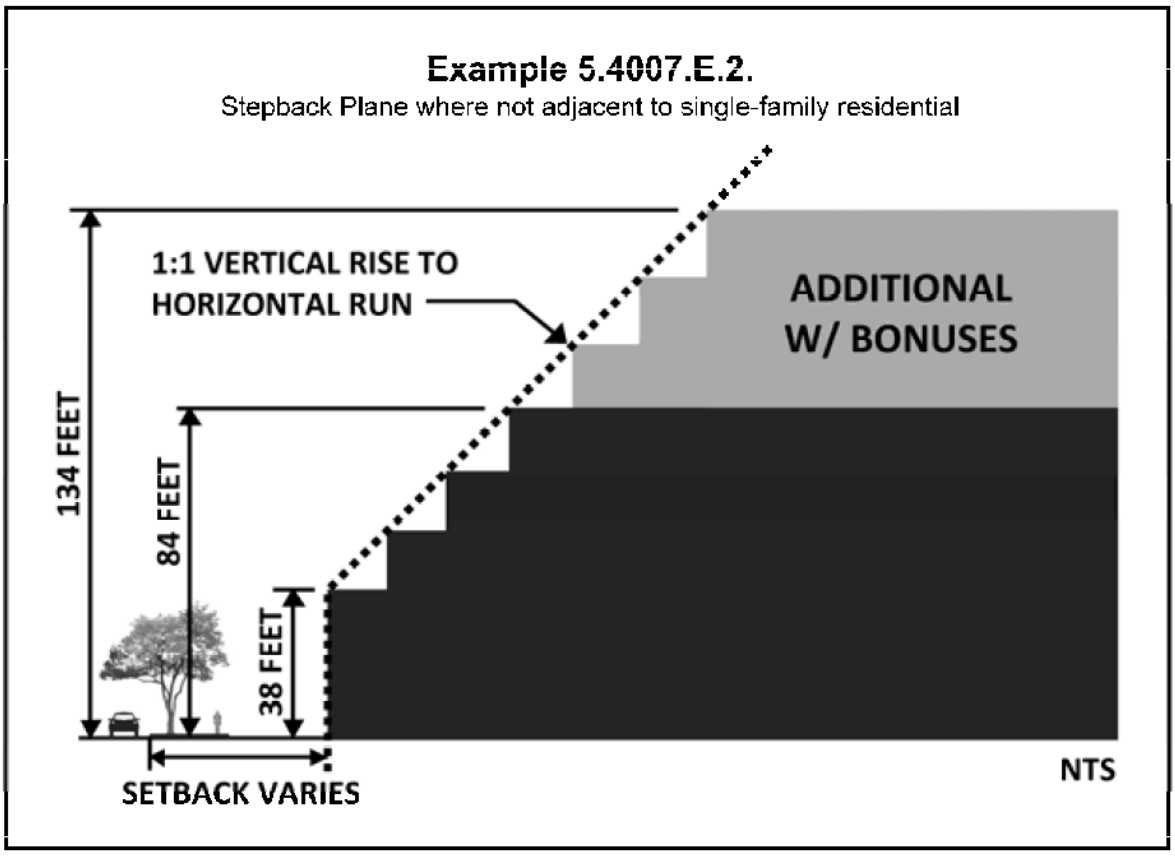
1. Abutting single family districts (as shown on Table 4.100.A., or the portion of a Planned Community (P-C) with an underlying zoning district comparable to the single-family residential districts shown on Table 4.100.A., or a Planned Residential Development (PRD) District).

   a. Vertical to horizontal ratio: 1:2.5, beginning 6 feet above the PCP District boundary. (See Example 5.4007.E.1.)

2. Other locations.

   a. Vertical to horizontal ratio: 1:1, beginning 38 feet above the setback line. (See Example 5.4007.E.2.)





3. Minor amendments to achieve a more suitable Development Plan. Upon demonstration of significant sustainable, high-quality urban design and other features beyond those required by the City, the Zoning Administrator may approve up to a maximum of 10 percent deviation to the stepback plane requirements. Exception: Amendments cannot be applied to the requirements of Section 5.4007.E.1.

F. Screening. All operations and storage shall be conducted within a completely enclosed building or within an area contained by a wall or fence as determined by Development Review Board approval.

Sec. 5.4008. - Bonus provisions.

A. Applicability. The City Council may approve bonus development standards for property zoned PCP upon demonstration of noteworthy investments in sustainable, high-quality design and other features that provide public benefits, improve the quality of life in the community, and assist in achieving the goals and policies of the General Plan, Greater Airpark Character Area Plan, and City objectives, subject to the following criteria:

1. Minimum Development Plan area: 4.00 acres of gross lot area.

2. Limitations:

    a. Bonus development standards cannot be applied to any portion of a PCP District Development Plan that is less than 300 feet from a single family district (as shown on Table 4.100.A., or the portion of a Planned Community (P-C) with an underlying zoning district comparable to the single-family residential districts shown on Table 4.100.A., or a Planned Residential Development (PRD) District).

    b. Bonus development standards cannot be applied to any portion of a PCP District Development Plan that is within the AC-3 area shown on Figure 1, Airport Influence Area, in the Scottsdale Revised Code, Chapter 5—Aviation, as amended.

B. Bonus development allowances. Subject to the maximum bonus development standards as provided below, the City Council may approve an increase of the floor area ratio (FAR) and/or an increase of the building height based upon the property owner providing Special Public Improvements as identified below and/or any other community benefit(s) approved by City Council as part of a Development Plan.

C. Maximum bonus development standards:

1. Floor area ratio.

    a. Maximum: 2.0 for the Development Plan.

2. Building height (inclusive of all rooftop appurtenances).

    a. Maximum:

        i. Development Plan area of 4.00 to 5.00 acres of gross lot area: 92 feet.

        ii. Development Plan area of 5.01 to 10.00 acres of gross lot area: 104 feet.

        iii. Development Plan area of 10.01 to 15.99 acres of gross lot area: 116 feet.

        iv. Development Plan area of 16.00 acres or more of gross lot area: 134 feet.

        v. The total floor area(s) of any single floor above building heights greater than 92 feet shall not exceed 20% of the total ground floor building area of the Development Plan.

b. Maximum near single-family residential. Maximum building height shall be 42 feet within 300 feet of any single-family residential district shown on Table 4.100.A., or the portion of a Planned Community (P-C) with an underlying zoning district comparable to the single-family residential districts shown on Table 4.100.A., or any Planned Residential Development (PRD) district.

D. Allocation of bonus development standards. The Development Plan shall identify the specific allocation of bonus development standards and is subject to City Council approval.

E. Special Public Improvements requirements. Development projects utilizing Special Public Improvements and/or other community benefit(s) to achieve bonus development standards shall comply with the Special Public Improvements requirements as outlined in Section 7.1200.

F. Special conditions.

1. Building materials: Reflective materials are limited to 60 percent of the building wall area for portions of a building located above a building height of 104 feet.

2. Open Space. Minimum: 28 percent of the net lot area of the Development Plan receiving a bonus.

G. Bonus development standards procedures.

1. Any application of bonus development standards, or amendment to application of bonus development standards, shall be subject to City Council approval through a zoning district map amendment with a Development Plan. A development agreement is required with the utilization of Special Public Improvements and/or any other proposed community benefit(s).

a. The Development Plan shall include a development project narrative that:

i. Describes, in addition to other project narrative requirements, the bonus development standards sought, specifying the proposed floor area ratio and/or building height, as applicable,

ii. Identifies how the development project will comply with the Special Public Improvements requirements and/or an analysis of any other proposed community benefit(s), as applicable, and

iii. Provides the method and calculations for determining the Total Construction Cost Estimate, as outlined in Section 7.1200, as applicable.

b. The development agreement shall be in a form satisfactory to the City Attorney and include, but not be limited to, the requirements outlined in Section 7.1200.

Sec. 5.4009. – General Provisions.
Except as otherwise provided, the provisions of Article VII apply.

Sec. 5.4010. – Sign Requirements.
The provisions of Article VIII apply. In lieu of using the PCP sign standards of Article VII, the property owner may choose to use signs allowed in the Planned Regional Center (PRC) District in the PCP District.

Sec. 5.4011. – Parking and Loading Requirements.
The provisions of Article IX apply.

Sec. 5.4012. – Landscaping Requirements.
The provisions of Article X apply.

Additionally, we are working with the Arizona State Land Department to modify the Planned Community standard to remove the Hayden Core Transition prohibition on non-industrial uses and propose the following modification:

E. TRANSITIONAL AREAS. Per the Development Plan, all non-residential uses within Grayhawk Transition Area 1, Grayhawk Transition Area 2, Hayden Core Transition Area and Princess Transition Area within three hundred (300) feet of the application boundary shall have a maximum height of (30) feet. ~~The Hayden Core Transition Area shall only allow uses consistent with the comparable Industrial Park (I-1) district.~~

GREATER PHOENIX METRO GREEN INFRASTRUCTURE HANDBOOK COMPLIANCE

Axon shares in the desire to incorporate low impact development into its World Headquarters Campus and has incorporated the principles set forth in the Greater Phoenix Metro Green Infrastructure Handbook.

Specifically, the Axon Campus utilizes materials from the recommended plant palette which are native to the Sonoran Desert and low water use. Additional provisions from the handbook may be incorporated during the design review phase of the project.

10/15/2024 9:40:18 AM

SITE LEGEND

- Proposed Commercial (Ground floor Only)
- Proposed Building (Residential)
- Courtyard/Open Space
- Proposed Hotel
- Leasing/Amenity Space (Ground Floor Only)
- Outdoor Amenity Space (4th or 5th Floor Only)
- Overhead Pedestrian Bridge
- Site Entry
- Traffic Flow
- 55' / 49' / 25' Fire Apparatus Turn Radius
- # TOTAL STALL COUNT IN ROW
- # ADA 11'X18' STALL COUNT IN ROW
- PROPERTY LINE
- EXISTING SITE R.O.W. LINE
- PROPOSED SITE R.O.W. LINE
- BUILDING SETBACK LINE
- EASEMENT LINE
- BUILDING STEPBACK LIMITS
- INTERNAL LOT LINE
- SITE VISIBILITY LINE

DEVELOPMENT DATA

PROJECT DESCRIPTION:

MASTER PLAN FOR AXON CAMPUS TO INCLUDE NEW MULTI-FAMILY RESIDENTIAL, HOTEL, RETAIL, IN ADDITION TO LIGHT INDUSTRIAL ON THE NORTHEAST CORNER OF HAYDEN ROAD AND AXON WAY.

ZONING:

CURRENT: I-1
PROPOSED: PCD-PCP/AMU-R

APN:

ASSESSOR PARCEL NUMBER
215-07-407 AND 215-07-408

CONSTRUCTION TYPE:

Buildings A,B,C,D: IA, IIIA, & VA
Buildings E: IA & VA

BUILDING HEIGHT:

PROPOSED: .
AXON WORLD HQ 96'-0" MAX.
BUILDINGS A-E 68'-0" MAX.

LOT COVERAGE:

Proposed New Building Gross Areas:
Buildings A-E = 1,559,644 S.F.

FLOOR AREA RATIO (FAR) = .80

OPEN SPACE:

Required: 25% of Site Net Area
.25 x 1,617,029 SF = 404,257 SF

Provided: 890,101 SF
(See sheet A1.16)

BUILDING SETBACKS:

Front:
25'-0" from Back of Curb (Hayden Rd & Axon Way)
30'-0" from Back of Curb (Mayo Blvd)

Side & Rear: 15'-0" from Non-residential

SITE DATA

SITE AREAS		
APN	Area (GROSS)	Acres (GROSS)
New Residential Development Site (PCP-AMU-R):		
APN: 215-07-407	1,546,815 SF	35.51 acres
APN: 215-07-408	76,627 SF	1.76 acres
ROAD R.O.W.	323,941 SF	7.44 acres
	1,947,383 SF	44.71 acres

SITE AREAS		
APN	Area (GROSS)	Acres (GROSS)
Axon HQ Site (I-1):		
APN: 215-07-407 AXON	988,548 SF	22.69 acres
ROAD R.O.W. AXON	100,828 SF	2.31 acres
	1,089,376 SF	25.01 acres

Axon HQ Gross Area: 401,085 S.F.
NEW FLOOR AREA RATIO (FAR) = .41

SITE AREA:

TOTAL GROSS AREA: 1,947,383 SF (44.71 ACRES)
TOTAL NET AREA: 1,617,029 SF (37.12 ACRES)

BUILDING USAGE

New Building Area		Amenity Area	5th Level Amenity
Building	Gross Area	Gross Area	Gross Area
BUILDING A	486,625	12,350 SF	3,900 SF
BUILDING B	265,575	11,862 SF	1,500 SF
BUILDING C	161,436	12,025 SF	1,500 SF
BUILDING D	227,786	12,108 SF	6,900 SF
BUILDING E	418,222	12,247 SF	
Total	1,559,644	60,593 SF	

Note: 413,226 SF Total Ground Floor Gross Area across all buildings.

Ground Floor Residential = 240,815 SF / 413,226 SF = 58%

Ground Floor Non-residential = 172,411 SF / 413,226 SF = 42%
60,953 SF Amenities
49,486 SF Commercial
+ 61,972 SF Service/Circulation/non-residential
172,411 SF Total Non-Residential

Multifamily Residential		
Building Name	Levels	Unit Count_CALC
BUILDING A	5	717
BUILDING B	5	390
BUILDING C	5	231
BUILDING E	4	627

Total Units: 1965 + 435 Keys

Commercial Gross Area	
Building	Gross Area
BUILDING C	40,957 SF
BUILDING D	8,529 SF
Total	49,486 SF

Hotel		
Building Name	Levels	Unit Count
BUILDING D	5	435 KEYS

REQUIRED RESIDENTIAL PARKING:
(1965) STUDIOS/1 BED @ 1.3
TOTAL = 2,555 STALLS

REQUIRED GUEST:
1 PER 6 UNITS = 328 STALLS

REQUIRED HOTEL PARKING:
(435) UNIT @ 1.0
TOTAL = 435 STALLS

REQUIRED HOTEL COMMERCIAL PARKING:
8,529 SF @ 1 STALL PER 400GSF
AFTER FIRST 2,000 SF
TOTAL = 17 STALLS

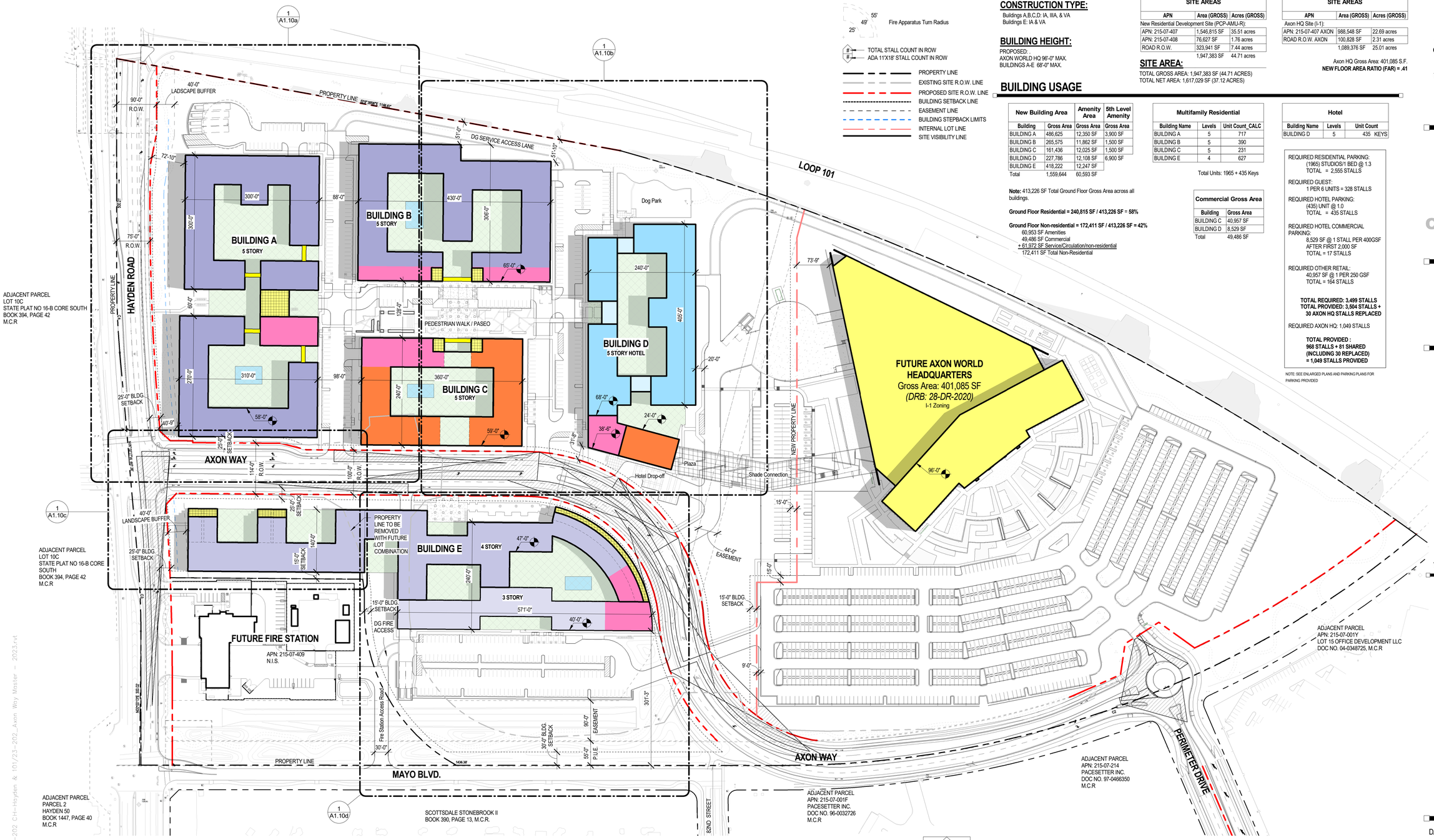
REQUIRED OTHER RETAIL:
40,957 SF @ 1 PER 250 GSF
TOTAL = 164 STALLS

TOTAL REQUIRED: 3,499 STALLS
TOTAL PROVIDED: 3,504 STALLS +
30 AXON HQ STALLS REPLACED

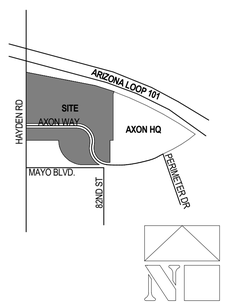
REQUIRED AXON HQ: 1,049 STALLS

TOTAL PROVIDED :
968 STALLS + 81 SHARED
(INCLUDING 30 REPLACED)
= 1,049 STALLS PROVIDED

NOTE: SEE ENLARGED PLANS AND PARKING PLANS FOR PARKING PROVIDED



VICINITY MAP



1 SITE PLAN OVERALL
SCALE: 1" = 100'-0"

AXON WAY & HAYDEN ROAD

NE CORNER OF N. HAYDEN RD AND AXON WAY
SCOTTSDALE, ARIZONA 85255

Office of Rich Barber Architecture, LLC
ORB
WorldHQ@ORBArch.com

PRELIMINARY NOT FOR CONSTRUCTION

REGISTERED ARCHITECT — RICHARD BARBER — 15813 — 10 15 2024 — STATE OF ARIZONA — Expires 3/31/2026

AXON

REZONE

DATE: OCTOBER 15, 2024 ORB #: 23-202

A1.10

SITE PLAN

13-ZN-2020#2
10/24/2024

Autodesk Docs://23-202 CH-Hayden & 101/23-202_Axon Way Master - 2023.rvt



DEVELOPMENT DATA

PROJECT DESCRIPTION:

MASTER PLAN FOR AXON CAMPUS TO INCLUDE NEW MULTI-FAMILY RESIDENTIAL, HOTEL, RETAIL, IN ADDITION TO LIGHT INDUSTRIAL ON THE NORTHEAST CORNER OF HAYDEN ROAD AND AXON WAY.

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PROPOSED: PCD-PCP/AMU-R

APN:

ASSESSOR PARCEL NUMBER
215-07-407 AND 215-07-408

CONSTRUCTION TYPE:

BUILDING A, B, C, D: IA, IIIA & VA
BUILDING E : IA & VA

BUILDING HEIGHT:

AXON H.Q. 96'-0" MAX.
BUILDINGS A-E 68'-0" MAX.

LOT COVERAGE:

Proposed New Building Gross Areas:
Buildings A-F = 1,559,644 S.F.

FLOOR AREA RATIO (FAR) = .80

OPEN SPACE:

Required: 25% of Site Net Area
.25 x 1,617,029 SF = 404,257 SF

Provided: 890,101 SF (See sheet A1.16)

BUILDING SETBACKS:

Front:
25'-0" from Back of Curb (Hayden Rd & Axon Way)
30'-0" from Back of Curb (Mayo Blvd)

Side & Rear: 15'-0" from Non-residential

SITE AREA:

TOTAL GROSS AREA: 1,947,383 SQ. FT. / 44.71 ACRES
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BUILDING E	4	627

Total Units: 1965 + 435 Keys

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Building Name	Levels	Unit Count
BUILDING D	5	435 KEYS

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Building	Gross Area
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Total	49,486 SF

Note: 413,226 SF Total Ground Floor Gross Area across all buildings.

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Ground Floor Non-residential = 172,411 SF / 413,226 SF = 42%
60,953 SF Amenities
49,486 SF Commercial
+ 61,972 SF Service/Circulation/non-residential
172,411 SF Total Non-Residential

VEHICLE PARKING ANALYSIS

UNDERGOUND GARAGE PARKING			Site Surface Parking		Total	Ratio to Units	ADA Stalls (4% of Total)	Bicycle (1 per 10 Stalls)
Building	Levels	Parking Total	Parking Location	Count	Count			
BLDG A	2	1021	BUILDING A	40	1,061	1.46	43	106
BLDG B	2	552	BUILDING B	23	575	1.46	23	58
BLDG C	2	331	BUILDING C	11	342	1.46	14	35
BLDG D - HOTEL	2	450	BUILDING D	5	455	1.0	18	45
BLDG E	2	749	BUILDING E	171	920	1.46	37	92
		3,103	COMMERCIAL	181	181		8	19
				431	3,534			355

REQUIRED RESIDENTIAL PARKING:
(1965) STUDIOS/1 BED @ 1.3
TOTAL = 2,555 STALLS

REQUIRED GUEST:
1 PER 6 UNITS = 328 STALLS

REQUIRED HOTEL PARKING:
(435) UNIT @ 1.0
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8,529 SF @ 1 STALL PER 400GSF AFTER FIRST 2,000 SF
TOTAL = 17 STALLS

REQUIRED OTHER RETAIL:
40,957 SF @ 1 PER 250 GSF
TOTAL = 164 STALLS

TOTAL REQUIRED: 3,499 STALLS
TOTAL PROVIDED: 3,504 STALLS + 30 AXON HQ STALLS REPLACED

REQUIRED AXON HQ: 1,049 STALLS

TOTAL PROVIDED : 968 STALLS + 81 SHARED (INCLUDING 30 REPLACED) = 1,049 STALLS PROVIDED

ACCESSIBILITY NOTES

1. CONTRACTOR SHALL OBTAIN A COPY OF THE FAIR HOUSING ACT DESIGN MANUAL AND ICC/A.N.S.I. A117.1-2009 FOR ON SITE REFERENCE.
2. ALL SIDEWALKS PART OF THE ACCESSIBLE ROUTE SHALL BE ACCESSIBLE PER A.N.S.I. SECTION CHAPTER 4. THE RUNNING SLOPE OF WALKING SURFACES SHALL NOT BE STEEPER THAN 1:20 (5%). THE CROSS SLOPE OF A WALKING SURFACE SHALL NOT BE STEEPER THAN 1:48 (2%). THE CLEAR WIDTH OF ALL SIDEWALKS SHALL BE NO LESS THAN 36". COORDINATE ALL GRADES TO COMPLY WITH SLOPE AND CROSS SLOPE REQUIREMENTS.
3. ALL GROUND FLOOR UNITS TO BE ANSI TYPE 'B' UNITS U.N.O.

SITE LEGEND

- Proposed Commercial (Ground floor Only)
- Proposed Building (Residential)
- Courtyard/Open Space
- Proposed Hotel
- Leasing/Amenity Space (Ground Floor Only)
- Outdoor Amenity Space (4th or 5th Floor Only)
- Overhead Pedestrian Bridge
- Site Entry
- Traffic Flow
- Fire Apparatus Turn Radius (55' / 49' / 25')
- TOTAL STALL COUNT IN ROW
- ADA 11'X18' STALL COUNT IN ROW
- PROPERTY LINE
- EXISTING SITE R.O.W. LINE
- PROPOSED SITE R.O.W. LINE
- BUILDING SETBACK LINE
- EASEMENT LINE
- BUILDING STEPBACK LIMITS
- INTERNAL LOT LINE
- SITE VISIBILITY LINE

KEYNOTES

1001	TYPICAL PARKING STALL, 9' x 18'
1002	ACCESSIBLE PARKING STALL, MIN. 11' x 18'
1008	LOADING AREA
1011	BICYCLE PARKING
1016	ROLLED CURB FOR SERVICE ACCESS
1101	PROPERTY LINE
1111	SIGHT VISIBILTY TRIANGLE
1207	LANDSCAPE AREA
1307	COMPACTOR EQUIPMENT

AXON WAY & HAYDEN ROAD

NE CORNER OF N. HAYDEN RD AND AXON WAY
SCOTTSDALE, ARIZONA 85255

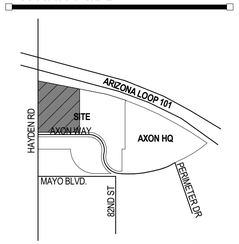
Office of Rich Barber Architecture, LLC
ORB
WorldHQ@ORBArch.com

PRELIMINARY NOT FOR CONSTRUCTION

REGISTERED ARCHITECT — 15613 — RICHARD L. BARBER — 10/15/2024 — ARIZONA U.S.A. — Expires 3/31/2026

AXON

VICINITY MAP



REZONE

DATE: OCTOBER 15, 2024 ORB #: 23-202

A1.10a

SITE PLAN AREA A

13-ZN-2020#2
10/24/2024

10/15/2024 9:40:30 AM
Autodesk Docs://23-202 CH-Hayden & 101/23-202_Axon Way Master - 2023.rvt



1 SITE PLAN AREA B

0' 20' 40' 80'

SCALE: 1" = 40'-0"

DEVELOPMENT DATA

PROJECT DESCRIPTION:

MASTER PLAN FOR AXON CAMPUS TO INCLUDE NEW MULTI-FAMILY RESIDENTIAL, HOTEL, RETAIL, IN ADDITION TO LIGHT INDUSTRIAL ON THE NORTHEAST CORNER OF HAYDEN ROAD AND AXON WAY.

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PROPOSED: PCD-PCP/AMU-R

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ASSESSOR PARCEL NUMBER
215-07-407 AND 215-07-408

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BUILDING E : IA & VA

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AXON H.Q. 96'-0" MAX.
BUILDINGS A-E 68'-0" MAX.

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FLOOR AREA RATIO (FAR) = .80

OPEN SPACE:

Required: 25% of Site Net Area
.25 x 1,617,029 SF = 404,257 SF

Provided: 890,101 SF (See sheet A1.16)

BUILDING SETBACKS:

Front:
25'-0" from Back of Curb (Hayden Rd & Axon Way)
30'-0" from Back of Curb (Mayo Blvd)

Side & Rear: 15'-0" from Non-residential

SITE AREA:

TOTAL GROSS AREA: 1,947,383 SQ. FT. / 44.71 ACRES
TOTAL NET AREA: 1,617,029 SQ. FT. / 37.12 ACRES

SITE AREAS

APN	Area (GROSS)	Acres (GROSS)
New Residential Development Site (PCP-AMU-R):		
APN: 215-07-407	1,546,815 SF	35.51 acres
APN: 215-07-408	76,627 SF	1.76 acres
ROAD R.O.W.	323,941 SF	7.44 acres
	1,947,383 SF	44.71 acres
Axon HQ Site (I-1):		
APN: 215-07-407 AXON	988,548 SF	22.69 acres
ROAD R.O.W. AXON	100,828 SF	2.31 acres
	1,089,376 SF	25.01 acres

BUILDING USAGE

New Building Area		Amenity Area
Building	Gross Area	Gross Area
BUILDING A	486,625	12,350 SF
BUILDING B	265,575	11,862 SF
BUILDING C	161,436	12,025 SF
BUILDING D	227,786	12,108 SF
BUILDING E	418,222	12,247 SF
Total	1,559,644	60,593 SF

Multifamily Residential		
Building Name	Levels	Unit Count_CALC
BUILDING A	5	717
BUILDING B	5	390
BUILDING C	5	231
BUILDING E	4	627

Total Units: 1965 + 435 Keys

Hotel		
Building Name	Levels	Unit Count
BUILDING D	5	435 KEYS

Commercial Gross Area	
Building	Gross Area
BUILDING C	40,957 SF
BUILDING D	8,529 SF
Total	49,486 SF

Note: 413,226 SF Total Ground Floor Gross Area across all buildings.

Ground Floor Residential = 240,815 SF / 413,226 SF = 58%

Ground Floor Non-residential = 172,411 SF / 413,226 SF = 42%
60,953 SF Amenities
49,486 SF Commercial
+ 61,972 SF Service/Circulation/non-residential
172,411 SF Total Non-Residential

VEHICLE PARKING ANALYSIS

UNDERGOUND GARAGE PARKING			Site Surface Parking		Total	Ratio to Units	ADA Stalls (4% of Total)	Bicycle (1 per 10 Stalls)
Building	Levels	Parking Total	Parking Location	Count	Count			
BLDG A	2	1021	BUILDING A	40	1,061	1.46	43	106
BLDG B	2	552	BUILDING B	23	575	1.46	23	58
BLDG C	2	331	BUILDING C	11	342	1.46	14	35
BLDG D - HOTEL	2	450	BUILDING D	5	455	1.0	18	45
BLDG E	2	749	BUILDING E	171	920	1.46	37	92
		3,103	COMMERCIAL	181	181		8	19
				431	3,534			355

REQUIRED RESIDENTIAL PARKING:
(1965) STUDIOS/1 BED @ 1.3
TOTAL = 2,555 STALLS

REQUIRED GUEST:
1 PER 6 UNITS = 328 STALLS

REQUIRED HOTEL PARKING:
(435) UNIT @ 1.0
TOTAL = 435 STALLS

REQUIRED HOTEL COMMERCIAL PARKING:
8,529 SF @ 1 STALL PER 400GSF AFTER FIRST 2,000 SF
TOTAL = 17 STALLS

REQUIRED OTHER RETAIL:
40,957 SF @ 1 PER 250 GSF
TOTAL = 164 STALLS

TOTAL REQUIRED: 3,499 STALLS
TOTAL PROVIDED: 3,504 STALLS + 30 AXON HQ STALLS REPLACED

REQUIRED AXON HQ: 1,049 STALLS

TOTAL PROVIDED : 968 STALLS + 81 SHARED (INCLUDING 30 REPLACED) = 1,049 STALLS PROVIDED

ACCESSIBILITY NOTES

1. CONTRACTOR SHALL OBTAIN A COPY OF THE FAIR HOUSING ACT DESIGN MANUAL AND ICC/A.N.S.I. A117.1-2009 FOR ON SITE REFERENCE.
2. ALL SIDEWALKS PART OF THE ACCESSIBLE ROUTE SHALL BE ACCESSIBLE PER A.N.S.I. SECTION CHAPTER 4. THE RUNNING SLOPE OF WALKING SURFACES SHALL NOT BE STEEPER THAN 1:20 (5%). THE CROSS SLOPE OF A WALKING SURFACE SHALL NOT BE STEEPER THAN 1:48 (2%). THE CLEAR WIDTH OF ALL SIDEWALKS SHALL BE NO LESS THAN 36". COORDINATE ALL GRADES TO COMPLY WITH SLOPE AND CROSS SLOPE REQUIREMENTS.
3. ALL GROUND FLOOR UNITS TO BE ANSI TYPE 'B' UNITS U.N.O.

SITE LEGEND

- Proposed Commercial (Ground floor Only)
- Proposed Building (Residential)
- Courtyard/Open Space
- Proposed Hotel
- Leasing/Amenity Space (Ground Floor Only)
- Outdoor Amenity Space (4th or 5th Floor Only)
- Overhead Pedestrian Bridge
- Site Entry
- Traffic Flow
- Fire Apparatus Turn Radius (55' / 49' / 25')
- TOTAL STALL COUNT IN ROW
- ADA 11'X18' STALL COUNT IN ROW
- PROPERTY LINE
- EXISTING SITE R.O.W. LINE
- PROPOSED SITE R.O.W. LINE
- BUILDING SETBACK LINE
- EASEMENT LINE
- BUILDING STEPBACK LIMITS
- INTERNAL LOT LINE
- SITE VISIBILITY LINE

KEYNOTES

1002	ACCESSIBLE PARKING STALL, MIN. 11' x 18'
1008	LOADING AREA
1011	BICYCLE PARKING
1016	ROLLED CURB FOR SERVICE ACCESS
1101	PROPERTY LINE
1102	EASEMENT
1107	VIEW FENCE
1111	SIGHT VISIBILITY TRIANGLE
1122	NEW PEDESTRIAN BRIDGE
1207	LANDSCAPE AREA
1302	REFUSE ENCLOSURE
1310	FIRE TRUCK TURNING RADIUS

AXON WAY & HAYDEN ROAD

NE CORNER OF N. HAYDEN RD AND AXON WAY
SCOTTSDALE, ARIZONA 85255

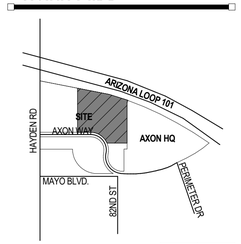
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REGISTERED ARCHITECT
15813
Rich Barber
10 15 2024
ARIZONA U.S.A.
Expires 3/31/2026

PRELIMINARY NOT FOR CONSTRUCTION

AXON

VICINITY MAP



REZONE

DATE: OCTOBER 15, 2024 ORB #: 23-202

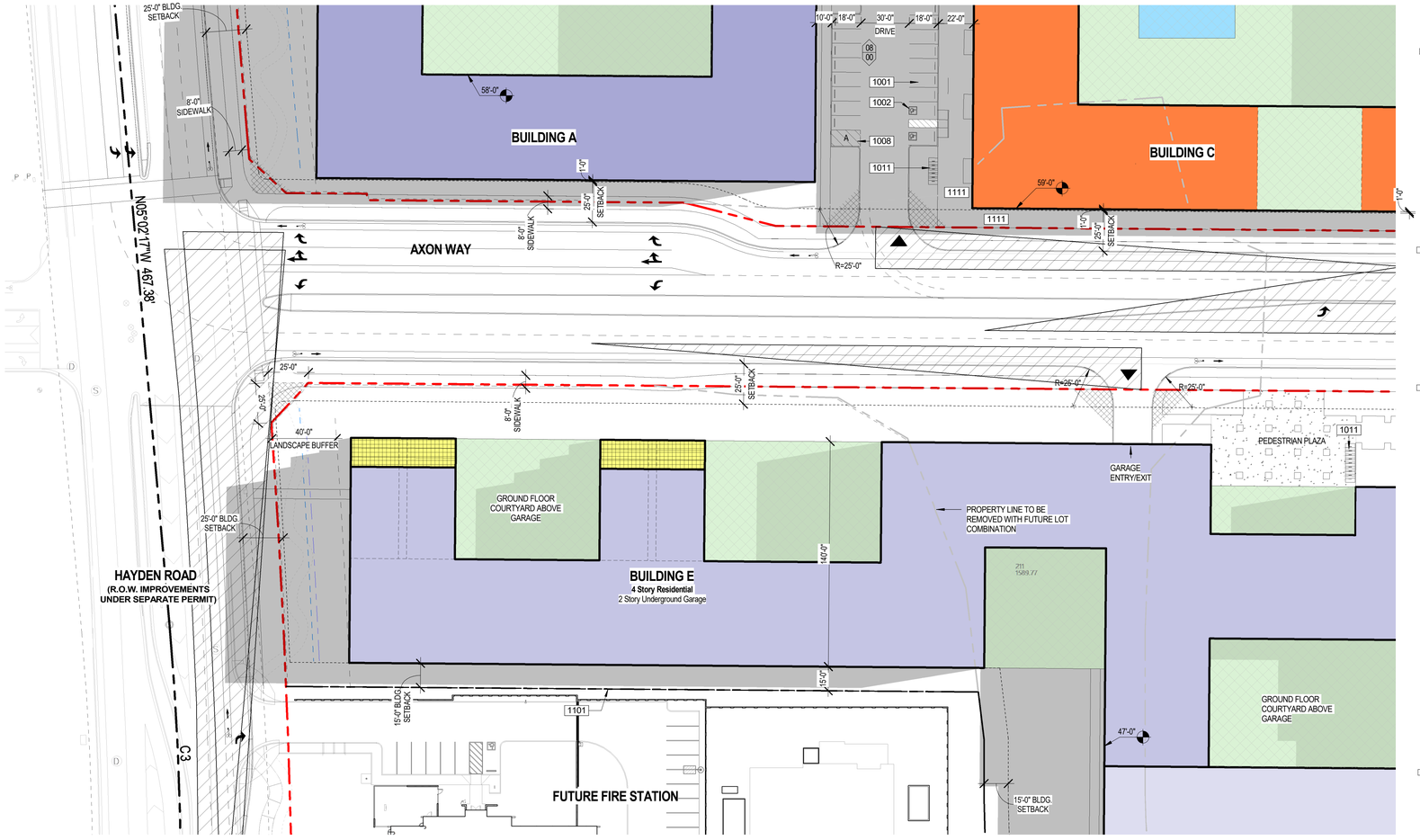
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SITE PLAN AREA B

13-ZN-2020#2
10/24/2024

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1 SITE PLAN OVERALL

0' 20' 40' 80'

SCALE: 1" = 40'-0"

DEVELOPMENT DATA

PROJECT DESCRIPTION:

MASTER PLAN FOR AXON CAMPUS TO INCLUDE NEW MULTI-FAMILY RESIDENTIAL, HOTEL, RETAIL, IN ADDITION TO LIGHT INDUSTRIAL ON THE NORTHEAST CORNER OF HAYDEN ROAD AND AXON WAY.

ZONING:

CURRENT: I-1
PROPOSED: PCD-PCP/AMU-R

APN:

ASSESSOR PARCEL NUMBER
215-07-407 AND 215-07-408

CONSTRUCTION TYPE:

BUILDING A, B, C, D: IA, IIIA & VA
BUILDING E : IA & VA

BUILDING HEIGHT:

AXON H.Q. 96'-0" MAX.
BUILDINGS A-E 68'-0" MAX.

LOT COVERAGE:

Proposed New Building Gross Areas:
Buildings A-F = 1,559,644 S.F.

FLOOR AREA RATIO (FAR) = .80

OPEN SPACE:

Required: 25% of Site Net Area
.25 x 1,617,029 SF = 404,257 SF

Provided: 890,101 SF (See sheet A1.16)

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AXON WAY & HAYDEN ROAD

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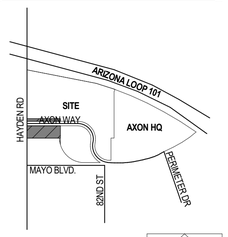
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WorldHQ@ORBArch.com



PRELIMINARY NOT FOR CONSTRUCTION

AXON

VICINITY MAP



REZONE

DATE: OCTOBER 15, 2024 ORB #: 23-202

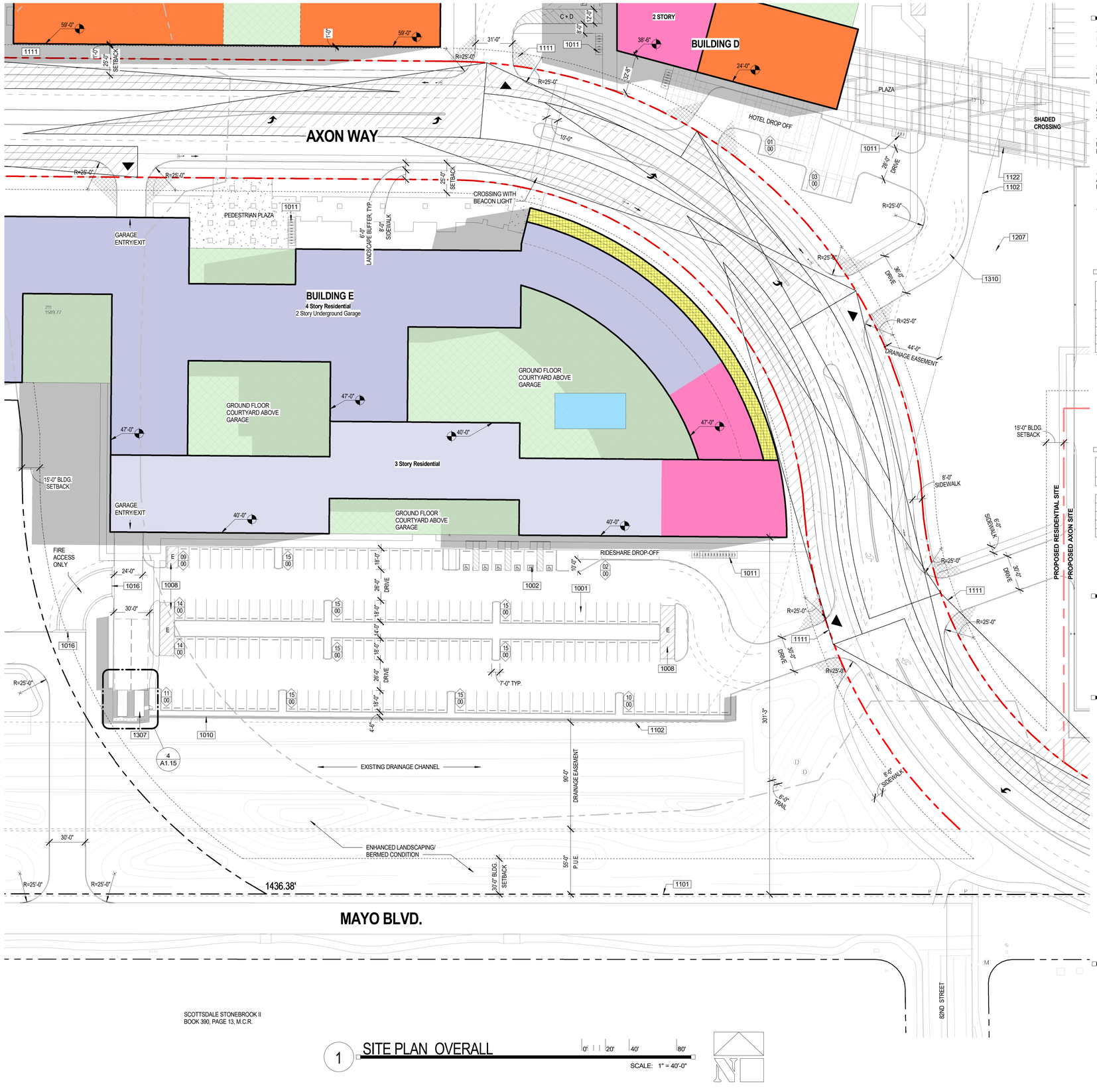
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SITE PLAN AREA C

13-ZN-2020#2
10/24/2024

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AXON WAY & HAYDEN ROAD

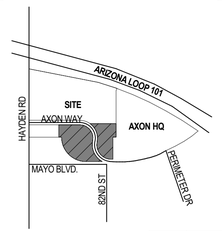
NE CORNER OF N. HAYDEN RD AND AXON WAY
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Office of Rich Barber Architecture, LLC
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PRELIMINARY NOT FOR CONSTRUCTION
REGISTERED ARCHITECT
RICHARD BARBER
15813
Rich Barber
10 15 2024
ARIZONA U.S.A.
Expires 3/31/2026

AXON

VICINITY MAP



N

REZONE

DATE: OCTOBER 15, 2024 ORB #: 23-202

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SITE PLAN AREA D

13-ZN-2020#2
10/24/2024

Autodesk Docs://23-202 CH-Hayden & 101/23-202_Axon Way Master - 2023.rvt

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Color Legend

- APN: 215-07-407
- APN: 215-07-407 AXON
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- ROAD R.O.W.
- ROAD R.O.W. AXON

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UPDATED ZONING DATA FOR AXON WORLD HEADQUARTERS SITE

NOTE: CHANGES ARE LIMITED TO UPDATED FLOOR AREA RATIO, SHARED PARKING ADJUSTMENT, AND OPEN SPACE CALCULATIONS. PHYSICAL CHANGES TO APPROVED PLANS ARE NOT PROPOSED UNDER THIS SUBMITTAL.

APN:
ASSESSOR PARCEL NUMBER
215-07-407

NEW SITE AREA:
TOTAL GROSS AREA: 1,089,376 SF (25.01 ACRES)
TOTAL NET AREA: 988,548 SF (2.31 ACRES)

ZONING:
CURRENT: I-1

SETBACKS:
FRONT YARD : 20'-0" MIN.
REAR: N/A
SIDE: N/A

BUILDING HEIGHT:
CURRENT: AXON H.Q. 96'-0" MAX.

NEW LOT COVERAGE:
ALLOWED: FLOOR AREA RATIO (FAR) : 0.80
PROPOSED: FLOOR AREA RATIO (FAR) : 0.41

SCREENING:
CURRENT: SITE WALLS, BERMS

NEW OPEN SPACE:
LIGHT INDUSTRIAL REQUIRED OPEN SPACE:

SITE NET AREA: 988,548 SQ. FT.
FIRST FLOOR (16 FT.)
10% OF NET AREA: 98,854 SQ. FT.

EVERY ADDITIONAL 10' AFTER FIRST 16'
96' - 16' = 80'
NET AREA x 0.04 (4%) 316,335 SQ. FT.

TOTAL REQUIRED OPEN SPACE: **415,189 SQ. FT.**

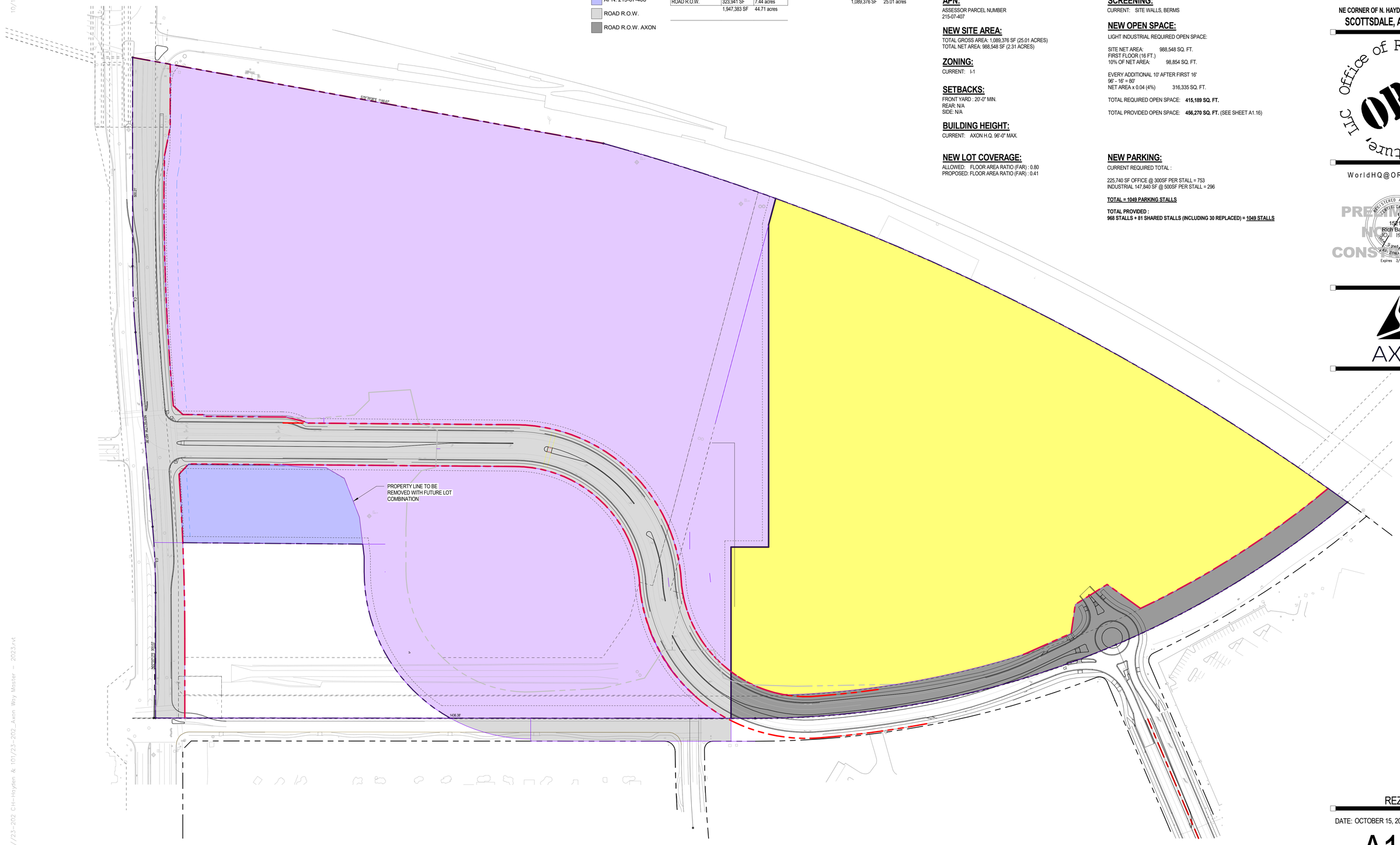
TOTAL PROVIDED OPEN SPACE: **456,270 SQ. FT.** (SEE SHEET A1.16)

NEW PARKING:
CURRENT REQUIRED TOTAL :

225,740 SF OFFICE @ 300SF PER STALL = 753
INDUSTRIAL 147,840 SF @ 500SF PER STALL = 296

TOTAL = 1049 PARKING STALLS

TOTAL PROVIDED :
968 STALLS + 81 SHARED STALLS (INCLUDING 30 REPLACED) = 1049 STALLS



1 SITE AREA - EXHIBIT

0' 50' 100' 200'

SCALE: 1" = 100'-0"

AXON WAY & HAYDEN ROAD

NE CORNER OF N. HAYDEN RD AND AXON WAY
SCOTTSDALE, ARIZONA 85255

Office of Rich Barber Architecture, LLC
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15413
Rich Barber
10 15 2024
ARIZONA U.S.A.
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AXON

REZONE

DATE: OCTOBER 15, 2024 ORB #: 23-202

A1.11

AREA PLAN

13-ZN-2020#2
10/24/2024

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AXON WAY & HAYDEN ROAD

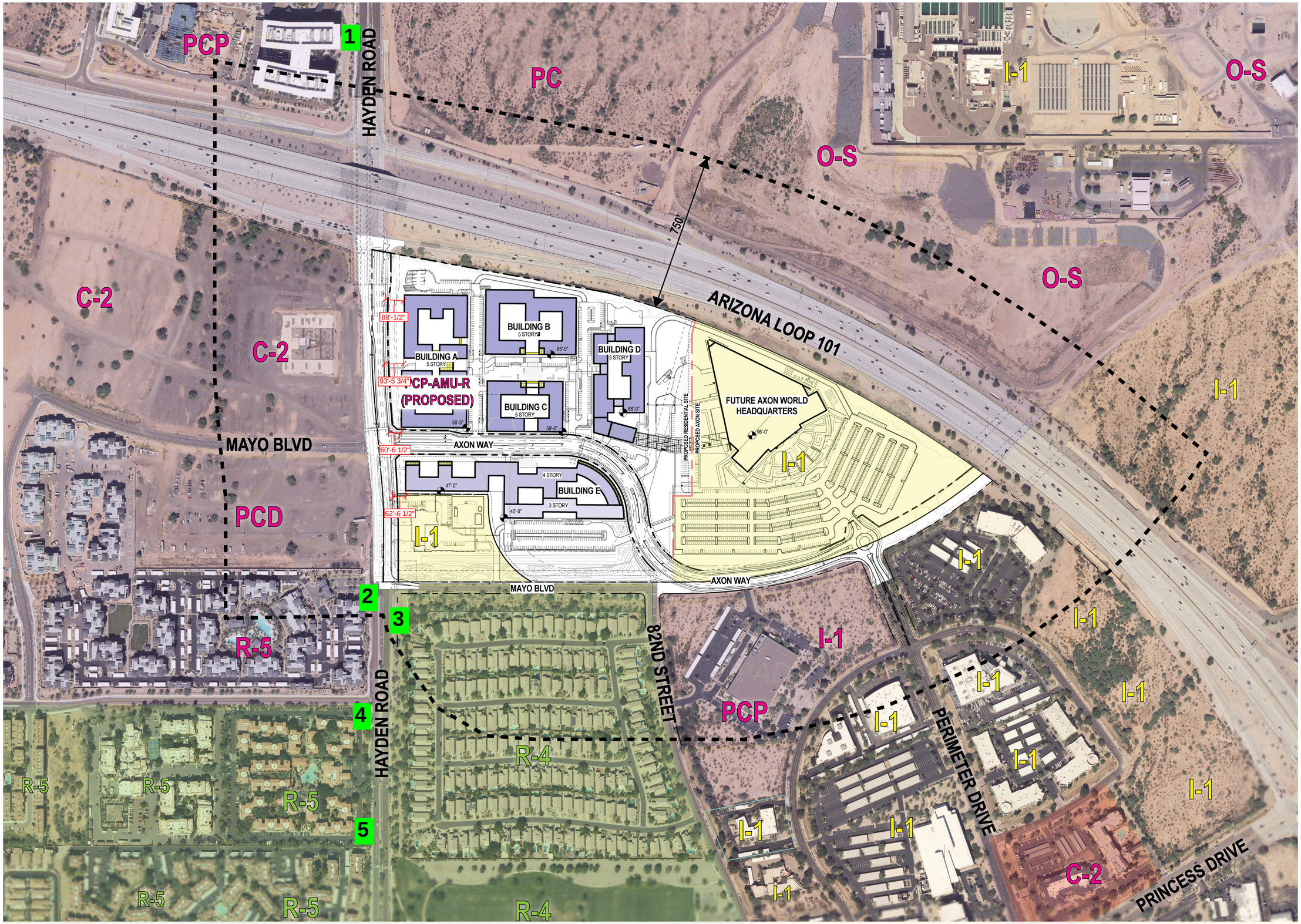
NE CORNER OF N. HAYDEN RD AND AXON WAY
SCOTTSDALE, ARIZONA 85255

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AXON



1 CONTEXT SITE PLAN

0' 100' 200' 400'

SCALE: 1" = 200'-0"

N

REZONE

DATE: OCTOBER 15, 2024 ORB #: 23-202

A1.00

CONTEXT PLAN

13-ZN-2020#2
10/24/2024

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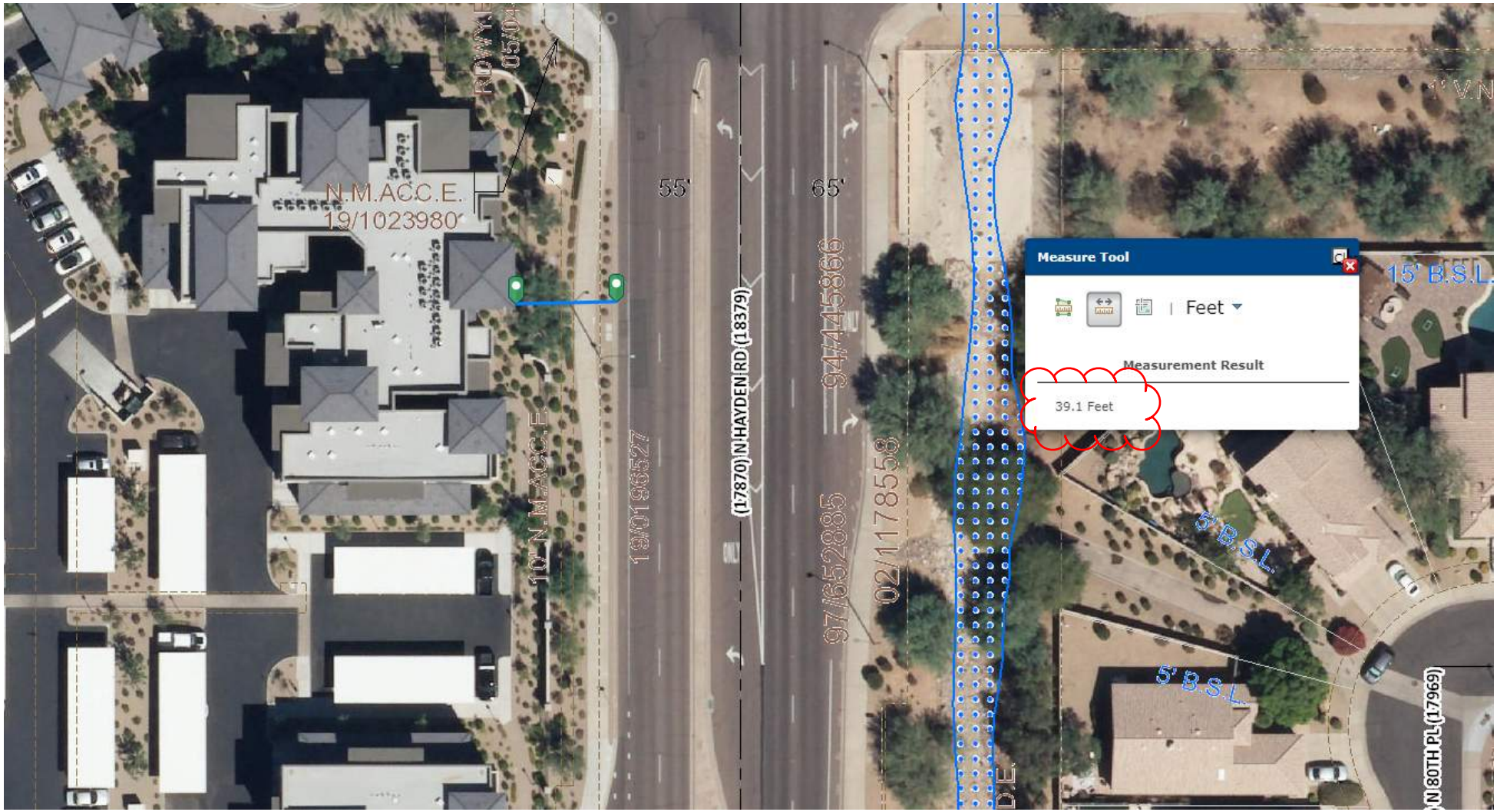


1

LOT 1A OF CAVASSON
APN:212-34-959A
18700 N HAYDEN RD

Note: Approximate dimensions taken from Right of Way to building or site perimeter wall. Accuracy is limited to current City of Scottsdale Parcel information.

13-ZN-2020#2
10/24/2024



2

HAYDEN PRINCESS, LLC
APN:215-07-016F
17900 N HAYDEN RD

Note: Approximate dimensions taken from Right of Way to building or site perimeter wall. Accuracy is limited to current City of Scottsdale Parcel information.

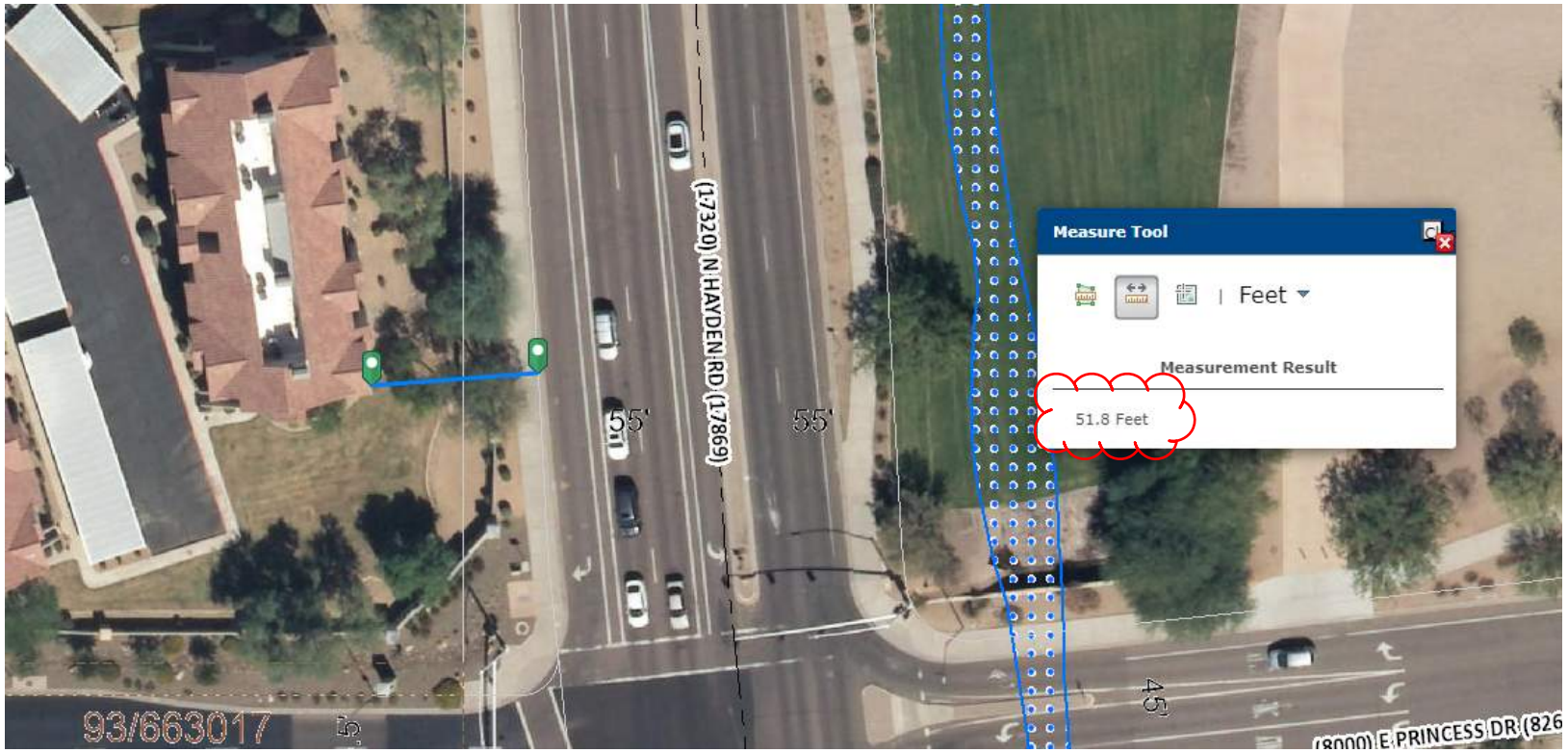


3

SCOTTSDALE STONEBROOK II
17762 N 80 PL

Note: Approximate dimensions taken from Right of Way to building or site perimeter wall. Accuracy is limited to current City of Scottsdale Parcel information.





4 | 5

SCOTTSDALE PINNACLE CONDOMINUM
APN:215-08-759
17700 N HAYDEN RD

Note: Approximate dimensions taken from Right of Way to building or site perimeter wall. Accuracy is limited to current City of Scottsdale Parcel information.

13-ZN-2020#2
10/24/2024

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CAMPUS AREA & OPEN SPACE PROVIDED

RESIDENTIAL (PCP/AMU-R)

PARKING LOT + PARKING LOT LANDSCAPE (15% MIN.)
211,824.00 SQ. FT. TOTAL

C — COMMERCIAL SPACES IN FRONTAL AREAS

OPEN SPACE OTHER THAN FRONTAGE OPEN SPACE
415,673 SQ. FT. TOTAL

FRONTAGE OPEN SPACE
164,957 SQ. FT. TOTAL

ENHANCED LANDSCAPE
57,273 SQ. FT. TOTAL

COURTYARD OPEN SPACE
252,198 SQ. FT. TOTAL

TOTAL OPEN SPACE PROVIDED:
890,101 SQ. FT.

AXON HQ SITE (I-1)

PARKING LOT / PARKING LOT LANDSCAPE
398,906 SF SQ. FT. TOTAL

OPEN SPACE
456,270 SQ. FT. TOTAL PROVIDED

REQUIRED OPEN SPACE CALCULATIONS

REQUIRED OPEN SPACE:

AXON HQ (I-1):
LIGHT INDUSTRIAL REQUIRED OPEN SPACE:

SITE NET AREA:	988,548 SQ. FT.
FIRST FLOOR (16 FT.) 10% OF NET AREA:	98,854 SQ. FT.
EVERY ADDITIONAL 10' AFTER 96' - 16' = 80' NET AREA x 0.04 (4%)	316,335 SQ. FT.
TOTAL REQUIRED OPEN SPACE:	**415,189 SQ. FT.**

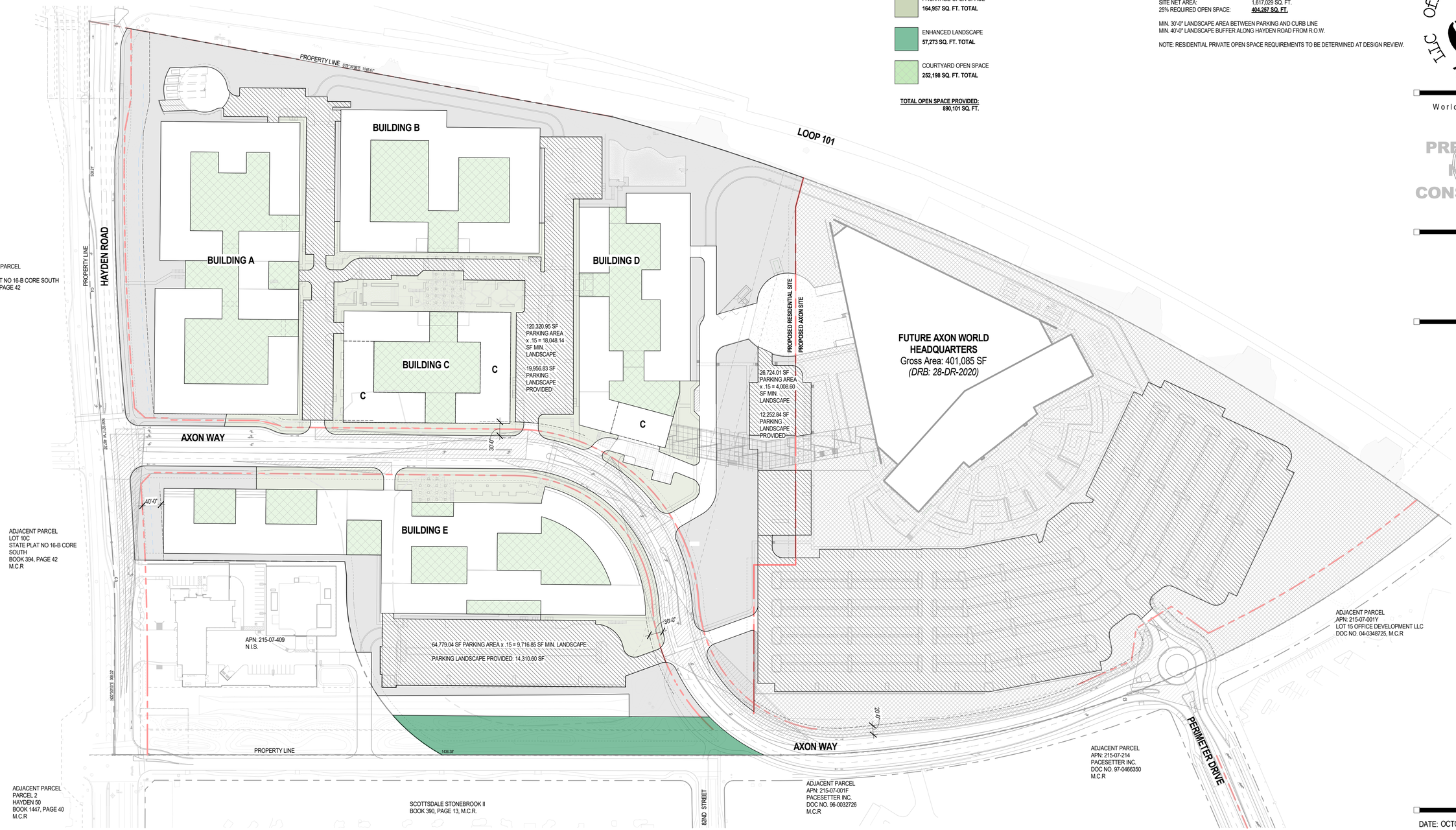
MIN. 20'-0" LANDSCAPE AREA FROM STREETLINE

RESIDENTIAL (PCP-AMU-R):

SITE NET AREA:	1,617,029 SQ. FT.
25% REQUIRED OPEN SPACE:	**404,257 SQ. FT.**

MIN. 30'-0" LANDSCAPE AREA BETWEEN PARKING AND CURB LINE
MIN. 40'-0" LANDSCAPE BUFFER ALONG HAYDEN ROAD FROM R.O.W.

NOTE: RESIDENTIAL PRIVATE OPEN SPACE REQUIREMENTS TO BE DETERMINED AT DESIGN REVIEW.



1 CONCEPTUAL OPEN SPACE PLAN
0' 50' 100' 200'
SCALE: 1" = 100'-0"

AXON WAY & HAYDEN ROAD

NE CORNER OF N. HAYDEN RD AND AXON WAY
SCOTTSDALE, ARIZONA 85255

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AXON

REZONE

DATE: OCTOBER 15, 2024 ORB #: 23-202

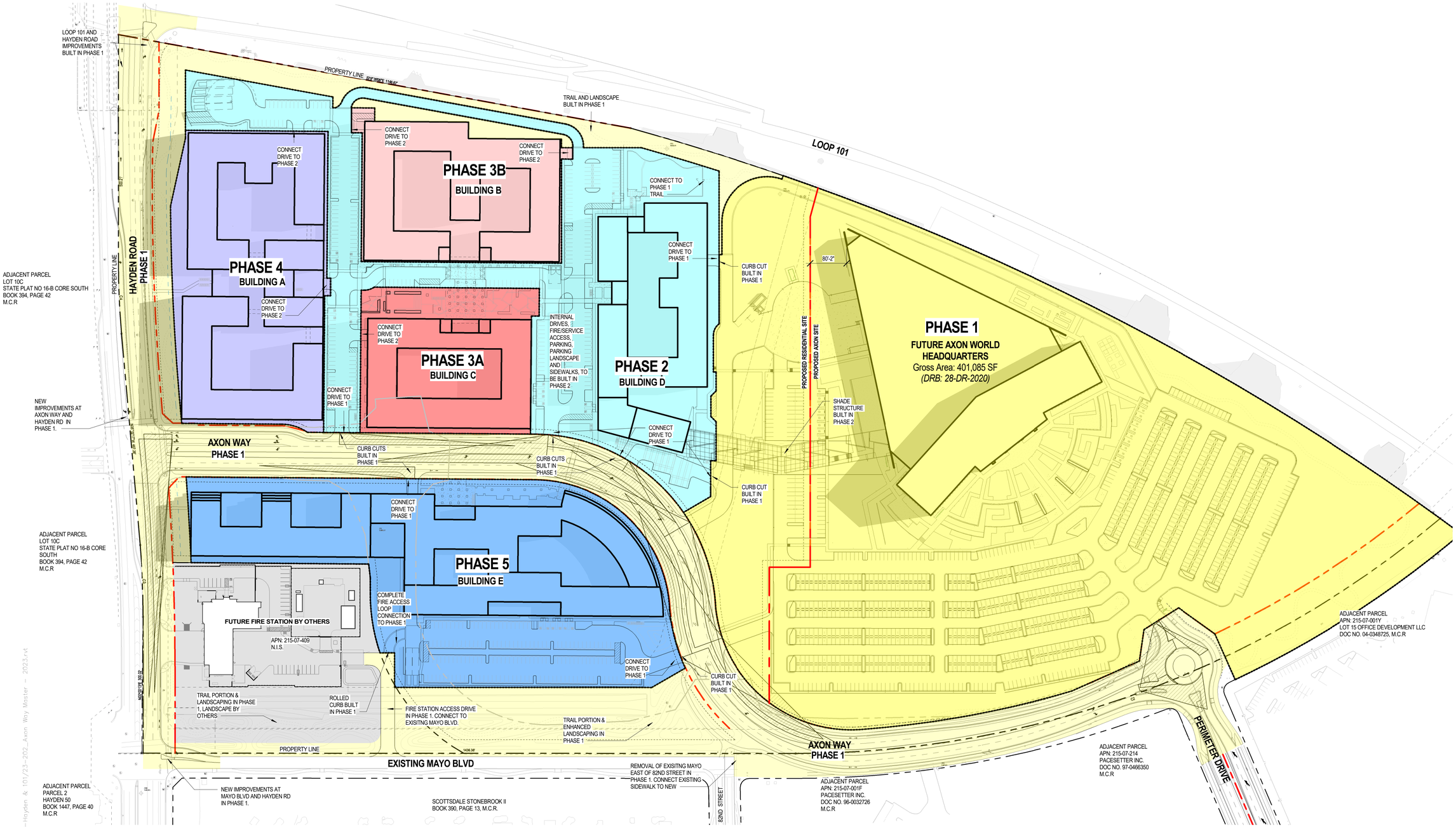
A1.16

OPEN SPACE PLAN

13-ZN-2020#2
10/24/2024

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1 CONCEPTUAL PHASING PLAN

SCALE: 1" = 100'-0"

AXON WAY & HAYDEN ROAD

NE CORNER OF N. HAYDEN RD AND AXON WAY
SCOTTSDALE, ARIZONA 85255

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CONCEPTUAL PHASING PLAN

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LOADING ZONE CALCULATIONS

RESIDENTIAL:

BUILDING A:
717 Dwelling Units = 3 Loading Zones Required
(2) 12x45 - Offstreet
(1) 10x18 - Offstreet*
(1) 12x45 - Offstreet Shared w/ Building B & C

BUILDING B:
390 Dwelling Units = 2 Loading Zones Required
(1) 12x45 - Offstreet
(1) 10x18 - Offstreet*
(1) 12x45 - Offstreet Shared w/ Building B & C

BUILDING C:
231 Dwelling Units = 2 Loading Zones Required
(1) 12x45 - Offstreet Shared w/ Building D
(1) 10x18 - Offstreet*
(1) 12x45 - Offstreet Shared w/ Building B & C

BUILDING D (HOTEL):
435 Units = 2 Loading Zones Required
(1) 12x45 - Offstreet
(1) 12x45 - Offstreet Shared w/ Building C

BUILDING E:
627 Dwelling Units = 3 Loading Zones Required
(2) 12x45 - Offstreet
(1) 10x18 - Offstreet*

*Proposed (1) 10'x18' Loading Maximum per Building

COMMERCIAL:

BUILDING C:
49,486 SF = 1 Loading Zone Required
(1) 12X65 - Offstreet shared with Building D

BUILDING D:
8,529 SF = 1 Loading Zone Required
(1) 12X65 - Offstreet shared with Building C

ACCESSIBILITY NOTES

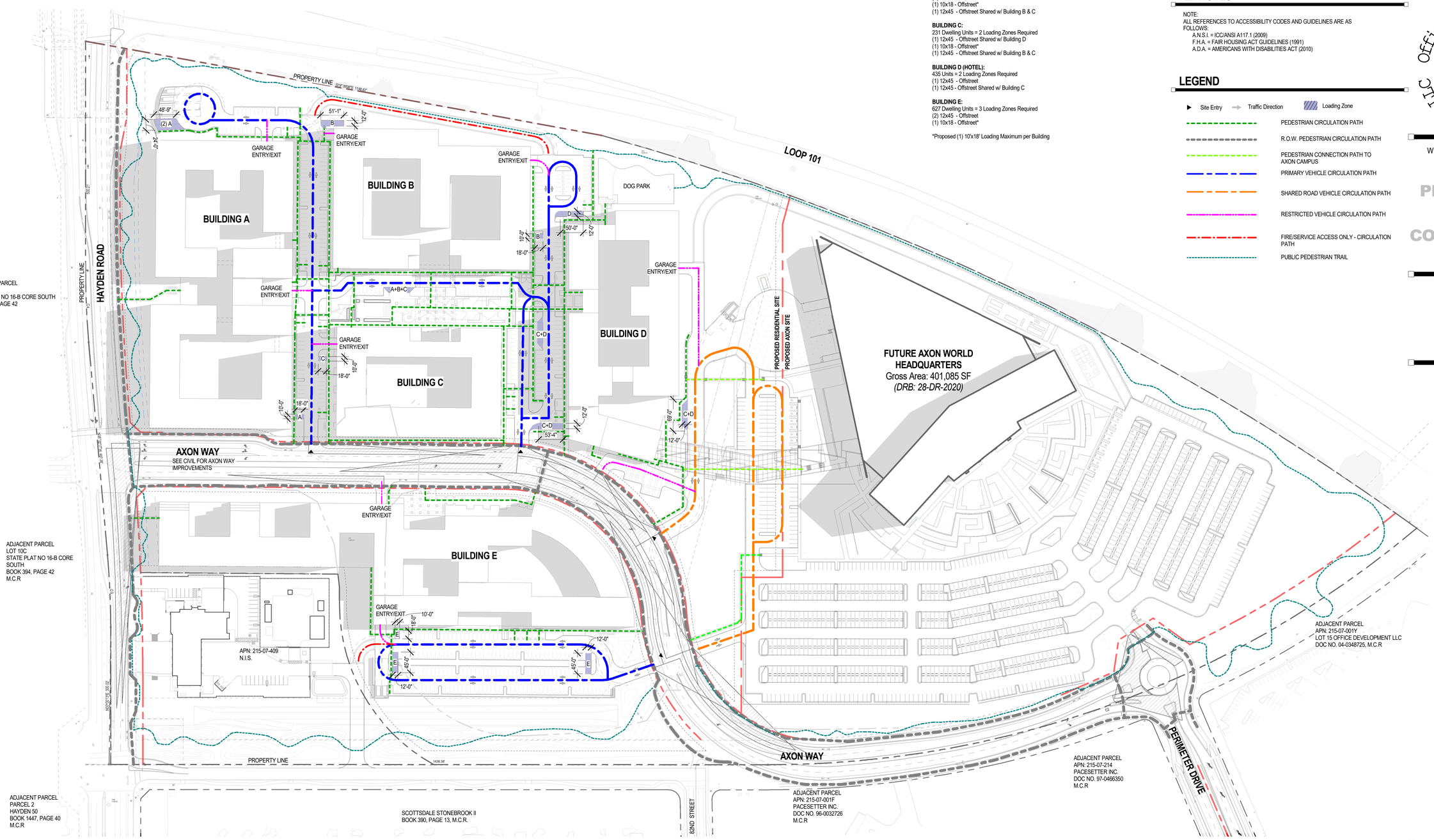
1. CONTRACTOR SHALL OBTAIN A COPY OF THE FAIR HOUSING ACT DESIGN MANUAL AND ICC/A.N.S.I. A117.1-2009 FOR ON SITE REFERENCE.
2. ALL SIDEWALKS PART OF THE ACCESSIBLE ROUTE SHALL BE ACCESSIBLE PER A.N.S.I. SECTION CHAPTER 4. THE RUNNING SLOPE OF WALKING SURFACES SHALL NOT BE STEEPER THAN 1:20 (5%). THE CROSS SLOPE OF A WALKING SURFACE SHALL NOT BE STEEPER THAN 1:48 (2%). THE CLEAR WIDTH OF ALL SIDEWALKS SHALL BE NO LESS THAN 36". COORDINATE ALL GRADES TO COMPLY WITH SLOPE AND CROSS SLOPE REQUIREMENTS.

KEYNOTES

NOTE:
ALL REFERENCES TO ACCESSIBILITY CODES AND GUIDELINES ARE AS FOLLOWS:
A.N.S.I. = ICC/ANSI A117.1 (2009)
F.H.A. = FAIR HOUSING ACT GUIDELINES (1991)
A.D.A. = AMERICANS WITH DISABILITIES ACT (2010)

LEGEND

- Site Entry
- Traffic Direction
- Loading Zone
- PEDESTRIAN CIRCULATION PATH
- R.O.W. PEDESTRIAN CIRCULATION PATH
- PEDESTRIAN CONNECTION PATH TO AXON CAMPUS
- PRIMARY VEHICLE CIRCULATION PATH
- SHARED ROAD VEHICLE CIRCULATION PATH
- RESTRICTED VEHICLE CIRCULATION PATH
- FIRE/SERVICE ACCESS ONLY - CIRCULATION PATH
- PUBLIC PEDESTRIAN TRAIL



1 PEDESTRIAN & VEHICULAR PLAN
SCALE: 1" = 100'-0"

AXON WAY & HAYDEN ROAD

NE CORNER OF N. HAYDEN RD AND AXON WAY
SCOTTSDALE, ARIZONA 85255

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STATE OF ARIZONA
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REZONE

DATE: OCTOBER 15, 2024 ORB #: 23-202

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PEDESTRIAN AND VEHICULAR PLAN

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10/24/2024

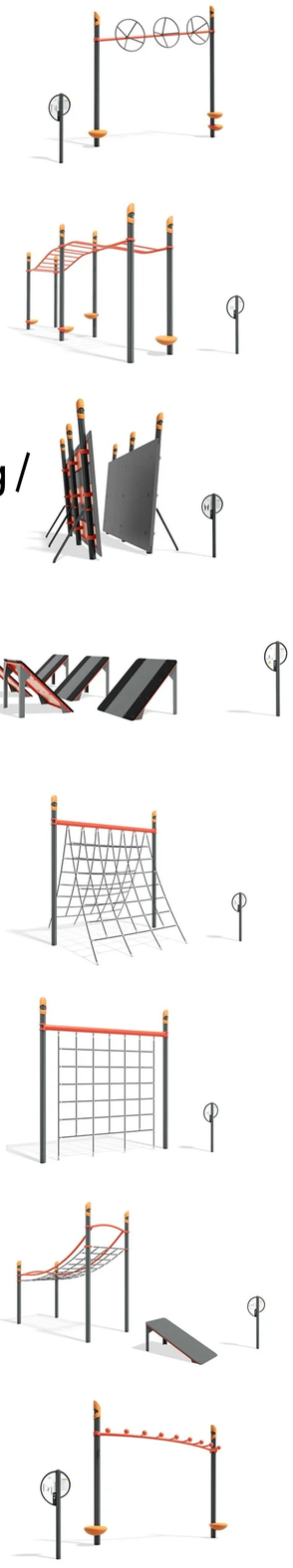
Autodesk Docs://23-202 CH-Hayden & 101/23-202_Axon Way Master - 2023.rvt

LEGEND

- 6′ sidewalk
- 8′ sidewalk
- 10′ sidewalk
- * 6′ trail (1mi.±)
- 6′ combined trail/sidewalk
- pedestrian crosswalk
- pedestrian mall
- AXON world headquarters planned pedestrian circulation
- * fitness station
- covered pedestrian gathering/ coffee connection

* EXACT LOCATION(S) & EQUIPMENT TO BE FINALIZED WITH PLAN IMPROVEMENTS

CONCEPTUAL FITNESS EQUIPMENT



LOOP 101

N. HAYDEN ROAD

BUILDING A

BUILDING B

BUILDING C

BUILDING D

BUILDING E

DOG PARK

PROPERTY LINE

FUTURE AXON WORLD HEADQUARTERS

AXON WAY

FUTURE FIRE STATION

ENHANCED LANDSCAPE BUFFER

EXISTING SINGLE FAMILY RESIDENCES

NORTH

0 80 160 240

SCALE: 1" = 80'-0"

AXON

PEDESTRIAN CIRCULATION PLAN

collectiV landscape architects

13-ZN-2020#2
10/24/2024

AXON MULTI-USE CAMPUS

TRAFFIC IMPACT AND MITIGATION ANALYSIS

October 2024

CivTech Project No. 21-0551

South of State Route Loop 101/Pima Freeway East of Hayden Road
[Crossroads East Parcel P-13]

Prepared for:
Axon Enterprise, Inc.
c/o Huellmantel & Affiliates
605 South Ash Avenue
Tempe, Arizona 85281

For Submittal to:
City of Scottsdale

10605 North Hayden Road, Suite 140 • Scottsdale, Arizona 85260 • 480.659.4250

CivTech

13-ZN-2020#2
10/24/2024

AXON WORLD HEADQUARTERS CAMPUS, PHASE 2
TRAFFIC IMPACT AND MITIGATION ANALYSIS

SOUTH OF STATE ROUTE LOOP 101/PIMA FREEWAY
EAST OF HAYDEN ROAD

Prepared for:

Axon Enterprise, Inc.
c/o Huellmantel & Affiliates
P.O. Box 1833
Tempe, Arizona 85280

For Submittal to:

City of Scottsdale Arizona Department of Transportation

Prepared by:

CivTech Inc.
10605 North Hayden Road, Suite 140
Scottsdale, Arizona 85260

Office: 480-659-4250
Fax: 480-659-0566
info@civtech.com



October 2024
CIVTECH PROJECT NO. 21-0551

13-ZN-2020#2
10/24/2024

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EXECUTIVE SUMMARY

Axon Enterprise, Inc. ("Axon") is proposing to build a World Headquarters Campus which will include a 435-key hotel and a 1,965-dwelling unit (DU) three- to five-story (i.e., mid-rise) multifamily residential community with a total of 49,486 square feet (SF) of ground-floor commercial uses. The current Project is Phase 2 (or the remaining phases) of the development of the full campus site. Phase 2 will complement Phase 1, which is the 401,085 SF Axon office building. Phase 1 has already received all the necessary entitlement approvals from the City of Scottsdale. The World Headquarters Campus consists of three individual Maricopa County Assessor numbered parcels and 10.03 acres of City roadway right of way that total 73.57 acres. The approved Phase 1 is approximately 25 acres and the proposed Phase 2 is approximately 44 acres with the remaining land in the original 73.57 acres dedicated to the City of Scottsdale for rights-of-way and a Civic Use Site.

The former Mayo Boulevard east of Hayden Road was renamed Axon Way; when built, it will be realigned west of Perimeter Drive such that it intersects Hayden Road across from Mayo Boulevard. This realignment will result in the existing Union Hills Drive roadway segment between 82nd Street and Perimeter Drive being removed, to allow only vehicles coming from southern residential neighborhood to utilize the existing Union Hills Drive. A review of County Assessor maps shows that the right-of-way (ROW) for a prior expected realignment had been dedicated by Axon; after review of CivTech's several versions of this TIMA and discussions between the City and Axon, the alignment will be revised and any and all changes will be formally addressed via a new plat. Primary access to the site will be via the (future) signalized intersection of Hayden Road and Mayo Boulevard/Axon Way and five (5) internal stop-controlled driveways along Axon Way.

The following conclusions and recommendations have been documented in this study:

GENERAL

- As currently proposed, Phase 2 of the Axon campus is anticipated to generate 14,082 trips on a typical weekday with 1,076 trips (302 in/774 out) generated during the AM peak hour and 1,127 trips (651 in/476 out) generated during the PM peak hour before any reductions are taken. Net of reductions for internal capture or interaction, Phase 2 is expected to generate 11,794 trips on a typical weekday with 950 trips (252 in/698 out) generated during the AM peak hour and 897 trips (530 in/367 out) generated during the PM peak hour.

EXISTING (2023)

- The results of the existing conditions analysis indicate that most study intersections and individual approaches operate with *overall* acceptable levels of service (LOS D or better). The analysis indicates that several individual approaches already operate at less than LOS D at the following intersections: **Hayden Road & Loop 101 EB Ramps**, **Hayden Road & Loop 101 WB Ramps**, **Hayden Road & Legacy Boulevard**, **Loop 101 SB Ramps & Princess Drive/Pima Road**, and **Loop 101 NB Ramps & Pima Road**. (Details are provided in the text.)

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FUTURE CONDITIONS (2025 & 2030)

- **With Axon's proposed mitigations, all intersections are expected to operate with overall acceptable levels of services LOS D or better**.

- The results of the Synchro analysis reveal that—exclusive of the **Loop 101 SB Ramps & Princess Drive/Pima Road** intersection—the study intersections could be expected generally to operate at acceptable overall levels of service (LOS D or better). Several individual *approaches* are expected to operate at LOS E or F at five of the study intersections: **Hayden Road & Axon Way/Mayo Boulevard, Hayden Road & Loop 101 Interchange, 82nd Street & Princess Drive, Loop 101 Interchange & Princess Drive/Pima Road,** and **Hayden Road & Mayo Boulevard/Union Hills Drive**. Mitigations applied to the 2025 Build scenario were applied to the 2030 Build scenario at the intersections of **Hayden Road & Axon Way/Mayo Boulevard** and **Hayden Road & Loop 101 Interchange**.

- *Hayden Road and Mayo Boulevard/Axon Way*. In the 2025 Build scenario, *using the same signal timing CivTech assumed for the background/no-build condition,* the signalized intersection of **Hayden Road and Mayo Boulevard/Axon Way** is expected to operate with an overall intersection delay of 110.1 sec/veh (LOS F) in the southbound approach during the PM peak hour.

  - To mitigate the delay in 2025, it is recommended that a dual southbound left-turn lane be added and signal timing be adjusted to increase green time in the northbound and southbound approaches. With these mitigations in place, the intersection is expected to operate with acceptable levels of service. With these same mitigations, the 2030 analysis produces similarly acceptable results, requiring no further mitigations.

  - A dual northbound left-turn lane and dual eastbound left-turn lane were added at the intersection in both the 2030 No Build and Build scenarios, as recommended in the *Banner Scottsdale Medical Center TIMA.*

- *82nd Street and Princess Drive*. In the 2030 No Build scenario, the unsignalized intersection of **82nd Street and Princess Drive** is expected to operate with an overall intersection LOS A; however, there is expected delay in the southbound left-turn movement of 38.4 sec/veh (LOS E) during the PM peak hour. In the 2030 Build scenario, although the overall intersection operates with LOS A, the intersection is expected to operate with a delay in the southbound left-turn movement of 41.0 sec/veh (LOS E) during the PM peak hour.

  - It is not uncommon for low-volume stop-controlled driveways onto higher volume major roads to experience higher delays for brief periods during peak hours. Additionally, 1) the intersection is located between two other signalized study intersections, which provide regular gaps in the traffic stream that would allow outbound/southbound movements onto Princess Drive, 2) there will be no site-generated traffic on 82nd Street, and 3) the installation of a signal at this intersection with a cycle of 120 seconds would (mathematically) very likely result in an average delay of greater than the calculated average delay 39.7 sec/veh for southbound vehicles; therefore, no mitigation is recommended.

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- *Hayden Road and Loop 101*. In the 2025 No Build scenario, the signalized intersection of **Hayden Road and Loop 101 EB Ramps** is expected to operate with an overall intersection delay of 103.2 sec/veh (LOS F) and 92.8 sec/veh (LOS F) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 171.7 sec/veh (LOS F) during the PM peak hour. The eastbound approach is expected to operate with a delay of 210.3 sec/veh (LOS F) and 87.6 sec/veh (LOS F) during the AM and PM peak hours, respectively.

- In the 2025 Build scenario, the intersection is expected to operate with an overall intersection delay of 112.4 sec/veh (LOS F) and 119.1 sec/veh (LOS F) during the AM and PM peak hours, respectively. The eastbound approach is expected to operate with a delay of 250.6 sec/veh (LOS F) and 185.3 sec/veh (LOS F) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 175.0 sec/veh (LOS F) during the PM peak hour.

  - To mitigate the delay at the interchange in 2025, CivTech recommends adjusting the signal timing by increasing the green time in the eastbound and westbound approaches and adjust the phasing to have southbound approach lead and northbound approach lag. This signal timing adjustment will result in an unchanged cycle length of 120 seconds. With these mitigations in place, the interchange is expected to operate with acceptable overall intersection levels of service, as well as levels of service better than that of the No Build scenario.

- In the 2025 No Build scenario, the signalized intersection of **Hayden Road and Loop 101 WB Ramps** is expected to operate with an overall intersection delay of 90.5 sec/veh (LOS F) and 159.6 sec/veh (LOS F) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with delay of 87.0 sec/veh (LOS F) and 98.0 sec/veh (LOS F) during the AM and PM peak hours, respectively. The northbound approach is expected to operate with a delay of 122.2 sec/veh (LOS F) and 258.3 sec/veh (LOS F) during the AM and PM peak hours, respectively.

- In the 2025 Build scenario, the intersection is expected to operate with an overall intersection delay of 211.7 sec/veh (LOS F) and 203.7 sec/veh (LOS F) during the AM and PM peak hours, respectively. The northbound approach is expected to operate with a delay of 409.8 sec/veh (LOS F) and 354.1 sec/veh (LOS F) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 86.0 sec/veh (LOS F) and 97.6 sec/veh (LOS F) during the AM and PM peak hours, respectively.

  - To mitigate the delay at the interchange in 2025, CivTech recommends adjusting the signal timing by increasing the green time in the eastbound and westbound approaches and adjust the phasing to have southbound approach lead and northbound approach lag. This signal timing adjustment will result in an unchanged cycle length of 120 seconds. With these mitigations in place, the interchange is expected to operate with acceptable overall intersection levels of service, as well as levels of service better than that of the No Build scenario.

- In the 2030 No Build scenario, the signalized intersection of **Hayden Road and Loop 101 EB Ramps** is expected to operate with an overall intersection delay of 134.3 sec/veh (LOS F) and 114.9 sec/veh (LOS F) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 189.1 sec/veh (LOS F) during the PM peak hour. The

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eastbound approach is expected to operate with a delay of 281.6 sec/veh (LOS F) and 149.2 sec/veh (LOS F) during the AM and PM peak hours, respectively.

- In the 2030 Build scenario, the intersection is expected to operate with an overall intersection delay of 76.0 sec/veh (LOS E) and 61.7 sec/veh (LOS E) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 97.5 sec/veh (LOS F) and 119.5 sec/veh (LOS F) during the AM and PM peak hours, respectively. The eastbound approach is expected to operate with a delay of 98.1 sec/veh (LOS F) during the AM peak hour.
  - To mitigate the delay at the interchange in 2030, CivTech recommends restriping the eastbound shared left/through/right-turn lane as a shared left-turn/through lane, restriping the westbound shared left-turn/through lane as an exclusive left-turn lane, adding an eastbound right-turn lane, adding a shared northbound through/right-turn lane, adding a northbound through lane, and adding a southbound through/right-turn lane. Additionally, it is recommended that signal timing be adjusted to increase green time in the northbound and southbound approaches during the PM peak hour, resulting in an unchanged cycle length of 120 seconds. With these mitigations in place, the interchange is expected to operate with overall acceptable levels of service and improved levels of service than that in the No Build scenario.

- In the 2030 No Build scenario, the signalized intersection of **Hayden Road and Loop 101 WB Ramps** is expected to operate with overall intersection delays of 114.8 sec/veh (LOS F) and 212.3 sec/veh (LOS F) during the AM and PM peak hours, respectively. The northbound approach is expected to operate with a delay of 182.7 sec/veh (LOS F) and 367.9 sec/veh (LOS F) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with delay of 87.1 sec/veh (LOS F) and 100.3 sec/veh (LOS F) during the AM and PM peak hours, respectively. The westbound approach is expected to operate with a delay of 65.6 sec/veh (LOS E) during the AM peak hour.

- In the 2030 Build scenario, the signalized intersection of **Hayden Road and Loop 101 WB Ramps** is expected to operate with overall intersection delays of 76.0 sec/veh (LOS E) and 61.7 sec/veh (LOS E) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with delays of 97.5 sec/veh (LOS F) and 119.5 sec/veh (LOS F) during the AM and PM peak hours, respectively. The eastbound approach is expected to operate with a delay of 98.1 sec/veh (LOS F) during the AM peak hour.
  - To mitigate the delay at the interchange in 2030, CivTech recommends restriping the eastbound shared left/through/right-turn lane as a shared left-turn/through lane, restriping the westbound shared left-turn/through lane as an exclusive left-turn lane, adding an eastbound right-turn lane, adding a shared northbound through/right-turn lane, adding a northbound through lane, and adding a southbound through/right-turn lane. Additionally, it is recommended that signal timing be adjusted to increase green time in the northbound and southbound approaches during the PM peak hour, resulting in an unchanged cycle length of 120 seconds. With these mitigations in place, the interchange is expected to operate with overall acceptable levels of service and improved levels of service than that in the No Build scenario.

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CivTech has discussed this proposed mitigation with ADOT representatives, who indicated support for this scenario based on its improvement to the Level of Service.

- Signal timing adjustments at this interchange for the Existing, 2025 Opening Year and 2030 Horizon Year are shown in the table below. With these mitigations in place, the peak hour delays at the intersection in the 2025 Build scenarios are expected to be similar to those in the corresponding No Build scenarios.

TABLE – APPLIED SIGNAL TIMING CHANGES
Hayden Road & Loop 101 Interchange (Times in Seconds)

Scenario	Phase 1 NB LT	Phase 2 SB Th	Phase 3 WB	Phase 5 SB LT	Phase 6 NB Th	Phase 7 EB
Existing AM	20	45	25	30	35	30
2025 AM Total	45	31	44	30	46	44
2030 AM Total	45	31	44	30	46	44
Existing PM	32	33	35	20	47	18
2025 PM Total	45	30	31	25	50	45
2030 PM Total	63	30	27	26	67	27

- *Loop 101 and Princess Drive/Pima Road*. The interchange of **Loop 101 and Princess Drive/Pima Road** is expected to operate with delays in both the 2025 and 2030 No Build and Build scenarios.

  - Southbound Ramps. In the 2025 No Build scenario, the signalized intersection of **Loop 101 SB Ramps & Princess Drive/Pima Road** is expected to operate with an overall intersection delay of 77.2 sec/veh (LOS E) and 55.9 sec/veh (LOS E) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 161.7 sec/veh (LOS F) during the AM peak hour and the westbound approach is expected to operate with a delay of 67.2 sec/veh (LOS E) during the PM peak hours. The eastbound approach is expected to operate with a delay of 70.2 sec/veh (LOS E) and 61.1 sec/veh (LOS E) during the AM and PM peak hours, respectively.

    In the 2025 Build scenario, the intersection is expected to operate with an overall intersection delay of 75.3 sec/veh (LOS E) during the AM peak hour. The southbound approach is expected to operate with a delay of 161.7 sec/veh (LOS F) during the AM peak hour and the westbound approach is expected to operate with a delay of 65.7 sec/veh (LOS E) during the PM peak hours. The eastbound approach is expected to operate with a delay of 57.7 sec/veh (LOS E) and 57.9 sec/veh (LOS E) during the AM and PM peak hours, respectively.

    In the 2030 No Build scenario, the signalized intersection of **Loop 101 SB Ramps & Princess Drive/Pima Road** is expected to operate with an overall intersection delay of 85.4 sec/veh (LOS F) and 60.7 sec/veh (LOS E) during the AM and PM peak hours, respectively. The eastbound approach is expected to operate with a delay of 68.5 sec/veh (LOS E) and 58.8 sec/veh (LOS E) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 184.7 sec/veh (LOS F) in the AM peak hour and the westbound approach is expected to operate with a delay of 81.0 sec/veh (LOS F) during the PM peak hour.

In the 2030 Build scenario, the intersection of **Loop 101 SB Ramps & Princess Drive/Pima Road** is expected to operate with an overall intersection delay of 81.0 sec/veh (LOS F) and 60.5 sec/veh (LOS E) during the AM and PM peak hours, respectively. During the AM peak hour, the southbound approach is expected to operate with a delay of 184.7 sec/veh (LOS F). During the PM peak hour, the eastbound and westbound approaches are expected to operate with delays of 56.9 sec/veh (LOS E) and 81.7 sec/veh (LOS F) during the AM and PM peak hours, respectively.

- Northbound Ramps. In the 2025 No Build scenario, the signalized intersection of **Loop 101 NB Ramps & Princess Drive/Pima Road** is expected to operate with a delay in the eastbound approach of 81.7 sec/veh (LOS F) during the AM peak hour. In the 2025 Build scenario, the intersection is expected to operate with a delay in the eastbound approach of 81.8 sec/veh (LOS F) during the AM peak hour.

  In the 2030 No Build scenario, the signalized intersection of **Loop 101 NB Ramps & Princess Drive/Pima Road** is expected to operate with a delay in the eastbound approach of 96.1 sec/veh (LOS F) and a delay in the northbound approach of 57.0 sec/veh (LOS E) during the AM peak hour. In the 2030 Build scenario, the intersection is expected to operate with a delay in the northbound and eastbound approach of 59.8 sec/veh (LOS E) and 96.2 sec/veh (LOS F), respectively, during the AM peak hour.

  - No mitigation is recommended that this interchange, as the interchange is expected to operate with similar delays and levels of service in both the No Build and Build scenarios.

TURN LANE WARRANTS

- Based on City criteria, a dedicated eastbound right-turn lane is warranted at Access B, but is not recommended, as the intersection is expected to operate with LOS A without the dedicated right-turn lane.

- Based on City criteria, left-turn lanes are not warranted at Access C, Access E, nor Access F, but are recommended, as Axon Way is a divided roadway.

QUEUE STORAGE

- The queue storage analysis reveals that most existing turn lanes will provide adequate queue storage capacity based on expected 2030 peak hour turning movement volumes.

PROPOSED IMPROVEMENTS

The following improvements are recommended with the addition of the proposed development:

- The intersection of **Hayden Road & Mayo Boulevard/Axon Way** be reconstructed as a four-legged signalized intersection. The addition of the following lanes is recommended: northbound right-turn, dual southbound left-turn, westbound left-turn, westbound shared through/right-turn and westbound right-turn lane.

- The stop-controlled intersection of **82nd Street & Axon Way** be reconstructed by removing the planned east leg that would have otherwise shared campus access with the neighborhood.

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- The stop-controlled intersection of **Perimeter Drive & Axon Way** be reconstructed as a three-legged roundabout with a shared left-turn/through lane in the northbound approach, a shared through/right-turn lane in the southbound approach and an exclusive left-turn lane and dedicated right-turn lane in the eastbound approach.

- To mitigate the delay at the interchange of **Hayden Road & Loop 101**, CivTech recommends restriping the eastbound shared left/through/right-turn lane as a shared left-turn/through lane, adding an eastbound right-turn lane, adding a shared northbound through/right-turn lane, adding a shared southbound through/right-turn lane, and restriping the westbound approach to have dual left-turn lanes, a shared through/right-turn lane, and a right-turn lane.

- The intersection of **Access A & Axon Way** be constructed as a three-legged restricted RI/RO intersection with stop-control in the southbound approach. The southbound approach will consist of a dedicated right-turn lane. The eastbound approach will consist of two through lanes and the westbound approach will consists of one through lane and one shared through/right-turn lane.

- The intersection of **Access B & Axon Way** be constructed as a three-legged restricted RI/RO intersection with stop-control in the northbound approach. The northbound approach will consist of a dedicated right-turn lane. The eastbound approach will consist of one through lane and one shared through/right-turn lane and the westbound approach will consist of two through lanes.

- The intersection of **Access C & Axon Way** be constructed as a three-legged intersection with stop-control in the southbound approach. The southbound approach will each consist of a shared left/right-turn lane. The eastbound approach will consist of a left-turn lane and two through lanes. The westbound approach will consist of a through lane and a shared through/right-turn lane.

- The intersection of **Access D & Axon Way** be constructed as a three-legged intersection with stop-control in the southbound approach. The southbound approach will consist of a dedicated right-turn lane. The eastbound and westbound will each consist of two through lanes.

- The intersection of **Axon Way & Access E** be constructed as a three-legged intersection with stop-control in the westbound approach. The northbound approach will consist of one through lane and one shared through/right-turn lane. The southbound approach will consist of one left-turn lane and two through lanes. The westbound approach will consist of one shared left/right-turn lane.

- The intersection of **Axon Way & Access F** be constructed as a four-legged intersection with stop-control in the eastbound and westbound approaches. The northbound and southbound approaches will each consist of one left-turn lane, one through lane and one shared through/right-turn lane. The eastbound and westbound approaches will each consist of one shared left/through/right-turn lane.

- The intersection of **Hayden Road & Mayo Boulevard/Union Hills Drive** will be reconstructed as a RI/RO/LI on the east leg. A porkchop will be constructed on the east leg to prevent westbound left-turn movements.

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INTRODUCTION

Axon Enterprise, Inc. ("Axon") is proposing to build a World Headquarters Campus which will include a 435-key hotel and a 1,965-dwelling unit (DU) three- to five-story (i.e., mid-rise) multifamily residential community with a total of 49,486 square feet (SF) of ground-floor commercial uses. The current Project is Phase 2 (or the remaining phases) of the development of the full campus site. Phase 2 will complement Phase 1, which is the 401,085 SF Axon office building. Phase 1 has already received all the necessary entitlement approvals from the City of Scottsdale. The World Headquarters Campus consists of three individual Maricopa County Assessor numbered parcels and 10.03 acres of City roadway right of way that total 73.57 acres. The approved Phase 1 is approximately 25 acres and the proposed Phase 2 is approximately 44 acres with the remaining land in the original 73.57 acres dedicated to the City of Scottsdale for rights-of-way and a Civic Use Site.

Primary access to the site will be via the (future) signalized intersection of Hayden Road and Axon Way and six (6) internal driveways along Axon Way. A location map is provided in **Figure 1**.

PURPOSE OF REPORT AND STUDY OBJECTIVES

CivTech Inc. was retained in late June 2023 by Axon to perform a Category 2 Traffic Impact and Mitigation Analysis (TIMA) for the proposed Axon campus, the level of study requested by the City of Scottsdale. This version represents a 4th Submittal of a 3rd submittal sealed by CivTech on July 16, 2023. City comments and CivTech responses can be found in **Appendix A**.

Turning movement counts will be recorded and future submittals will address traffic and transportation impacts of the proposed development on the surrounding streets and intersections. The specific objectives of the study will then be as follows:

1. To evaluate lane requirements on all existing and proposed roadways and at all existing and future signalized intersections within the study area and recommend any capacity related improvements.

2. To determine ultimate build-out level of service for all existing and future signalized intersections within the study area and recommend any capacity related improvements.

3. To evaluate the need for future traffic control changes within the proposed study area.

CivTech will analyze major intersections within one-mile of the site and all site driveways.

STUDY REQUIREMENTS

This study analyzes the traffic impact due to the proposed Axon campus on the surrounding street network and has been prepared per the requirements of Section 5-1 (Transportation Impact Study) of the City of Scottsdale's 2018[1] *Design Standards and Polices Manual*.

[1] In 2021, the City issued an update in draft form; it has not yet been adopted. A comparison of the 2018 and 2021 versions as this proposal us being prepared reveals that the primary difference applicable to a Level 3 TIMA would be a requirement to provide copies of the digital files used by CivTech for the analysis, e.g., the Synchro files used for the LOS analysis. Otherwise, there are no differences.

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STUDY AREA

The study area has been identified as the following arterial-to-arterial and arterial-to-collector intersections:

1. Hayden Rd and Axon Wy/Mayo Blvd
2. 82nd St and Mayo Blvd/Union Hills Dr
3. Perimeter Dr and Axon Wy
4. Hayden Rd and Princess Dr
5. Hayden Rd and Loop 101 EB Ramps
6. Hayden Rd and Loop 101 WB Ramps
7. Hayden Rd and Legacy Blvd
8. 82nd St and Princess Dr
9. Perimeter Dr & Princess Dr
10. Loop 101 SB Ramps and Princess Dr/Pima Rd
11. Loop 101 NB Ramps and Princess Dr/Pima Rd
12. Hayden Rd and Mayo Blvd/Union Hills Dr

In addition, CivTech will analyze all proposed accesses to the development.

HORIZON YEARS

The opening year 2025 and a horizon year 2030 are included in this analysis. For purposes of this analysis, it is assumed that the proposed development will be fully built-out by the study year 2025.

HISTORY

In 2011, the Arizona State Land Department engaged CivTech to prepare a traffic study for Crossroads East development (the "Crossroad 2011 Study"). As originally studied, the entire Crossroads East development, located in the northeast corner of Scottsdale Road and Princess Drive, was expected to provide 3,305,943 SF of retail uses, 2,557,669 SF of office space, 3,443 DUs, and 7,775,460 SF of industrial land uses on approximately 882 gross acres. CivTech prepared a follow-up enhanced traffic statement in 2022 (the "Crossroad 2022 Study"). At the time of the Phase 1 study the entire Axon campus site plus the City parcel was designated as "Parcel P-13" of Crossroads East. Since that time land for proposed roadways (as well as the fire station and water treatment facility) were dedicated to the City. It was on this 2022 traffic statement that was included with the application package upon which Phase 1 received its entitlement approvals.

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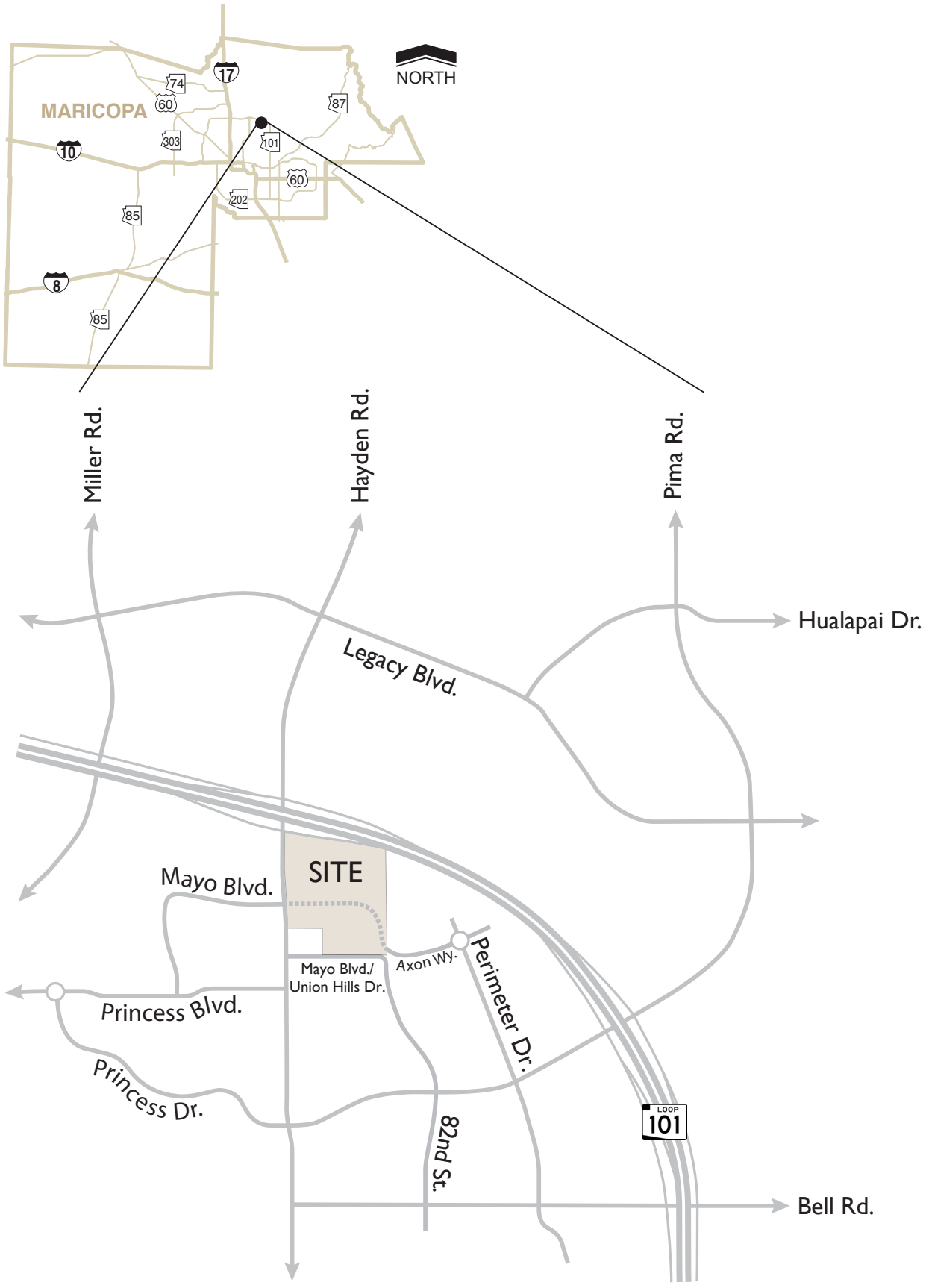


Figure 1: Vicinity Map

EXISTING CONDITIONS

SURROUNDING LAND USE

The Axon site is currently undeveloped land, located north of Axon Way, east of Hayden Road, and south of State Highway Loop 101 (SR 101 or Loop 101), the Pima Freeway.

South of the site (across Axon Way) from west to east are:

- The Scottsdale Stonebrook multifamily residential (R-4 PCD) subdivision between Hayden Road and 82nd Street.
- Three parcels owned by Pacesetter, Inc. and used for the manufacture of medical devices (PCD PCP & I-1 PCD). The largest of the parcels, in the southeast corner of the 82nd Street & Axon Way intersection is developed; the two others, one to its east and the other to its south, are undeveloped and will presumably be used for future expansion of the facility.
- Between Perimeter Drive and Loop 101 at 17851 North 85th Street is a three-story general office building.
- Across Hayden Road to the west are parcels within the Crossroads East area, some of which have been sold and one that remains in the name of the Arizona State Land Department (ASLD). Some consist of high-density multifamily in various stages of completion.

TRANSIT

The closest existing transit routes to the proposed development are Local Routes 72 (Scottsdale Road) and 170 (Bell Road). Route 72 begins just north of Loop 101, connecting Scottsdale Healthcare Drive on the north to the Chandler Fashion Center/Transit Station at its southern terminus. Route 170 provides additional connectivity within the north Scottsdale area and requires just a single transfer to reach alternate destinations. Route 170 provides east-west connectivity along Bell Road and Frank Lloyd Wright Boulevard.

ROADWAY NETWORK

The existing roadway network within the study area includes the following:

Hayden Road is a north-south, four-lane major arterial with a center raised median per the Scottsdale Transportation Action Plan within the vicinity of the proposed site. There is one bike lane in each direction. Hayden Road transitions from Miller Road in the north at Deer Valley Road and transitions to Greenway Hayden Loop in the south at Frank Lloyd Wright Boulevard. Hayden Road provides direct access to the Pima Freeway (Loop 101) and all major east-west arterials within the vicinity of the proposed site. The posted speed limit is 40 mph within the vicinity of the proposed site and 45 mph north of Loop 101.

Axon Way/Mayo Boulevard is an east-west three-lane collector roadway with one (1) lane and one (1) bike lane in each direction of travel and a center two-way left-turn lane (TWLTL) west of Hayden Road. Mayo Boulevard currently begins in the west approximately one-third of a mile west of Hayden Road at 78th Street and terminates in the east at Hayden Road. Mayo Boulevard currently

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is not continuous between Hayden Road and Scottsdale Road. Mayo Boulevard as expected to be extended west and to connect to Scottsdale Road resulting in a continuous Mayo Boulevard to the west, terminating west of Tatum Boulevard. The posted speed limit on Mayo Boulevard west of Hayden Road is 30 mph.

82nd Street is a north-south three-lane collector roadway with a continuous TWLTL and a bike lane in each direction. 82nd Street begins in the north at Mayo Boulevard and extends southerly across Princess Drive and terminates at Bell Road, where it serves as the access for a gated condominium community and a gated apartment complex. The posted speed limit on 82nd Street south of Mayo Boulevard is 30 mph to Princess Drive and 35 mph between Princess Drive and Bell Road.

Perimeter Drive is a north-south, five-lane major collector with a TWLTL per the Scottsdale's Transportation Action Plan within the vicinity of the proposed site. There is one bike lane in each direction. Perimeter Drive begins to the north at Axon Way and terminates approximately 800 feet south of Bell Road. Perimeter Drive provides direct access to Princess Drive and Bell Road. The posted speed limit is 35 mph within the vicinity of the proposed site.

Pima Freeway (Loop 101) is an eight-lane freeway within the vicinity of the study area. The westbound/eastbound on and off ramps and freeway are under the direction and control of the Arizona Department of Transportation (ADOT). The Loop 101 within the vicinity of the study area provides regional access to the Piestewa Freeway (SR 51) to the west, north Phoenix, the City of Scottsdale to the east and the Cities of Tempe, Mesa, and Chandler to the south. The posted speed limit is 65 mph on the freeway.

Loop 101 Eastbound Ramp provides access to the Pima Freeway East. The off-ramp consists of one (1) lane of travel eastbound. The on-ramp consists of two (2) lanes of travel eastbound, leading to a meter ramp and then merges into one (1) lane of travel, prior to merging onto the freeway.

Loop 101 Westbound Ramp provides access to the Pima Freeway West. The off-ramp consists of one (1) lane of travel westbound. The on-ramps consists of three (3) lanes of travel westbound that splits into two (2) lanes that merge onto the freeway and two (2) lanes that merge onto the Loop 101 Frontage Road.

Loop 101 Northbound Ramp provides access to the Pima Freeway North. The off-ramp consists of two (2) lanes of travel northbound that merges with Pima Road and becomes four (4) lanes of travel northbound. The on-ramp consists of two (2) lanes of travel northbound.

Loop 101 Southbound Ramp provides access to the Pima Freeway South. The off-ramp consists of one (1) lane of travel southbound and the on-ramp consists of three (3) lanes of travel southbound that splits into two (2) lanes that merge onto the freeway and two (2) lanes that merge onto Pima Road. The on-ramp is metered.

Legacy Boulevard is an east-west, four-lane minor arterial roadway providing a link between Hayden Road and Scottsdale Road. There is one bike lane in each direction and a center raised median. Currently, Legacy Boulevard begins in the west at Scottsdale Road and terminates in the

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east at Hayden Road. The posted speed limit is 45 mph between Hayden Road and Miller Road and 40 mph between Miller Road and Scottsdale Road.

Princess Drive is an east-west four-lane major collector roadway with a center raised median and a bike lane in each direction. Princess Drive begins in the northwest at Princess Boulevard and extends easterly, transitioning into Pima Road at Loop 101. Princess Drive provides access to Loop 101. The posted speed limit is 35 mph within the vicinity of the proposed site.

Mayo Boulevard/Union Hills Drive is an east-west two-lane minor collector that currently intersects Hayden Road south of Mayo Boulevard, across from the main driveway of the San Artes Apartments. Union Hills Drive currently begins in the west at Hayden Road and extends easterly, terminating at but not intersecting with the Pima Freeway (Loop 101). Union Hills Drive is currently a two-lane roadway with a single lane in each direction. The posted speed limit is 35 mph within the vicinity of the site.

INTERSECTIONS

1. The intersection of ***Hayden Road and Axon Way (formerly Mayo Boulevard)*** is currently a three-legged-intersection under stop control in the eastbound approach. The northbound approach consists of one (1) exclusive left-turn lane, two (2) through lanes and a bike lane. The southbound approach consists of two (2) through lanes, a bike lane and one (1) dedicated right-turn lane. The eastbound approach consists of one (1) exclusive left-turn lane, a bike lane and one (1) dedicated right-turn lane.

2. The intersection of ***82nd Street and Mayo Boulevard/Union Hills Drive*** is a three-legged "T-intersection" (with no southbound approach) under stop control on all approaches. The northbound approach consists of separate left and right-turn lanes and a bike lane. The eastbound approach consists of one (1) shared through and right-turn lane. The westbound approach consists of one (1) shared through and left-turn lane.

3. The intersection of ***Perimeter Drive and Axon Way*** is a three-legged "T-intersection" (with no southbound approach) under stop control on the northbound approach. The northbound approach consists of one (1) exclusive left-turn lane, a bike lane, and one (1) dedicated right-turn lane. The eastbound approach consists of one (1) through lane and one (1) dedicated right-turn lane. The westbound approach consists of one (1) shared through and left-turn lane.

4. The intersection of ***Hayden Road and Princess Drive*** is a signalized four-legged intersection with split phasing between the westbound approach and eastbound approach, and permitted left-turn phasing in the northbound and southbound approaches. Both the northbound and southbound approaches each consist of one (1) exclusive left-turn lane, two (2) through lanes, a bike lane, and one (1) dedicated right-turn lane. The eastbound approach consists of one (1) shared left-turn and through lane and one (1) dedicated right-turn lane. The westbound approach consists of two (2) exclusive left-turn lanes, one (1) dedicated right-turn lane and one (1) bike lane.

5. The intersection of ***Hayden Road and the EB Loop 101 Ramps*** is a signalized intersection within the Loop 101 tight urban diamond traffic interchange (TUDI). The northbound approach

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consists of three (3) through lanes and one (1) dedicated right-turn lane. The southbound approach consists of two (2) exclusive left-turn lanes and two (2) through lanes. The eastbound approach consists of one (1) exclusive left-turn lane, one (1) shared left-turn, through, and right-turn lane, and one (1) dedicated right-turn lane.

6. The intersection of ***Hayden Road and the WB Loop 101 Ramps*** is a signalized intersection within the Loop 101 TUDI. The northbound approach consists of one (1) exclusive left-turn lane and two (2) through lanes. The southbound approach consists of four (4) through lanes and one (1) dedicated right-turn lane. The westbound approach consists of one (1) exclusive left-turn lane, one (1) shared left-turn and through lane, one (1) shared through and right-turn lane, and one (1) dedicated right-turn lane.

7. The intersection of ***Hayden Road and Legacy Boulevard*** is a signalized three-legged "T-intersection" (with no westbound approach) with permitted left-turn phasing in the northbound and eastbound approaches. The northbound approach consists of one (1) exclusive left-turn lane, two (2) through lanes, and a bike lane. The southbound approach consists of two (2) through lanes, a bike lane, and one (1) dedicated right-turn lane. The eastbound approach consists of one (1) exclusive left-turn lane, a bike lane, and one (1) dedicated right-turn lane.

8. The intersection of ***82nd Street and Princess Drive*** is a four-legged-intersection under stop control in the northbound and southbound approaches. The northbound and southbound approaches each consist of one (1) exclusive left-turn lane, one (1) shared through/right-turn lane, and a bike lane. The eastbound approach consists of one (1) exclusive left-turn lane, one (1) through lane and one (1) shared through/right-turn lane. The westbound approach consists of one (1) exclusive left-turn lane, one (1) through lane, one (1) shared through and right-turn lane, and a bike lane.

9. The intersection of ***Princess Drive and Perimeter Drive*** is a signalized four-legged-intersection with permitted left-turn phasing on all approaches. The northbound approach consists of one (1) exclusive left-turn lane, two (2) through lanes, a bike lane, and one (1) dedicated right-turn lane. The southbound approach consists of one (1) exclusive left-turn lane, one (1) through lane, one (1) shared through and right-turn lane, and a bike lane. The eastbound approach consists of one (1) exclusive left-turn lane, two (2) through lanes, and one (1) shared through and right-turn lane. The westbound approach consists of one (1) exclusive left-turn lane, two (2) through lanes, and one (1) dedicated right-turn lane.

10. The intersection of ***Loop 101 SB Ramps and Princess Drive/Pima Road*** is a signalized intersection within the Loop 101 TUDI. The southbound approach consists of one (1) exclusive left-turn lane, one (1) shared through and left-turn lane, one (1) shared through and right-turn lane and one (1) dedicated right-turn lane. The eastbound approach consists of three (3) through lanes and two (2) dedicate right-turn lanes. The westbound approach consists of two (2) exclusive left-turn lanes and three (3) through lanes.

11. The intersection of ***Loop 101 NB Ramps and Princess Drive/Pima Road*** is a signalized intersection within the Loop 101 TUDI. The northbound approach consists of one (1) exclusive left-turn lane, one (1) shared through and left-turn lane, one (1) through lane and one (1) channelized right-turn lane. The eastbound approach consists of one (1) exclusive left-turn lane and two (2)

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through lanes. The westbound approach consists of four (4) through lanes and one (1) dedicated right-turn lane.

12. The intersection of ***Hayden Road and Mayo Boulevard/Union Hills Drive*** is a four-legged intersection under stop control on the eastbound and westbound approaches. The northbound approach consists of one (1) exclusive left-turn lane, two (2) through lanes, a bike lane, and one (1) dedicated right-turn lane. The southbound approach consists of one (1) exclusive left-turn lane, two (2) through lanes, a bike lane, and one (1) dedicated right-turn lane. The westbound approach consists of one (1) shared left/through/right-turn lane. The eastbound approach is a driveway to the gated San Artes apartments and consists of one (1) shared left/through/right-turn lane.

The existing stop controls and lane geometries within the project area are depicted in **Figure 2**.

TRAFFIC VOLUMES

CivTech contracted Field Data Services of Arizona (FDS) Inc. to conduct turning movement counts at eight (8) of the study intersections. These turning movement counts were conducted on Tuesday, July 11, 2023 from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM during an average weekday. Existing turning movement traffic count data was also taken from the Maricopa Association Government (MAG) website for the following intersections:

- Hayden Rd & Legacy Blvd
- Hayden Rd & Loop 101 WB Ramps
- Hayden Rd & Loop 101 EB Ramps
- 82nd St & Mayo Blvd/Union Hills Dr
- Hayden Rd & Axon Wy/Mayo Blvd
- Hayden Rd & Mayo Blvd/Union Hills Dr
- Hayden Rd & Princess Dr
- Perimeter Dr & Axon Wy

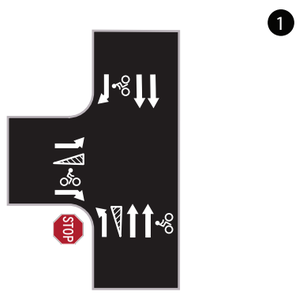
Because the traffic counts were taken during the slower summer season, a seasonal adjustment factor of 1.075 was applied to the traffic counts taken in July, as determined by the City of Scottsdale.

Additional turning movement counts at four (4) of the study intersections were conducted on Tuesday, August 8, 2023 from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM during an average weekday:

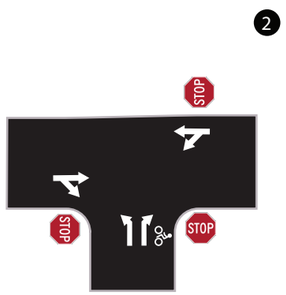
- Loop 101 NB Ramps & Princess Dr
- Loop 101 SB Ramps & Princess Dr
- Perimeter Dr & Princess Dr
- 82nd St & Princess Dr

The existing traffic volumes observed for this study are presented in **Figure 3**. Traffic volumes data obtained for this study have been included in **Appendix B**.

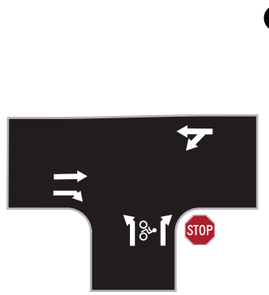
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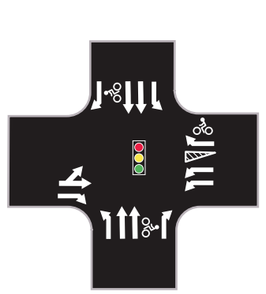
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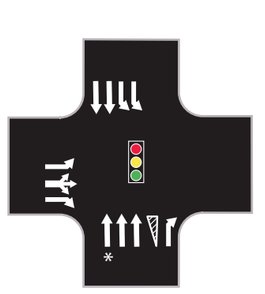
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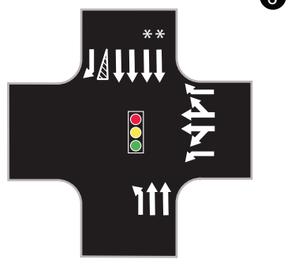
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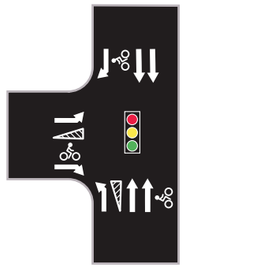
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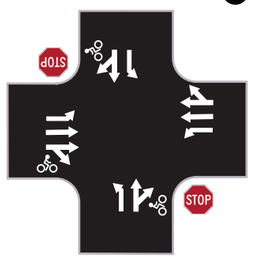
Hayden Rd & Loop 101 EB Ramps



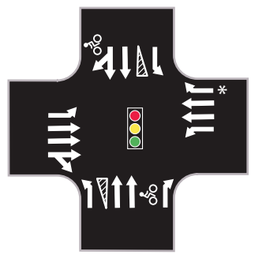
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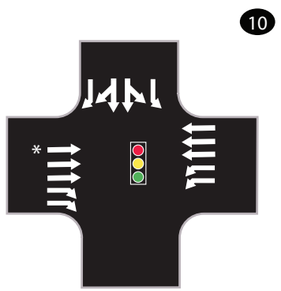
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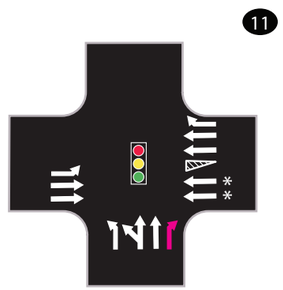
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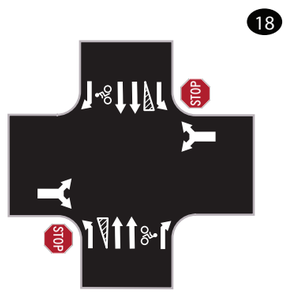
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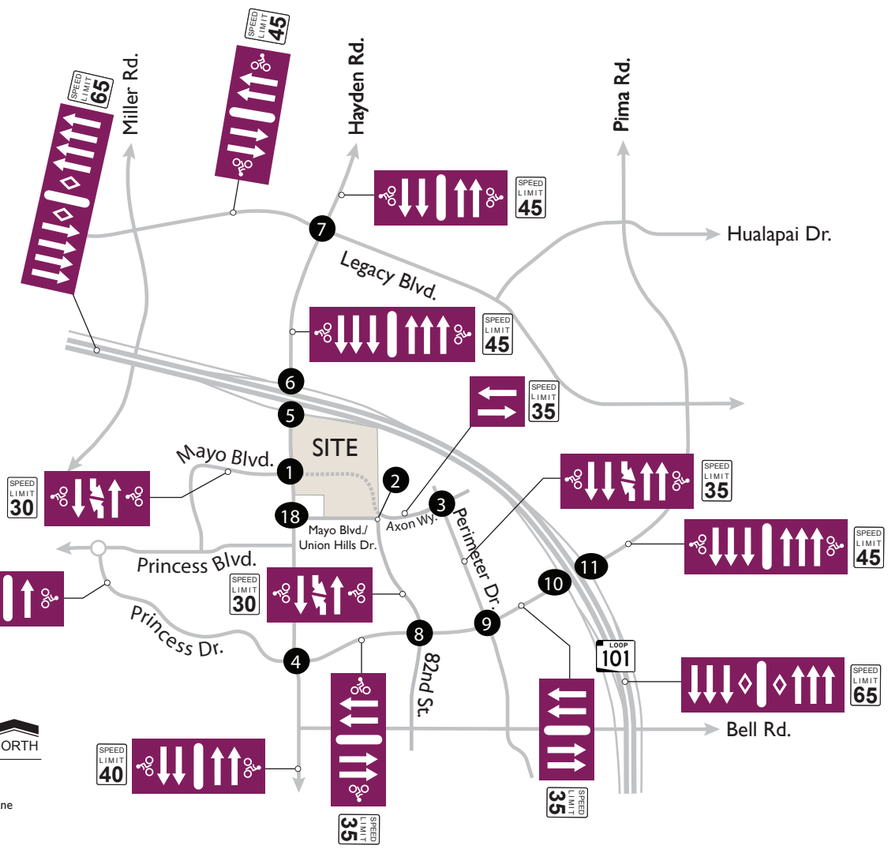
Loop 101 SB Ramps @ Princess Dr/Pima Rd



Loop 101 NB Ramps @ Princess Dr/Pima Rd



Hayden Rd & Union Hills Dr

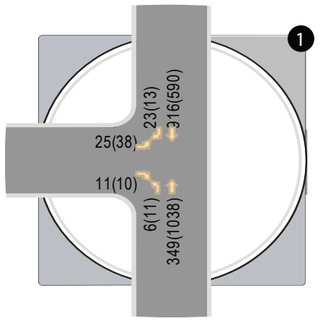


LEGEND

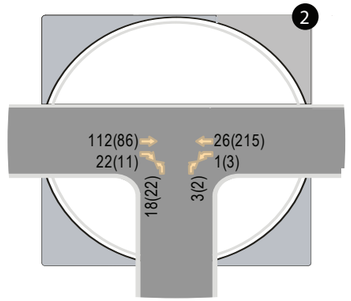
NORTH

- Thru or Turning Movement
- Two-Way Left Turn-Lane
- Raised Median
- Bike Lane
- Striped Carrot
- Raised Median
- HOV Lane
- Channelized Turn Lane
- Drop Lane
- Traffic Signal
- Stop Sign
- Speed Limit

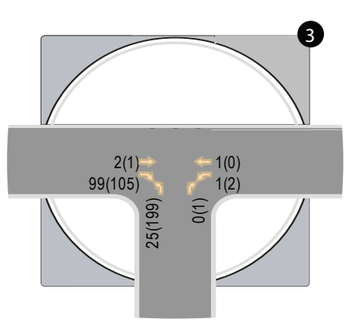
Figure 2: Existing Lane Configurations and Traffic Controls



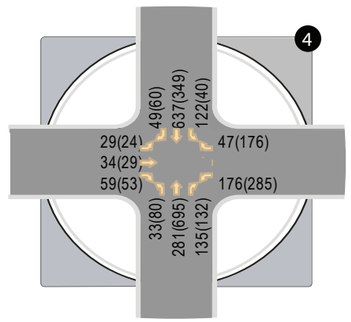
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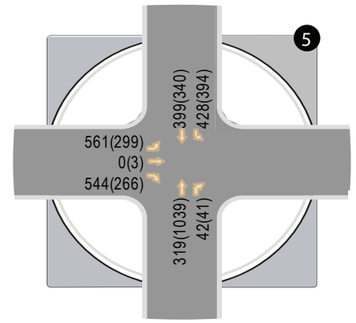
82nd St & Mayo Blvd/Union Hills Dr



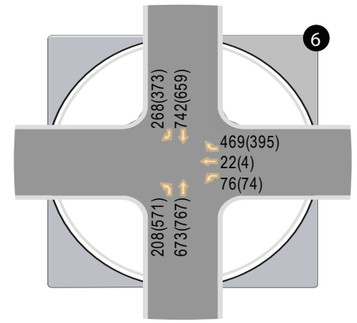
Perimeter Dr & Mayo Blvd/Union Hills Dr



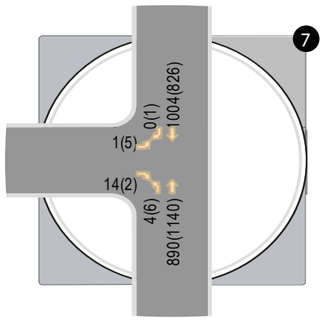
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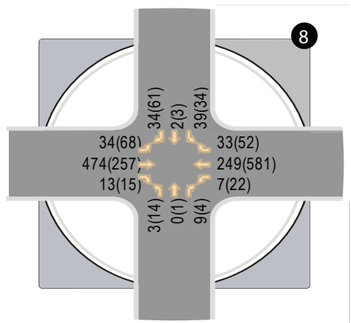
Hayden Rd & Loop 101 EB Ramps



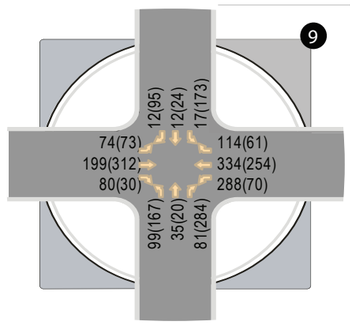
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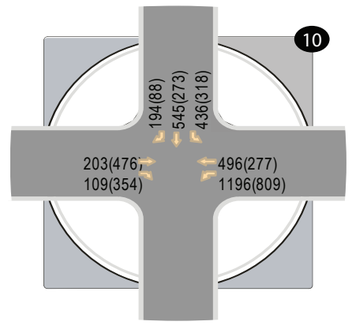
Hayden Rd & Legacy Blvd



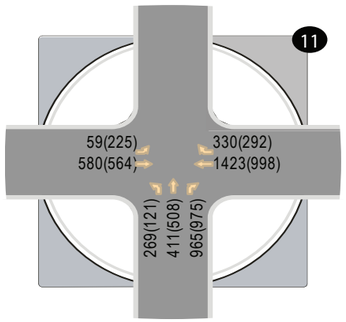
82nd St & Princess Dr



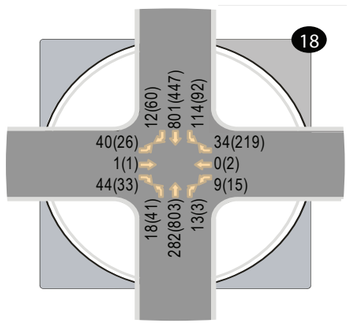
Perimeter Dr & Princess Dr



Loop 101 SB Ramps @ Princess Dr/Pima Rd



Loop 101 NB Ramps @ Princess Dr/Pima Rd



Hayden Rd & Mayo Blvd/Union Hills Dr

LEGEND

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

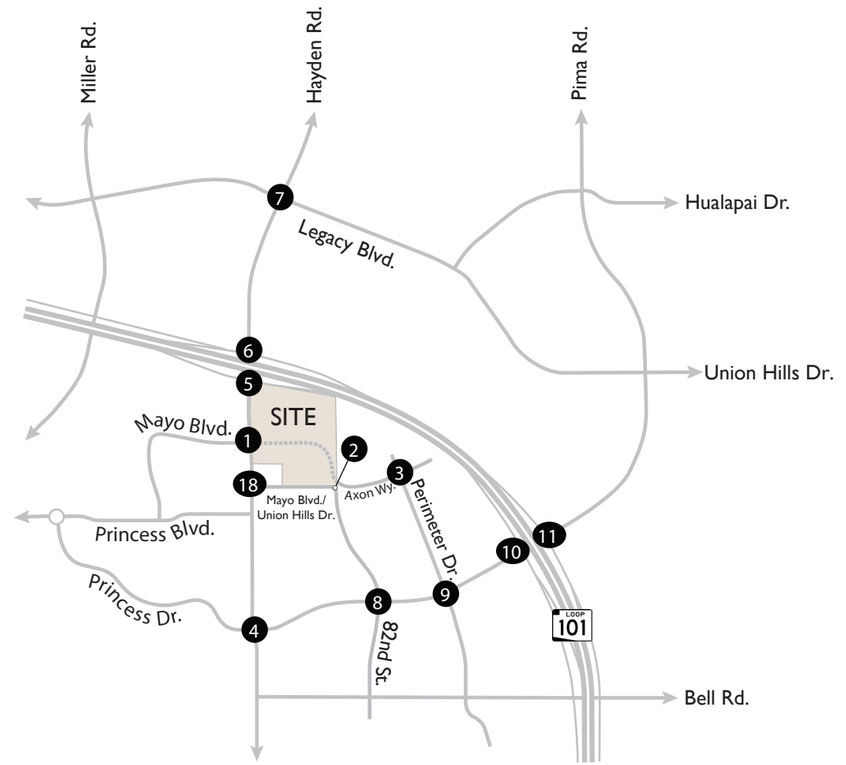


Figure 3: Existing Traffic Volumes

CRASH ANALYSIS

Crash data for the study area was obtained from the City of Scottsdale for the latest three (3) years of continuous data. In total, there have been 105 incidents within the study area in the years 2020-2022. A majority of these crashes occurred at intersections along Hayden Road within the vicinity of the site. The summary of intersection crash data is presented in **Table 1**.

TABLE 1 – INTERSECTION CRASH DATA SUMMARY

ID	Intersection	Total	Year of Occurrence			Incident Severity		Incident Type						
			2022	2021	2020	Incident with Injury (# of Injuries)	# of Fatalities	Single Vehicle	Angle	Left Turn	Rear End	Head On	Sideswipe	Other
4	Hayden Rd & Princess Dr	15	4	4	7	7 (15)	0	1	4	2	5	1	2	0
5&6	Hayden Rd & Loop 101(1)	28	6	15	7	9 (13)	0	4	5	4	14	0	1	0
7	Hayden Rd & Legacy Blvd	7	2	0	5	2 (2)	0	1	1	2	1	0	2	0
8	82nd St & Princess Dr	5	1	1	3	2 (3)	0	0	3	0	1	1	0	0
9	Perimeter Dr & Princess Dr	8	2	3	3	4 (6)	0	0	6	0	1	0	1	0
10&11	Loop 101 & Princess Dr/ Pima Rd(1)	39	16	18	5	6 (8)	0	4	10	0	19	0	6	0
18	Hayden Rd & Mayo Blvd/ Union Hills Dr	3	1	1	1	1 (1)	0	1	1	1	0	0	0	0
Totals		**105**	**32**	**42**	**31**	**31 (48)**	**0**	**11**	**30**	**9**	**41**	**2**	**12**	**0**

(1) Combination of both intersections.

A review of the crash data summarized in **Table 1** reveals that there have been 105 crashes reported at nine (9) of the intersections within the vicinity of the site. The highest percentage type of crash at most intersection is rear end and angle collisions and the lowest percentage type of crash at most intersections is head on collisions. Crash analysis worksheets are included in **Appendix C**.

CAPACITY ANALYSIS

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. Levels of service for intersections are defined within ranges of average control delay per vehicle, the number of seconds a vehicle can expect to wait due to the presence of a traffic control device. lists the level of service criteria for signalized and unsignalized intersections. **Table 2** summarizes this information.

TABLE 2 – INTERSECTION LEVEL OF SERVICE CRITERIA

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

Source: Exhibits 19-8, 20-2, 21-8, and 22-8, Highway Capacity Manual, 6th Edition (2016)

Synchro 11 software using the methodologies of the latest (6th) edition of the *Highway Capacity Manual* (HCM 2016)

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were used to calculate average per-vehicle control delays, from which movement, approach, and overall intersection levels of service are determined. At the two TUDIs, each of which has two "clustered" signals that cannot be analyzed by HCM 2016, CivTech applied the HCM 2000 methodology. The methods take into account lane geometry, traffic volumes, and traffic control (two-way stop, all-way stop, or signal). Synchro's analysis worksheets report individual movement delay/LOS and overall delay/LOS for signalized intersections and the worst-case delay/LOS and the average overall intersection delay for unsignalized intersections. Results of the existing, no build, and build scenarios level of service analyses conducted for the proposed development are summarized in **Table 3** for both peak hours. The output sheets for the existing conditions have been included in **Appendix D**.

TABLE 3 – EXISTING PEAK HOUR LEVELS OF SERVICE

ID	Intersection	Intersection Control	Approach	Existing LOS AM (PM)
1	Hayden Rd & Axon Wy/Mayo Blvd	One-way stop (EB)	NB Left EB Left EB Right	A (A) B (B) B (A)
2	82nd St & Mayo Blvd/Union Hills Dr	All-way stop	NB EB WB	A (A) A (A) A (A)
			Overall	***A (A)***
3	Perimeter Dr & Mayo Blvd/Union Hills Dr	One-way stop (NB)	NB Left NB Right WB Left	A (A) A (A) A (A)
4	Hayden Rd & Princess Dr	Signal	NB SB EB	A (A) A (A) D **(E)**
			Overall	***A (A)***
5	Hayden Rd & Loop 101 EB Ramps	Signal	NB Thru NB Right *NB Overall* SB Left SB Thru *SB Overall* EB Left EB Shared EB Right *EB Overall*	24.6 C (32.8 C) 34.9 C (25.4 C) 25.9 C (32.5 C) 25.3 C (196.7 **F**) 13.5 B (16.4 B) 19.6 B (113.3 **F**) 96.5 **F** (42.4 D) 45.5 D (41.8 D) 36.6 D (36.5 D) 60.3 **E** (40.3 D)
			Overall	***39.6 D (59.9 D)***
6	Hayden Rd & Loop 101 WB Ramps	Signal	NB Left NB Thru *NB Overall* SB Thru SB Right *SB Overall* WB Left WB Shared WB Right *WB Overall*	150.4 **F** (298.1 **F**) 44.1 D (16.2 B) 70.3 **E** (136.4 **F**) 31.0 C (43.9 D) 42.9 D (56.4 D) 34.3 C (48.2 D) 52.9 D (54.2 D) 50.3 D (49.9 D) 50.1 D (50.1 D) 50.6 D (50.6 D)
			Overall	***51.0 D (89.4 F)***

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TABLE 3 – EXISTING PEAK HOUR LEVELS OF SERVICE

ID	Intersection	Intersection Control	Approach	Existing LOS AM (PM)
7	Hayden Rd & Legacy Blvd	Signal	NB SB EB	A (A) A (A) **E (E)**
			Overall	***A (A)***
8	82nd St & Princess Dr	Two-way stop (NB/SB)	NB Left NB Shared SB Left SB Shared EB Left WB Left	C (C) B (B) C (D) B (B) A (A) A (A)
9	Perimeter Dr & Princess Dr	Signal	NB SB EB WB	B (C) B (C) C (C) C (C)
			Overall	***C (C)***
10	Loop 101 SB Ramps & Princess Dr/Pima Rd	Signal	SB Left SB Shared SB Right *SB Overall* EB Thru EB Right *EB Overall* WB Left WB Thru *WB Overall*	163.3 **F** (30.4 C) 178.0 **F** (29.8 C) 41.1 D (25.3 C) 153.2 **F** (29.4 C) 54.2 D (51.6 D) 128.6 **F** (100.6 **F**) 80.1 **F** (72.5 **E**) 26.7 C (56.7 **E**) 7.6 A (25.8 C) 20.8 C (48.5 D)
			Overall	***76.2 E (51.4 D)***
11	Loop 101 NB Ramps & Princess Dr/Pima Rd	Signal	NB Left NB Shared NB Right *NB Overall* EB Left EB Thru *EB Overall* WB Thru WB Right *WB Overall*	63.3 **E** (26.7 C) 54.9 D (30.0 C) 251.3 **F** (176.0 **F**) 168.5 **F** (116.5 **F**) 31.7 C (28.6 C) 76.1 **E** (41.4 D) 71.7 **E** (37.7 D) 14.4 B (50.8 D) 14.2 B (48.7 D) 14.4 B (50.4 D)
			Overall	***86.9 F (75.8 E)***
18	Hayden Rd & Mayo Blvd/Union Hills Dr	Two-way stop (EB/WB)	NB Left SB Left EB Shared WB Shared	A (A) A (A) B (B) A (B)

The results of the existing conditions analysis summarized in **Table 3** indicate that most study intersections and individual approaches operate with *overall* acceptable levels of service (LOS D or better). The analysis indicates that several individual approaches already operate at less than LOS D. These approaches are:

The signalized intersection of **Hayden Road & Princess Drive** operates with a delay in the eastbound approach of 56.7 sec/veh (LOS E) during the PM peak hour.

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The signalized intersection of **Hayden Road & Loop 101 EB Ramps** operates with a delay in the eastbound approach of 60.3 sec/veh (LOS E) in the AM peak hour and a delay in southbound approach of 113.3 sec/veh (LOS F) during the PM peak hour.

The signalized intersection of **Hayden Road & Loop 101 WB Ramps** operates with a delay in the northbound approach of 70.3 sec/veh (LOS E) and 136.4 sec/veh (LOS F) during the AM and PM peak hours, respectively.

The signalized intersection of **Hayden Road & Legacy Boulevard** operates with a delay in the eastbound approach of 61.1 sec/veh (LOS E) and 61.0 sec/veh (LOS E) during the AM and PM peak hours, respectively.

The signalized intersection of **Loop 101 SB Ramps & Princess Dr/Pima Rd** operates with an overall delay of 76.2 sec/veh (LOS E) and a delay in the southbound approach of 153.2 sec/veh (LOS F) during the AM peak hour. The eastbound approach operates with a delay of 80.1 sec/veh (LOS F) and 72.5 sec/veh (LOS E) during the AM and PM peak hours, respectively.

The signalized intersection of **Loop 101 NB Ramps & Princess Dr/Pima Rd** operates with overall delays of 86.9 sec/veh (LOS F) and 75.8 sec/veh (LOS E) during the AM and PM peak hours, respectively. The northbound approach operates with a delay of 168.5 sec/veh (LOS F) and 116.5 sec/veh (LOS F) during the AM and PM peak hours, respectively. The eastbound approach operates with a delay of 71.7 sec/veh (LOS E) during the AM peak hour.

FUTURE ROADWAY IMPROVEMENTS

REGIONAL IMPROVEMENTS

Regional improvements from Princess Drive west along Loop 101 anticipated in CivTech's Crossroad 2011 Study have been implemented.

Mayo Boulevard will be connected between 78th Street and 73rd Place as other Crossroads East parcels are developed, providing a new minor arterial roadway between Hayden and Scottsdale Roads. In this study, CivTech has assumed that this connection will *not* be made before the study horizon year of 2030.

An additional northbound right-turn lane is expected to be added at the intersection of **Loop 101 NB Ramps & Pima Road/Princess Drive** by opening year 2025. This improvement will be added to the background and total scenarios for opening year 2025 and horizon year 2030.

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PROPOSED DEVELOPMENT

SITE LOCATION

Axon is proposing to build a World Headquarters Campus with a 435-room hotel and a 1,965 DU three- to five-story (i.e., mid-rise) multifamily residential community with a total of 49,486 SF of ground-floor commercial uses. The current Project is Phase 2 of the development of the site. Phase 2 will complement Phase 1, which is a 401,085 SF Axon office building. Phase 1 has already received all the necessary zoning and other approvals from the City of Scottsdale. The site consists of three individual Maricopa County Assessor numbered parcels and 10.03 acres of City roadway right of way that total 73.57 acres. Axon has acquired two of the parcels, 57.17-acre APN 215-07-407 and 1.76-acre APN 215-07-408. The third, 4.61-acre 215-07-409, is presently owned by the City of Scottsdale.

SITE ACCESS

As shown in **Figure 4**, the former Mayo Boulevard east of Hayden Road has already been renamed Axon Way and realigned west of 82nd Street such that it intersects Hayden Road across from Mayo Boulevard. It is expected to be a four-lane collector roadway with two (2) lanes and one (1) bike lane in each direction of travel and a raised center median. Axon Way will extend east, travel south at the 82nd Street alignment (but not connect), and travel east to connect with the existing intersection at Perimeter Drive & Union Hills Drive. The posted speed limit on Axon Way is expected to be 35 mph. See **Figure 16** for the proposed lane configurations.

A review of Assessor maps shows that the ROW for a prior expected realignment had been dedicated by Axon; after review of CivTech's several versions of this TIMA and discussions between the City and Axon, the alignment will be revised and any and all changes will be formally addressed via a new plat.

Primary access to the site will be via the (future) signalized intersection of Hayden Road and Axon Way and six (6) driveways along Axon Way:

Access A is a restricted right-in/right-out (RI/RO) driveway, located approximately 360 feet east of Hayden Road along Axon Way. Access A primarily provides access to Buildings A, B, and C.

Access B is a restricted right-in/right-out (RI/RO) driveway, located approximately 600 feet east of Hayden Road along Axon Way. Access B provides access to Building E.

Access C is a full movement driveway, located approximately 825 feet east of Hayden Road along Axon Way. Access C provides access to Buildings B, C, and D.

Access D is a restricted right-out exit only driveway, located approximately 950 feet east of Hayden Road along Axon Way. Access D provides exit-access only to Building D.

Access E is a full movement driveway, located approximately 1,125 feet east of Hayden Road along Axon Way. Access E provides access to Building D and also serves as a truck driveway for the Axon Headquarters.

Access F is a full movement driveway, located approximately 1,380 feet east of Hayden Road along Axon Way. Access F provides access to Building E to the west and Axon Headquarters to the east.

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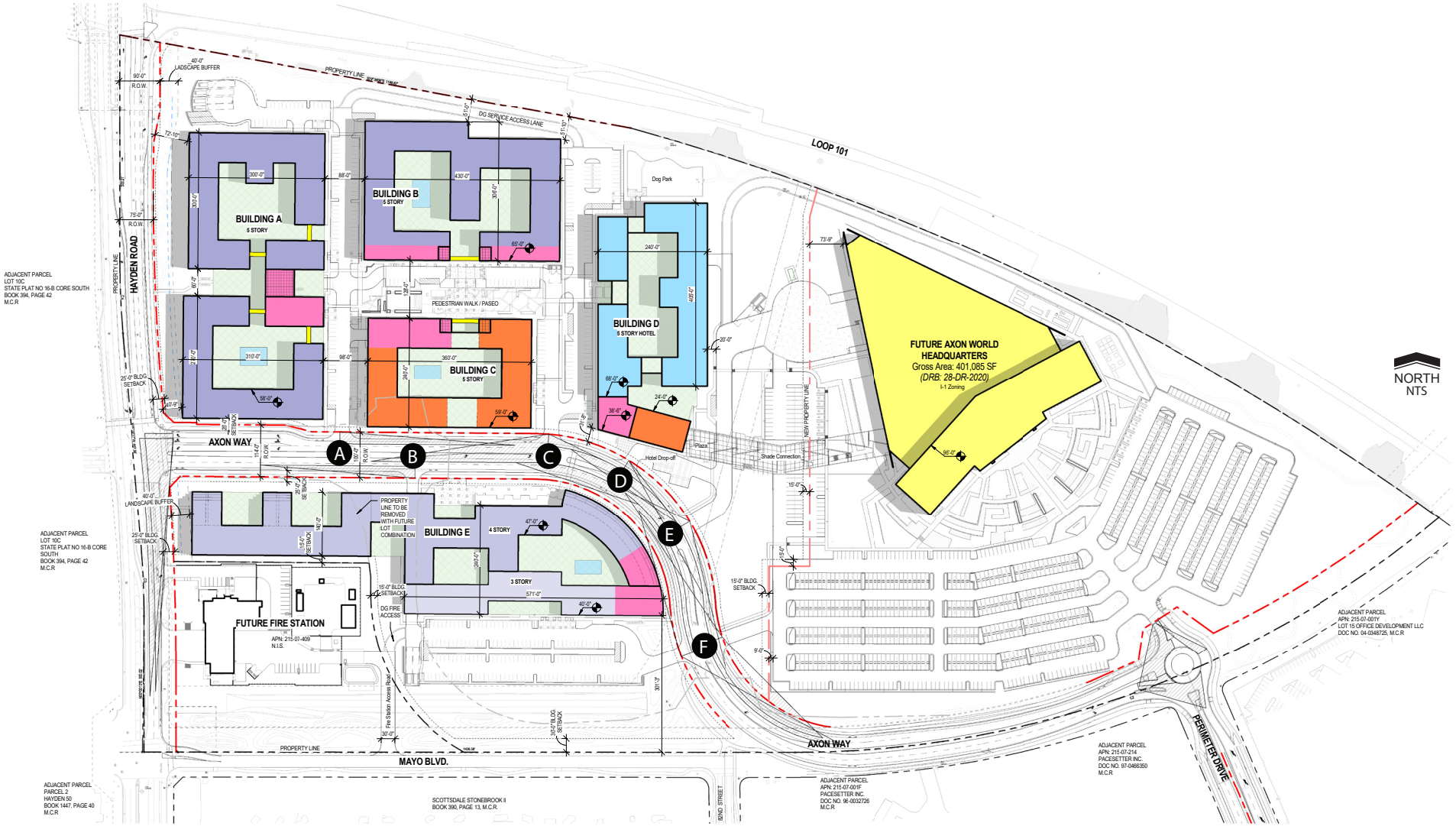


Figure 4: Site Plan and Access

With the addition of the development, the east leg of the existing intersection of 82nd Street and Mayo Boulevard/Union Hills Drive will be removed, which will allow access to the residents of the southern neighbors, but not to the trips generated by the Axon development. 82nd will be a local road in the future with this update. Additionally, the intersection of Perimeter Drive and Mayo Boulevard/Union Hills Drive connect to Axon Way and will be reconstructed as a roundabout and the east leg will be removed.

TRIP GENERATION

The potential trip generation for the proposed development was estimated utilizing the latest (11th) edition of Institute of Transportation Engineers' (ITE) *Trip Generation Manual* (TripGen11) and the 3rd Edition of its *Trip Generation Handbook*. TripGen11 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.

ITE's Land Use Code (LUC) 221, Mid-Rise Residential was selected by CivTech as the appropriate land use for the residential use. ITE LUC 821, Shopping Plaza (40-150k), was chosen to estimate trips generated by the ground-floor retail at Buildings C and D. The Hotel is LUC 312, as it is assumed that a majority of hotel guests are likely to be traveling to visit the Axon Headquarters.

Please note that the commercial land use represents ground-floor commercial within Buildings C and D. The commercial land use is not expected to generate significant external vehicular trips. While the above land uses were utilized in the analysis, it is believed that ITE LUC 231, Mid-Rise Residential with Ground Floor Commercial is a more fitting land use for Buildings C and D.

INTERNAL CAPTURE

According to data presented in the *Trip Generation Handbook*, 3rd Edition, trips attracted to certain land uses are often shared. This means that a single trip (vehicle) to the proposed development may visit additional attractions within the site during the same visit, an occurrence known as internal capture. This is especially true for large multi-use developments. An example of this would be a business person, who generated a trip on their drive to work, who walks to the restaurant in their building for lunch. This restaurant trip is not a new trip on the roadway.

Internal capture in a multi-use development describes the attraction of trips from one of the development's lands use components by another and results in a trip that begins and ends onsite. The importance of internal capture in the qualification of traffic impact for a multi-use development is that internally captured trips comprise a portion of the total development's trip generation without using the external road system. As a result, a multi-use development will generally create less demand on the external road system (i.e., fewer external trips) than the sum of the trip generation potential of each of its use components when considered as single-use developments. The percentage of a multi-use development's total trip generation that will be internally captured will depend on the strength of the attraction between its land use components. The calculations of internal capture are provided in **Appendix E**; the results show an internal capture rate of 5% for the AM peak hour and 14% for the PM peak hour.

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However, CivTech understands Axon will offer workshops and product demonstrations for its clients and prospective clients in its new office building and that the hotel will be utilized by those clients visiting from out of the area. Therefore, to account for this, CivTech applied a 35% internal capture for the hotel land use and a 40% internal capture for the retail land use.

ALTERNATIVE MODES

Alternate modes of travel affect the number of trips on the roadway. Since the site is more than one-half mile from the nearest bus stop, it is considered by ITE as not being close to transit. However, CivTech understands that there will be bicycle trails to and through the campus. In addition, some Axon employees who reside in the adjacent apartments may walk to work, especially on very pleasant days. Therefore, CivTech applied a reduction of five percent for the use of alternative modes of transportation to/from the office. The net trips generated are documented after the site trip generation discussion in the discussion of other developments that are considered in the analysis.

PASS-BY AND DIVERTED LINK TRIPS

Based on the published ITE data, as found in the *Trip Generation Handbook,* 3rd Edition, it could be estimated that some portion of the traffic entering and exiting a commercial development would come from traffic already on the external street system. The term 'pass-by' trips refers to traffic already traveling on a study roadway from an origin to a destination that stops into the commercial development on the way. The term 'diverted link trips' refers to traffic on major roadway corridors, such as Hayden Road, that are diverted into the development from their original destination.

Pass-by/diverted trip peak hour ratios were estimated and calculated per the ITE *Trip Generation Handbook,* 3rd Edition. PM peak hour reductions were applied to those trips generated by the retail land use. This reduction was also applied to the study area by adjusting the number of through trips on the adjacent street system (Hayden Road) while maintaining the projected number of movements at each driveway location. This reduces the impact of double counting the same trip on the arterial roadway network. *The anticipated trip generation is detailed in* ***Table 4*** *at the top of the next page. Supplemental trip generation calculations are also provided in* ***Appendix E****.*

As currently proposed, Phase 2 of the Axon campus is anticipated to generate 14,082 trips on a typical weekday with 1,076 trips (302 in/774 out) generated during the AM peak hour and 1,127 trips (651 in/476 out) generated during the PM peak hour before any reductions are taken. Net of reductions for internal capture or interaction, Phase 2 is expected to generate 11,794 trips on a typical weekday with 950 trips (252 in/698 out) generated during the AM peak hour and 897 trips (530 in/367 out) generated during the PM peak hour.

Please note that a last-minute revision to the site plan eliminated *ten (10) multifamily DUs (from 1,975 to 1,965) and* added *ten (10) hotel rooms. The net difference in peak hour trips generated—i.e., those assigned to the roadway network and, therefore, used in the capacity analysis of future with-development conditions—were* fewer *peak hour trips: 3 fewer trips (1 in/2 out) during the AM peak hour and 4 fewer trips (2 in/2 out) during the PM peak hour. Given this almost-negligible (less than ½ of 1% during either peak hour)* reduction *in peak hour trips, CivTech did not deem it necessary to revise the applicable figures in this report (Figures 6, 12, and 13) or the capacity analysis of future with-development conditions.*

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TABLE 4 – TRIP GENERATION

Land Use	Quantity Units[†]	ITE Code	ITE Land Use Name	AM Distribution		PM Distribution	
				In	Out	In	Out
Multifamily	1,965 DUs	221	Mid-Rise Residential	23%	77%	61%	39%
Hotel	435 Rooms	312	Business Hotel	39%	61%	55%	45%
Retail	49.486 KSF	821	Shopping Plaza (40-150k)	62%	38%	49%	51%

Land Use	ADT		AM Peak Hour				PM Peak Hour			
	Avg. Rate	Total	Avg. Rate	In	Out	Total	Avg. Rate	In	Out	Total
Multifamily	4.75	9,326	0.43	196	657	853	0.39	468	299	767
Hotel	3.26	1,414	0.32	53	84	137	0.24	57	46	103
Retail	67.52	3,342	1.73	53	33	86	5.19	126	131	257
Totals Trips		**14,082**		**302**	**774**	**1,076**		**651**	**476**	**1,127**
Internal Capture Reductions (Retail)	*40%*	*(1,336)*	*40%*	*(21)*	*(13)*	*(34)*	*40%*	*(50)*	*(53)*	*(103)*
Internal Capture Reductions (Hotel)	*35%*	*(494)*	*35%*	*(19)*	*(29)*	*(48)*	*35%*	*(20)*	*(16)*	*(36)*
Alternate Mode Reductions (Multifamily)	*5%*	*(464)*	*5%*	*(10)*	*(33)*	*(43)*	*5%*	*(24)*	*(15)*	*(39)*
Pass-By Trips (Retail)	*0%*	*(0)*	*0%*	*(0)*	*(0)*	*(0)*	*34%*	*(26)*	*(26)*	*(52)*
Total "New" Trips		**11,794**		**252**	**698**	**950**		**530**	**367**	**897**

Notes: [†] KSF = 1,000 square feet; DUs = Dwelling Units

[‡] No rate published. Average rate estimated assuming ratio of AM+PM to Daily rate was similar to that of mid-rise *without* commercial.

CALCULATIONS (Equations shown only where applicable)			
Land Use [Units]	*Daily*	*AM Peak Hour*	*PM Peak Hour*
Multifamily [X = 1,965 DUs]	T_{Day} = 4.77*X – 46.46	T_{AM} = 0.44X – 11.61	T_{PM} = 0.39X + 0.34
Strip Retail [X = 49.486 KSF]	T_{Day} = X*67.52	T_{AM} = X*1.73	T_{PM} = X*5.19
Hotel [X = 435 Rooms]	T_{Day} = 2.9*X + 151.69	T_{AM} = 0.3*X + 6.94	T_{PM} = 0.21*X + 12.03

TRIP DISTRIBUTION AND ASSIGNMENT

Two trip distributions were assumed for the proposed development one for employment to be applied to the residential trips and one for population to be applied to the trips generated by the Axon headquarters building and hotel. It is expected that the proposed development will generate trips based on future employment and population within a 12-mile radius of the site. Future total employment and population within a 12-mile radius of the site, as projected by the 2030 socio-economic data compiled by the Maricopa Association of Governments (MAG), were used as the bases to estimate trip distribution. The resulting trip distribution percentages for the study area are shown in **Table 5**. The trip distribution calculations are included in **Appendix F**.

TABLE 5 – SITE TRIP DISTRIBUTION

Direction (To/From)	Employment	Population
North on Hayden Road (north of Legacy Boulevard)	5%	5%
South on Hayden Road (south of Princess Drive)	15%	20%
South on Loop 101 (south of Princess Drive)	35%	30%
East on Princess Drive (east of Loop 101)	5%	5%
West on Loop 101 (west of Hayden Road)	35%	35%
West on Mayo Boulevard (west of Hayden Road)	5%	5%
Total	**100%**	**100%**

The trip distribution percentages noted in **Table 5** are illustrated on the roadway network within the study area in **Figure 5** were applied to the site trips generated to determine the AM and PM peak hour site traffic at the intersections within the study area. The resulting site generated traffic for the proposed development is presented in **Figure 6**. Pass-by Trips can be found in **Figure 7**.

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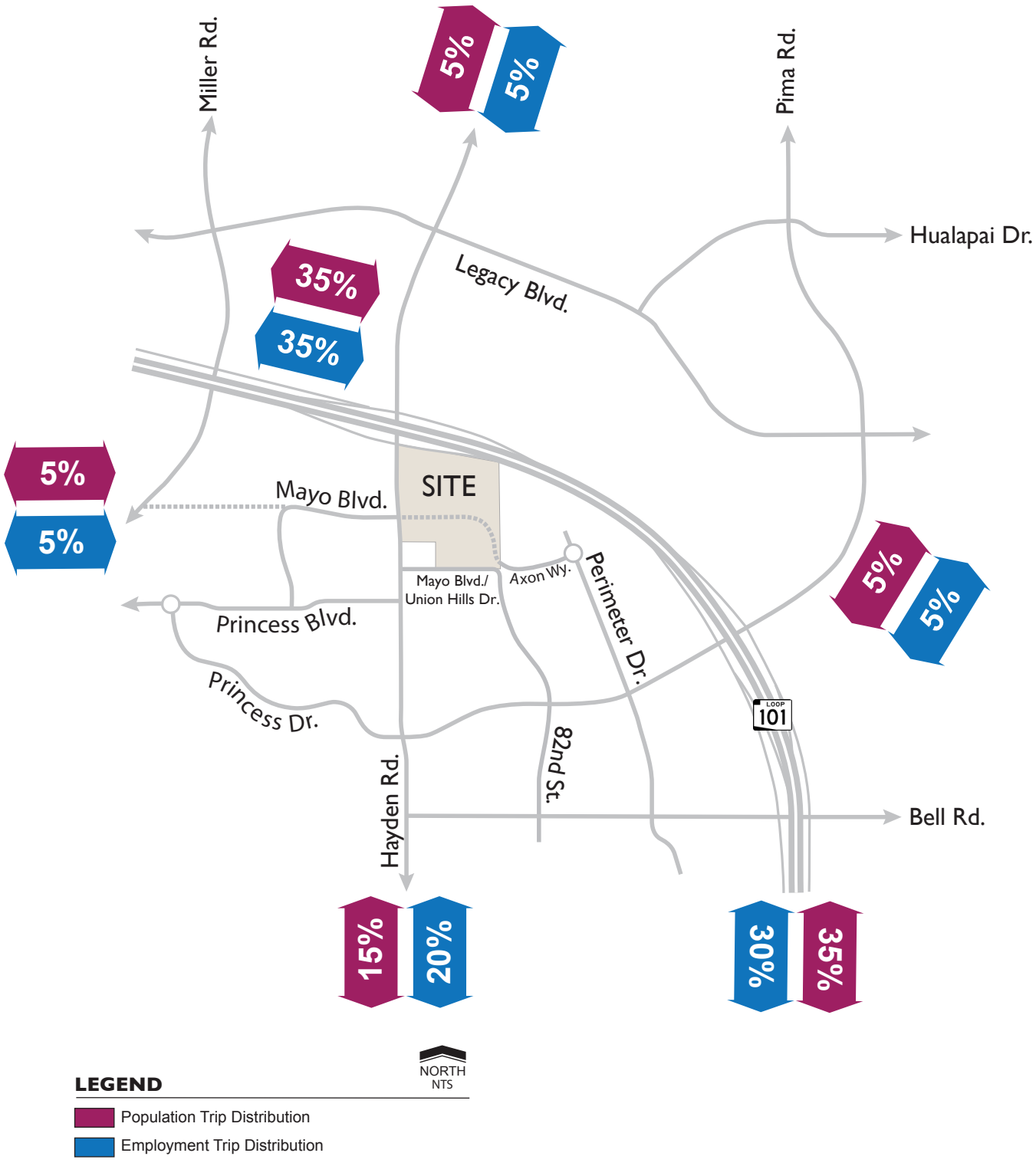
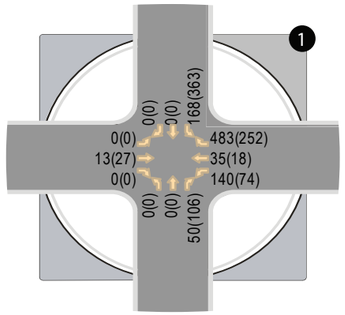
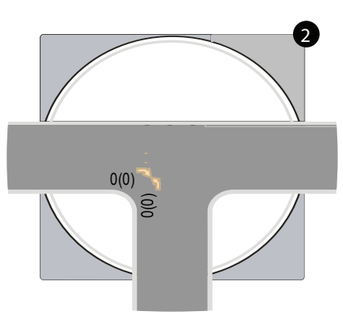


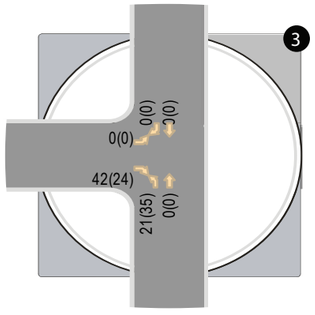
Figure 5: Trip Distribution



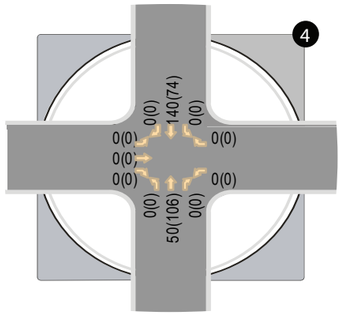
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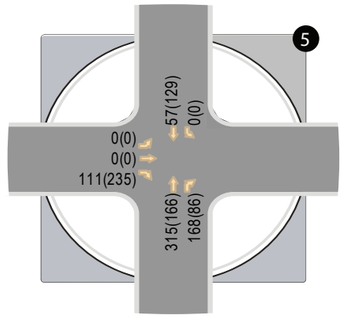
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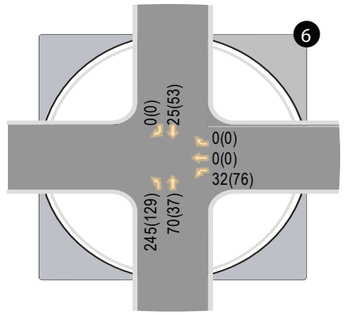
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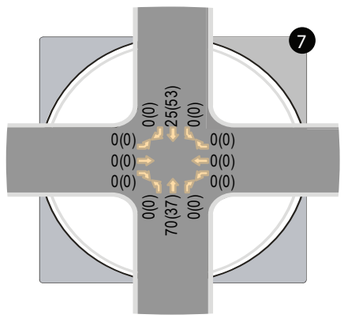
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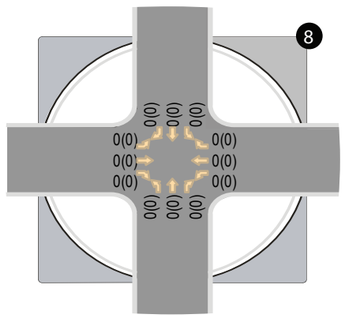
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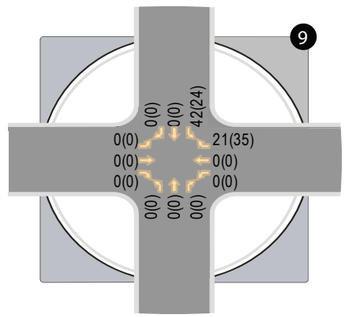
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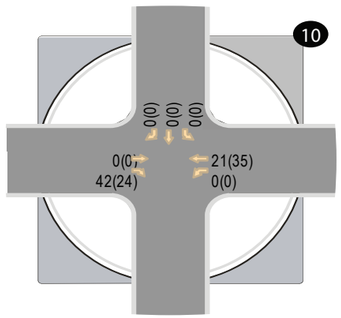
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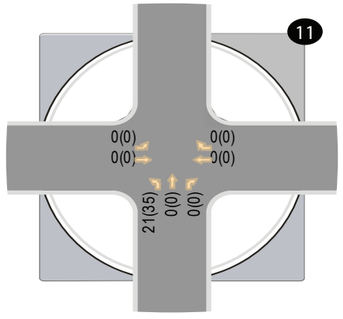
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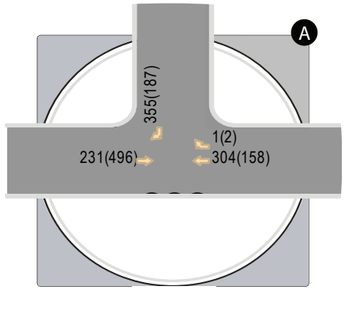
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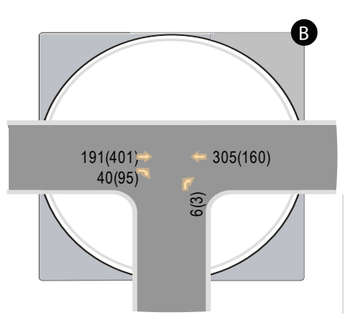
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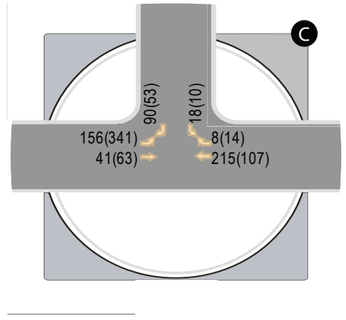
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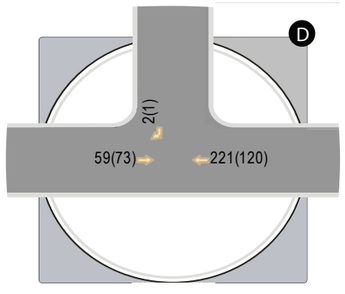
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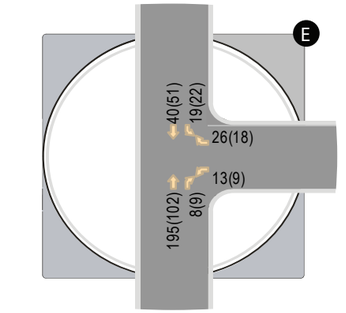
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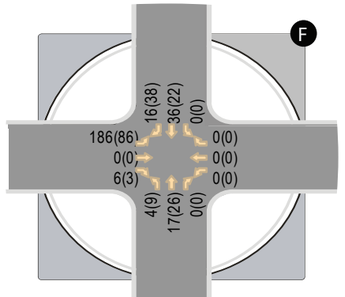
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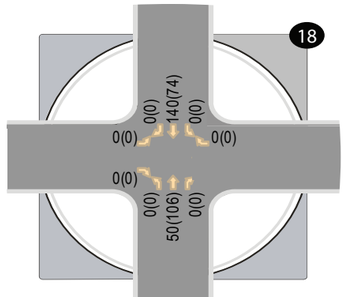
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Axon Wy & Access E



Axon Wy & Access F



Hayden Rd & Union Hills Dr/Mayo Blvd

NORTH

LEGEND

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

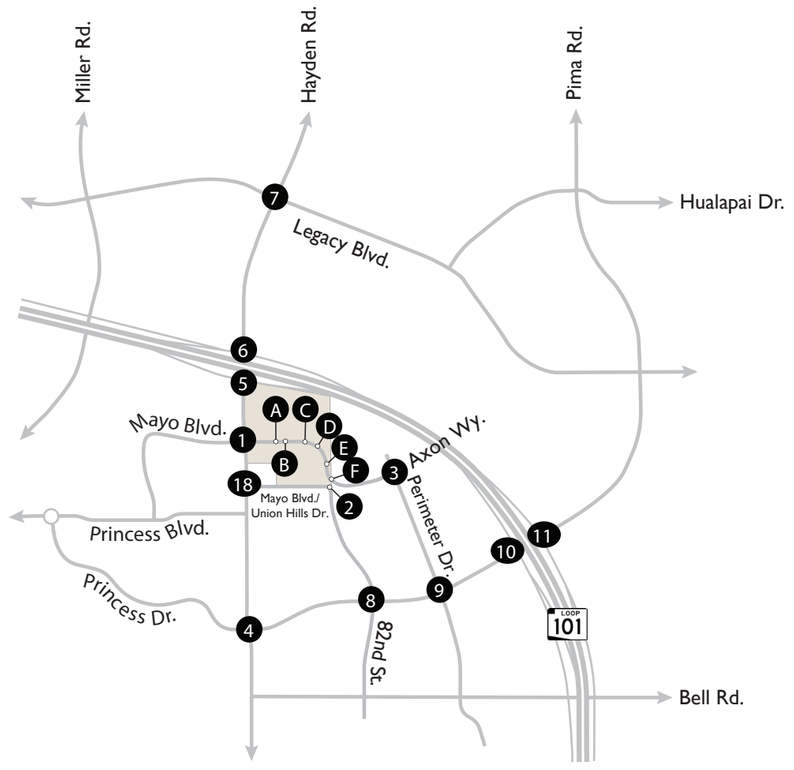
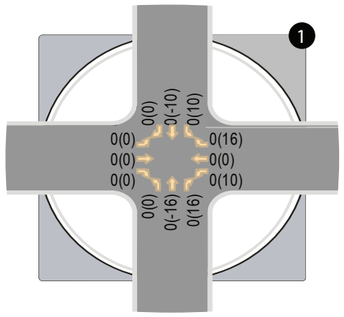
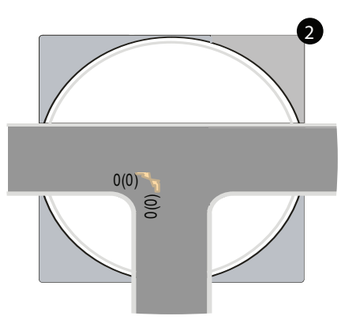


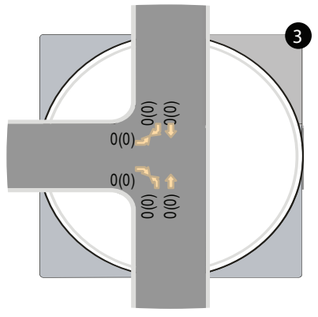
Figure 6: Site Generated Traffic Volumes



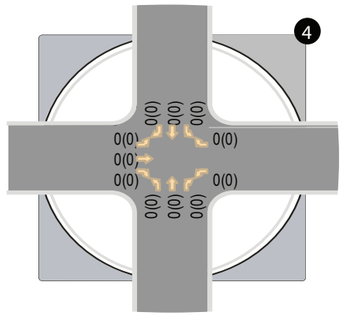
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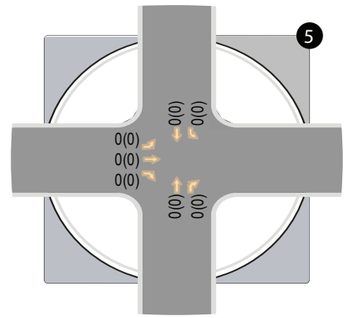
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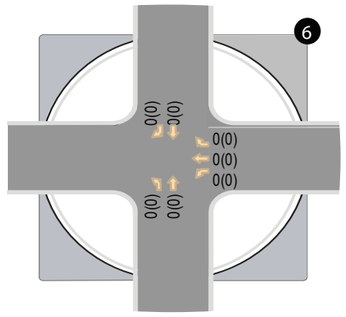
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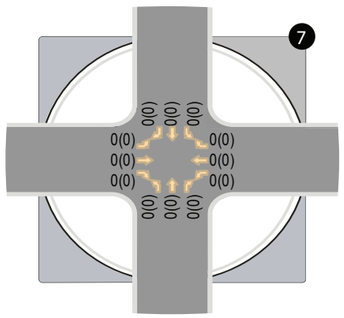
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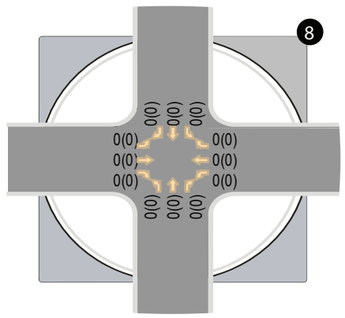
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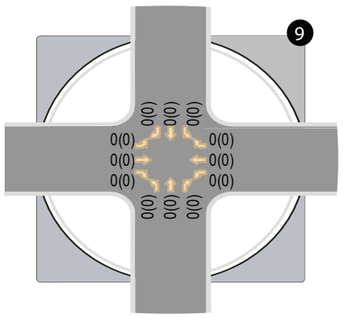
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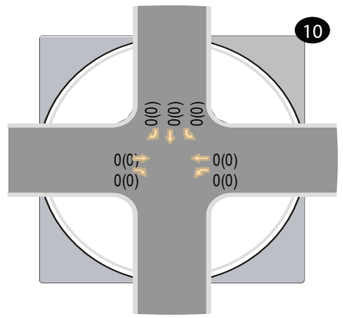
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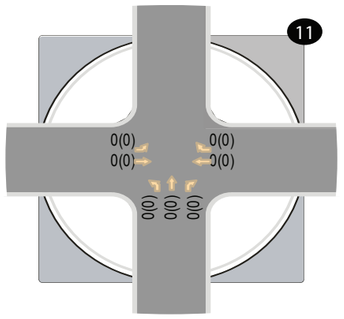
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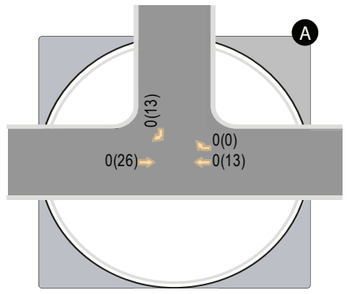
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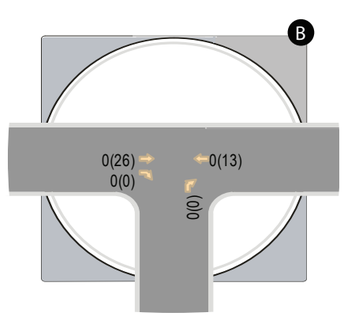
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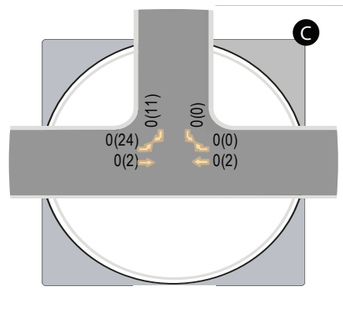
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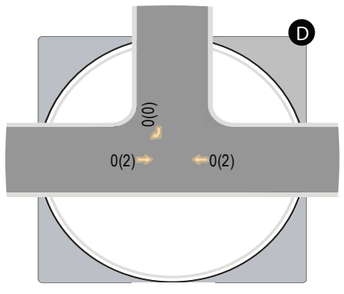
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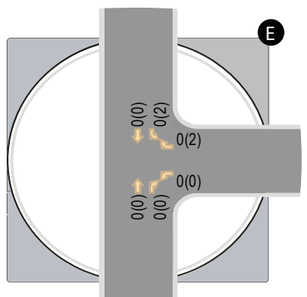
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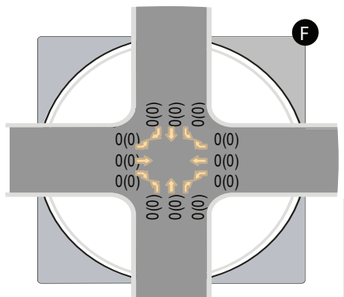
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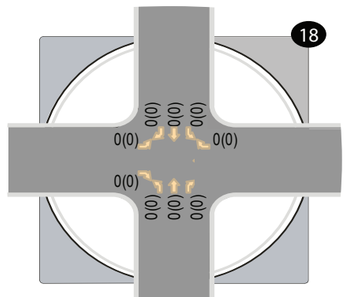
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Axon Wy & Access E



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Hayden Rd & Union Hills Dr/Mayo Blvd

NORTH

LEGEND

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

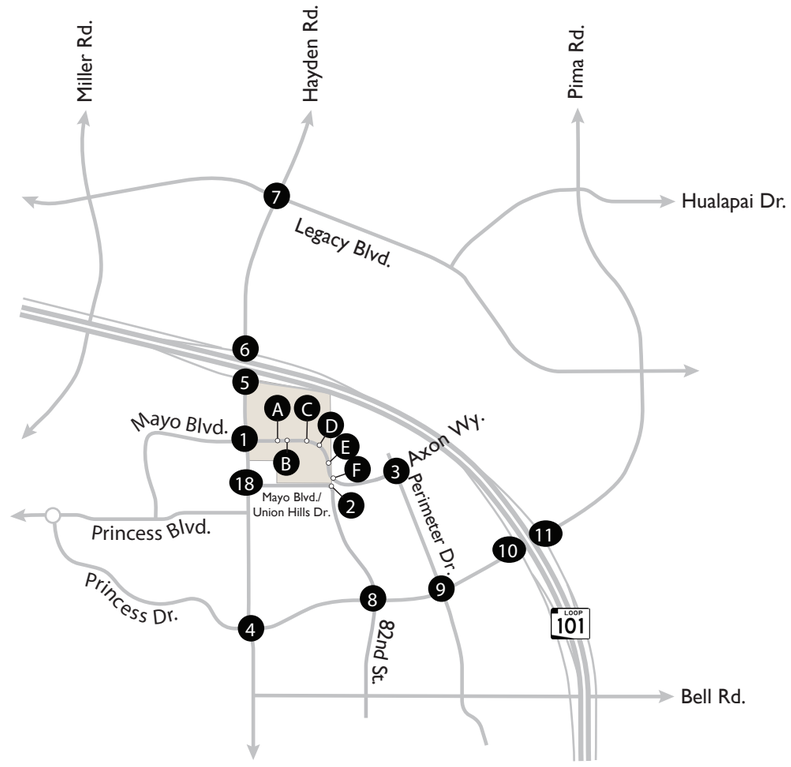


Figure 7: Pass-By Trips

FUTURE BACKGROUND TRAFFIC

CivTech reviewed historical daily traffic volumes from the City of Scottsdale website Traffic Volume Map to estimate an average annual growth rate. Reported average daily traffic volumes on Hayden Road south of Loop 101 were 15,700 vehicles per day (vpd) in 2016, decreased to 12,600 vpd in 2018, and 15,100 vpd in 2020, an increase from 2018, but still not at 2016 levels. Thus, Hayden Road experienced a net average annual decrease from 2016 to 2020. Since a negative growth rate is not realistic, CivTech applied a modest 1% annual growth rate from 2023 to project 2025 and 2030 non-site or background traffic volumes. The factors applied were 1.02 (= 1.010^2) to 2025 and 1.072 (= 1.010^7) to 2030.

Background Volume Redistribution

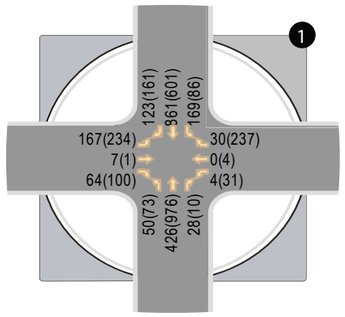
With the addition of the proposed development, the east leg of the existing intersection of 82nd Street & Mayo Boulevard/Union Hills Drive will be removed, which will allow access to the residents of the southern neighbors, but not to the trips generated by the Axon development. With the removal of the east leg, the existing volumes going in and out of the east leg were rerouted to travel along Axon Way instead, therefore, these volumes will be utilizing the intersection of Hayden Road & Mayo Boulevard/Axon Way and Hayden Road & Union Hills Drive/Mayo Boulevard. With this redistribution, the volumes are taken from the northbound and southbound through movements at the intersection of Hayden Road & Mayo Boulevard/Axon Way and added to the northbound right-turn movement and southbound left-turn movement; this may result in background volumes that are less than that of the existing volumes.

The projected background volumes for the opening year of 2025 are presented in **Figure 8.** The projected background volumes for the study horizon year of 2030 are presented in **Figure 9**. Background traffic calculations for opening year 2025 and horizon year 2030 are located within **Appendix G.**

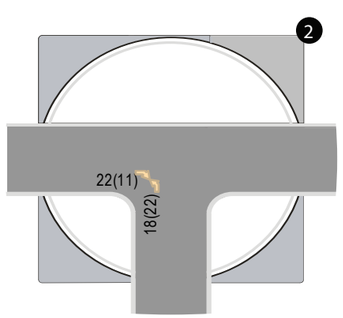
TRIPS FROM OTHER DEVELOPMENTS

Axon Campus, Phase 1. Phase 1 of the Axon campus is the 401,085 SF World Headquarters. Phase 1 is located to the east of the current project. Phases 1 and 2 of the Axon campus will occupy the entirety of Crossroads East Parcel P13, except for a small parcel that will be retained by the City of Scottsdale. To determine anticipated trips generated for the new Axon Headquarters, counts were taken at the existing Axon Headquarters to determine custom rates, as it is assumed to be the most accurate representation of Axon employee's flexible and staggered shifts. CivTech elected to use custom rates rather than ITE rates, as ITE rates assume most employees would be entering/exiting the site during the AM and PM peak hours, which is not the case with the Axon Headquarters. Counts were taken from Tuesday, May 28, 2024 to Friday, May 31, 2024 to determine average vehicle entry/exit throughout the day. Based on the results, approximately 38 vehicles are expected to access the existing Axon Headquarters during the AM peak hour and approximately 23 vehicles are expected during the PM peak hour. The existing Axon Headquarters is approximately 100,000 SF and consists of approximately 36.5% office space and 64.5% industrial space, which is assumed to be the same ratio for the proposed Axon Headquarters. The proposed Axon Headquarters is expected to be approximately 401,085 SF, and therefore, the existing counts are multiplied by 4.011 to better represent the larger proposed Headquarters Building. Additionally, since the counts were taken during

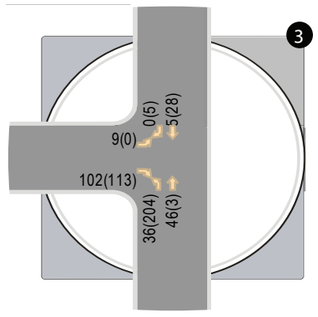
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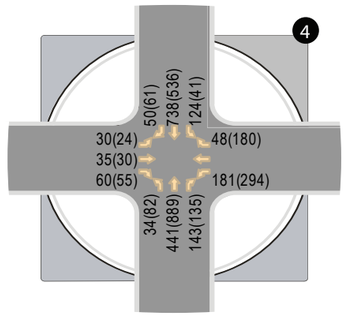
Hayden Rd & Mayo Blvd/Axon Wy



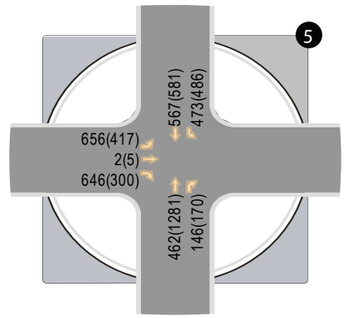
82nd St & Union Hills Dr/Mayo Blvd



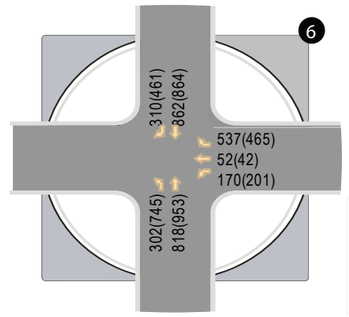
Perimeter Dr & Axon Wy



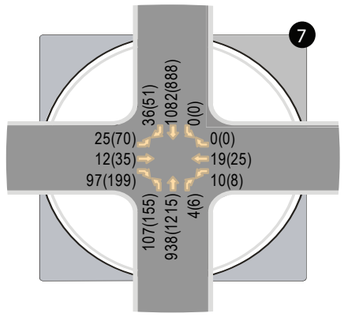
Hayden Rd & Princess Dr



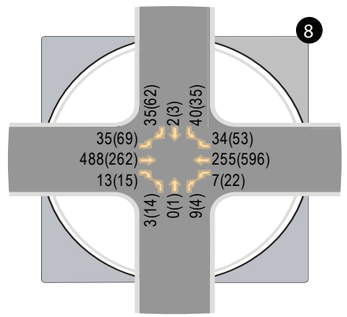
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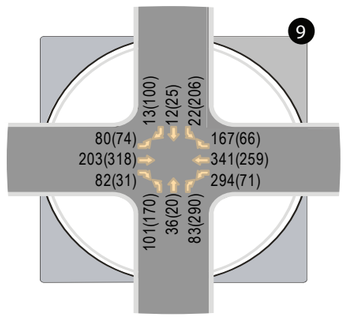
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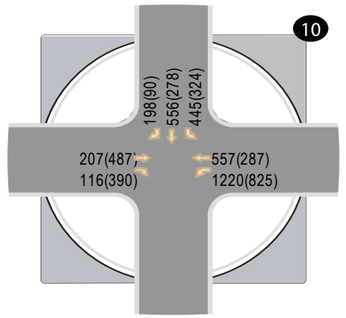
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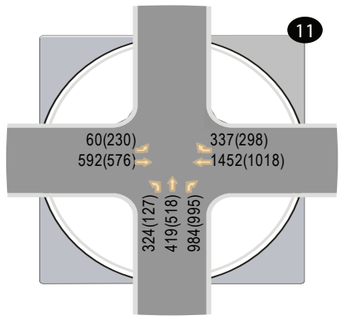
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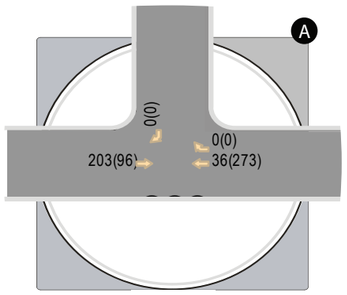
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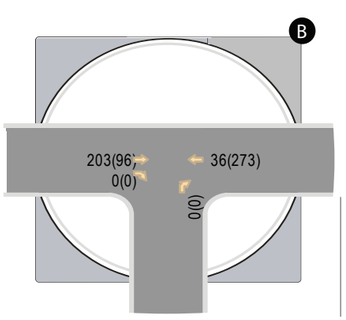
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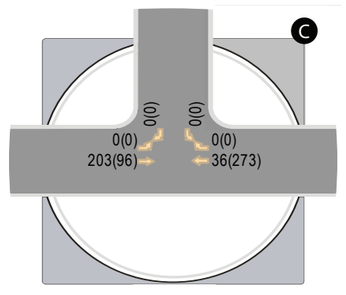
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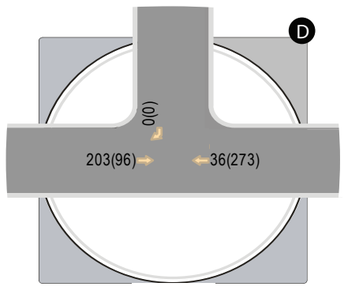
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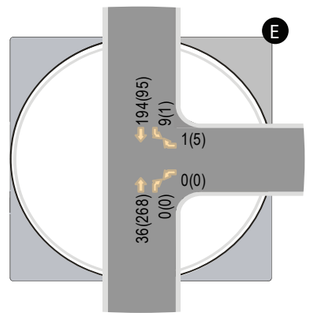
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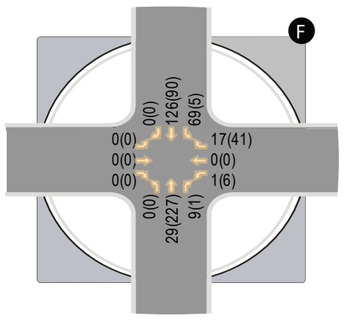
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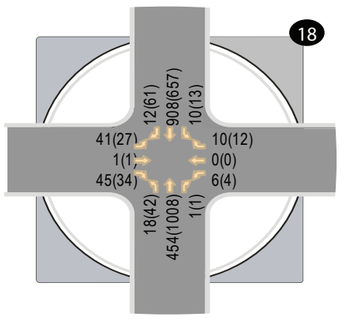
Access D & Axon Wy



Axon Wy & Access E



Axon Wy & Access F



Hayden Rd & Union Hills Dr/Mayo Blvd

NORTH

LEGEND

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

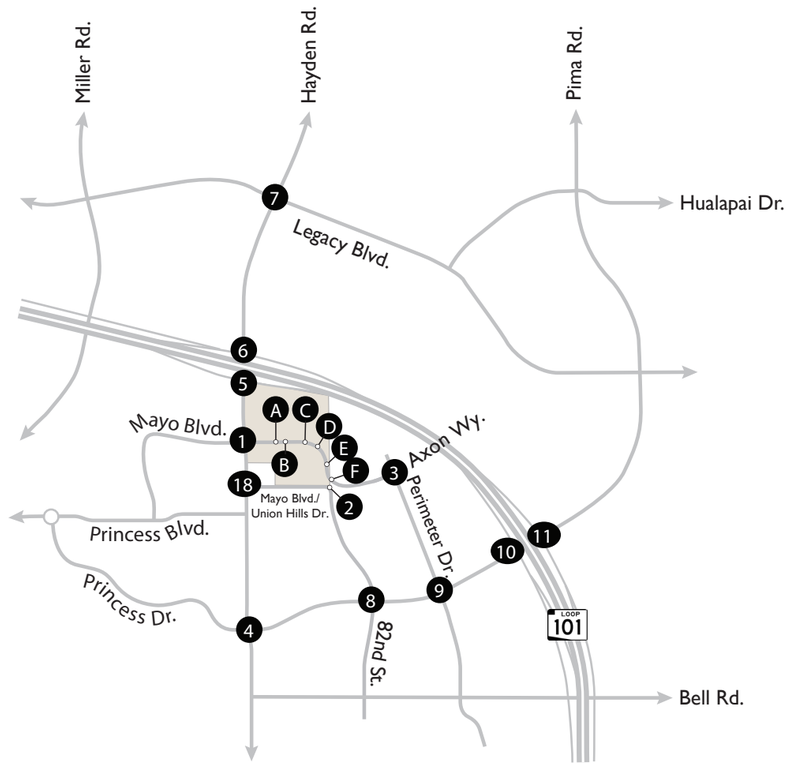
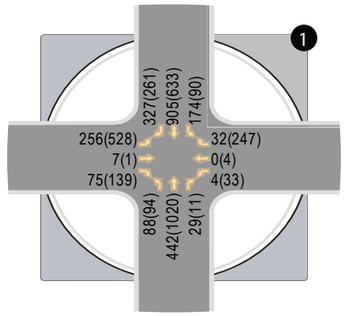
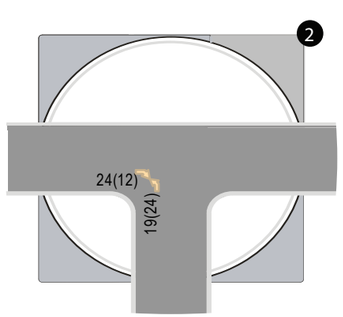


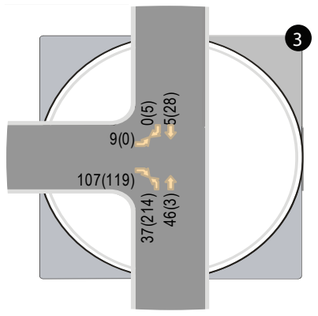
Figure 8: 2025 Background Traffic Volumes



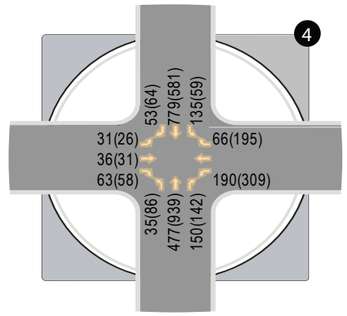
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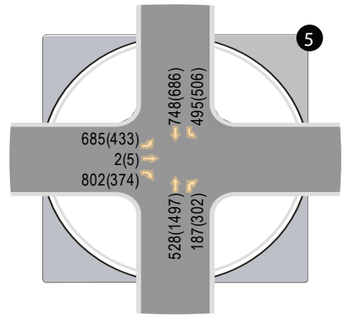
82nd St & Union Hills Dr/Mayo Blvd



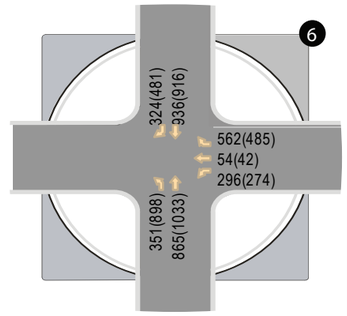
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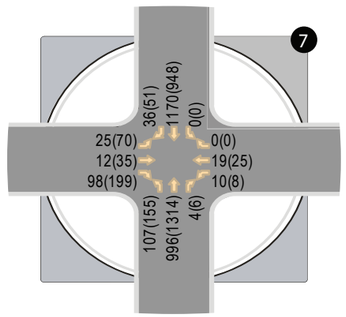
Hayden Rd & Princess Dr



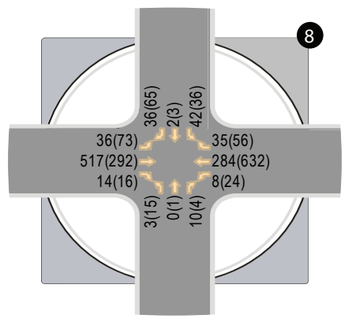
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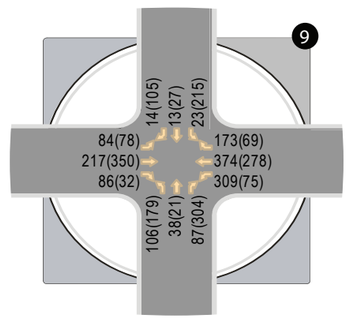
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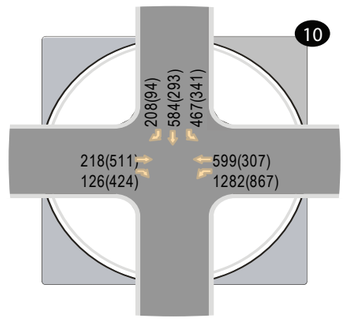
Hayden Rd & Legacy Blvd



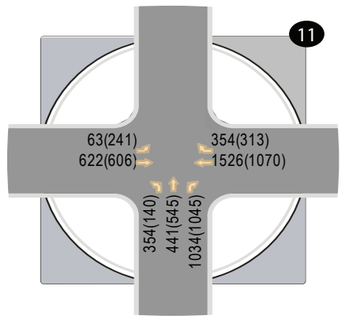
82nd St & Princess Dr



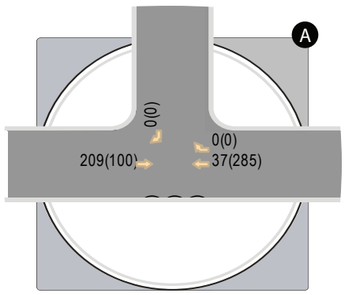
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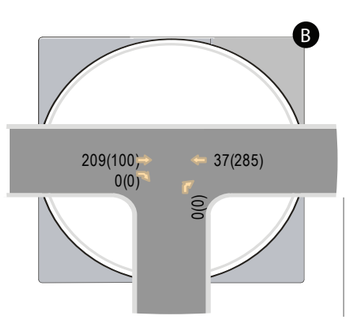
Loop 101 SB Ramps @ Princess Dr/Pima Rd



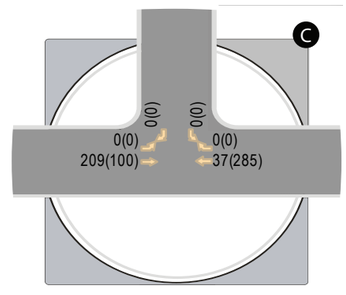
Loop 101 NB Ramps @ Princess Dr/Pima Rd



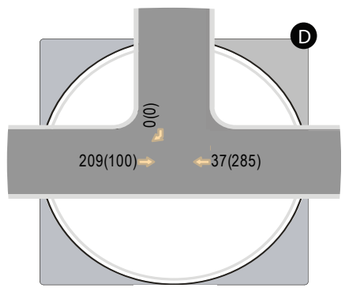
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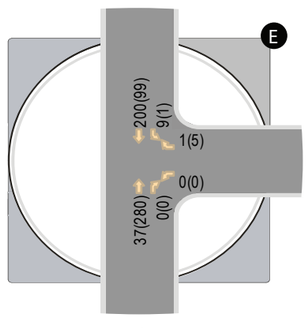
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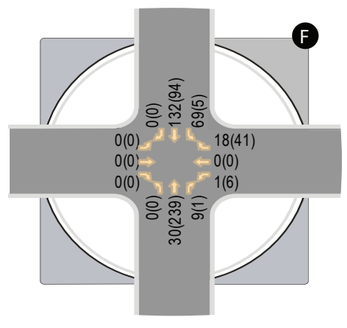
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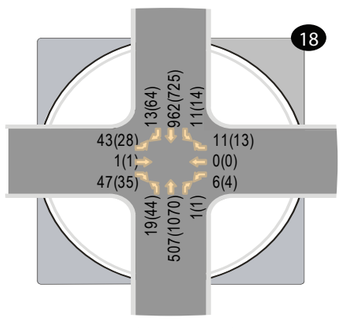
Access D & Axon Wy



Axon Wy & Access E



Axon Wy & Access F



Hayden Rd & Union Hills Dr/Mayo Blvd

NORTH

LEGEND

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

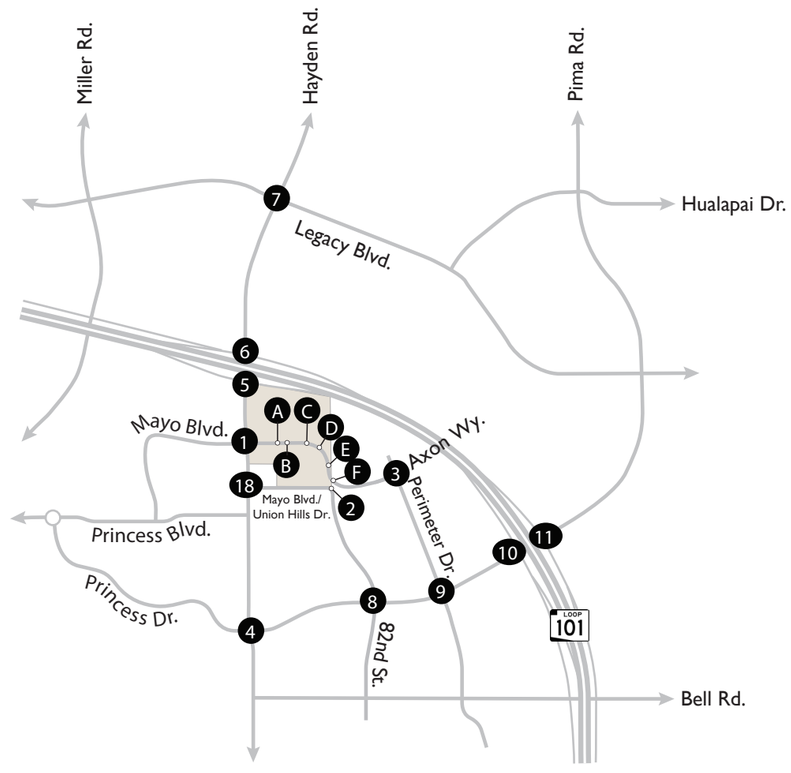


Figure 9: 2030 Background Traffic Volumes

Memorial Day week, a seasonal factor of 1.1 was applied to be more conservative. Custom rates were calculated for the weekday, AM peak hour and PM peak hour by dividing the traffic counts by the building square footage, and multiplying the seasonal factor. Using this information, the new Axon Headquarters is expected to generate 2,512 trips on a typical weekday, with 156 trips (142 in/14 out) generated during the AM peak hour and 94 trips (10 in/84 out) during the PM peak hour. Phase 1 site-generated volumes will be included in both the 2025 and 2030 Background volumes.

In addition to adding trips from Phase 1 and applying a factor that represents expected regional growth in traffic volumes, CivTech was asked by City reviewers to include traffic volumes generated by four other developments expected/approved by the City in the area. These are described below. CivTech studied the first two. Site trip assignment figures for each are included in **Appendix G**.

Optima McDowell Mountain Village. The Optima McDowell Mountain Village is a proposed mixed-use development located north of Mayo Boulevard and east of Scottsdale Road in the City of Scottsdale, Arizona. The development plans to consist of up to 1,390 DUs of luxury multifamily residences in six individual buildings with some retail on the ground floor and a lower courtyard area. The development will also provide an underground parking lot for residences that can be accessed from Mayo Boulevard. Optima McDowell Mountain Village is expected to open in 2025, and therefore, these site-generated volumes will be included in both the 2025 and 2030 Background scenarios.

Cavasson. The Cavasson development is a ±134-acre project located on the southwest corner of Hayden Road and Legacy Boulevard in Scottsdale. The development plans to consist of a 400-room hotel, up to 1,600 DUs of multifamily residential units, 1,800,00 SF of office space, 194,000 SF of retail use and 12,000 SF and fast-food restaurant land use. Per recommendations from the City of Scottsdale, CivTech assumed 60% of the entire Cavasson site would be built out by opening year 2025. The remainder of the site is assumed to be built after horizon year 2030, and therefore, 60% of the full build site-generated volumes will be included in both the 2025 and 2030 Background scenarios. It should be noted that approximately 84% of Phase 1 has been occupied since traffic counts were taken in July 2023; therefore, this portion of Phase 1 has been removed from the 60% full build site-generated volumes, as it is considered to be part of the existing volumes.

Northwest Corner Hayden Road and Mayo Boulevard. This development, proposed for approximately 73.2 acres, is a mixed-use development consisting of hospital, medical office, retail, senior living, office, and restaurant land uses. The development is anticipated to include a 352-bed hospital, 276,100 SF of medical offices, 144,780 SF of retail floor area, 250 DUs of senior living, 32,670 SF of General Office space, and 30,000 SF of restaurant floor area. Full build-out is not expected until 2040; therefore, CivTech estimated that 20% of its trips could be generated by 2025 and half of its by 2030.

Banner Scottsdale Medical Center. This development is proposed on yet-to-be acquired parcels of Arizona State Trust Land along the south side of the Mayo Boulevard alignment between Hayden and Scottsdale Roads. Phase 1 includes a 119,500 SF medical office building that is expected to be constructed by 2026, and will be included in the 2030 background volumes. Full buildout of the site is expected to be by 2040, and therefore, will not be included in this analysis.

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The addition of a dual eastbound left-turn lane and dual northbound left-turn lane are being recommended at the intersection of Hayden Road and Mayo Boulevard/Axon Way within the Banner Scottsdale Medical Center TIMA and will therefore be included in both the 2030 No Build and Build analyses.

The turning movements expected from these other developments for the opening year of 2025 and for the study horizon year of 2030 are presented in **Figure 10** and **Figure 11**, respectively. Surrounding development volumes can be found in **Appendix G**.

TOTAL TRAFFIC

The total traffic volumes used in the capacity analysis were determined by adding the site generated traffic to the estimated projected background traffic. Total peak hour traffic volumes for the opening year of 2025 are shown in **Figure 12**. Total peak hour traffic volumes for the horizon year of 2030 are shown in **Figure 13**.

AVERAGE DAILY ROADWAY SEGMENT VOLUMES

Average daily roadway segment volumes were calculated for several roadways within the study area. To determine the 2025 and 2030 background average daily roadway segment volumes, CivTech used the City of Scottsdale's *2022 Average Daily Traffic Volumes SEGMENT* figure. **Table 6** shows the segment volumes utilized. A growth factor of 1.030 was applied to project 2025 background volumes and a growth factor of 1.083 was applied to project 2030 background volumes. Average daily volumes from surrounding developments were added to the projected background volumes. Average daily traffic volumes from the 2025 and 2030 Background scenarios are shown in **Figure 14**.

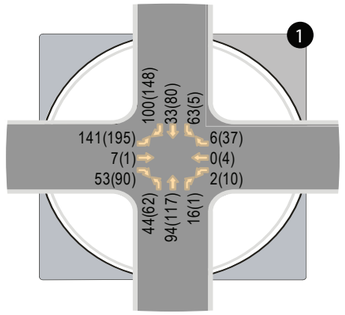
TABLE 6 – AVERAGE DAILY SEGMENT TRAFFIC VOLUMES

Roadway Segment	2022 Average Daily Traffic Volumes	2025 Average Daily Traffic Volumes	2030 Average Daily Traffic Volumes
Hayden Road (between Bell Road & Loop 101)	15,100	15,553	16,353
Hayden Road (between Loop 101 & Legacy Boulevard)	20,800	21,424	22,526
Perimeter Drive (between Princess Drive & Mayo Boulevard/Union Hills Drive)	2,600	2,678	2,816
82nd Street (between Princess Drive & Mayo Boulevard/Union Hills Drive)	452*	466	489

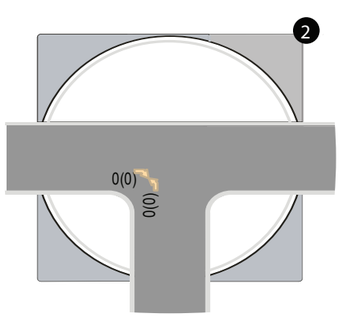
*Volume retrieved from Maricopa Association of Governments Traffic Count (TCDS)

Total average daily volumes were determined by adding the background volumes with the site-generated volumes from the proposed site. Average daily traffic volumes from the 2025 and 2030 Total scenarios are shown in **Figure 15**.

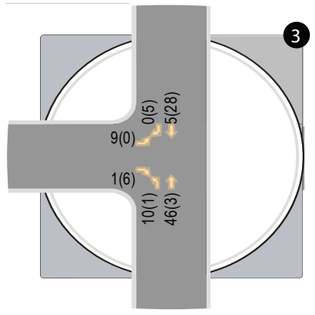
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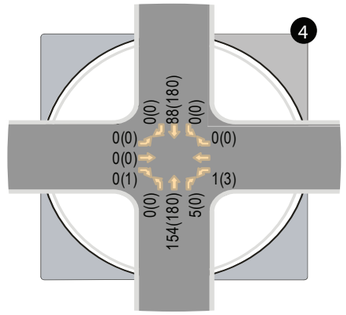
Hayden Rd & Mayo Blvd/Axon Wy



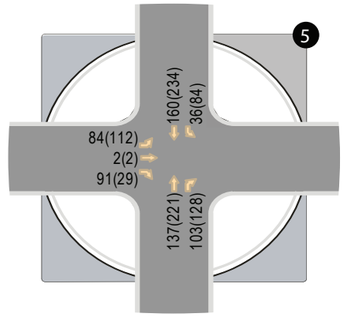
82nd St & Union Hills Dr/Mayo Blvd



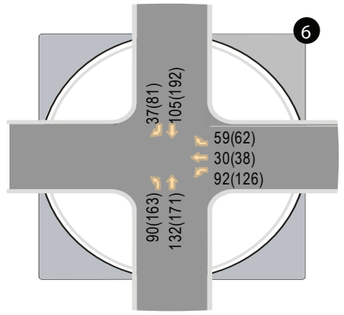
Perimeter Dr & Axon Wy



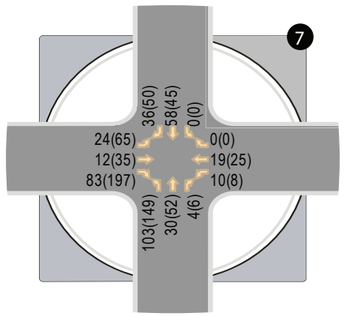
Hayden Rd & Princess Dr



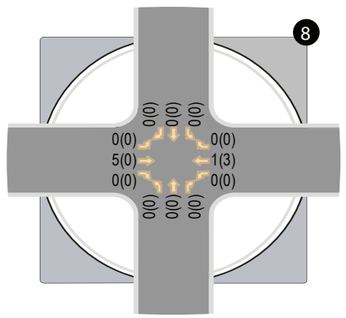
Hayden Rd & Loop 101 EB Ramps



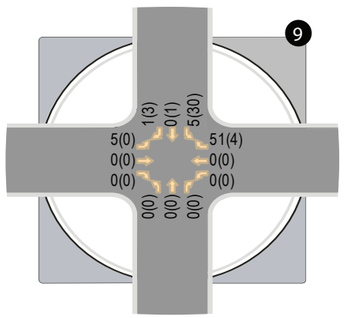
Hayden Rd & Loop 101 WB Ramps



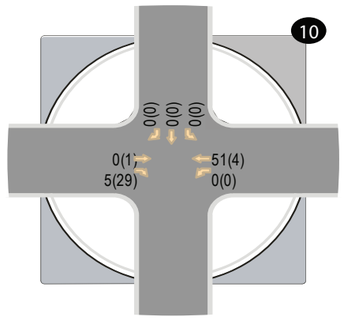
Hayden Rd & Legacy Blvd



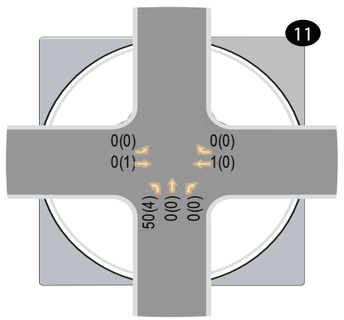
82nd St & Princess Dr



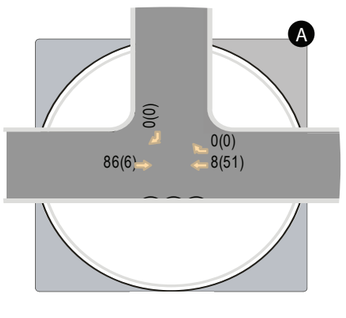
Perimeter Dr & Princess Dr



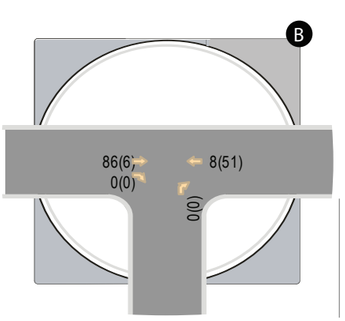
Loop 101 SB Ramps @ Princess Dr/Pima Rd



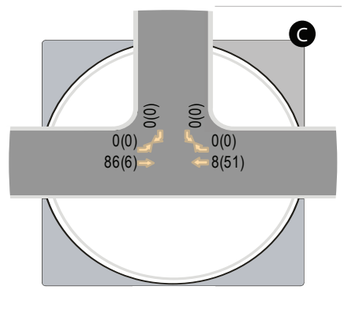
Loop 101 NB Ramps @ Princess Dr/Pima Rd



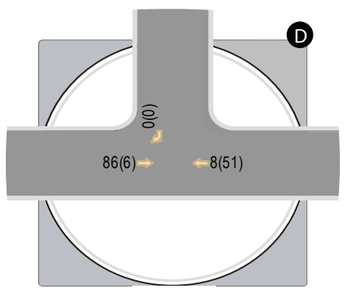
Access A & Axon Wy



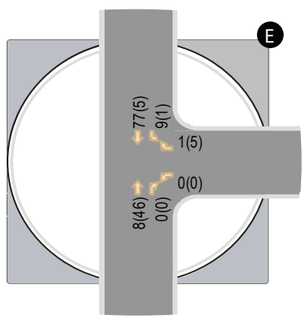
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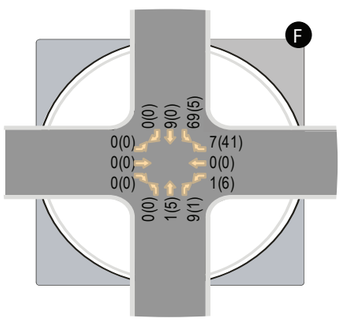
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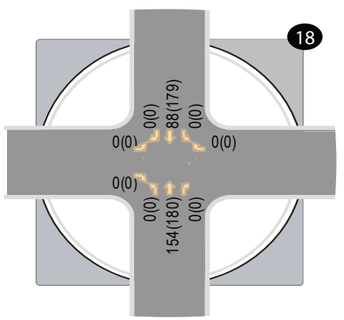
Access D & Axon Wy



Axon Wy & Access E



Axon Wy & Access F



Hayden Rd & Union Hills Dr/Mayo Blvd

NORTH

LEGEND

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

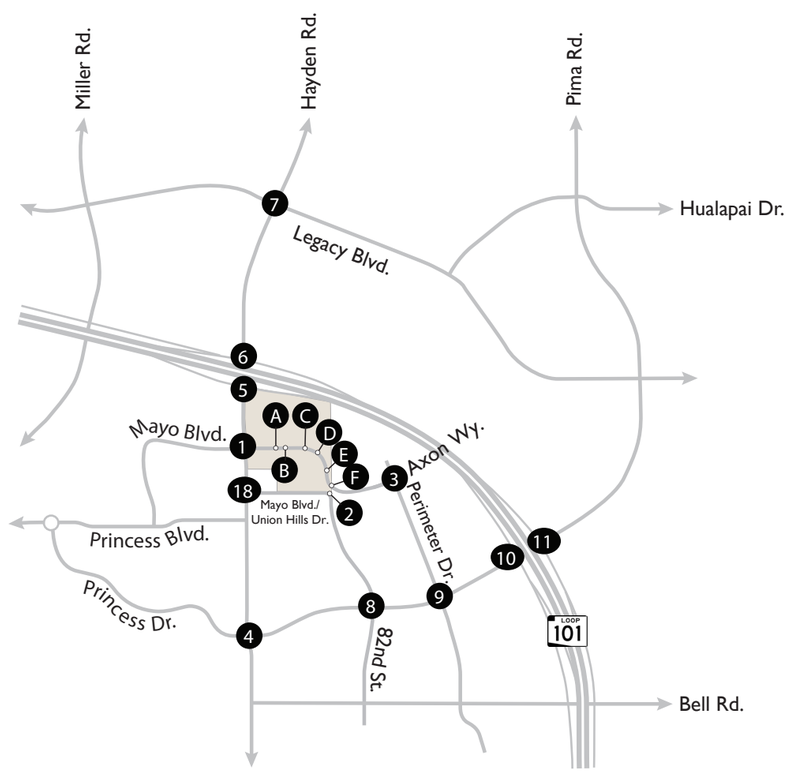
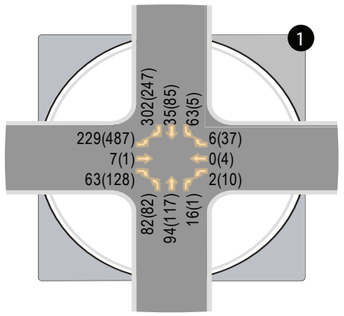
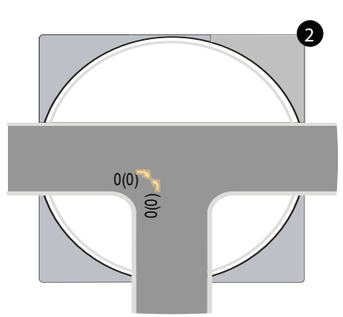


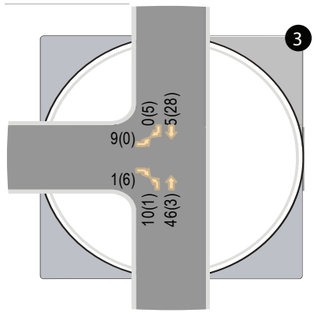
Figure 10: 2025 Surrounding Development Traffic Volumes



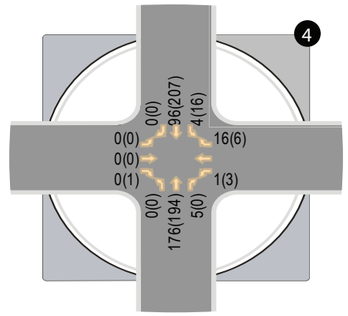
Hayden Rd & Mayo Blvd/Axon Wy



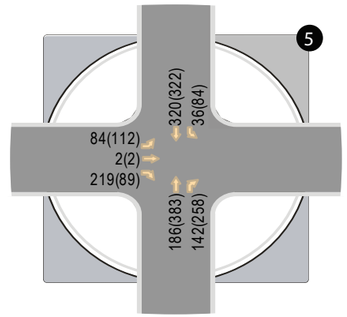
82nd St & Union Hills Dr/Mayo Blvd



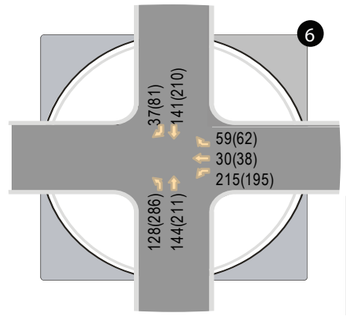
Perimeter Dr & Axon Wy



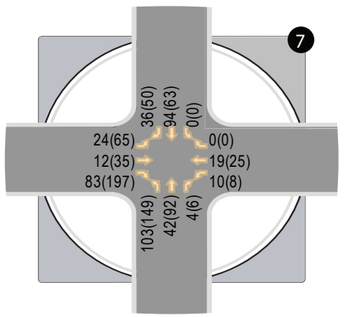
Hayden Rd & Princess Dr



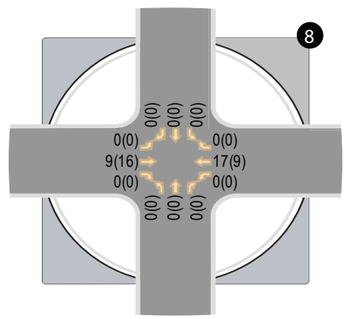
Hayden Rd & Loop 101 EB Ramps



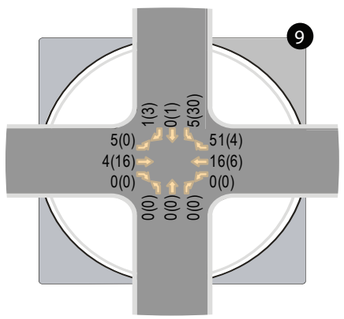
Hayden Rd & Loop 101 WB Ramps



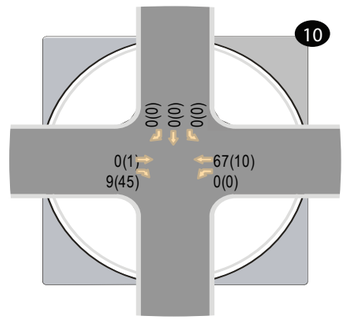
Hayden Rd & Legacy Blvd



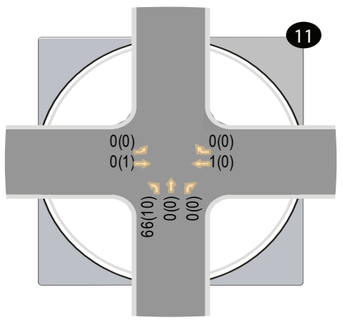
82nd St & Princess Dr



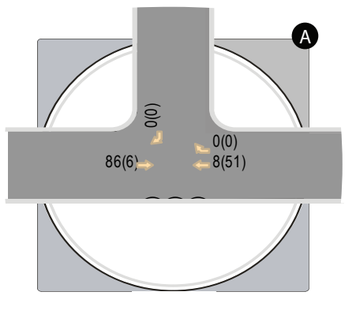
Perimeter Dr & Princess Dr



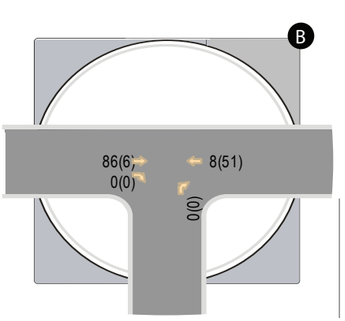
Loop 101 SB Ramps @ Princess Dr/Pima Rd



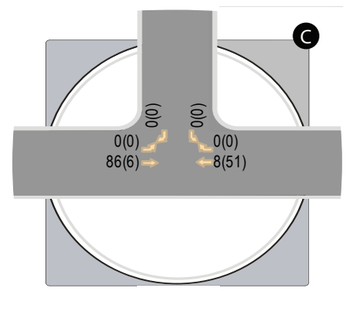
Loop 101 NB Ramps @ Princess Dr/Pima Rd



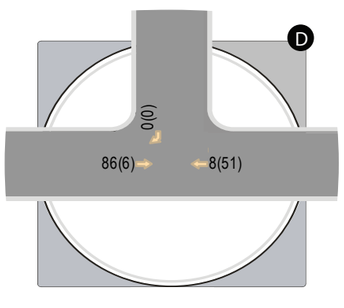
Access A & Axon Wy



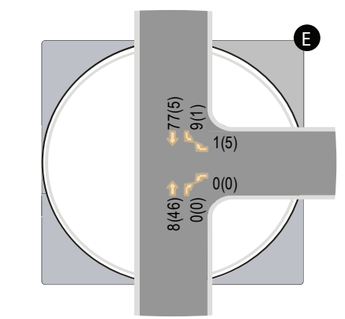
Access B & Axon Wy



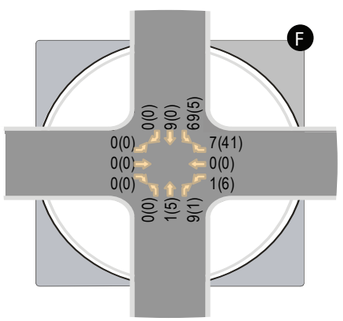
Access C & Axon Wy



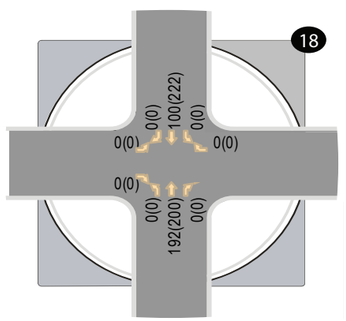
Access D & Axon Wy



Axon Wy & Access E



Axon Wy & Access F



Hayden Rd & Union Hills Dr/Mayo Blvd

NORTH

LEGEND

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

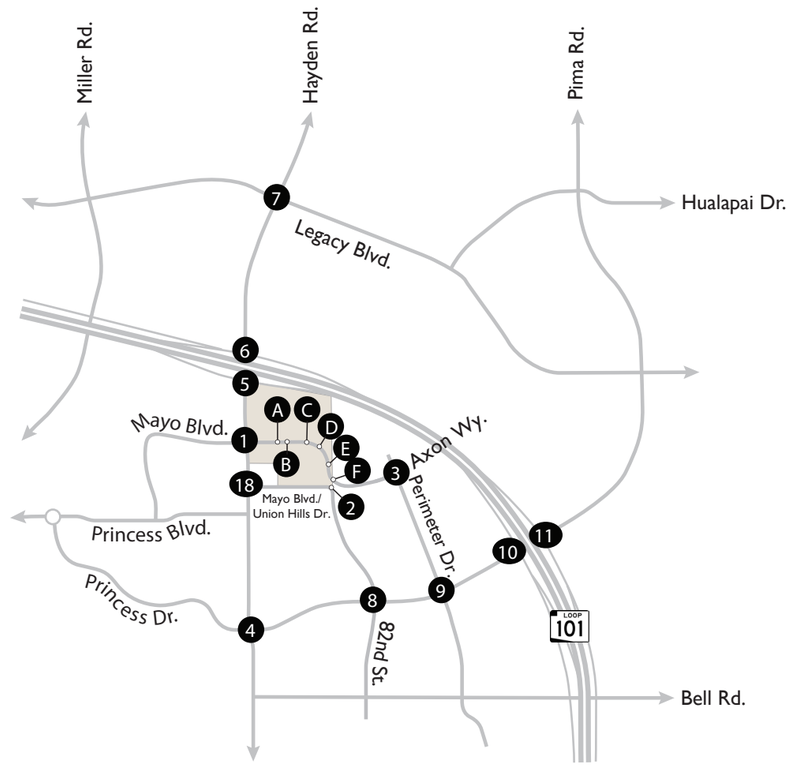
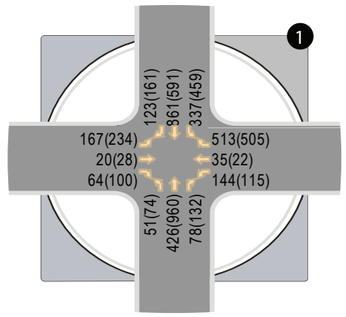
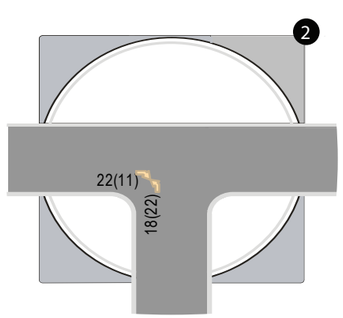


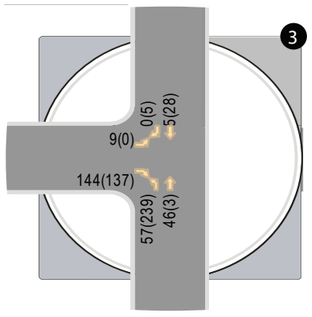
Figure 11: 2030 Surrounding Developments Traffic Volumes



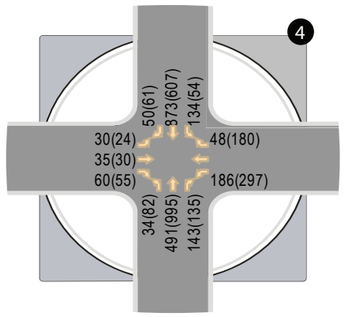
Hayden Rd & Mayo Blvd/Axon Wy



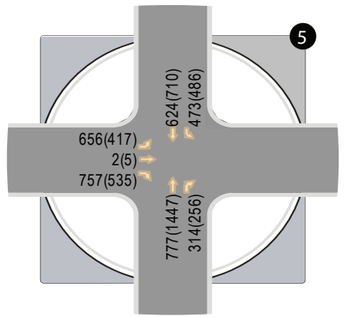
82nd St & Union Hills Dr/Mayo Blvd



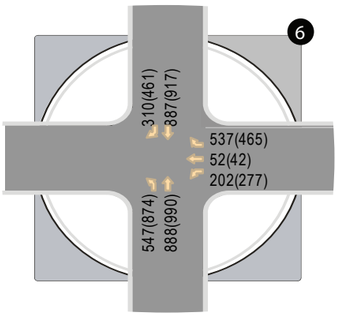
Perimeter Dr & Axon Wy



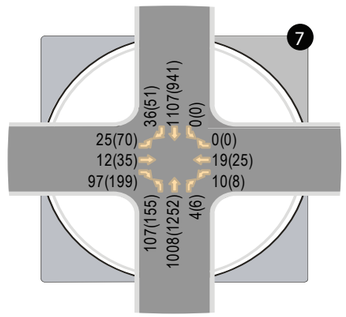
Hayden Rd & Princess Dr



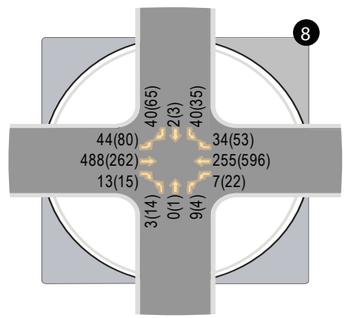
Hayden Rd & Loop 101 EB Ramps



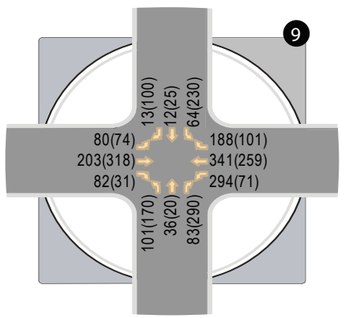
Hayden Rd & Loop 101 WB Ramps



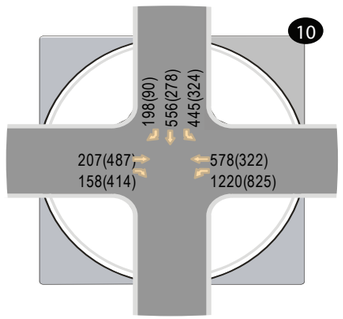
Hayden Rd & Legacy Blvd



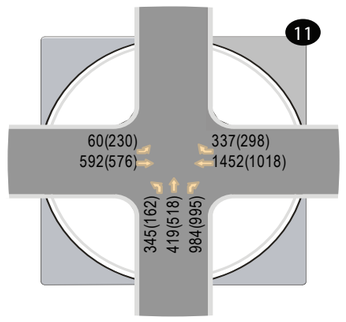
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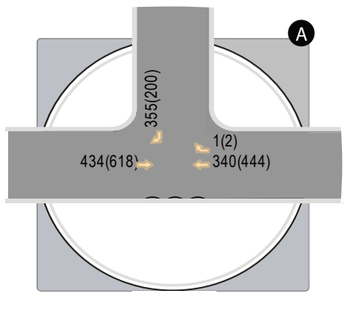
Perimeter Dr & Princess Dr



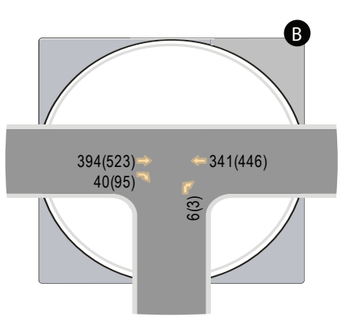
Loop 101 SB Ramps @ Princess Dr/Pima Rd



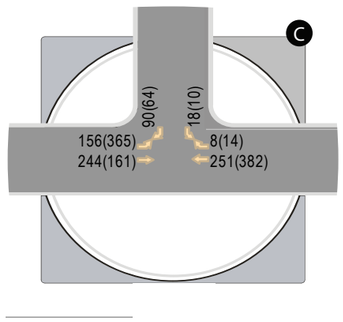
Loop 101 NB Ramps @ Princess Dr/Pima Rd



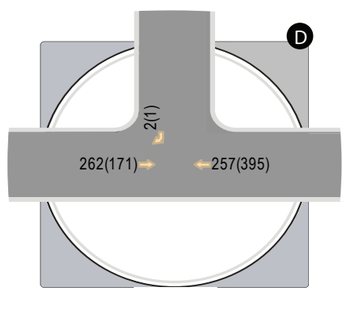
Access A & Axon Wy



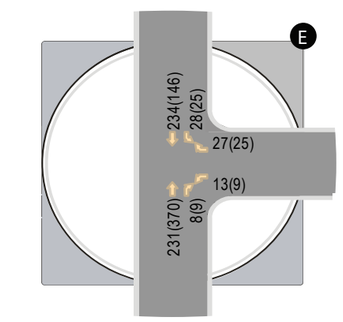
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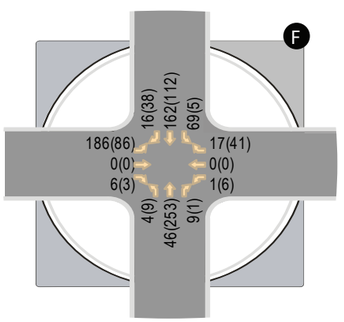
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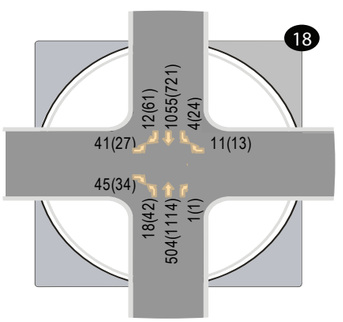
Access D & Axon Wy



Axon Wy & Access E



Axon Wy & Access F



Hayden Rd & Union Hills Dr/Mayo Blvd

NORTH

LEGEND

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

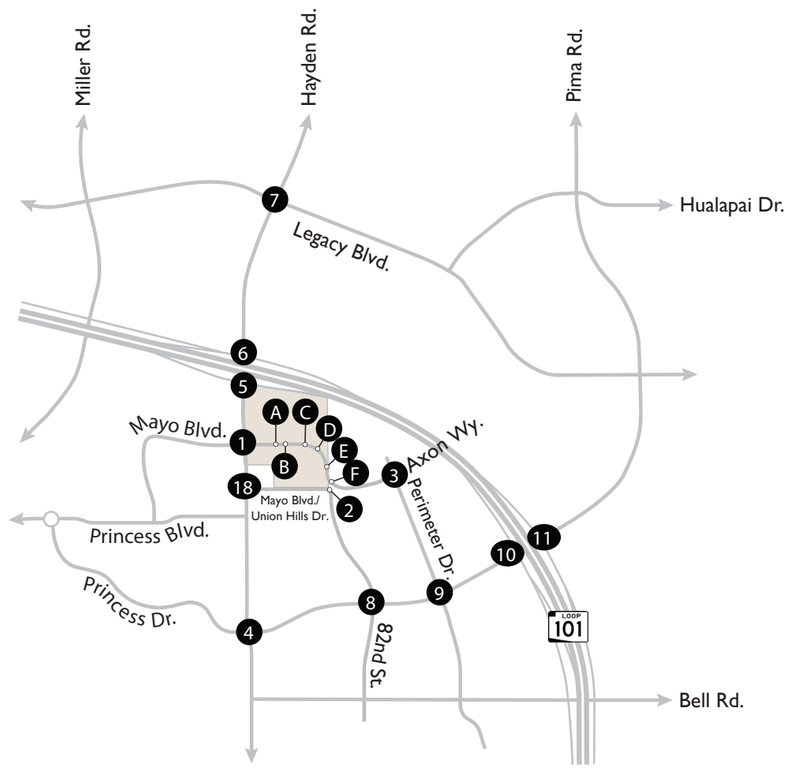
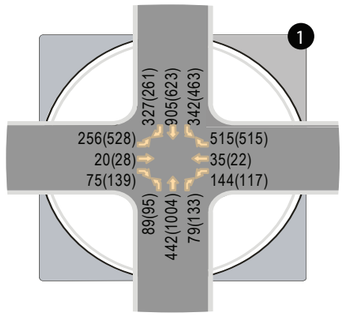
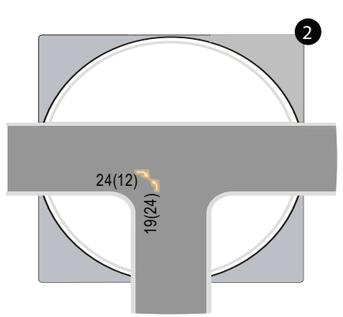


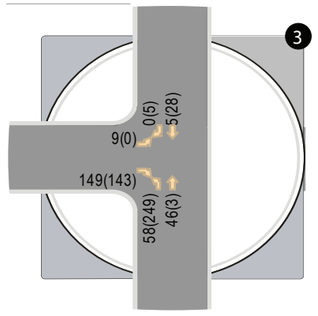
Figure 12: 2025 Total Traffic Volumes



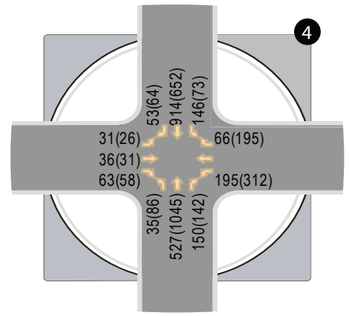
Hayden Rd & Mayo Blvd/Axon Wy



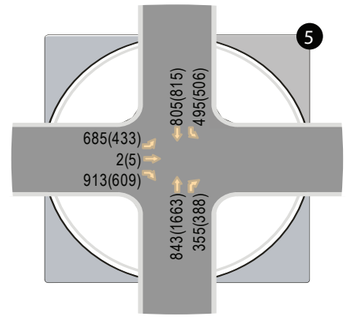
82nd St & Union Hills Dr/Mayo Blvd



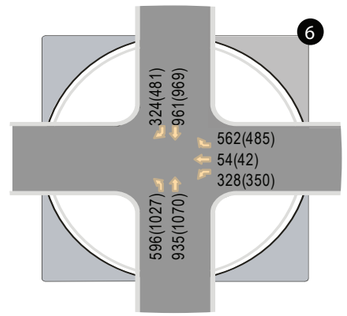
Perimeter Dr & Axon Wy



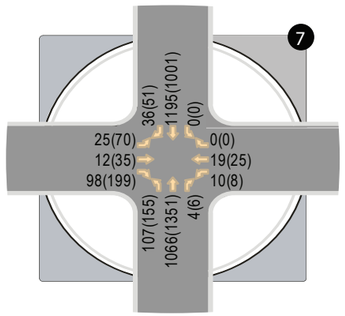
Hayden Rd & Princess Dr



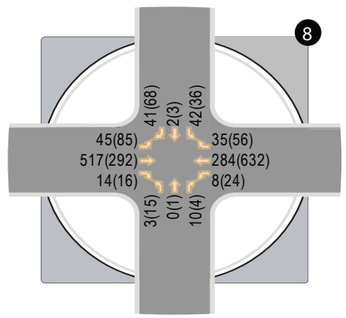
Hayden Rd & Loop 101 EB Ramps



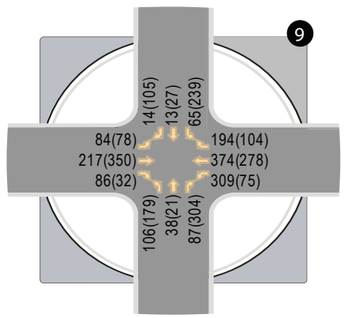
Hayden Rd & Loop 101 WB Ramps



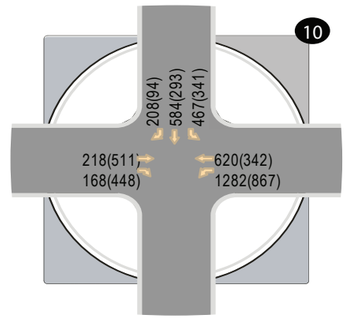
Hayden Rd & Legacy Blvd



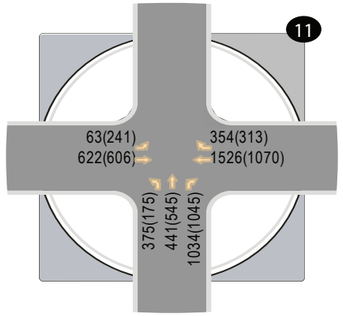
82nd St & Princess Dr



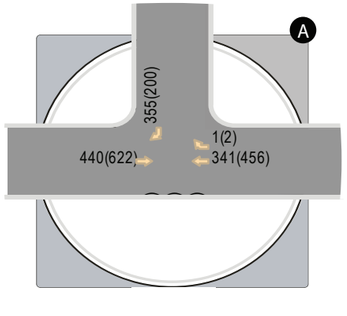
Perimeter Dr & Princess Dr



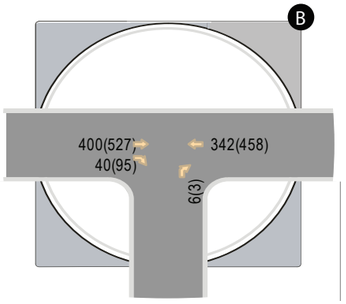
Loop 101 SB Ramps @ Princess Dr/Pima Rd



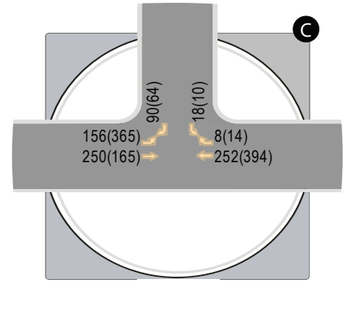
Loop 101 NB Ramps @ Princess Dr/Pima Rd



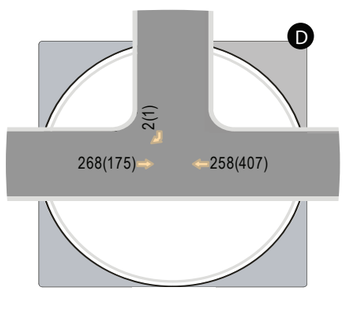
Access A & Axon Wy



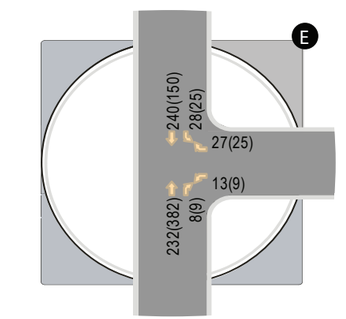
Access B & Axon Wy



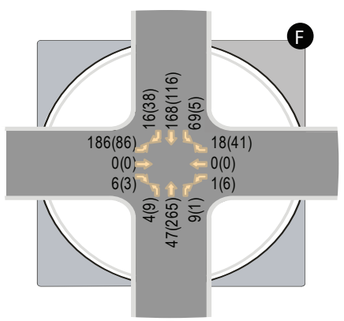
Access C & Axon Wy



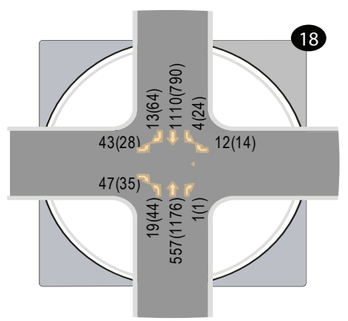
Access D & Axon Wy



Axon Wy & Access E



Axon Wy & Access F



Hayden Rd & Union Hills Dr/Mayo Blvd

NORTH

LEGEND

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

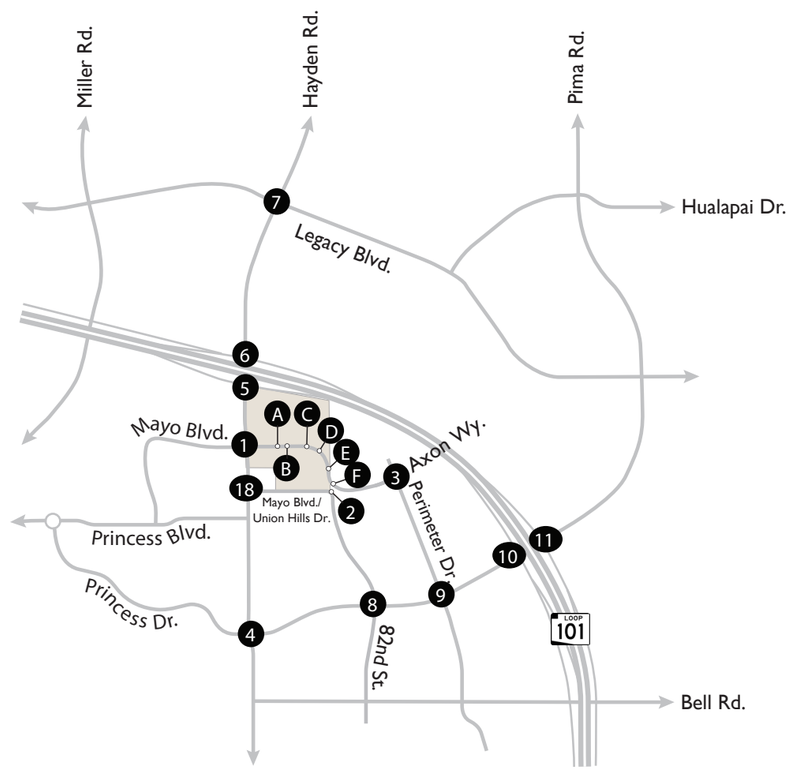


Figure 13: 2030 Total Traffic Volumes

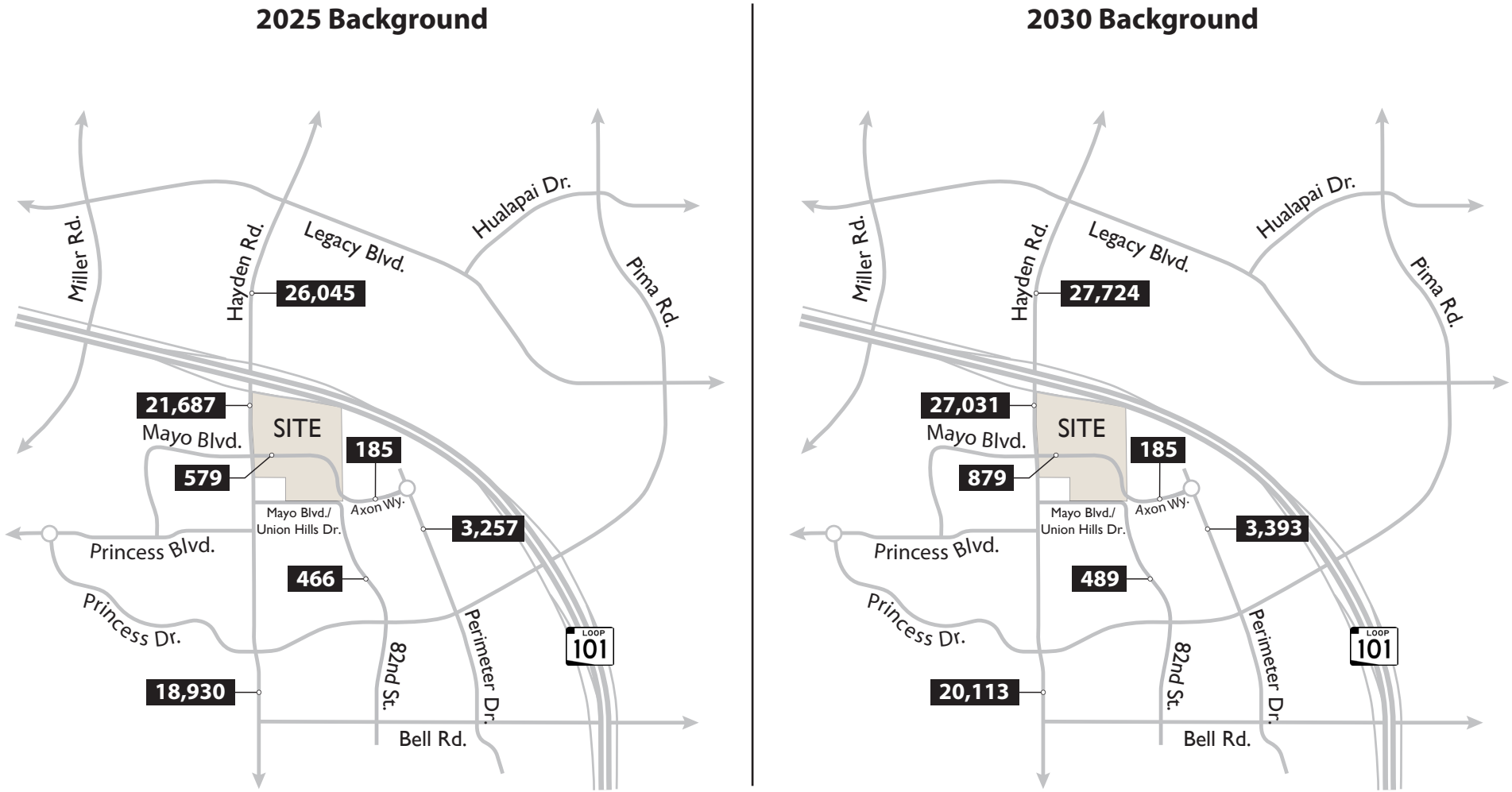


Figure 14: 2025 and 2030 Average Daily Background Traffic Volumes

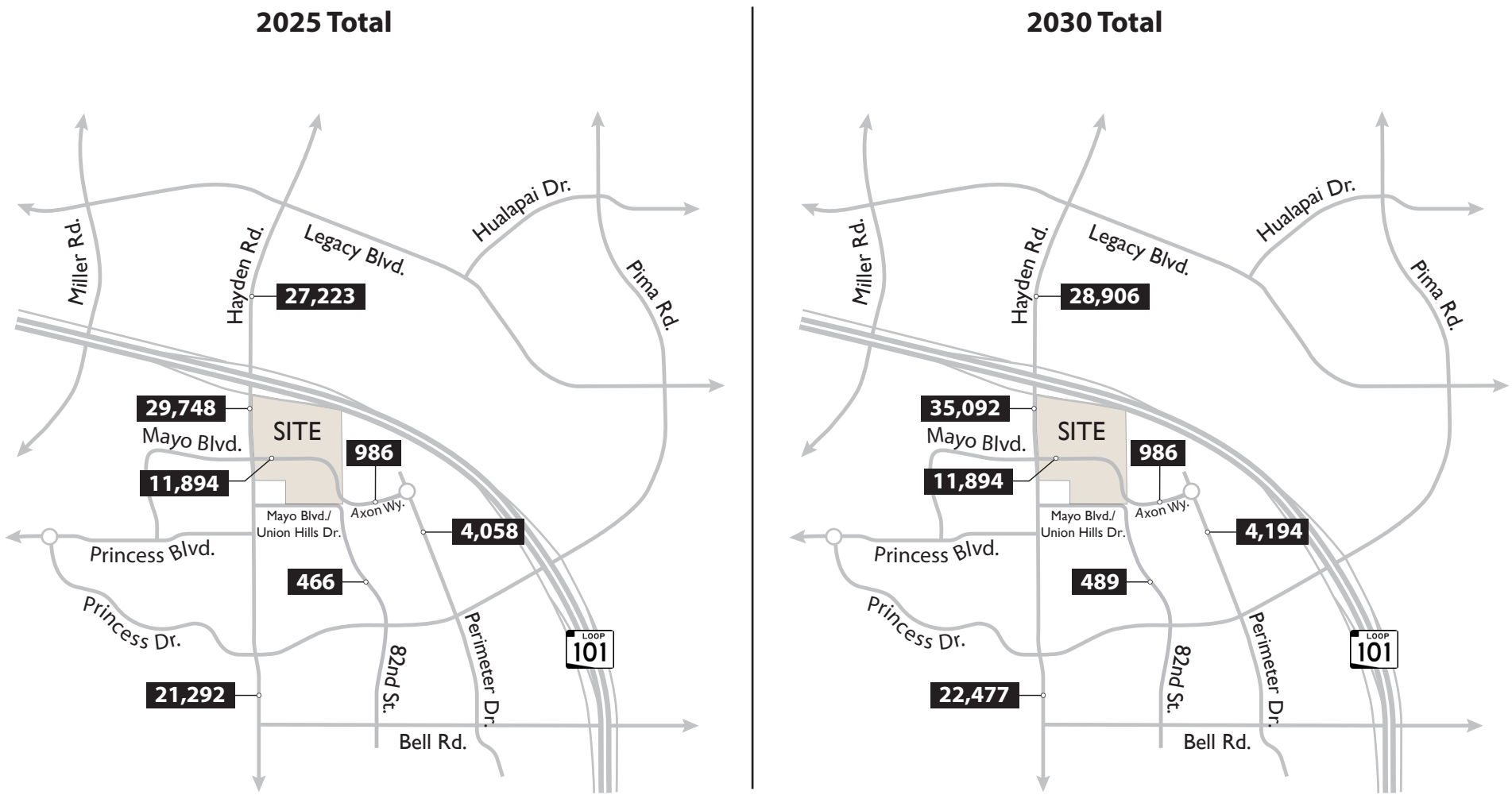


Figure 15: 2025 and 2030 Average Daily Total Traffic Volumes

TRAFFIC AND IMPROVEMENT ANALYSIS

INTERSECTION CAPACITY ANALYSIS

The overall intersection and approach levels of service are summarized **Table 7** for the 2025 and 2030 Background (No-Build) and Total (Build) conditions. Detailed analysis worksheets for the 2025 analysis can be found in **Appendix H** and in **Appendix I** for the 2030 analysis. Both appendices include worksheets for mitigated intersections, where applicable. It should be noted that delays are expected in both the Build and No Build scenarios. There are several proposed surrounding developments that are expected to be built out by 2030, further increasing delays at these intersections. *Please note that, for the formerly three-legged intersection of Hayden Road and Axon Way/Mayo Boulevard, CivTech applied a signal cycle and timings for the background/no-build conditions based on other study intersections in the Hayden Road corridor. At this intersection and others where mitigations were applied in 2025 under the total/build conditions, the mitigations were carried through to 2030. (Therefore, no results may be reported for unmitigated, Total/Build conditions.)*

TABLE 7 – PEAK HOUR LEVELS OF SERVICE

ID	Intersection	Intersection Control	Approach/ Movement	2025		2030	
				No Build	Build	No Build	Build
				AM (PM)	AM(PM)	AM(PM)	AM(PM)
1	Hayden Rd & Axon Wy/Mayo Blvd	Signalized	NB	A (A)	A (B)	A (B)	-
			SB	A (A)	A (**F**)	B (D)	
			EB	D (D)	D (D)	D (D)	
			WB	D (D)	D (D)	**E (E)**	
			Overall	***B (B)***	***B (E)***	***C (C)***	-
		Mitigated – Add dual SBL, Signal Timing Adjustment	NB	-	B (C)	-	D (D)
			SB		C (C)		A (C)
			EB		D (D)		D (D)
			WB		D (D)		C (D)
			Overall	***-***	***C (C)***	***-***	***C (D)***
3	Perimeter Dr & Axon Wy	Roundabout	NB	A (A)	A (A)	A (A)	A (A)
			SB	A (A)	A (A)	A (A)	A (A)
			EB	A (A)	A (A)	A (A)	A (A)
			Overall	***A (A)***	***A (A)***	***A (A)***	***A (A)***
4	Hayden Rd & Princess Dr	Signalized	NB	A (A)	A (A)	A (A)	A (A)
			SB	A (A)	A (A)	A (A)	A (A)
			EB	D (D)	D (D)	D (D)	D (D)
			Overall	***A (A)***	***A (A)***	***A (A)***	***A (A)***
5	Hayden Rd & Loop 101 EB Ramps	Signalized	NB Thru	31.1 C (36.1 D)	37.2 D (44.3 D)	29.5 C (51.1 D)	-
			NB Right	34.2 C (20.7 C)	22.2 C (32.3 C)	40.9 D (38.7 D)	
			NB Overall	31.8 C (34.2 C)	33.0 C (42.4 D)	32.5 C (49.0 D)	
			SB Left	25.0 C (338.7 **F**)	25.7 C (343.2 **F**)	30.3 C (372.7 **F**)	
			SB Thru	12.2 B (32.0 C)	13.2 B (53.0 D)	17.2 B (45.7 D)	
			SB Overall	18.0 B (171.7 **F**)	18.8 B (175.0 **F**)	22.6 C (189.1 **F**)	
			EB Left	290.8 **F** (107.2 **F**)	366.5 **F** (295.4 **F**)	408.9 **F** (201.6 **F**)	
			EB Shared	286.6 **F** (108.6 **F**)	330.9 **F** (204.1 **F**)	382.0 **F** (193.4 **F**)	
			EB Right	41.6 D (43.4 D)	42.4 D (45.6 D)	42.8 D (45.4 D)	
			EB Overall	210.3 **F** (87.6 **F**)	250.6 **F** (185.3 **F**)	281.6 **F** (149.2 **F**)	
			Overall	***103.2 F (92.8 F)***	***112.4 F (119.1 F)***	***134.3 F (114.9 F)***	-

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TABLE 7 – PEAK HOUR LEVELS OF SERVICE

ID	Intersection	Intersection Control	Approach/ Movement	2025		2030	
				No Build	Build	No Build	Build
				AM (PM)	AM(PM)	AM(PM)	AM(PM)
5	Hayden Rd & Loop 101 EB Ramps *(cont.)*	Mitigated – Signal Timing Adjustment	NB Thru	-	27.3 C (35.8 D)	-	20.8 C (39.8 D)
			NB Right		25.9 C (39.1 D)		34.6 C (21.1 C)
			NB Overall		26.9 C (36.3 D)		24.7 C (36.2 D)
			SB Left		40.4 D (46.7 D)		43.9 D (49.9 D)
			SB Thru		40.3 D (93.8 **F**)		132.3 **F** (165.2 **F**)
			SB Overall		40.4 D (74.0 **E**)		97.5 **F** (119.5 **F**)
			EB Left		96.6 **F** (39.9 D)		144.7 **F** (43.1 D)
			EB Shared		84.6 **F** (36.3 D)		111.9 **F** (36.5 D)
			EB Right		32.5 C (30.4 C)		33.0 C (30.7 C)
			EB Overall		72.0 **E** (35.7 D)		98.1 **F** (36.9 D)
			Overall	**-**	***48.4 D (48.0 D)***	**-**	***76.0 E (61.7 E)***
		Mitigated – Lane Restriping, Lane Additions: NBT/R, SBT, EBR	NB Thru	-	-	-	29.0 C (38.1 D)
			NB Right				41.6 D (158.7 **F**)
			NB Overall				31.2 C (58.7 **E**)
			SB Left				45.6 D (69.5 **E**)
			SB Thru				32.6 C (34.8 C)
			SB Overall				37.7 D (48.1 D)
			EB Left				45.3 D (70.3 **E**)
			EB Shared				45.5 D (68.3 **E**)
			EB Right				33.6 C (43.4 D)
			EB Overall				38.7 D (54.2 D)
			Overall	**-**	**-**	**-**	***36.1 D (54.3 D)***
6	Hayden Rd & Loop 101 WB Ramps	Signalized	NB Left	325.6 **F** (568.3 **F**)	933.0 **F** (736.7 **F**)	446.1 **F** (768.8 **F**)	-
			NB Thru	46.9 D (15.9 B)	87.5 **F** (16.4 B)	75.9 **E** (19.4 B)	
			NB Overall	122.2 **F** (258.3 **F**)	409.8 **F** (354.1 **F**)	182.7 **F** (367.9 **F**)	
			SB Thru	45.3 D (48.6 D)	45.6 D (49.8 D)	46.1 D (49.9 D)	
			SB Right	209.7 **F** (196.1 **F**)	208.9 **F** (198.4 **F**)	212.5 **F** (201.9 **F**)	
			SB Overall	87.0 **F** (98.0 **F**)	86.0 **F** (97.6 **F**)	87.1 **F** (100.3 **F**)	
			WB Left	65.8 **E** (52.1 D)	82.0 **F** (52.7 D)	123.9 **F** (52.9 D)	
			WB Shared	46.7 D (43.1 D)	46.3 D (42.4 D)	47.7 D (42.2 D)	
			WB Right	46.0 D (42.3 D)	45.5 D (40.7 D)	45.3 D (40.7 D)	
			WB Overall	50.4 D (45.0 D)	54.4 D (44.5 D)	65.6 **E** (44.4 D)	
			Overall	***90.5 F (159.6 F)***	***211.7 F (203.7 F)***	***114.8 F (212.3 F)***	-
		Mitigated – Signal Timing Adjustment	NB Left	-	80.5 **F** (95.5 **F**)	-	112.3 **F** (212.7 **F**)
			NB Thru		33.5 C (25.6 C)		34.4 C (27.3 C)
			NB Overall		51.4 D (58.4 **E**)		64.7 **E** (118.1 **F**)
			SB Thru		36.7 D (43.6 D)		38.9 D (46.2 D)
			SB Right		101.8 **F** (65.5 **E**)		55.8 **E** (66.5 **E**)
			SB Overall		52.9 D (50.6 D)		43.0 D (52.7 D)
			WB Left		33.7 C (58.9 **E**)		35.2 D (62.3 **E**)
			WB Shared		30.8 C (44.0 D)		31.9 C (43.7 D)
			WB Right		30.9 C (42.1 D)		31.0 C (41.2 D)
			WB Overall		31.5 C (47.2 D)		32.4 C (47.8 D)
			Overall	**-**	***47.3 D (53.5 D)***	**-**	***49.1 D (82.3 F)***
		Mitigated – Lane Restriping, Lane Additions: NBT/R, SBT, EBR	NB Left	-	-	-	120.0 **F** (116.3 **F**)
			NB Thru				29.1 C (11.9 B)
			NB Overall				64.5 **E** (63.0 **E**)
			SB Thru				36.4 D (51.3 D)
			SB Right				73.7 **E** (17.6 B)
			SB Overall				42.0 D (45.9 D)
			WB Left				33.5 C (51.1 D)
			WB Shared				35.5 C (47.9 D)
			WB Right				32.2 C (43.1 D)
			WB Overall				33.7 C (47.8 D)
			Overall	**-**	**-**	**-**	***48.9 D (54.3 D)***

TABLE 7 – PEAK HOUR LEVELS OF SERVICE

ID	Intersection	Intersection Control	Approach/ Movement	2025		2030	
				No Build	Build	No Build	Build
				AM (PM)	AM(PM)	AM(PM)	AM(PM)
7	Hayden Rd & Legacy Blvd	Signalized	NB	C (C)	C (C)	B (B)	B (B)
			SB	B (B)	B (B)	B (B)	B (B)
			EB	C (D)	C (D)	C (D)	C (D)
			WB	C (C)	C (C)	C (C)	C (C)
			Overall	***C (C)***	***C (C)***	***B (B)***	***B (B)***
8	82nd St & Princess Dr	Two-way Stop (NB/WB)	NB Left	C (C)	C (C)	C (D)	C (D)
			NB Shared	B (B)	B (B)	B (B)	B (B)
			SB Left	C (D)	C (D)	C (**E**)	C (**E**)
			SB Shared	B (B)	B (B)	B (B)	B (B)
			EB Left	A (A)	A (A)	A (A)	A (A)
			WB Left	A (A)	A (A)	A (A)	A (A)
9	Perimeter Dr & Princess Dr	Signalized	NB	B (C)	B (C)	B (C)	B (C)
			SB	B (C)	B (C)	B (C)	B (C)
			EB	B (B)	B (B)	B (B)	B (B)
			WB	C (C)	C (C)	C (C)	C (C)
			Overall	***C (C)***	***C (C)***	***C (C)***	***C (C)***
10	Loop 101 SB Ramps & Princess Dr/ Pima Rd	Signalized	SB Left	172.0 **F** (31.9 C)	172.0 **F** (31.8 C)	197.6 **F** (31.4 C)	197.6 **F** (31.1 C)
			SB Shared	189.0 **F** (32.0 C)	189.0 **F** (31.8 C)	216.8 **F** (31.5 C)	216.8 **F** (31.2 C)
			SB Right	40.3 D (27.6 C)	40.3 D (27.5 C)	40.4 D (27.0 C)	40.4 D (26.7 C)
			SB Overall – 101 Ramp	161.7 **F** (31.4 C)	161.7 **F** (31.3 C)	184.7 **F** (30.9 C)	184.7 **F** (30.6 C)
			EB Thru	52.1 D (50.2 D)	49.4 D (49.4 D)	53.6 D (50.9 D)	41.1 D (50.3 D)
			EB Right	102.7 **F** (74.7 **E**)	69.3 **E** (68.0 **E**)	94.3 **F** (68.2 **E**)	41.4 D (64.4 **E**)
			EB Overall – Princess Dr	70.2 **E** (61.1 **E**)	57.7 **E** (57.9 **E**)	68.5 **E** (58.8 **E**)	41.2 D (56.9 **E**)
			WB Left	26.8 C (86.0 **F**)	26.6 C (85.7 **F**)	27.5 C (104.4 **F**)	27.3 C (107.7 **F**)
			WB Thru	8.0 A (16.1 B)	8.2 A (17.3 B)	8.1 A (18.5 B)	8.3 A (19.6 B)
			WB Overall – Pima Rd	20.7 C (67.2 **E**)	20.5 C (65.7 **E**)	21.1 C (81.0 **F**)	20.9 C (81.7 **F**)
			Overall	***77.2 E (55.9 E)***	***75.3 E (54.4 D)***	***85.4 F (60.7 E)***	***81.6 F (60.5 E)***
11	Loop 101 NB Ramps & Princess Dr/ Pima Rd	Signalized	NB Left	71.8 **E** (29.6 C)	75.5 **E** (30.4 C)	84.1 **F** (29.2 C)	91.7 **F** (29.7 C)
			NB Shared	60.3 **E** (33.6 D)	63.9 **E** (33.5 D)	70.4 **E** (33.3 D)	75.4 **E** (33.0 D)
			NB Right	42.6 D (32.5 C)	42.6 D (32.3 C)	42.9 D (32.7 C)	42.9 D (32.4 C)
			NB Overall – 101 Ramp	52.0 D (32.7 C)	53.8 D (32.5 C)	57.0 **E** (32.7 C)	59.8 **E** (32.4 C)
			EB Left	31.0 C (72.0 **E**)	31.1 C (72.1 **E**)	29.6 C (73.3 **E**)	29.6 C (73.6 **E**)
			EB Thru	87.2 **F** (43.1 D)	87.3 **F** (43.1 D)	103.7 **F** (42.5 D)	103.8 **F** (42.5 D)
			EB Overall – Princess Dr	81.7 **F** (51.4 D)	81.8 **F** (51.4 D)	96.1 **F** (51.6 D)	96.2 **F** (51.7 D)
			WB Thru	14.6 B (35.4 D)	14.6 B (35.5 D)	14.9 B (37.6 D)	14.9 B (38.0 D)
			WB Right	14.4 B (36.0 D)	14.4 B (36.2 D)	14.8 B (38.1 D)	14.8 B (38.6 D)
			WB Overall – Pima Rd	14.5 B (35.5 D)	14.5 B (35.7 D)	14.8 B (37.7 D)	14.8 B (38.2 D)
			Overall	***41.1 D (37.7 D)***	***41.9 D (37.7 D)***	***45.2 D (38.5 D)***	***46.5 D (38.5 D)***
A	Access A & Axon Wy	1-way stop (SB)	SB Right	-	B (B)	-	B (B)
B	Access B & Axon Wy	1-way stop (NB)	NB Right	-	A (B)	-	A (B)
C	Access C & Axon Wy	1-way stop (SB)	SB Shared	-	B (C)	-	A (C)
			EB Left		A (B)		A (B)
D	Access D & Axon Wy	1-way stop (SB)	SB Right	-	A (A)		A (A)
E	Axon Wy & Access E	1-way stop (WB)	SB Left	A (A)	A (A)	A (A)	A (A)
			WB Shared	A (A)	B (B)	A (A)	A (B)
F	Axon Wy & Access F	2-way stop (EB/WB)	NB Left	A (A)	A (A)	A (A)	A (A)
			SB Left	A (A)	A (A)	A (A)	A (A)
			EB Shared	A (A)	C (B)	A (A)	C (B)
			WB Shared	A (A)	A (A)	A (A)	A (A)
18	Hayden Rd & Mayo Blvd/Union Hills Dr	2-way stop (EB/WB)	NB Left	A (A)	A (A)	A (A)	A (A)
			SB Left	A (B)	A (B)	A (B)	A (B)
			EB Shared	C (C)	C (D)	C (D)	C (D)
			WB Shared	B (C)	B (B)	B (C)	B (B)

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The results of the Synchro analysis summarized in **Table 7** reveal that—exclusive of the **Loop 101 SB Ramps & Princess Drive/Pima Road** intersection—the study intersections could be expected generally to operate at acceptable *overall* levels of service (LOS D or better). Several individual *approaches* are expected to operate at LOS E or F at five of the study intersections: **Hayden Road & Axon Way/Mayo Boulevard, Hayden Road & Loop 101 Interchange, 82nd Street & Princess Drive, Loop 101 Interchange & Princess Drive/Pima Road,** and **Hayden Road & Mayo Boulevard/Union Hills Drive**. Mitigations applied to the 2025 Build scenario were applied to the 2030 Build scenario at the intersections of **Hayden Road & Axon Way/Mayo Boulevard** and **Hayden Road & Loop 101 Interchange**.

INTERSECTIONS NOT AT INTERCHANGES

Hayden Road and Axon Way/Mayo Boulevard

In the 2025 Build scenario, *using the same signal timing CivTech assumed for the background/no-build condition,* the signalized intersection of **Hayden Road and Axon Way/Mayo Boulevard** is expected to operate with an overall intersection delay of 110.1 sec/veh (LOS F) in the southbound approach during the PM peak hour.

- To mitigate the delay in 2025, it is recommended that a dual southbound left-turn lane be added and signal timing be adjusted to increase green time in the northbound and southbound approaches. With these mitigations in place, the intersection is expected to operate with acceptable levels of service. With these same mitigations, the 2030 analysis produces similarly acceptable results, requiring no further mitigations.

- A dual northbound left-turn lane and dual eastbound left-turn lane were added at the intersection in both the 2030 No Build and Build scenarios, as recommended in the *Banner Scottsdale Medical Center TIMA.*

82nd Street and Princess Drive

In the 2030 No Build scenario, the stop-controlled intersection of **82nd Street and Princess Drive** is expected to operate with a delay in the southbound left-turn movement of 38.4 sec/veh (LOS E) during the PM peak hour. In the 2030 Build scenario, the intersection is expected to operate with an overall intersection LOS A; however, there is expected delay in the southbound left-turn movement of 41.0 sec/veh (LOS E) during the PM peak hour.

- It is not uncommon for low-volume stop-controlled driveways onto higher volume major roads to experience higher delays for brief periods during peak hours. Additionally, 1) the intersection is located between two other signalized study intersections, which provide regular gaps in the traffic stream that would allow outbound/southbound movements onto Princess Drive, 2) there will be no site-generated traffic on 82nd Street, and 3) the installation of a signal at this intersection with a cycle of 120 seconds would (mathematically) very likely result in an average delay of greater than the calculated average delay 39.7 sec/veh for southbound vehicles; therefore, no mitigation is recommended.

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INTERCHANGES

Hayden Road and Loop 101

Eastbound Ramps. In the 2025 No Build scenario, the signalized intersection of **Hayden Road and Loop 101 EB Ramps** is expected to operate with an overall intersection delay of 103.2 sec/veh (LOS F) and 92.8 sec/veh (LOS F) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 171.7 sec/veh (LOS F) during the PM peak hour. The eastbound approach is expected to operate with a delay of 210.3 sec/veh (LOS F) and 87.6 sec/veh (LOS F) during the AM and PM peak hours, respectively. In the 2025 Build scenario, the intersection is expected to operate with an overall intersection delay of 112.4 sec/veh (LOS F) and 119.1 sec/veh (LOS F) during the AM and PM peak hours, respectively. The eastbound approach is expected to operate with a delay of 250.6 sec/veh (LOS F) and 185.3 sec/veh (LOS F) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 175.0 sec/veh (LOS F) during the PM peak hour.

- To mitigate the delay at the interchange in 2025, CivTech recommends adjusting the signal timing by increasing the green time in the eastbound and westbound approaches and adjust the phasing to have southbound approach lead and northbound approach lag. This signal timing adjustment will result in an unchanged cycle length of 120 seconds. With these mitigations in place, the interchange is expected to operate with acceptable overall intersection levels of service, as well as levels of service better than that of the No Build scenario.

In the 2030 No Build scenario, the signalized intersection of **Hayden Road and Loop 101 EB Ramps** is expected to operate with an overall intersection delay of 134.3 sec/veh (LOS F) and 114.9 sec/veh (LOS F) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 189.1 sec/veh (LOS F) during the PM peak hour. The eastbound approach is expected to operate with a delay of 281.6 sec/veh (LOS F) and 149.2 sec/veh (LOS F) during the AM and PM peak hours, respectively. In the 2030 Build scenario, the intersection is expected to operate with an overall intersection delay of 76.0 sec/veh (LOS E) and 61.7 sec/veh (LOS E) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 97.5 sec/veh (LOS F) and 119.5 sec/veh (LOS F) during the AM and PM peak hours, respectively. The eastbound approach is expected to operate with a delay of 98.1 sec/veh (LOS F) during the AM peak hour.

- To mitigate the delay at the interchange in 2030, CivTech recommends restriping the eastbound shared left/through/right-turn lane as a shared left-turn/through lane, restriping the westbound shared left-turn/through lane as an exclusive left-turn lane, adding an eastbound right-turn lane, adding a shared northbound through/right-turn lane, adding a northbound through lane, and adding a southbound through/right-turn lane. Additionally, it is recommended that signal timing be adjusted to increase green time in the northbound and southbound approaches during the PM peak hour, resulting in an unchanged cycle length of 120 seconds. With these mitigations in place, the interchange is expected to operate with overall acceptable levels of service and improved levels of service than that in the No Build scenario.

Westbound Ramps. In the 2025 No Build scenario, the signalized intersection of **Hayden Road and Loop 101 WB Ramps** is expected to operate with an overall intersection delay of 90.5 sec/veh

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(LOS F) and 159.6 sec/veh (LOS F) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with delay of 87.0 sec/veh (LOS F) and 98.0 sec/veh (LOS F) during the AM and PM peak hours, respectively. The northbound approach is expected to operate with a delay of 122.2 sec/veh (LOS F) and 258.3 sec/veh (LOS F) during the AM and PM peak hours, respectively. In the 2025 Build scenario, the intersection is expected to operate with an overall intersection delay of 211.7 sec/veh (LOS F) and 203.7 sec/veh (LOS F) during the AM and PM peak hours, respectively. The northbound approach is expected to operate with a delay of 409.8 sec/veh (LOS F) and 354.1 sec/veh (LOS F) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 86.0 sec/veh (LOS F) and 97.6 sec/veh (LOS F) during the AM and PM peak hours, respectively.

- To mitigate the delay at the interchange in 2025, CivTech recommends adjusting the signal timing by increasing the green time in the eastbound and westbound approaches and adjust the phasing to have southbound approach lead and northbound approach lag. This signal timing adjustment will result in an unchanged cycle length of 120 seconds. With these mitigations in place, the interchange is expected to operate with acceptable overall intersection levels of service, as well as levels of service better than that of the No Build scenario.

In the 2030 No Build scenario, the signalized intersection of **Hayden Road and Loop 101 WB Ramps** is expected to operate with overall intersection delays of 114.8 sec/veh (LOS F) and 212.3 sec/veh (LOS F) during the AM and PM peak hours, respectively. The northbound approach is expected to operate with a delay of 182.7 sec/veh (LOS F) and 367.9 sec/veh (LOS F) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with delay of 87.1 sec/veh (LOS F) and 100.3 sec/veh (LOS F) during the AM and PM peak hours, respectively. The westbound approach is expected to operate with a delay of 65.6 sec/veh (LOS E) during the AM peak hour. In the 2030 Build scenario, the signalized intersection of **Hayden Road and Loop 101 WB Ramps** is expected to operate with overall intersection delays of 76.0 sec/veh (LOS E) and 61.7 sec/veh (LOS E) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with delays of 97.5 sec/veh (LOS F) and 119.5 sec/veh (LOS F) during the AM and PM peak hours, respectively. The eastbound approach is expected to operate with a delay of 98.1 sec/veh (LOS F) during the AM peak hour.

- To mitigate the delay at the interchange in 2030, CivTech recommends restriping the eastbound shared left/through/right-turn lane as a shared left-turn/through lane, restriping the westbound shared left-turn/through lane as an exclusive left-turn lane, adding an eastbound right-turn lane, adding a shared northbound through/right-turn lane, adding a northbound through lane, and adding a southbound through/right-turn lane. Additionally, it is recommended that signal timing be adjusted to increase green time in the northbound and southbound approaches during the PM peak hour, resulting in an unchanged cycle length of 120 seconds. With these mitigations in place, the interchange is expected to operate with overall acceptable levels of service and improved levels of service than that in the No Build scenario.

  CivTech has discussed this proposed mitigation with ADOT representatives, who indicated support for this scenario based on its improvement to the Level of Service.

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- Signal timing adjustments at this interchange for the Existing, 2025 Opening Year and 2030 Horizon Year are shown at the top of the next page in **Table 8**. With these mitigations in place, the peak hour delays at the intersection in the 2025 Build scenarios are expected to be similar to those in the corresponding No Build scenarios.

TABLE 8 – APPLIED SIGNAL TIMING CHANGES
Hayden Road & Loop 101 Interchange (Times in Seconds)

Scenario	Phase 1 NB LT	Phase 2 SB Th	Phase 3 WB	Phase 5 SB LT	Phase 6 NB Th	Phase 7 EB
Existing AM	20	45	25	30	35	30
2025 AM Total	45	31	44	30	46	44
2030 AM Total	45	31	44	30	46	44
Existing PM	32	33	35	20	47	18
2025 PM Total	45	30	31	25	50	45
2030 PM Total	63	30	27	26	67	27

Loop 101 and Princess Drive/Pima Road

The interchange of **Loop 101 and Princess Drive/Pima Road** is expected to operate with delays in both the 2025 and 2030 No Build and Build scenarios.

Southbound Ramps. In the 2025 No Build scenario, the signalized intersection of **Loop 101 SB Ramps & Princess Drive/Pima Road** is expected to operate with an overall intersection delay of 77.2 sec/veh (LOS E) and 55.9 sec/veh (LOS E) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 161.7 sec/veh (LOS F) during the AM peak hour and the westbound approach is expected to operate with a delay of 67.2 sec/veh (LOS E) during the PM peak hours. The eastbound approach is expected to operate with a delay of 70.2 sec/veh (LOS E) and 61.1 sec/veh (LOS E) during the AM and PM peak hours, respectively. In the 2025 Build scenario, the intersection is expected to operate with an overall intersection delay of 75.3 sec/veh (LOS E) during the AM peak hour. The southbound approach is expected to operate with a delay of 161.7 sec/veh (LOS F) during the AM peak hour and the westbound approach is expected to operate with a delay of 65.7 sec/veh (LOS E) during the PM peak hours. The eastbound approach is expected to operate with a delay of 57.7 sec/veh (LOS E) and 57.9 sec/veh (LOS E) during the AM and PM peak hours, respectively.

In the 2030 No Build scenario, the signalized intersection of **Loop 101 SB Ramps & Princess Drive/Pima Road** is expected to operate with an overall intersection delay of 85.4 sec/veh (LOS F) and 60.7 sec/veh (LOS E) during the AM and PM peak hours, respectively. The eastbound approach is expected to operate with a delay of 68.5 sec/veh (LOS E) and 58.8 sec/veh (LOS E) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 184.7 sec/veh (LOS F) in the AM peak hour and the westbound approach is expected to operate with a delay of 81.0 sec/veh (LOS F) during the PM peak hour. In the 2030 Build scenario, the intersection of **Loop 101 SB Ramps & Princess Drive/Pima Road** is expected to operate with an overall intersection delay of 81.0 sec/veh (LOS F) and 60.5 sec/veh (LOS E) during the AM and PM peak hours, respectively. During the AM peak hour, the southbound approach is expected to operate with a delay of 184.7 sec/veh (LOS F). During the PM peak hour, the eastbound and westbound

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approaches are expected to operate with delays of 56.9 sec/veh (LOS E) and 81.7 sec/veh (LOS F) during the AM and PM peak hours, respectively.

Northbound Ramps. In the 2025 No Build scenario, the signalized intersection of **Loop 101 NB Ramps & Princess Drive/Pima Road** is expected to operate with a delay in the eastbound approach of 81.7 sec/veh (LOS F) during the AM peak hour. In the 2025 Build scenario, the intersection is expected to operate with a delay in the eastbound approach of 81.8 sec/veh (LOS F) during the AM peak hour.

In the 2030 No Build scenario, the signalized intersection of **Loop 101 NB Ramps & Princess Drive/Pima Road** is expected to operate with a delay in the eastbound approach of 96.1 sec/veh (LOS F) and a delay in the northbound approach of 57.0 sec/veh (LOS E) during the AM peak hour. In the 2030 Build scenario, the intersection is expected to operate with a delay in the northbound and eastbound approach of 59.8 sec/veh (LOS E) and 96.2 sec/veh (LOS F), respectively, during the AM peak hour.

- No mitigation is recommended that this interchange, as the interchange is expected to operate with similar average delays and levels of service in both the No Build and Build scenarios.

TURN LANE WARRANTING AND QUEUE LENGTH ANALYSIS

RIGHT-TURN DECELERATION LANES

CivTech deferred to City of Scottsdale *Design Standards & Policies Manual*, 2018, section 5-3.206 to determine if right-turn lanes are warranted at the site accesses:

"Deceleration lanes are required at all new driveways on major arterials and at new commercial/retail driveways minor arterials. Deceleration lanes for driveways may also be required on collector streets and for non-commercial/retail driveways on minor arterials. The lane length should be based on the distance needed to allow the vehicle to exit the through lane and slow to a 15-mph travel speed. To determine the need for a deceleration lane on streets classified as a minor arterial or collector, use the following criteria:

A. At least 5,000 vpd are expected to use the street;
B. The 85th percentile traffic speed on the street is at least 35 mph;
C. At least 30 vehicles will make right turns into the driveway during a 1-hour period.

Access A and Axon Way: With 4,411 vpd traveling westbound on Axon Way, a posted speed limit of 35 mph, and 2 westbound right turns expected during the PM peak hour, a deceleration lane is not warranted for the westbound right-turn lane at the intersection of Access A and Axon Way.

Access B and Axon Way: With 5,135 vpd traveling eastbound on Axon Way, a posted speed limit of 35 mph, and up to 95 eastbound right turns expected during the PM peak hour, a deceleration lane is warranted for the eastbound right-turn lane at the intersection of Access B and Axon Way. While a dedicated eastbound right-turn lane is warranted at Access B, it is not recommended, as the intersection is expected to operate with LOS A without the dedicated right-turn lane.

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Access C and Axon Way: With 3,545 vpd traveling westbound on Axon Way, a posted speed limit of 35 mph, and up to 14 westbound right turns expected during the PM peak hour, a deceleration lane is not warranted for the westbound right-turn lane at the intersection of Access C and Axon Way.

Axon Way and Access E: With 3,360 vpd traveling northbound on Axon Way, a posted speed limit of 35 mph, and up to 9 northbound right turns expected during the PM peak hour, a deceleration lane is not warranted for the northbound right-turn lane at the intersection of Axon Way and Access E.

Axon Way and Access F (NB): With 1,689 vpd traveling northbound on Axon Way, a posted speed limit of 35 mph, and up to 9 northbound right turns expected during the AM peak hour, a deceleration lane is not warranted for the northbound right-turn lane at the intersection of Axon Way and Access F.

Axon Way and Access F (SB): With 2,086 vpd traveling southbound on Axon Way, a posted speed limit of 35 mph, and up to 38 southbound right turns expected during the PM peak hour, a deceleration lane is not warranted for the southbound right-turn lane at the intersection of Axon Way and Access F.

Left-Turn Deceleration Lanes

CivTech deferred to City of Scottsdale *Design Standards & Policies Manual*, 2018, section 5-3.206 to determine if left-turn lanes are warranted at the site accesses:

"Left-turn lanes may also be required at street intersections on minor collectors based on the projected left-turn volume and conflicting through volume. The lane lengths should be determined based on the anticipated turning volume and whether there is signalized or unsignalized traffic control."

CivTech deferred to section 7.15 of the *MCDOT Roadway Design Manual* to determine whether the left-turn volumes and conflicting through volumes are large enough to require a left-turn deceleration lane.

Access C and Axon Way: With 165 vph traveling westbound on Axon Way and 365 vph making the eastbound left-turn into Access C during the PM peak hour, a deceleration lane is not warranted for the eastbound left-turn lane at the intersection of Axon Way and Access C. However, CivTech recommends a dedicated eastbound left-turn lane be provided on Axon Way approaching Access C, as Axon Way is a divided roadway.

Axon Way and Access E: With 382 vph traveling northbound on Axon Way and 25 vph making the southbound left-turn into Access E during the PM peak hour, a deceleration lane is not warranted for the southbound left-turn lane at the intersection of Axon Way and Access E. However, CivTech recommends a dedicated southbound left-turn lane be provided on Axon Way approaching Access E, as Axon Way is a divided roadway.

Axon Way and Access F (NB): With 116 vph traveling southbound on Axon Way and 9 vph making the northbound left-turn into Access F during the PM peak hour, a deceleration lane is not warranted for the northbound left-turn lane at the intersection of Axon Way and Access F. However, CivTech recommends a dedicated northbound left-turn lane be provided on Axon Way approaching Access F, as Axon Way is a divided roadway.

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Axon Way and Access F (SB): With 265 vph traveling northbound on Axon Way and 5 vph making the southbound left-turn into Access F during the PM peak hour, a deceleration lane is not warranted for the northbound left-turn lane at the intersection of Axon Way and Access F. However, CivTech recommends a dedicated southbound left-turn lane be provided on Axon Way approaching Access F, as Axon Way is a divided roadway.

QUEUE LENGTH ANALYSIS

Adequate turn storage should be provided on any approach where turn lanes are permitted and/or warranted. A queuing analysis was performed for all warranted/recommended and existing intersection turn lanes where site traffic is expected as well as left-turn lanes adjacent to the site using the methodology documented on pages 9-96 through 9-99 of the latest (7th) edition of the American Association of Highway and Transportation Officials' (AASHTO) *A Policy on Geometric Design of Highways and Streets* (the AASHTO "Green Book"). The Green Book indicates that, "A deceleration lane should be sufficiently long to store the number of vehicles likely to accumulate in a queue during a critical period."

For a right-turn lane at an unsignalized driveway or intersection, the critical period has typically been two minutes and the storage length estimated as the length required to hold the average number of arriving vehicles per a two-minute period, of which there are 30 per hour. Thus, for unsignalized driveways and intersections, the storage length for a right-turn lane can be calculated by use of the following formula:

Storage Length = $\left\{\frac{(veh/hr)}{(30\ periods/hr)}\right\} \times VL$, where *VL* is an assumed average Vehicle Length of 25 feet.

For unsignalized intersections, the storage length for a left-turn lane is determined by the use of Equations 9-3 and 9-4 of the Green Book.

Storage Length = $\left\{\frac{\ln[P(n>N)]}{\ln\frac{v}{c}} - 1\right\} \times VL$ [9-4], where $c = \frac{V_0 e^{-V_0 t_c/3600}}{1-e^{-V_0 t_c/3600}}$ [9-3] and *VL* is 25 feet.

Where signalized, the critical period per the Green Book is one-and-a-half to two signal cycles.[1] The equation used to calculate the queue storage for a right- *or* left-turn lane using AASHTO methodology is thus:

Storage Length = $\left\{\frac{1.5\ x\ (veh/hr)}{(cycles/hr)}\right\} \times VL$, where *VL* is, again, 25 feet.

Outlined in the latest (6th) edition of the *Highway Capacity Manual*, (HCM 6) is another methodology to calculate turn lane storage length. This method is used by the Synchro software to report the 95th percentile number of vehicles stored at an intersection to the back of the queues. CivTech multiplied this number of vehicles by average Vehicle Length of 25 feet to convert the number of vehicles to a required queue and rounded this number up to the nearest multiple of five feet.

[1] AASHTO, under Section 9.7.2.2 (page 9-96) of the Green Book, indicates that storage length for a turn lane, exclusive of taper, "should usually be based on 1.5 to 2 times the average number of vehicles that would need to be stored per signal cycle" at a signalized intersection.

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The turn lane storage requirements for the study intersections are summarized in **Table 9**. Queue storage calculations are provided in **Appendix J**. A review of the results of the queue storage analysis summarized in **Table 9** reveals that most existing turn lanes will provide adequate queue storage capacity based on expected 2030 peak hour turning movement volumes.

TABLE 9 – TURN LANE QUEUE STORAGE LENGTHS

ID	Intersection	Intersection Control	Movement	Queue Storage (feet)				
				Existing[1]	AASHTO	ADOT[2]	HCM[3]	Recommended
1	Hayden Rd & Axon Wy/Mayo Blvd	Signal	NB Left SB Left EB Left WB Left NB Right SB Right WB Right	195′ - 305′ - - 175′ -	[4]175′ [4]775 [4]900′ 250′ 225′ 550′ 875′	-	[4]140′ [4]520′ [4]740′ 215′ 75′ 60′ 140′	[4]390′ [4][10]520′ [4]740′ 215′ [9]150′ No change 140′
4	Hayden Rd & Princess Dr	Signal	NB Left SB Left WB Left NB Right SB Right EB Right	155′ 255′ [4][8]300′ 240′ 255′ 175′	150′ 250′ [4]525′ 250′ 125′ 125′	-	25′ 40′ [4]<25′ 25′ 25′ 50′	No change No change [8]No change No change No change No change
5	Hayden Rd & Loop 101 EB Ramps	Signal	SB Left EB Left NB Right EB Right	[4]500′ 430′ 260′ 430′	[4]800′ 1,150′ 650′ [4]1,525′	[4]905′ 1,045′ 670′ [4]1,320′	[4]550′ 405′ 220′ [4]110′	[4][5][12]No change [6][12]No change [6]No change [4]860′
6	Hayden Rd & Loop 101 WB Ramps	Signal	NB Left WB Left SB Right WB Right	245′ 495′ 235′ 495′	1,725′ [4]600′ 825′ 950′	1,470′ [4]620′ 880′ 895′	1,375′ [4]400′ 175′ 85′	[5][11]No change [6]No change No change [6]No change
7	Hayden Rd & Legacy Blvd	Signal	NB Left SB Left EB Left WB Left NB Right SB Right EB Right WB Right	250′ - - - - 160′ - -	[4]275′ <25′ 125′ 25′ 25′ 100′ 350′ <25′	-	[4]250′ <25′ 85′ 25′ 25′ 25′ 190′ <25′	No change [9]150′ [9]150′ [9]150′ [9]150′ No change 190′ [9]150′
8	82nd St & Princess Dr	2-way stop (NB/SB)	NB Left SB Left EB Left WB Left	105′ 90′ 100′ 85′	25′ 50′ 75′ 25′	-	25′ 30′ 25′ 25′	No change No change No change No change
9	Princess Dr & Perimeter Dr	Signal	NB Left SB Left EB Left WB Left NB Right	100′ 210′ 80′ 275′ 250′	300′ 400′ 150′ 525′ 525′	-	180′ 235′ 40′ 350′ 135′	[7][12]No change [7]No change No change [10][12]No change No change
10	Loop 101 SB Ramps & Princess Dr/ Pima Rd	Signal	SB Left WB Left SB Right EB Right	355′ [4][8]480′ 355′ [4][8]490′	800′ [4]2,150′ 350′ [4]750′	770′ [4]1,880′ 445′ [4]695′	650′ [4]1,180′ 60′ [4]280′	[6][12]No change [5][12]No change [6]No change No change
11	Loop 101 NB Ramps & Princess Dr/ Pima Rd	Signal	NB Left EB Left NB Right WB Right	275′ 265′ [11]280′ 285′	625′ 425′ [4]1,750′ 600′	645′ 445′ [4]1,495′ 705′	460′ 310′ [4]270′ 255′	[6]No change [5][12]No change [4][12]560′ [12]No change
C	Access C & Axon Wy	2-way stop (NB/SB)	EB Left	-	325′	-	45′	[9]100′

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TABLE 9 – TURN LANE QUEUE STORAGE LENGTHS

ID	Intersection	Intersection Control	Movement	Queue Storage (feet)				
				Existing[1]	AASHTO	ADOT[2]	HCM[3]	Recommended
E	Axon Wy & Access E	1-way stop (WB)	SB Left	-	25′	-	25′	[9]100′
F	Axon Wy & Access F	2-way stop (EB/WB)	NB Left SB Left	-	<25′ 75′	-	<25′ 25′	[9]100′ [9]100′
18	Hayden Rd & Mayo Blvd/Union Hills Dr	2-way stop (EB/WB)	NB Left SB Left NB Right SB Right	230′ 370′ 145′ 125′	50′ 25′ 25′ 75′	-	25′ <25′ <25′ <25′	No change No change No change No change

(1) Measured from beginning of stop bar to the end of the stripe.
(2) ADOT desired lengths used.
(3) HCM 95th percentile queue reported in vehicles/lane, assuming 1 vehicle ~ 25 feet.
(4) Total storage for dual turn lanes.
(5) Additional storage is provided upstream.
(6) Shared lane provides additional storage.
(7) TWLTL provides additional storage upstream.
(8) Dual lanes contain one lane of storage and one drop lane for additional storage downstream.
(9) City of Scottsdale standard storage length is 150 feet, with a 100-foot minimum length.
(10) Lack of right-of-way for extended queue lengths.
(11) Additional 160′ of storage will be provided upstream, in addition to the 145′ of existing storage.
(12) Site does not contribute or minimally contributes traffic to movement.

Figure 16 shows the future intersection lane configurations, turn lanes, and traffic controls.

SIGHT DISTANCE ANALYSIS

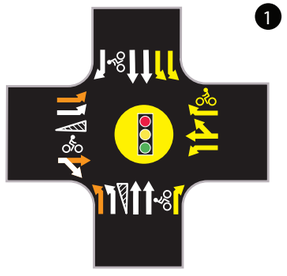
Adequate sight distance shall be provided at intersections and site access driveways to allow safe turning movements. There shall be sufficient unobstructed sight distance along both approaches of a street/driveway intersection and across their included corners to allow operators of vehicles to see each other in time to prevent a collision.

The City of Scottsdale provides minimum sight distance requirements based on the posted roadway speed and the number of through lanes in each direction of travel. Minimum sight distances should be provided on the Development Plans at each of the proposed access points per the City of Scottsdale *Design Standards & Policies Manual* (DS&PM). Sight distance for the roadways is summarized below in **Table 10**.

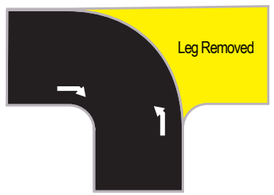
TABLE 10 – CITY OF SCOTTSDALE SIGHT DISTANCE REQUIREMENTS

Roadway	Posted Speed Limit/ Design Speed (mph)	Number of Lanes	Sight Distance Along Roadway	
			Though Movement	Turn Movement
Axon Way	35/45	4	430′	497′

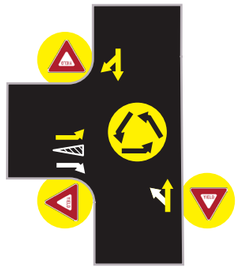
Excerpts from the DS&PM are included in **Appendix K**.



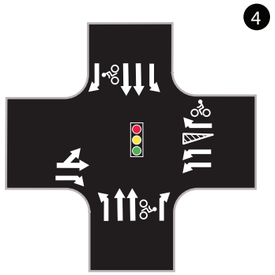
Hayden Rd & Mayo Blvd/Axon Wy



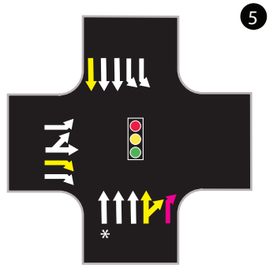
82nd St & Mayo Blvd./Union Hills Dr.



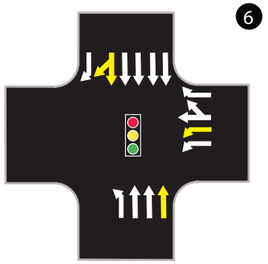
Perimeter Dr. & Axon Wy



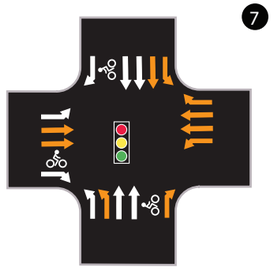
Hayden Rd & Princess Dr



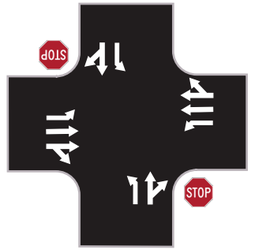
Hayden Rd & Loop 101 EB Ramps



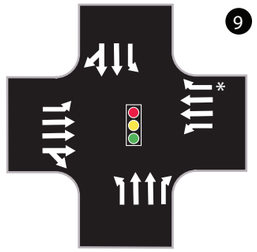
Hayden Rd & Loop 101 WB Ramps



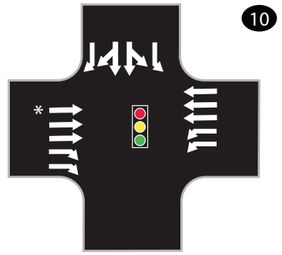
Hayden Rd & Legacy Blvd



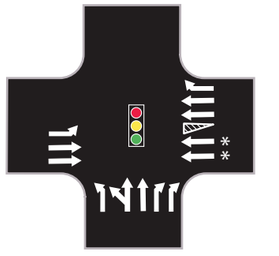
82nd St & Princess Dr



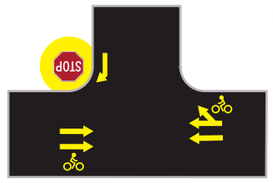
Perimeter Dr & Princess Dr



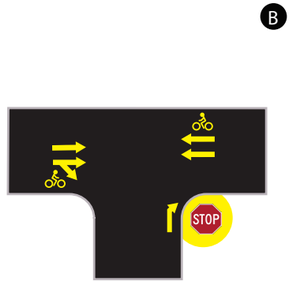
Loop 101 SB Ramps @ Princess Dr/Pima Rd



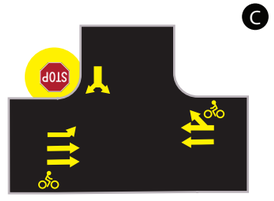
Loop 101 NB Ramps @ Princess Dr/Pima Rd



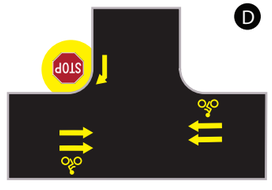
Access A & Axon Wy



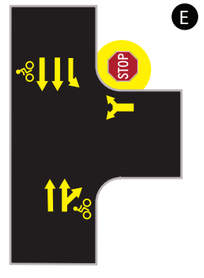
Access B & Axon Wy



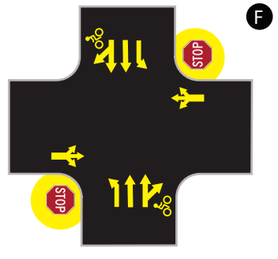
Access C & Axon Wy



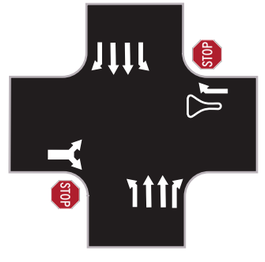
Access D & Axon Wy



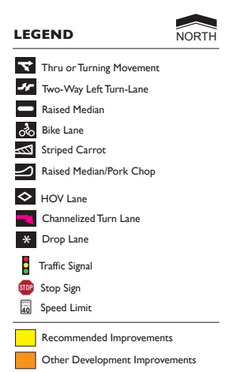
Access E & Axon Wy



Access F & Axon Wy



Hayden Rd & Mayo Blvd/Union Hills Dr



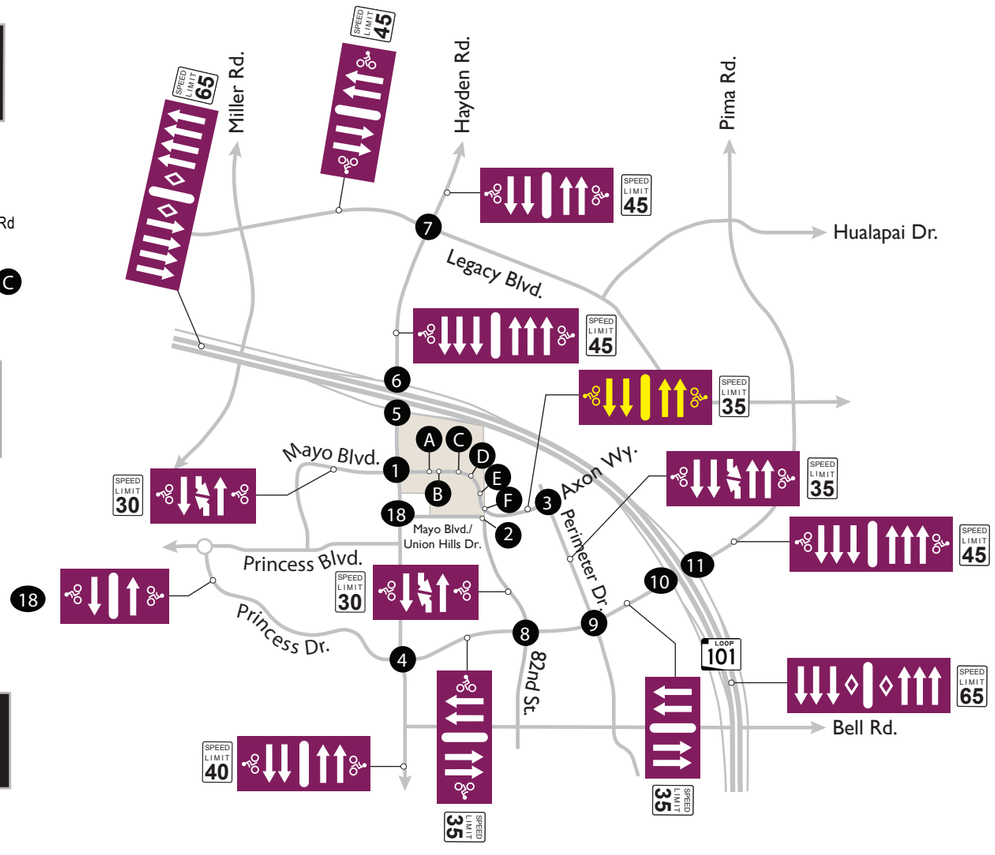


Figure 16: Proposed Lane Configurations and Traffic Controls

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations have been documented in this study:

GENERAL

- As currently proposed, Phase 2 of the Axon campus is anticipated to generate 14,082 trips on a typical weekday with 1,076 trips (302 in/774 out) generated during the AM peak hour and 1,127 trips (651 in/476 out) generated during the PM peak hour before any reductions are taken. Net of reductions for internal capture or interaction, Phase 2 is expected to generate 11,794 trips on a typical weekday with 950 trips (252 in/698 out) generated during the AM peak hour and 897 trips (530 in/367 out) generated during the PM peak hour.

EXISTING (2023)

- The results of the existing conditions analysis indicate that most study intersections and individual approaches operate with *overall* acceptable levels of service (LOS D or better). The analysis indicates that several individual approaches already operate at less than LOS D at the following intersections: **Hayden Road & Loop 101 EB Ramps**, **Hayden Road & Loop 101 WB Ramps**, **Hayden Road & Legacy Boulevard**, **Loop 101 SB Ramps & Princess Drive/Pima Road**, and **Loop 101 NB Ramps & Pima Road**. (Details are provided in the text.)

FUTURE CONDITIONS (2025 & 2030)

- **With Axon's proposed mitigations, all intersections are expected to operate with overall acceptable levels of services LOS D or better**.

- The results of the Synchro analysis reveal that—exclusive of the **Loop 101 SB Ramps & Princess Drive/Pima Road** intersection—the study intersections could be expected generally to operate at acceptable overall levels of service (LOS D or better). Several individual *approaches* are expected to operate at LOS E or F at five of the study intersections: **Hayden Road & Axon Way/Mayo Boulevard, Hayden Road & Loop 101 Interchange, 82nd Street & Princess Drive, Loop 101 Interchange & Princess Drive/Pima Road,** and **Hayden Road & Mayo Boulevard/Union Hills Drive**. Mitigations applied to the 2025 Build scenario were applied to the 2030 Build scenario at the intersections of **Hayden Road & Axon Way/Mayo Boulevard** and **Hayden Road & Loop 101 Interchange**.

- *Hayden Road and Mayo Boulevard/Axon Way*. In the 2025 Build scenario, *using the same signal timing CivTech assumed for the background/no-build condition,* the signalized intersection of **Hayden Road and Mayo Boulevard/Axon Way** is expected to operate with an overall intersection delay of 110.1 sec/veh (LOS F) in the southbound approach during the PM peak hour.

  - To mitigate the delay in 2025, it is recommended that a dual southbound left-turn lane be added and signal timing be adjusted to increase green time in the northbound and southbound approaches. With these mitigations in place, the intersection is expected to operate with acceptable levels of service. With these same mitigations, the 2030 analysis produces similarly acceptable results, requiring no further mitigations.

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- A dual northbound left-turn lane and dual eastbound left-turn lane were added at the intersection in both the 2030 No Build and Build scenarios, as recommended in the *Banner Scottsdale Medical Center TIMA.*

- *82nd Street and Princess Drive*. In the 2030 No Build scenario, the unsignalized intersection of **82nd Street and Princess Drive** is expected to operate with an overall intersection LOS A; however, there is expected delay in the southbound left-turn movement of 38.4 sec/veh (LOS E) during the PM peak hour. In the 2030 Build scenario, although the overall intersection operates with LOS A, the intersection is expected to operate with a delay in the southbound left-turn movement of 41.0 sec/veh (LOS E) during the PM peak hour.

  - It is not uncommon for low-volume stop-controlled driveways onto higher volume major roads to experience higher delays for brief periods during peak hours. Additionally, 1) the intersection is located between two other signalized study intersections, which provide regular gaps in the traffic stream that would allow outbound/southbound movements onto Princess Drive, 2) there will be no site-generated traffic on 82nd Street, and 3) the installation of a signal at this intersection with a cycle of 120 seconds would (mathematically) very likely result in an average delay of greater than the calculated average delay 39.7 sec/veh for southbound vehicles; therefore, no mitigation is recommended.

- *Hayden Road and Loop 101*. In the 2025 No Build scenario, the signalized intersection of **Hayden Road and Loop 101 EB Ramps** is expected to operate with an overall intersection delay of 103.2 sec/veh (LOS F) and 92.8 sec/veh (LOS F) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 171.7 sec/veh (LOS F) during the PM peak hour. The eastbound approach is expected to operate with a delay of 210.3 sec/veh (LOS F) and 87.6 sec/veh (LOS F) during the AM and PM peak hours, respectively.

- In the 2025 Build scenario, the intersection is expected to operate with an overall intersection delay of 112.4 sec/veh (LOS F) and 119.1 sec/veh (LOS F) during the AM and PM peak hours, respectively. The eastbound approach is expected to operate with a delay of 250.6 sec/veh (LOS F) and 185.3 sec/veh (LOS F) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 175.0 sec/veh (LOS F) during the PM peak hour.

  - To mitigate the delay at the interchange in 2025, CivTech recommends adjusting the signal timing by increasing the green time in the eastbound and westbound approaches and adjust the phasing to have southbound approach lead and northbound approach lag. This signal timing adjustment will result in an unchanged cycle length of 120 seconds. With these mitigations in place, the interchange is expected to operate with acceptable overall intersection levels of service, as well as levels of service better than that of the No Build scenario.

- In the 2025 No Build scenario, the signalized intersection of **Hayden Road and Loop 101 WB Ramps** is expected to operate with an overall intersection delay of 90.5 sec/veh (LOS F) and 159.6 sec/veh (LOS F) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with delay of 87.0 sec/veh (LOS F) and 98.0 sec/veh (LOS F) during the AM and PM peak hours, respectively. The northbound approach is expected to operate with a delay of 122.2 sec/veh (LOS F) and 258.3 sec/veh (LOS F) during the AM and PM peak hours, respectively.

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- In the 2025 Build scenario, the intersection is expected to operate with an overall intersection delay of 211.7 sec/veh (LOS F) and 203.7 sec/veh (LOS F) during the AM and PM peak hours, respectively. The northbound approach is expected to operate with a delay of 409.8 sec/veh (LOS F) and 354.1 sec/veh (LOS F) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 86.0 sec/veh (LOS F) and 97.6 sec/veh (LOS F) during the AM and PM peak hours, respectively.

  - To mitigate the delay at the interchange in 2025, CivTech recommends adjusting the signal timing by increasing the green time in the eastbound and westbound approaches and adjust the phasing to have southbound approach lead and northbound approach lag. This signal timing adjustment will result in an unchanged cycle length of 120 seconds. With these mitigations in place, the interchange is expected to operate with acceptable overall intersection levels of service, as well as levels of service better than that of the No Build scenario.

- In the 2030 No Build scenario, the signalized intersection of **Hayden Road and Loop 101 EB Ramps** is expected to operate with an overall intersection delay of 134.3 sec/veh (LOS F) and 114.9 sec/veh (LOS F) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 189.1 sec/veh (LOS F) during the PM peak hour. The eastbound approach is expected to operate with a delay of 281.6 sec/veh (LOS F) and 149.2 sec/veh (LOS F) during the AM and PM peak hours, respectively.

- In the 2030 Build scenario, the intersection is expected to operate with an overall intersection delay of 76.0 sec/veh (LOS E) and 61.7 sec/veh (LOS E) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 97.5 sec/veh (LOS F) and 119.5 sec/veh (LOS F) during the AM and PM peak hours, respectively. The eastbound approach is expected to operate with a delay of 98.1 sec/veh (LOS F) during the AM peak hour.

  - To mitigate the delay at the interchange in 2030, CivTech recommends restriping the eastbound shared left/through/right-turn lane as a shared left-turn/through lane, restriping the westbound shared left-turn/through lane as an exclusive left-turn lane, adding an eastbound right-turn lane, adding a shared northbound through/right-turn lane, adding a northbound through lane, and adding a southbound through/right-turn lane. Additionally, it is recommended that signal timing be adjusted to increase green time in the northbound and southbound approaches during the PM peak hour, resulting in an unchanged cycle length of 120 seconds. With these mitigations in place, the interchange is expected to operate with overall acceptable levels of service and improved levels of service than that in the No Build scenario.

- In the 2030 No Build scenario, the signalized intersection of **Hayden Road and Loop 101 WB Ramps** is expected to operate with overall intersection delays of 114.8 sec/veh (LOS F) and 212.3 sec/veh (LOS F) during the AM and PM peak hours, respectively. The northbound approach is expected to operate with a delay of 182.7 sec/veh (LOS F) and 367.9 sec/veh (LOS F) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with delay of 87.1 sec/veh (LOS F) and 100.3 sec/veh (LOS F) during the AM and PM peak hours, respectively. The westbound approach is expected to operate with a delay of 65.6 sec/veh (LOS E) during the AM peak hour.

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- In the 2030 Build scenario, the signalized intersection of **Hayden Road and Loop 101 WB Ramps** is expected to operate with overall intersection delays of 76.0 sec/veh (LOS E) and 61.7 sec/veh (LOS E) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with delays of 97.5 sec/veh (LOS F) and 119.5 sec/veh (LOS F) during the AM and PM peak hours, respectively. The eastbound approach is expected to operate with a delay of 98.1 sec/veh (LOS F) during the AM peak hour.

  - To mitigate the delay at the interchange in 2030, CivTech recommends restriping the eastbound shared left/through/right-turn lane as a shared left-turn/through lane, restriping the westbound shared left-turn/through lane as an exclusive left-turn lane, adding an eastbound right-turn lane, adding a shared northbound through/right-turn lane, adding a northbound through lane, and adding a southbound through/right-turn lane. Additionally, it is recommended that signal timing be adjusted to increase green time in the northbound and southbound approaches during the PM peak hour, resulting in an unchanged cycle length of 120 seconds. With these mitigations in place, the interchange is expected to operate with overall acceptable levels of service and improved levels of service than that in the No Build scenario.

    CivTech has discussed this proposed mitigation with ADOT representatives, who indicated support for this scenario based on its improvement to the Level of Service.

  - Signal timing adjustments at this interchange for the Existing, 2025 Opening Year and 2030 Horizon Year are shown in the table below. With these mitigations in place, the peak hour delays at the intersection in the 2025 Build scenarios are expected to be similar to those in the corresponding No Build scenarios.

TABLE – APPLIED SIGNAL TIMING CHANGES

Hayden Road & Loop 101 Interchange (Times in Seconds)

Scenario	Phase 1 NB LT	Phase 2 SB Th	Phase 3 WB	Phase 5 SB LT	Phase 6 NB Th	Phase 7 EB
Existing AM	20	45	25	30	35	30
2025 AM Total	45	31	44	30	46	44
2030 AM Total	45	31	44	30	46	44
Existing PM	32	33	35	20	47	18
2025 PM Total	45	30	31	25	50	45
2030 PM Total	63	30	27	26	67	27

- *Loop 101 and Princess Drive/Pima Road*. The interchange of **Loop 101 and Princess Drive/Pima Road** is expected to operate with delays in both the 2025 and 2030 No Build and Build scenarios.

  - Southbound Ramps. In the 2025 No Build scenario, the signalized intersection of **Loop 101 SB Ramps & Princess Drive/Pima Road** is expected to operate with an overall intersection delay of 77.2 sec/veh (LOS E) and 55.9 sec/veh (LOS E) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 161.7 sec/veh (LOS F) during the AM peak hour and the westbound approach is expected to operate with a delay of 67.2 sec/veh (LOS E) during the PM peak hours. The eastbound approach is expected to operate with

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a delay of 70.2 sec/veh (LOS E) and 61.1 sec/veh (LOS E) during the AM and PM peak hours, respectively.

In the 2025 Build scenario, the intersection is expected to operate with an overall intersection delay of 75.3 sec/veh (LOS E) during the AM peak hour. The southbound approach is expected to operate with a delay of 161.7 sec/veh (LOS F) during the AM peak hour and the westbound approach is expected to operate with a delay of 65.7 sec/veh (LOS E) during the PM peak hours. The eastbound approach is expected to operate with a delay of 57.7 sec/veh (LOS E) and 57.9 sec/veh (LOS E) during the AM and PM peak hours, respectively.

In the 2030 No Build scenario, the signalized intersection of **Loop 101 SB Ramps & Princess Drive/Pima Road** is expected to operate with an overall intersection delay of 85.4 sec/veh (LOS F) and 60.7 sec/veh (LOS E) during the AM and PM peak hours, respectively. The eastbound approach is expected to operate with a delay of 68.5 sec/veh (LOS E) and 58.8 sec/veh (LOS E) during the AM and PM peak hours, respectively. The southbound approach is expected to operate with a delay of 184.7 sec/veh (LOS F) in the AM peak hour and the westbound approach is expected to operate with a delay of 81.0 sec/veh (LOS F) during the PM peak hour.

In the 2030 Build scenario, the intersection of **Loop 101 SB Ramps & Princess Drive/Pima Road** is expected to operate with an overall intersection delay of 81.0 sec/veh (LOS F) and 60.5 sec/veh (LOS E) during the AM and PM peak hours, respectively. During the AM peak hour, the southbound approach is expected to operate with a delay of 184.7 sec/veh (LOS F). During the PM peak hour, the eastbound and westbound approaches are expected to operate with delays of 56.9 sec/veh (LOS E) and 81.7 sec/veh (LOS F) during the AM and PM peak hours, respectively.

- Northbound Ramps. In the 2025 No Build scenario, the signalized intersection of **Loop 101 NB Ramps & Princess Drive/Pima Road** is expected to operate with a delay in the eastbound approach of 81.7 sec/veh (LOS F) during the AM peak hour. In the 2025 Build scenario, the intersection is expected to operate with a delay in the eastbound approach of 81.8 sec/veh (LOS F) during the AM peak hour.

  In the 2030 No Build scenario, the signalized intersection of **Loop 101 NB Ramps & Princess Drive/Pima Road** is expected to operate with a delay in the eastbound approach of 96.1 sec/veh (LOS F) and a delay in the northbound approach of 57.0 sec/veh (LOS E) during the AM peak hour. In the 2030 Build scenario, the intersection is expected to operate with a delay in the northbound and eastbound approach of 59.8 sec/veh (LOS E) and 96.2 sec/veh (LOS F), respectively, during the AM peak hour.

  - No mitigation is recommended that this interchange, as the interchange is expected to operate with similar delays and levels of service in both the No Build and Build scenarios.

TURN LANE WARRANTS

- Based on City criteria, a dedicated eastbound right-turn lane is warranted at Access B, but is not recommended, as the intersection is expected to operate with LOS A without the dedicated right-turn lane.

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- Based on City criteria, left-turn lanes are not warranted at Access C, Access E, nor Access F, but are recommended, as Axon Way is a divided roadway.

QUEUE STORAGE

- The queue storage analysis reveals that most existing turn lanes will provide adequate queue storage capacity based on expected 2030 peak hour turning movement volumes.

PROPOSED IMPROVEMENTS

The following improvements are recommended with the addition of the proposed development:

- The intersection of **Hayden Road & Mayo Boulevard/Axon Way** be reconstructed as a four-legged signalized intersection. The addition of the following lanes is recommended: northbound right-turn, dual southbound left-turn, westbound left-turn, westbound shared through/right-turn and westbound right-turn lane.

- The stop-controlled intersection of **82nd Street & Axon Way** be reconstructed by removing the planned east leg that would have otherwise shared campus access with the neighborhood.

- The stop-controlled intersection of **Perimeter Drive & Axon Way** be reconstructed as a three-legged roundabout with a shared left-turn/through lane in the northbound approach, a shared through/right-turn lane in the southbound approach and an exclusive left-turn lane and dedicated right-turn lane in the eastbound approach.

- To mitigate the delay at the interchange of **Hayden Road & Loop 101**, CivTech recommends restriping the eastbound shared left/through/right-turn lane as a shared left-turn/through lane, adding an eastbound right-turn lane, adding a shared northbound through/right-turn lane, adding a shared southbound through/right-turn lane, and restriping the westbound approach to have dual left-turn lanes, a shared through/right-turn lane, and a right-turn lane.

- The intersection of **Access A & Axon Way** be constructed as a three-legged restricted RI/RO intersection with stop-control in the southbound approach. The southbound approach will consist of a dedicated right-turn lane. The eastbound approach will consist of two through lanes and the westbound approach will consists of one through lane and one shared through/right-turn lane.

- The intersection of **Access B & Axon Way** be constructed as a three-legged restricted RI/RO intersection with stop-control in the northbound approach. The northbound approach will consist of a dedicated right-turn lane. The eastbound approach will consist of one through lane and one shared through/right-turn lane and the westbound approach will consist of two through lanes.

- The intersection of **Access C & Axon Way** be constructed as a three-legged intersection with stop-control in the southbound approach. The southbound approach will each consist of a shared left/right-turn lane. The eastbound approach will consist of a left-turn lane and two through lanes. The westbound approach will consist of a through lane and a shared through/right-turn lane.

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- The intersection of **Access D & Axon Way** be constructed as a three-legged intersection with stop-control in the southbound approach. The southbound approach will consist of a dedicated right-turn lane. The eastbound and westbound will each consist of two through lanes.

- The intersection of **Axon Way & Access E** be constructed as a three-legged intersection with stop-control in the westbound approach. The northbound approach will consist of one through lane and one shared through/right-turn lane. The southbound approach will consist of one left-turn lane and two through lanes. The westbound approach will consist of one shared left/right-turn lane.

- The intersection of **Axon Way & Access F** be constructed as a four-legged intersection with stop-control in the eastbound and westbound approaches. The northbound and southbound approaches will each consist of one left-turn lane, one through lane and one shared through/right-turn lane. The eastbound and westbound approaches will each consist of one shared left/through/right-turn lane.

- The intersection of **Hayden Road & Mayo Boulevard/Union Hills Drive** will be reconstructed as a RI/RO/LI on the east leg. A porkchop will be constructed on the east leg to prevent westbound left-turn movements.

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LIST OF REFERENCES

Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis. Transportation Research Board, Washington, D.C., 2016.

Manual on Uniform Traffic Control Devices. U.S. Department of Transportation, Federal Highways Administration, Washington, D.C., 2009.

Roadway Design Manual, Maricopa County Department of Transportation, Phoenix, Arizona, Revised March 2023.

Trip Generation Manual, 11th Edition, Institute of Transportation Engineers, Washington, D.C., 2021.

Trip Generation Handbook, 3rd Edition, Institute of Transportation Engineers, Washington, D.C., 2014.

City of Phoenix Ordinance Section 31-13, City of Phoenix, Arizona, November 2010.

Street Planning and Design Guidelines, 12.1.2 Traffic Impact Studies, City of Phoenix, Arizona, December 2009.

Design Standards & Policies Manual, Geometrics, City of Scottsdale, Arizona, June 2014.

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TECHNICAL APPENDICES

APPENDIX A:	**REVIEW COMMENTS AND RESPONSES**
APPENDIX B:	**EXISTING TRAFFIC COUNTS**
APPENDIX C:	**CRASH ANALYSIS DATA**
APPENDIX D:	**EXISTING PEAK HOUR ANALYSIS**
APPENDIX E:	**TRIP GENERATION & INTERNAL CAPTURE CALCULATIONS**
APPENDIX F:	**TRIP DISTRIBUTION CALCULATIONS**
APPENDIX G:	**BACKGROUND GROWTH**
APPENDIX H:	**2025 PEAK HOUR ANALYSIS**
APPENDIX I:	**2030 PEAK HOUR ANALYSIS**
APPENDIX J:	**QUEUE STORAGE ANALYSIS**
APPENDIX K:	**SIGHT DISTANCE ANALYSIS**

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APPENDIX A

REVIEW COMMENTS AND RESPONSES

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Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Kiran Guntapalli, Scottsdale**

Item	Review Comment	(Code) & Response
1.	**"Although the trip generation totals are not vastly different, please use LUC221, LUC822 and LUC310 for Apartments, Commercial, and Hotel to calculate appropriate Trip Generation numbers. Land Use Code 230 only has one or two data points; LUC 231 is in Center City Core and not applicable to the sub-urban setting. At a minimum both land use scenarios should be calculated for comparison. Also, please use fitted curve equation to calculate trips rather than average rate. Please find below trip generation table that COS staff prepared and let us know your comments."**	(1) As discussed at meetings with the City, LUC 221 was used for the Apartments, LUC 822 was used for the Retail and LUC 312 was used for the hotel.
2.	**"50% internal capture is too high for hotel guests. Typical numbers we accepted in other studies were at around 30%."**	(1) As discussed at meetings with the City, a 35% internal capture has been used for the hotel guests. The hotel is likely to have an internal capture of 35% due to the nature of the hotel use. The primary purpose of the hotel is to provide lodging for attendees Axon conferences and training sessions that will be held in the adjacent Axon headquarters. Axon frequently hosts police and miltary personnel from around the country and around the world.
3.	**"Typical internal capture on commercial space in 30-40% depending on proposed use."**	(1) Commercial internal capture has been updated to 40%.
4.	**"Please reference recent 2022 Traffic Volume and Collision Manual when determining using city data and to projected traffic volumes."**	(1) 2022 Traffic Volume & Collision Manual volumes utilized to calculate daily traffic volumes. CivTech used MAG traffic counts for the roadway segment of 82nd Street, as it did not appear on the 2022 Traffic Volumes & Collision Manual.
5.	**"Traffic Engineering and Traffic Management Center periodically review signal timings based on demand and it should not be stated as a mitigation measure in a traffic impact study."**	(1) Cycle lengths are not adjusted as a mitigation measure. Green time adjustments are recommended. Cycle lengths at all intersections will remain at 120 seconds.
6.	**"Verify lane configurations in Synchro network. Please find below excerpt from the report" [Intersection 1 in 2025 Total AM]**	(1) Additional lanes have been added as a mitigation. Other lane configurations have been verified.

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Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Kiran Guntapalli, Scottsdale**

Item	Review Comment	(Code) & Response
7.	**"With dual turn lanes and heavy turning movement, please propose appropriate signal phasing during the analysis. City standard with dual left-turns is that they shall always move through intersection in protected phasing only. "**	(1) All dual left-turn movements have been updated to protected phasing.
8.	**"Typical signal cycle length is 120 seconds."**	(1) All City signalized intersections have been updated to 120 seconds (as per signal timing sheets received from City of Scottsdale on 8/30/2023)
9.	**"Propose turn lane storage to accommodate 95% queues at the intersections."**	(1) HCM 95th percentile utilized for recommended queue lengths.
10.	**"A new development degrading the Intersection LOS to F in both AM and PM peak is not acceptable per city standards."**	(1) All approaches at City intersections operate with acceptable LOS or an LOS equivalent to the No Build scenario.
11.	**"Hayden Rd. & Mayo Blvd./Axon Wy: Verify Queue and back up to adjacent traffic control devices."**	(3) With the updated trip generation & analysis, the queue length for the WB Left-turn lane is 215 and is not expected to back up to adjacent intersections, as the closest driveway is 350 feet east.
12.	**"Axon Wy and west roundabout: Simulation of the entire corridor should be provided rather than evaluation of each traffic control independently."**	(1) This intersection has been updated to reflect site plan discussed with City of Scottsdale.
13.	**"Axon Wy & west roundabout: It appears that traffic from Hayden Rd. & Axon Wy will back up into the roundabout causing a gridlock"**	(1) This intersection has been updated to reflect site plan discussed with City of Scottsdale to provide better internal circulation. Access A is a RI/RO driveway located approximately 350 feet east of Hayden/Axon intersection. With a maximum calculated WB queue of 215 feet, it is not expected that these vehicles will block Access A or cause gridlock anywhere along Axon Way.
14.	**"Loop 101 and Hayden Rd: Signal timing is based on complete corridor analysis and adjust traffic signal timing is not an appropriate mitigation measure in a traffic study."**	(1) Cycle lengths are not adjusted as a mitigation measure. Green time adjustments are recommended. Cycle lengths at all intersections will remain at 120 seconds.

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Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Kiran Guntapalli, Scottsdale**

Item	Review Comment	(Code) & Response
15.	**"Loop 101 and Hayden Rd: "CivTech recommends that the existing pavement be restriped to add a second/dual northbound left-turn lane and an additional southbound through lane, restriping one of the westbound left-turn lanes as a shared left-turn/through lane(This already in place), and the signal timing be adjusted. With these mitigations in place, the peak hour delays at the intersection in the 2025 Build scenarios are expected to be similar to those in the corresponding No Build scenarios." This may accommodate additional traffic generated of Axon site but other city project may demonstrate the need for three through lanes. Therefore, this mitigation measure cannot be considered. Also the lane configurations on the downstream side is also a concern."**	(1) As discussed with meetings with the City of Scottsdale and ADOT, dual NB lefts will not be accepted. Different mitigations are being recommended to reduce the delay and queue length, specifically at this movement. It should be noted that this NBL is expected to operate with unacceptable delays in the No Build scenarios.
16.	**"Loop 101 and Hayden Rd: Hayden Road is classified a Major Arterial from Axon Wy to Legacy Blvd. Changing the third lane northbound lane to a drop lane at the interchange will change roadway cross-section to a minor arterial. This should be noted as roadway classification change and will need council approval."**	(1) As discussed with meetings with the City of Scottsdale and ADOT, dual NB lefts will not be accepted, and therefore a third NB thru lane is recommended and will not change the roadway classification.
17.	**"Axon Wy & Access B (east leg): Access B – Driveway to the proposed apartment between 82nd Street and Axon Wy. roundabout and it should be noted that and clarified that sight distance concerns are addressed for westbound traffic."**	(1) Site plan has been updated since previous submittal and all accesses in analysis willl match the site plan. Sight distance will be per City standards.
18.	**"Axon Wy & Access B (east leg): Accesses shown on the submitted site plan does not match the access shown in the traffic analysis."**	(1) Site plan has been updated since previous submittal and all accesses in analysis willl match the site plan.
19.	**"82nd Street & Axon Way: Not adding significant traffic"**	(1) This intersection will no longer be connected to our site and therefore, site-generated traffic will not utilize this intersection.

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10/24/2024

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Kiran Guntapalli, Scottsdale**

Item	Review Comment	(Code) & Response
20.	**"82nd Street & Axon Way: Less than 15 peak hour trips (Is this practical?)"**	(1) This intersection will no longer be connected to our site and therefore, site-generated traffic will not utilize this intersection.
21.	**"The Mayo Boulevard/Axon Way and Hayden Road lane configurations need to be corrected based upon the street classifications – two lane eastbound approach with a left-turn lane and right-turn lane, three lane southbound approach with a right turn lane, two lane northbound approach with a right-turn lane. Dual left-turn northbound should be considered. Please review the improvement plans submitted by the Axon consulting engineer and recommendations from the Del Rito master circulation plan. "**	(1) The lane configurations at the intersection of Mayo Blvd/Axon Wy & Hayden Road have been updated to incorporate surrounding development recommended improvements (i.e. Banner TIMA)
22.	**"There are unacceptable levels of service identified [for Mayo Boulevard/Axon Wy & Hayden Rd]. Additional mitigation measures need to be evaluated including reducing the site trip generation."**	(1) All approaches at City intersections operate with acceptable LOS or a LOS equivalent to the No Build scenario.

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APPENDIX B

EXISTING TRAFFIC COUNTS

13-ZN-2020#2
10/24/2024

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Hayden Rd DATE: 07/11/23 LOCATION: Scottsdale

E-W STREET: Mayo Blvd DAY: TUESDAY PROJECT# 23-1348-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 0	ST 2	SR 1	EL 1	ET 0	ER 1	WL 0	WT 0	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	62	0	0	138	4	8	0	3	0	0	0	215
7:15 AM	0	61	0	0	158	4	2	0	1	0	0	0	226
7:30 AM	2	66	0	0	206	2	11	0	1	0	0	0	288
7:45 AM	1	75	0	0	231	9	5	0	3	0	0	0	324
8:00 AM	2	78	0	0	220	6	7	0	3	0	0	0	316
8:15 AM	1	87	0	0	201	3	7	0	1	0	0	0	300
8:30 AM	2	85	0	0	200	3	4	0	3	0	0	0	297
8:45 AM	1	90	0	0	204	0	1	0	2	0	0	0	298
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	9	604	0	0	1558	31	45	0	17	0	0	0	2264
Approach %	1.47	98.53	0.00	0.00	98.05	1.95	72.58	0.00	27.42	####	####	####	
App/Depart	613	/	649	1589	/	1575	62	/	0	0	/	40	

AM Peak Hr Begins at: 745 AM

PEAK													
Volumes	6	325	0	0	852	21	23	0	10	0	0	0	1237
Approach %	1.81	98.19	0.00	0.00	97.59	2.41	69.70	0.00	30.30	####	####	####	
PEAK HR. FACTOR:	0.940			0.909			0.825			0.000			0.954

CONTROL: 1-Way Stop (EB)
COMMENT 1:
GPS: 33.651282, -111.907937

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Hayden Rd DATE: 07/11/23 LOCATION: Scottsdale

0

E-W STREET: Mayo Blvd DAY: TUESDAY PROJECT# 23-1348-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 0	ST 2	SR 1	EL 1	ET 0	ER 1	WL 0	WT 0	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	1	204	0	0	120	2	6	0	4	0	0	0	337
4:15 PM	1	191	0	0	103	1	7	0	2	0	0	0	305
4:30 PM	1	265	0	0	166	3	11	0	2	0	0	0	448
4:45 PM	2	210	0	0	151	4	10	0	2	0	0	0	379
5:00 PM	4	280	0	0	133	1	7	0	3	0	0	0	428
5:15 PM	3	210	0	0	99	4	7	0	2	0	0	0	325
5:30 PM	2	155	0	0	122	4	8	0	3	0	0	0	294
5:45 PM	4	133	0	0	97	1	4	0	2	0	0	0	241
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	18	1648	0	0	991	20	60	0	20	0	0	0	2757
Approach %	1.08	98.92	0.00	0.00	98.02	1.98	75.00	0.00	25.00	####	####	####	
App/Depart	1666	/	1708	1011	/	1011	80	/	0	0	/	38	

PM Peak Hr Begins at: 430 PM

PEAK													
Volumes	10	965	0	0	549	12	35	0	9	0	0	0	1580
Approach %	1.03	98.97	0.00	0.00	97.86	2.14	79.55	0.00	20.45	####	####	####	
PEAK HR. FACTOR:	0.858			0.830			0.846			0.000			0.882

CONTROL: 1-Way Stop (EB)
COMMENT 1: 0
GPS: 33.651282, -111.907937

13-ZN-2020#2
10/24/2024

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: 82nd St
E-W STREET: Axon Way

DATE: 07/11/23
DAY: TUESDAY

LOCATION: Scottsdale
PROJECT# 23-1348-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 0	NR 1	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	0	0	0	0	0	0	12	2	0	3	0	17
7:15 AM	6	1	1	0	0	0	0	17	2	0	3	0	30
7:30 AM	5	1	0	0	2	0	0	24	4	0	4	0	40
7:45 AM	5	0	2	0	0	0	0	26	3	0	8	0	44
8:00 AM	3	0	1	0	0	0	0	33	7	1	5	0	50
8:15 AM	4	0	0	0	0	0	0	21	6	0	7	0	38
8:30 AM	3	0	0	0	0	0	0	21	2	1	5	0	32
8:45 AM	5	0	0	0	0	0	0	14	5	0	4	0	28
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	31	2	4	0	2	0	0	168	31	2	39	0	279
Approach %	83.78	5.41	10.81	0.00	100.00	0.00	0.00	84.42	15.58	4.88	95.12	0.00	
App/Depart	37	/	2	2	/	35	199	/	172	41	/	70	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	17	1	3	0	2	0	0	104	20	1	24	0	172
Approach %	80.95	4.76	14.29	0.00	100.00	0.00	0.00	83.87	16.13	4.00	96.00	0.00	
PEAK HR. FACTOR:	0.750			0.250			0.775			0.781			0.860

CONTROL: 4-Way Stop
COMMENT 1:
GPS: 33.649428, -111.903607

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: 82nd St
E-W STREET: Axon Way

0

DATE: 07/11/23
DAY: TUESDAY

LOCATION: Scottsdale
PROJECT# 23-1348-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 0	NR 1	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	5	0	2	0	0	0	0	9	7	0	18	0	41
4:15 PM	2	0	1	0	0	0	0	20	1	0	19	0	43
4:30 PM	3	0	0	0	0	0	0	41	2	1	105	0	152
4:45 PM	5	0	2	0	0	0	0	29	2	1	31	0	70
5:00 PM	5	0	0	0	0	0	0	4	3	0	34	0	46
5:15 PM	7	0	0	0	0	0	0	6	3	1	30	0	47
5:30 PM	4	0	0	0	0	0	0	5	3	1	6	0	19
5:45 PM	3	0	0	0	0	0	0	4	2	1	8	0	18
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	34	0	5	0	0	0	0	118	23	5	251	0	436
Approach %	87.18	0.00	12.82	####	####	####	0.00	83.69	16.31	1.95	98.05	0.00	
App/Depart	39	/	0	0	/	28	141	/	123	256	/	285	

PM Peak Hr Begins at: 430 PM

PEAK													
Volumes	20	0	2	0	0	0	0	80	10	3	200	0	315
Approach %	90.91	0.00	9.09	####	####	####	0.00	88.89	11.11	1.48	98.52	0.00	
PEAK HR. FACTOR:	0.786			0.000			0.523			0.479			0.518

CONTROL: 4-Way Stop
COMMENT 1: 0
GPS: 33.649428, -111.903607

13-ZN-2020#2
10/24/2024

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Perimeter Dr DATE: 07/11/23 LOCATION: Scottsdale

E-W STREET: Axon Way DAY: TUESDAY PROJECT# 23-1348-004

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 0	NR 1	SL 0	ST 1	SR 0	EL 0	ET 1	ER 1	WL 0	WT 1	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	4	0	0	0	1	0	1	0	15	0	0	0	21
7:15 AM	3	0	0	0	1	0	1	0	15	0	0	0	20
7:30 AM	6	0	0	0	1	0	1	0	26	0	0	0	34
7:45 AM	10	0	0	0	1	0	1	1	20	0	1	0	34
8:00 AM	3	0	0	0	1	0	1	1	29	1	0	0	36
8:15 AM	4	0	0	1	2	0	3	0	17	0	0	0	27
8:30 AM	9	0	0	1	1	0	1	0	18	0	0	0	30
8:45 AM	5	1	1	1	0	1	0	1	13	1	0	0	24
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	44	1	1	3	8	1	9	3	153	2	1	0	226
Approach %	95.65	2.17	2.17	25.00	66.67	8.33	5.45	1.82	92.73	66.67	33.33	0.00	
App/Depart	46	/	10	12	/	163	165	/	7	3	/	46	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	23	0	0	1	5	0	6	2	92	1	1	0	131
Approach %	100.00	0.00	0.00	16.67	83.33	0.00	6.00	2.00	92.00	50.00	50.00	0.00	
PEAK HR. FACTOR:		0.575			0.500			0.806			0.500		0.910

CONTROL: 2-Way Stop (NB & SB)
COMMENT 1:
GPS: 33.649914, -111.900211

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Perimeter Dr DATE: 07/11/23 LOCATION: Scottsdale

0

E-W STREET: Axon Way DAY: TUESDAY PROJECT# 23-1348-004

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 0	NR 1	SL 0	ST 1	SR 0	EL 0	ET 1	ER 1	WL 0	WT 1	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	17	0	0	0	0	0	0	0	15	0	0	0	32
4:15 PM	48	0	0	0	0	0	0	0	25	0	0	0	73
4:30 PM	75	0	1	0	0	0	0	0	49	1	0	0	126
4:45 PM	28	0	0	0	0	0	0	1	20	0	0	0	49
5:00 PM	34	0	0	0	0	0	0	0	4	1	0	0	39
5:15 PM	15	0	0	0	0	0	0	0	6	0	0	0	21
5:30 PM	9	0	2	0	0	0	0	0	3	2	0	0	16
5:45 PM	15	0	0	0	0	0	0	0	3	0	0	0	18
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	241	0	3	0	0	0	0	1	125	4	0	0	374
Approach %	98.77	0.00	1.23	####	####	####	0.00	0.79	99.21	100.00	0.00	0.00	
App/Depart	244	/	0	0	/	129	126	/	4	4	/	241	

PM Peak Hr Begins at: 415 PM

PEAK													
Volumes	185	0	1	0	0	0	0	1	98	2	0	0	287
Approach %	99.46	0.00	0.54	####	####	####	0.00	1.01	98.99	100.00	0.00	0.00	
PEAK HR. FACTOR:		0.612			0.000			0.505			0.500		0.569

CONTROL: 2-Way Stop (NB & SB)
COMMENT 1: 0
GPS: 33.649914, -111.900211

13-ZN-2020#2
10/24/2024

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Hayden Rd DATE: 07/11/23 LOCATION: Scottsdale

E-W STREET: Princess Dr DAY: TUESDAY PROJECT# 23-1348-005

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 0.5	ET 0.5	ER 1	WL 2	WT 0	WR 1	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	2	40	20	29	119	2	5	9	11	30	2	7	276
7:15 AM	5	39	17	30	118	7	10	11	15	39	0	7	298
7:30 AM	8	38	34	38	160	12	7	12	19	48	1	13	390
7:45 AM	10	40	41	41	138	11	5	8	10	31	2	12	349
8:00 AM	12	70	32	31	153	12	8	9	16	33	0	10	386
8:15 AM	6	53	22	33	128	14	4	7	8	35	2	11	323
8:30 AM	6	69	42	27	171	8	8	8	17	45	2	12	415
8:45 AM	7	69	30	22	140	12	7	8	14	46	1	11	367
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	56	418	238	251	1127	78	54	72	110	307	10	83	2804
Approach %	7.87	58.71	33.43	17.24	77.40	5.36	22.88	30.51	46.61	76.75	2.50	20.75	
App/Depart	712	/	555	1456	/	1544	236	/	561	400	/	144	

AM Peak Hr Begins at: 800 AM

PEAK													
Volumes	31	261	126	113	592	46	27	32	55	159	5	44	1491
Approach %	7.42	62.44	30.14	15.05	78.83	6.13	23.68	28.07	48.25	76.44	2.40	21.15	
PEAK HR. FACTOR:		0.893			0.911			0.864			0.881		0.898

CONTROL: Signal
COMMENT 1:
GPS: 33.643093, -111.907708

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Hayden Rd DATE: 07/11/23 LOCATION: Scottsdale

E-W STREET: Princess Dr 0 DAY: TUESDAY PROJECT# 23-1348-005

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 0.5	ET 0.5	ER 1	WL 2	WT 0	WR 1	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	8	149	32	6	85	11	4	9	11	41	1	26	383
4:15 PM	18	140	31	9	73	6	6	3	12	57	1	29	385
4:30 PM	16	150	34	7	82	12	3	4	15	72	2	34	431
4:45 PM	17	166	30	11	88	14	7	4	10	56	4	48	455
5:00 PM	25	178	38	9	97	12	6	9	9	67	1	60	511
5:15 PM	16	152	21	10	58	18	6	10	15	60	3	22	391
5:30 PM	16	101	32	9	84	16	2	7	8	53	3	19	350
5:45 PM	25	109	32	3	50	7	9	9	19	32	0	15	310
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	141	1145	250	64	617	96	43	55	99	438	15	253	3216
Approach %	9.18	74.54	16.28	8.24	79.41	12.36	21.83	27.92	50.25	62.04	2.12	35.84	
App/Depart	1536	/	1441	777	/	1154	197	/	369	706	/	252	

PM Peak Hr Begins at: 430 PM

PEAK													
Volumes	74	646	123	37	325	56	22	27	49	255	10	164	1788
Approach %	8.78	76.63	14.59	8.85	77.75	13.40	22.45	27.55	50.00	59.44	2.33	38.23	
PEAK HR. FACTOR:		0.874			0.886			0.790			0.838		0.875

CONTROL: Signal
COMMENT 1: 0
GPS: 33.643093, -111.907708

13-ZN-2020#2
10/24/2024

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Hayden Rd DATE: 07/11/23 LOCATION: Scottsdale

E-W STREET: Loop 101 EB Ramps DAY: TUESDAY PROJECT# 23-1348-006

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 3	NR 1	SL 2	ST 2	SR 0	EL 1.3	ET 0.3	ER 1.3	WL 0	WT 0	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	60	12	85	57	0	93	0	86	0	0	0	393
7:15 AM	0	56	6	75	69	0	101	1	94	0	0	0	402
7:30 AM	0	68	9	106	97	0	125	0	111	0	0	0	516
7:45 AM	0	73	8	83	99	0	118	0	139	0	0	0	520
8:00 AM	0	75	10	113	91	0	132	0	135	0	0	0	556
8:15 AM	0	81	12	96	84	0	147	0	121	0	0	0	541
8:30 AM	0	79	10	99	96	0	114	0	103	0	0	0	501
8:45 AM	0	80	10	78	96	0	127	0	109	0	0	0	500
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	572	77	735	689	0	957	1	898	0	0	0	3929
Approach %	0.00	88.14	11.86	51.62	48.38	0.00	51.56	0.05	48.38	####	####	####	
App/Depart	649	/	1529	1424	/	1587	1856	/	813	0	/	0	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	0	297	39	398	371	0	522	0	506	0	0	0	2133
Approach %	0.00	88.39	11.61	51.76	48.24	0.00	50.78	0.00	49.22	####	####	####	
PEAK HR. FACTOR:		0.903			0.942			0.959			0.000		0.959

CONTROL: Signal
COMMENT 1:
GPS: 33.654024, -111.908020

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Hayden Rd DATE: 07/11/23 LOCATION: Scottsdale
0
E-W STREET: Loop 101 EB Ramps DAY: TUESDAY PROJECT# 23-1348-006

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 3	NR 1	SL 2	ST 2	SR 0	EL 1.3	ET 0.3	ER 1.3	WL 0	WT 0	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	0	194	15	122	69	0	56	1	54	0	0	0	511
4:15 PM	0	198	2	75	50	0	65	0	55	0	0	0	445
4:30 PM	0	270	7	85	84	0	51	0	85	0	0	0	582
4:45 PM	0	210	13	73	79	0	79	1	77	0	0	0	532
5:00 PM	0	279	8	111	96	0	66	1	39	0	0	0	600
5:15 PM	0	207	10	97	57	0	82	1	46	0	0	0	500
5:30 PM	0	154	10	71	74	0	60	0	53	0	0	0	422
5:45 PM	0	133	5	66	73	0	71	0	25	0	0	0	373
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	1645	70	700	582	0	530	4	434	0	0	0	3965
Approach %	0.00	95.92	4.08	54.60	45.40	0.00	54.75	0.41	44.83	####	####	####	
App/Depart	1715	/	2175	1282	/	1016	968	/	774	0	/	0	

PM Peak Hr Begins at: 430 PM

PEAK													
Volumes	0	966	38	366	316	0	278	3	247	0	0	0	2214
Approach %	0.00	96.22	3.78	53.67	46.33	0.00	52.65	0.57	46.78	####	####	####	
PEAK HR. FACTOR:		0.875			0.824			0.841			0.000		0.923

CONTROL: Signal
COMMENT 1: 0
GPS: 33.654024, -111.908020

13-ZN-2020#2
10/24/2024

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Hayden Rd DATE: 07/11/23 LOCATION: Scottsdale

E-W STREET: Loop 101 WB Ramps DAY: TUESDAY PROJECT# 23-1348-007

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 0	ST 4	SR 1	EL 0	ET 0	ER 0	WL 2	WT 0.5	WR 1.5	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	33	120	0	0	134	57	0	0	0	8	2	79	433
7:15 AM	34	123	0	0	123	52	0	0	0	21	4	82	439
7:30 AM	40	153	0	0	185	66	0	0	0	18	3	86	551
7:45 AM	39	152	0	0	162	60	0	0	0	20	3	122	558
8:00 AM	55	152	0	0	187	54	0	0	0	17	5	94	564
8:15 AM	57	171	0	0	159	68	0	0	0	21	8	119	603
8:30 AM	42	151	0	0	182	67	0	0	0	13	4	101	560
8:45 AM	48	159	0	0	159	59	0	0	0	15	1	101	542
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	348	1181	0	0	1291	483	0	0	0	133	30	784	4250
Approach %	22.76	77.24	0.00	0.00	72.77	27.23	####	####	####	14.04	3.17	82.79	
App/Depart	1529	/	1965	1774	/	1424	0	/	0	947	/	861	

AM Peak Hr Begins at: 745 AM

PEAK													
Volumes	193	626	0	0	690	249	0	0	0	71	20	436	2285
Approach %	23.57	76.43	0.00	0.00	73.48	26.52	####	####	####	13.47	3.80	82.73	
PEAK HR. FACTOR:		0.898			0.943			0.000			0.890		0.947

CONTROL: Signal
COMMENT 1:
GPS: 33.655188, -111.907991

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Hayden Rd DATE: 07/11/23 LOCATION: Scottsdale
0
E-W STREET: Loop 101 WB Ramps DAY: TUESDAY PROJECT# 23-1348-007

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 0	ST 4	SR 1	EL 0	ET 0	ER 0	WL 2	WT 0.5	WR 1.5	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	107	143	0	0	177	113	0	0	0	14	0	94	648
4:15 PM	86	177	0	0	120	87	0	0	0	5	0	74	549
4:30 PM	162	159	0	0	147	102	0	0	0	22	2	84	678
4:45 PM	113	176	0	0	136	67	0	0	0	16	0	96	604
5:00 PM	160	185	0	0	193	97	0	0	0	14	1	95	745
5:15 PM	96	193	0	0	137	81	0	0	0	17	1	92	617
5:30 PM	91	123	0	0	126	69	0	0	0	19	0	78	506
5:45 PM	52	152	0	0	118	52	0	0	0	21	2	84	481
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	867	1308	0	0	1154	668	0	0	0	128	6	697	4828
Approach %	39.86	60.14	0.00	0.00	63.34	36.66	####	####	####	15.40	0.72	83.87	
App/Depart	2175	/	2005	1822	/	1282	0	/	0	831	/	1541	

PM Peak Hr Begins at: 430 PM

PEAK													
Volumes	531	713	0	0	613	347	0	0	0	69	4	367	2644
Approach %	42.68	57.32	0.00	0.00	63.85	36.15	####	####	####	15.68	0.91	83.41	
PEAK HR. FACTOR:		0.901			0.828			0.000			0.982		0.887

CONTROL: Signal
COMMENT 1: 0
GPS: 33.655188, -111.907991

13-ZN-2020#2
10/24/2024

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Hayden Rd DATE: 07/11/23 LOCATION: Scottsdale

E-W STREET: Legacy Blvd DAY: TUESDAY PROJECT# 23-1348-008

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 0	ST 2	SR 1	EL 1	ET 0	ER 1	WL 0	WT 0	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	152	0	0	172	0	0	0	0	0	0	0	324
7:15 AM	0	150	0	0	182	0	1	0	1	0	0	0	334
7:30 AM	1	201	0	0	250	0	0	0	1	0	0	0	453
7:45 AM	1	209	0	0	236	0	0	0	3	0	0	0	449
8:00 AM	0	197	0	0	235	0	0	0	4	0	0	0	436
8:15 AM	2	196	0	0	231	0	1	0	3	0	0	0	433
8:30 AM	1	226	0	0	232	0	0	0	3	0	0	0	462
8:45 AM	0	208	0	0	223	1	1	0	3	0	0	0	436
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	5	1539	0	0	1761	1	3	0	18	0	0	0	3327
Approach %	0.32	99.68	0.00	0.00	99.94	0.06	14.29	0.00	85.71	####	####	####	
App/Depart	1544	/	1542	1762	/	1779	21	/	0	0	/	6	

AM Peak Hr Begins at: 745 AM

PEAK													
Volumes	4	828	0	0	934	0	1	0	13	0	0	0	1780
Approach %	0.48	99.52	0.00	0.00	100.00	0.00	7.14	0.00	92.86	####	####	####	
PEAK HR. FACTOR:		0.916			0.989			0.875			0.000		0.963

CONTROL: Signal
COMMENT 1:
GPS: 33.662106, -111.906207

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Hayden Rd DATE: 07/11/23 LOCATION: Scottsdale

0

E-W STREET: Legacy Blvd DAY: TUESDAY PROJECT# 23-1348-008

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 0	ST 2	SR 1	EL 1	ET 0	ER 1	WL 0	WT 0	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	1	238	0	0	220	0	0	0	2	0	0	0	461
4:15 PM	1	234	0	0	186	0	0	0	2	0	0	0	423
4:30 PM	0	230	0	0	182	0	1	0	1	0	0	0	414
4:45 PM	4	262	0	0	156	1	1	0	0	0	0	0	424
5:00 PM	0	277	0	0	262	0	1	0	0	0	0	0	540
5:15 PM	2	291	0	0	168	0	2	0	1	0	0	0	464
5:30 PM	0	227	0	0	176	1	0	0	2	0	0	0	406
5:45 PM	1	204	0	0	135	0	1	0	2	0	0	0	343
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	9	1963	0	0	1485	2	6	0	10	0	0	0	3475
Approach %	0.46	99.54	0.00	0.00	99.87	0.13	37.50	0.00	62.50	####	####	####	
App/Depart	1972	/	1969	1487	/	1495	16	/	0	0	/	11	

PM Peak Hr Begins at: 430 PM

PEAK													
Volumes	6	1060	0	0	768	1	5	0	2	0	0	0	1842
Approach %	0.56	99.44	0.00	0.00	99.87	0.13	71.43	0.00	28.57	####	####	####	
PEAK HR. FACTOR:		0.910			0.734			0.583			0.000		0.853

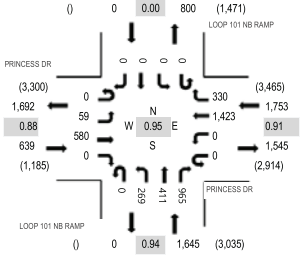
CONTROL: Signal
COMMENT 1: 0
GPS: 33.662106, -111.906207

13-ZN-2020#2
10/24/2024

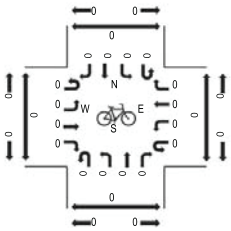
(303) 216-2439
www.alltrafficdata.net

Location: 1 LOOP 101 NB RAMP & PRINCESS DR AM
Date: Tuesday, August 8, 2023
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 08:00 AM - 08:15 AM

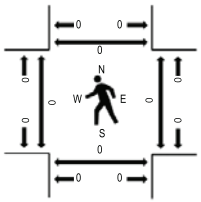
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

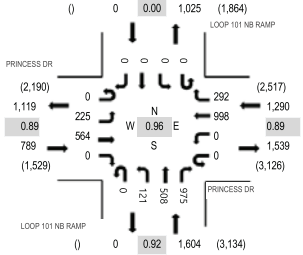
Traffic Counts - Motorized Vehicles

Interval Start Time	PRINCESS DR Eastbound				PRINCESS DR Westbound				LOOP 101 NB RAMP Northbound				LOOP 101 NB RAMP Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	9	90	0	0	0	287	101	0	58	52	208	0	0	0	0	805	3,696	0	0	0	0
7:15 AM	0	15	94	0	0	0	373	90	0	56	78	194	0	0	0	0	900	3,950	0	0	0	0
7:30 AM	0	10	115	0	0	0	403	94	0	59	91	221	0	0	0	0	993	4,037	0	0	0	0
7:45 AM	0	14	164	0	0	0	318	81	0	80	115	226	0	0	0	0	998	4,001	0	0	0	0
8:00 AM	0	19	158	0	0	0	360	85	0	65	111	261	0	0	0	0	1,059	3,989	0	0	0	0
8:15 AM	0	16	143	0	0	0	342	70	0	65	94	257	0	0	0	0	987		0	0	0	0
8:30 AM	0	13	133	0	0	0	376	86	0	61	63	225	0	0	0	0	957		0	0	0	0
8:45 AM	0	16	176	0	0	0	320	79	0	77	69	249	0	0	0	0	986		0	0	0	0
Count Total	0	112	1,073	0	0	0	2,779	686	0	521	673	1,841	0	0	0	0	7,685		0	0	0	0
Peak Hour	0	59	580	0	0	0	1,423	330	0	269	411	965	0	0	0	0	4,037		0	0	0	0

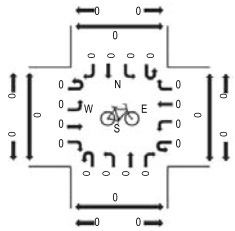
(303) 216-2439
www.alltrafficdata.net

Location: 1 LOOP 101 NB RAMP & PRINCESS DR PM
Date: Tuesday, August 8, 2023
Peak Hour: 04:00 PM - 05:00 PM
Peak 15-Minutes: 04:00 PM - 04:15 PM

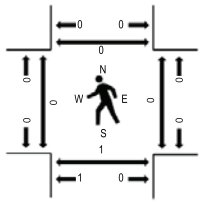
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

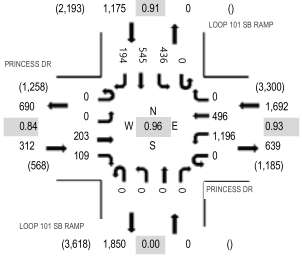
Interval Start Time	PRINCESS DR Eastbound				PRINCESS DR Westbound				LOOP 101 NB RAMP Northbound				LOOP 101 NB RAMP Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	56	145	0	0	0	282	80	0	22	160	217	0	0	0	0	962	3,683	0	0	0	0
4:15 PM	0	44	127	0	0	0	236	78	0	28	112	227	0	0	0	0	852	3,679	0	0	0	0
4:30 PM	0	59	135	0	0	0	240	73	0	37	134	239	0	0	0	0	917	3,671	0	0	0	0
4:45 PM	0	66	157	0	0	0	240	61	0	34	102	292	0	0	0	0	952	3,597	0	0	1	0
5:00 PM	0	50	121	0	0	0	271	67	0	27	149	273	0	0	0	0	958	3,497	0	0	0	0
5:15 PM	0	47	159	0	0	0	219	61	0	18	90	250	0	0	0	0	844		0	0	0	0
5:30 PM	0	33	141	0	0	0	221	58	0	23	104	263	0	0	0	0	843		0	0	0	0
5:45 PM	0	31	158	0	0	0	260	70	0	32	79	222	0	0	0	0	852		0	0	0	0
Count Total	0	386	1,143	0	0	0	1,969	548	0	221	930	1,983	0	0	0	0	7,180		0	0	1	0
Peak Hour	0	225	564	0	0	0	998	292	0	121	508	975	0	0	0	0	3,683		0	0	1	0

13-ZN-2020#2
10/24/2024

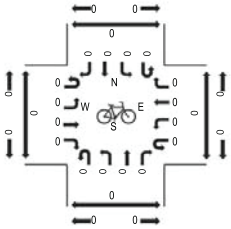
(303) 216-2439
www.alltrafficdata.net

Location: 2 LOOP 101 SB RAMP & PRINCESS DR AM
Date: Tuesday, August 8, 2023
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 07:30 AM - 07:45 AM

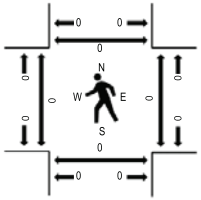
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

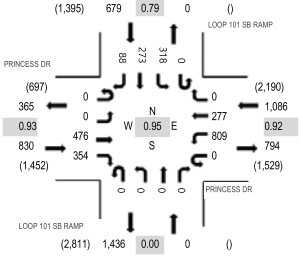
Traffic Counts - Motorized Vehicles

Interval Start Time	PRINCESS DR Eastbound				PRINCESS DR Westbound				LOOP 101 SB RAMP Northbound				LOOP 101 SB RAMP Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	26	22	0	258	87	0	0	0	0	0	0	73	83	36	585	2,957	0	0	0	0
7:15 AM	0	0	35	21	0	344	85	0	0	0	0	0	0	74	143	32	734	3,153	0	0	0	0
7:30 AM	0	0	41	38	0	362	100	0	0	0	0	0	0	84	172	27	824	3,179	0	0	0	0
7:45 AM	0	0	64	29	0	255	143	0	0	0	0	0	0	114	159	50	814	3,127	0	0	0	0
8:00 AM	0	0	47	23	0	299	126	0	0	0	0	0	0	130	110	46	781	3,104	0	0	0	0
8:15 AM	0	0	51	19	0	280	127	0	0	0	0	0	0	108	104	71	760		0	0	0	0
8:30 AM	0	0	39	26	0	319	118	0	0	0	0	0	0	107	112	51	772		0	0	0	0
8:45 AM	0	0	63	24	0	286	111	0	0	0	0	0	0	129	130	48	791		0	0	0	0
Count Total	0	0	366	202	0	2,403	897	0	0	0	0	0	0	819	1,013	361	6,061		0	0	0	0
Peak Hour	0	0	203	109	0	1,196	496	0	0	0	0	0	0	436	545	194	3,179		0	0	0	0

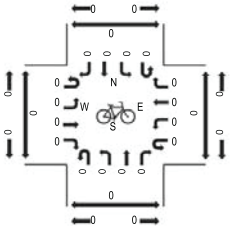
(303) 216-2439
www.alltrafficdata.net

Location: 2 LOOP 101 SB RAMP & PRINCESS DR PM
Date: Tuesday, August 8, 2023
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 04:45 PM - 05:00 PM

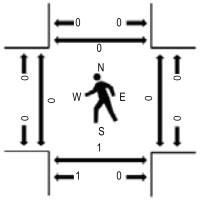
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

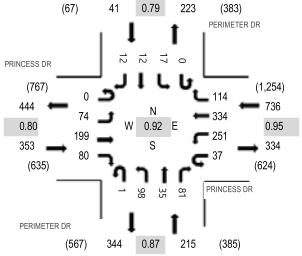
Interval Start Time	PRINCESS DR Eastbound				PRINCESS DR Westbound				LOOP 101 SB RAMP Northbound				LOOP 101 SB RAMP Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	0	124	76	0	242	62	0	0	0	0	0	0	77	49	12	642	2,583	0	0	0	0
4:15 PM	0	0	92	57	0	194	70	0	0	0	0	0	0	79	73	23	588	2,584	0	0	0	0
4:30 PM	0	0	129	94	0	197	80	0	0	0	0	0	0	65	70	32	667	2,595	0	0	0	0
4:45 PM	0	0	128	77	0	197	77	0	0	0	0	0	0	95	72	40	686	2,505	0	0	1	0
5:00 PM	0	0	112	110	0	227	71	0	0	0	0	0	0	59	56	8	643	2,454	0	0	0	0
5:15 PM	0	0	107	73	0	188	49	0	0	0	0	0	0	99	75	8	599		0	0	0	0
5:30 PM	0	0	90	64	0	186	58	0	0	0	0	0	0	84	84	11	577		0	0	0	0
5:45 PM	0	0	67	52	0	209	83	0	0	0	0	0	0	122	89	13	635		0	0	0	0
Count Total	0	0	849	603	0	1,640	550	0	0	0	0	0	0	680	568	147	5,037		0	0	1	0
Peak Hour	0	0	476	354	0	809	277	0	0	0	0	0	0	318	273	88	2,595		0	0	1	0

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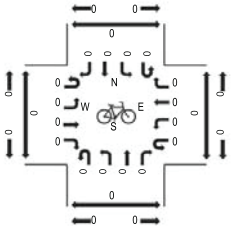
(303) 216-2439
www.alltrafficdata.net

Location: 3 PERIMETER DR & PRINCESS DR AM
Date: Tuesday, August 8, 2023
Peak Hour: 07:45 AM - 08:45 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

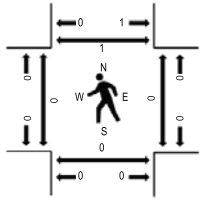
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

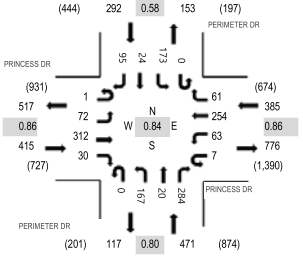
Traffic Counts - Motorized Vehicles

Interval Start Time	PRINCESS DR Eastbound				PRINCESS DR Westbound				PERIMETER DR Northbound				PERIMETER DR Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	8	32	11	2	44	54	18	0	22	2	16	0	5	2	2	218	1,070	0	0	0	0
7:15 AM	0	11	37	11	5	34	59	21	0	17	5	16	0	1	0	2	219	1,184	0	0	0	0
7:30 AM	0	10	61	20	5	36	63	22	0	19	5	19	0	7	0	1	268	1,306	0	0	0	0
7:45 AM	0	20	66	29	9	69	79	30	0	26	7	17	0	4	5	4	365	1,345	0	0	0	0
8:00 AM	0	12	50	18	13	56	83	29	1	24	15	22	0	4	2	3	332	1,271	0	0	0	0
8:15 AM	0	22	42	20	8	64	90	32	0	23	5	21	0	6	4	4	341		0	0	0	1
8:30 AM	0	20	41	13	7	62	82	23	0	25	8	21	0	3	1	1	307		0	0	0	0
8:45 AM	0	21	49	11	9	53	64	29	0	20	8	21	0	5	1	0	291		0	0	0	0
Count Total	0	124	378	133	58	418	574	204	1	176	55	153	0	35	15	17	2,341		0	0	0	1
Peak Hour	0	74	199	80	37	251	334	114	1	98	35	81	0	17	12	12	1,345		0	0	0	1

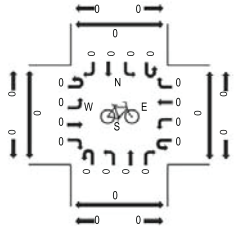
(303) 216-2439
www.alltrafficdata.net

Location: 3 PERIMETER DR & PRINCESS DR PM
Date: Tuesday, August 8, 2023
Peak Hour: 04:15 PM - 05:15 PM
Peak 15-Minutes: 04:30 PM - 04:45 PM

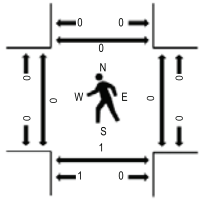
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

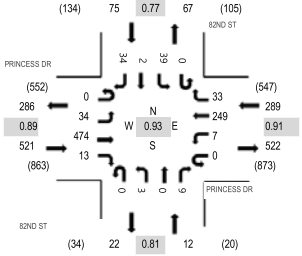
Interval Start Time	PRINCESS DR Eastbound				PRINCESS DR Westbound				PERIMETER DR Northbound				PERIMETER DR Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	1	9	59	5	0	18	56	2	0	54	6	97	0	31	2	14	354	1,528	0	0	0	0
4:15 PM	0	13	72	8	3	13	59	13	0	45	5	61	0	15	8	13	328	1,563	0	0	0	0
4:30 PM	0	24	75	5	3	18	67	15	0	48	9	72	0	75	5	49	465	1,489	0	0	0	0
4:45 PM	0	30	59	9	1	20	65	26	0	40	2	63	0	45	6	15	381	1,299	0	0	1	0
5:00 PM	1	5	106	8	0	12	63	7	0	34	4	88	0	38	5	18	389	1,191	0	0	0	0
5:15 PM	0	3	72	5	2	12	35	2	0	25	3	54	0	28	2	11	254		0	0	0	0
5:30 PM	0	1	67	6	0	12	56	4	0	29	1	62	0	21	3	13	275		0	0	0	0
5:45 PM	0	5	69	10	4	6	76	4	0	38	4	30	0	18	3	6	273		0	0	0	0
Count Total	2	90	579	56	13	111	477	73	0	313	34	527	0	271	34	139	2,719		0	0	1	0
Peak Hour	1	72	312	30	7	63	254	61	0	167	20	284	0	173	24	95	1,563		0	0	1	0

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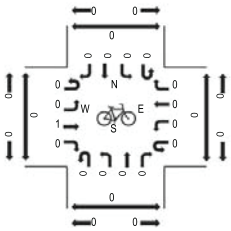
(303) 216-2439
www.alltrafficdata.net

Location: 4 82ND ST & PRINCESS DR AM
Date: Tuesday, August 8, 2023
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

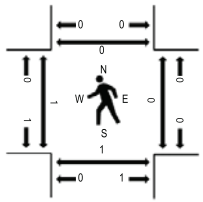
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

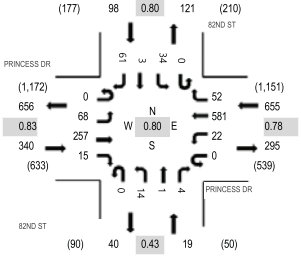
Traffic Counts - Motorized Vehicles

Interval Start Time	PRINCESS DR Eastbound				PRINCESS DR Westbound				82ND ST Northbound				82ND ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	7	61	0	0	2	48	2	0	2	0	1	0	5	1	10	139	739	1	0	0	0
7:15 AM	0	5	60	0	0	1	62	2	0	0	0	0	0	9	0	5	144	822	0	2	0	0
7:30 AM	0	11	110	2	0	3	53	10	0	0	0	1	0	13	0	12	215	897	1	0	1	0
7:45 AM	0	8	135	3	0	1	62	7	0	1	0	2	0	13	1	8	241	894	0	0	0	0
8:00 AM	0	12	117	4	0	2	62	9	0	1	0	3	0	7	0	5	222	825	0	0	0	0
8:15 AM	0	3	112	4	0	1	72	7	0	1	0	3	0	6	1	9	219		0	0	0	0
8:30 AM	0	7	97	1	1	2	76	6	0	1	0	1	0	9	1	10	212		0	0	1	0
8:45 AM	0	5	97	2	1	2	49	4	0	0	0	3	0	6	0	3	172		0	0	2	0
Count Total	0	58	789	16	2	14	484	47	0	6	0	14	0	68	4	62	1,564		2	2	4	0
Peak Hour	0	34	474	13	0	7	249	33	0	3	0	9	0	39	2	34	897		1	0	1	0

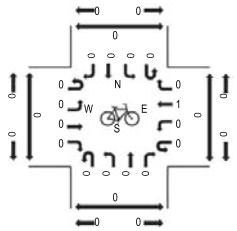
(303) 216-2439
www.alltrafficdata.net

Location: 4 82ND ST & PRINCESS DR PM
Date: Tuesday, August 8, 2023
Peak Hour: 04:15 PM - 05:15 PM
Peak 15-Minutes: 04:30 PM - 04:45 PM

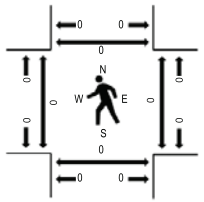
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	PRINCESS DR Eastbound				PRINCESS DR Westbound				82ND ST Northbound				82ND ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	5	48	0	0	1	138	6	0	0	0	1	0	6	0	13	218	1,084	0	0	0	0
4:15 PM	0	19	62	2	0	6	113	13	0	2	0	1	0	8	0	6	232	1,112	0	0	0	0
4:30 PM	0	21	76	5	0	4	187	18	0	2	1	0	0	6	1	25	346	1,066	0	0	0	0
4:45 PM	0	19	72	5	0	11	124	18	0	7	0	2	0	9	2	19	288	948	0	0	0	0
5:00 PM	0	9	47	3	0	1	157	3	0	3	0	1	0	11	0	11	246	927	0	0	0	0
5:15 PM	0	11	54	2	0	1	89	7	0	2	1	1	0	5	0	13	186		0	0	0	0
5:30 PM	0	14	52	6	0	8	114	6	0	4	0	2	0	5	1	16	228		0	0	0	0
5:45 PM	3	18	57	23	0	8	101	17	0	11	4	5	0	8	0	12	267		0	0	0	0
Count Total	3	116	468	46	0	40	1,023	88	0	31	6	13	0	58	4	115	2,011		0	0	0	0
Peak Hour	0	68	257	15	0	22	581	52	0	14	1	4	0	34	3	61	1,112		0	0	0	0

13-ZN-2020#2
10/24/2024

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Hayden Rd DATE: 07/11/23 LOCATION: Scottsdale

E-W STREET: Axon Way DAY: TUESDAY PROJECT# 23-1348-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	3	51	1	12	125	4	10	1	6	2	0	1	216
7:15 AM	1	45	1	18	138	3	9	0	16	2	0	7	240
7:30 AM	0	48	1	27	177	3	11	0	22	0	0	9	298
7:45 AM	5	57	1	27	205	2	8	1	9	2	0	11	328
8:00 AM	5	59	3	37	182	4	15	0	9	2	0	6	322
8:15 AM	2	76	5	22	179	1	3	0	12	2	0	9	311
8:30 AM	5	70	3	20	179	4	11	0	11	2	0	6	311
8:45 AM	4	78	1	18	176	12	5	0	9	1	0	8	312
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	25	484	16	181	1361	33	72	2	94	13	0	57	2338
Approach %	4.76	92.19	3.05	11.49	86.41	2.10	42.86	1.19	55.95	18.57	0.00	81.43	
App/Depart	525	/	613	1575	/	1468	168	/	199	70	/	58	

AM Peak Hr Begins at: 745 AM

PEAK													
Volumes	17	262	12	106	745	11	37	1	41	8	0	32	1272
Approach %	5.84	90.03	4.12	12.30	86.43	1.28	46.84	1.27	51.90	20.00	0.00	80.00	
PEAK HR. FACTOR:		0.877			0.921			0.823			0.769		0.970

CONTROL: 2-Way Stop (EB & WB)
COMMENT 1:
GPS: 33.649460, -111.907792

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Hayden Rd DATE: 07/11/23 LOCATION: Scottsdale

0

E-W STREET: Axon Way DAY: TUESDAY PROJECT# 23-1348-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	5	178	1	15	92	17	6	0	11	2	0	21	348
4:15 PM	8	167	0	21	76	8	5	0	15	1	0	20	321
4:30 PM	5	157	2	41	111	16	5	0	10	3	1	104	455
4:45 PM	5	173	0	31	114	8	7	0	10	3	1	32	384
5:00 PM	16	241	0	7	112	17	7	0	7	3	0	36	446
5:15 PM	12	176	1	7	79	15	5	1	4	5	0	32	337
5:30 PM	8	144	2	6	96	23	5	0	12	2	0	8	306
5:45 PM	10	120	1	5	81	13	7	0	9	1	0	10	257
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	69	1356	7	133	761	117	47	1	78	20	2	263	2854
Approach %	4.82	94.69	0.49	13.16	75.27	11.57	37.30	0.79	61.90	7.02	0.70	92.28	
App/Depart	1432	/	1666	1011	/	859	126	/	141	285	/	188	

PM Peak Hr Begins at: 430 PM

PEAK													
Volumes	38	747	3	86	416	56	24	1	31	14	2	204	1622
Approach %	4.82	94.80	0.38	15.41	74.55	10.04	42.86	1.79	55.36	6.36	0.91	92.73	
PEAK HR. FACTOR:		0.767			0.830			0.824			0.509		0.891

CONTROL: 2-Way Stop (EB & WB)
COMMENT 1: 0
GPS: 33.649460, -111.907792

13-ZN-2020#2
10/24/2024

APPENDIX C

CRASH ANALYSIS DATA

13-ZN-2020#2
10/24/2024

CRASH STATISTICS

2020-2022

Hayden & Mayo

Involvement

	# Incidents	Totals		# Motorists	# Non-Motorists
Incidents	3	5	Veh	5	0
Fatal	0	0	Ppl	0	0
Injury	1	1	Ppl	0	0
PDO	2	3	Veh		

Peds/Bikes Summary

	Incidents	Persons Injuries	Fatal	Non-Fatal
Pedestrian:	0	0	0	0
Bicycle:	0	0	0	0

Code	LightCondition	No.
1	DAYLIGHT	3
2	DAWN	0
3	DUSK	0
4	DARK_LIGHTED	0
5	DARK_NOT_LIGHTED	0
6	DARK_UNKNOWN_LIGHTING	0
99	UNKNOWN	0
	Check Total	3

	Weather	
1	CLEAR	3
2	CLOUDY	0
3	SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	0
4	RAIN	0
5	SNOW	0
6	SEVERE_CROSSWINDS	0
7	BLOWING_SAND_SOIL_DIRT	0
8	FOG_SMOG_SMOKE	0
9	BLOWING_SNOW	0
97	OTHER	0
99	UNKNOWN	0
	Check Total	3

	TrafficWayType	
1	ONE_WAY_TRAFFICWAY	0
2	TWO_WAY_NOT_DIVIDED	0
3	ED_WITH_CONTINUOUS_LEFT_TURN_LANE	0
4	_UNPROTECTED_PAINTED_4_FEET_MEDIAN	0
5	DED_POSITIVE_MEDIAN_BARRIER	2
99	UNKNOWN	1
	Check Total	3

	Weekday	
1	Sunday	0
2	Monday	0
3	Tuesday	1
4	Wednesday	2
5	Thursday	0
6	Friday	0
7	Saturday	0
	Check Total	3

Circumstances

Hit & Run?	1
Intersection Related?	2

Code	JunctionRelation	No.
0	NOT_JUNCTION_RELATED	1
1	INTERSECTION_NON_INTERCHANGE	1
2	INTERSECTION_RELATED_NON_INTERCHANGE	1
3	ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	0
4	RAILWAY_GRADE_CROSSING	0
5	CROSSOVER_RELATED	0
6	FRONTAGE_ROAD_NON_INTERCHANGE	0
7	DRIVEWAY	0
8	ALLEY_ACCESS_RELATED	0
9	UNKNOWN_NON_INTERCHANGE	0
10	THRU_ROADWAY	0
11	INTERSECTION_INTERCHANGE	0
12	INTERSECTION_RELATED_INTERCHANGE	0
13	ENTRANCE_EXIT_RAMP_INTERCHANGE	0
14	FRONTAGE_ROAD_INTERCHANGE	0
15	OTHER_PART_OF_INTERCHANGE	0
16	<not defined>	0
17	UNKNOWN_INTERCHANGE	0
18	UNKNOWN_JUNCTION	0
99	UNKNOWN	0
109	OTHER_NON_INTERCHANGE	0
	Check Total	3

	CollisionManner	
1	SINGLE_VEHICLE	1
2	ANGLE (front to side)(other than left turn)	1
3	LEFT_TURN	1
4	REAR_END	0
5	HEAD_ON	0
6	SIDESWIPE_SAME_DIRECTION	0
7	SIDESWIPE_OPPOSITE_DIRECTION	0
8	REAR_TO_SIDE	0
9	REAR_TO_REAR	0
97	OTHER	0
99	UNKNOWN	0
	Check Total	3

	TravelDirection	
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

Code	First Harmful Event	No.
1	OVERTURN_ROLLOVER	0
2	FIRE_EXPLOSION	0
3	IMMERSION	0
4	JACKKNIFE	0
5	CARGO_EQUIPMENT_LOSS_SHIFT	0
6	FELL_JUMPED_FROM_VEHICLE	0
7	THROWN_OR_FALLING_OBJECT	0
8	OTHER_NON_COLLISION	0
9	EQUIPMENT_FAILURE~~_TIRES_BRAKES~~	0
10	SEPARATION_OF_UNITS	0
11	RAN_OFF_ROAD_RIGHT	0
12	RAN_OFF_ROAD_LEFT	0
13	CROSS_MEDIAN	0
14	CROSS_CENTERLINE	0
15	DOWNHILL_RUNAWAY	0
16	MOTOR_VEHICLE_IN_TRANSPORT	1
17	PEDESTRIAN	0
18	PEDALCYCLE	0
19	RAILWAY_VEHICLE_TRAIN_ENGINE	0
20	LIGHT_RAILWAY_RAILCAR_VEHICLE	0
21	ANIMAL_WILD_NON_GAME	0
22	ANIMAL_WILD_GAME	0
23	ANIMAL_PET	0
24	ANIMAL_LIVESTOCK	0
25	PARKED_MOTOR_VEHICLE	1
26	WORK_ZONE_MAINTENANCE_EQUIPMENT	0
27	STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	0
28	OTHER_NON_FIXED_OBJECT	0
29	IMPACT_ATTENUATOR_CRASH_CUSHION	0
30	BRIDGE_OVERHEAD_STRUCTURE	0
31	BRIDGE_RAIL	0
32	CULVERT	0
33	CURB	1
34	DITCH	0
35	EMBANKMENT	0
36	GUARDRAIL_FACE	0
37	GUARDRAIL_END	0
38	CONCRETE_TRAFFIC_BARRIER	0
39	CABLE_TRAFFIC_BARRIER	0
40	OTHER_TRAFFIC_BARRIER	0
41	TREE_BUSH_STUMP_STANDING	0
42	TRAFFIC_SIGN_SUPPORT	0
43	TRAFFIC_SIGNAL_SUPPORT	0
44	UTILITY_POLE_LIGHT_SUPPORT	0
45	OTHER_POST_POLE_OR_SUPPORT	0
46	FENCE	0
47	MAILBOX	0
48	BUILDING	0
49	OTHER_FIXED_OBJECT	0
99	UNKNOWN	0
255	Not Reported	0
	Check Total	3

Code	Month	No.
1	January	1
2	February	0
3	March	1
4	April	1
5	May	0
6	June	0
7	July	0
8	August	0
9	September	0
10	October	0
11	November	0
12	December	0
	Total	3

	(Unit) SurfaceCondition	
1	DRY	5
2	WET	0
3	SNOW	0
4	SLUSH	0
5	ICE_FROST	0
6	WATER_STANDING_MOVING	0
7	SAND	0
8	MUD_DIRT_GRAVEL	0
9	OIL	0
97	OTHER	0
99	UNKNOWN	0
	Total	5

Additional Useful Information

Vehicle Action Codes

1	GOING_STRAIGHT_AHEAD
2	SLOWING_IN_TRAFFICWAY
3	STOPPED_IN_TRAFFICWAY
4	MAKING_LEFT_TURN
5	MAKING_RIGHT_TURN
6	MAKING_U_TURN
7	OVERTAKING_PASSING
8	CHANGING_LANES
9	NEGOTIATING_A_CURVE
10	BACKING
11	Avoiding_Vehicle_Object_Pedestrian
12	ENTERING_PARKING_POSITION
13	LEAVING_PARKING_POSITION
14	PROPERLY_PARKED
15	IMPROPERLY_PARKED
16	DRIVERLESS_MOVING_VEHICLE
17	CROSSING_ROAD
18	WALKING_WITH_TRAFFIC
19	WALKING_AGAINST_TRAFFIC
20	STANDING
21	LYING
22	GETTING_ON_OR_OFF_VEHICLE
23	WORKING_ON_OR_PUSHING_VEHICLE
24	WORKING_ON_ROAD
97	OTHER
99	UNKNOWN

Body Styles

-1	NOT_REPORTED
1	\Passenger Vehicles, including RVs
53	/
54	\TRUCKS
88	/
89	\MOBILEHOME (NOT RVS)
92	/
93	\TRAILERS
120	/
121	\MOTORCYCLES
128	/
254	UNKNOWN
255	NOT REPORTED

13-ZN-2020#2
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Hayden & Mayo

SUMMARY BY YEAR

SEVERITY / INCIDENTS	**2020**	**2021**	**2022**	**Totals**	**Checks**
Fatal Injury Incidents					
Non-fatal Injury Incidents		1		1	
PDO Incidents	1		1	2	
TOTALS	1	1	1	3	
Pedestrian Incidents					
Pedestrians Involved					
Bicycle Incidents					
Bicyclists Involved					
SEVERITY / INVOLVMENT					
Fatal Injuries					
Non-Fatal Injuries		1		1	
PDO Vehicles	2		1	3	
Pedestrians Fatally Injured					
Pedestrians Non-Fatally Injured					
Bicyclists Fatally Injured					
Bicyclists Non-Fatally Injured					
COLLISION MANNER					
SINGLE_VEHICLE 1			1	1	
ANGLE 2	1			1	
LEFT_TURN 3		1		1	
REAR_END 4					
HEAD_ON 5					
SIDESWIPE_SAME_DIRECTION 6					
IDESWIPE_OPPOSITE_DIRECTION 7					
REAR_TO_SIDE 8					
REAR_TO_REAR 9					
OTHER 97					
UNKNOWN 99					
TOTALS	1	1	1	3	

CRASH STATISTICS

2020-2022

Hayden & Princess

Involvement

	# Incidents	Totals		# Motorists	# Non-Motorists
Incidents	15	30	Veh	43	0
Fatal	0	0	Ppl	0	0
Injury	7	15	Ppl	0	0
PDO	8	15	Veh		

Peds/Bikes Summary

	Incidents	Persons	Injuries Fatal	Injuries Non-Fatal
Pedestrian:	0	0	0	0
Bicycle:	0	0	0	0

Code	LightCondition	No.
1	DAYLIGHT	11
2	DAWN	0
3	DUSK	0
4	DARK_LIGHTED	4
5	DARK_NOT_LIGHTED	0
6	DARK_UNKNOWN_LIGHTING	0
99	UNKNOWN	0
	Check Total	15

Code	Weather	No.
1	CLEAR	14
2	CLOUDY	0
3	SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	0
4	RAIN	1
5	SNOW	0
6	SEVERE_CROSSWINDS	0
7	BLOWING_SAND_SOIL_DIRT	0
8	FOG_SMOG_SMOKE	0
9	BLOWING_SNOW	0
97	OTHER	0
99	UNKNOWN	0
	Check Total	15

Code	TrafficWayType	No.
1	ONE_WAY_TRAFFICWAY	0
2	TWO_WAY_NOT_DIVIDED	0
3	ED_WITH_CONTINUOUS_LEFT_TURN_LANE	0
4	_UNPROTECTED_PAINTED_4_FEET_MEDIAN	3
5	DED_POSITIVE_MEDIAN_BARRIER	12
99	UNKNOWN	0
	Check Total	15

Code	Weekday	No.
1	Sunday	3
2	Monday	2
3	Tuesday	3
4	Wednesday	3
5	Thursday	0
6	Friday	3
7	Saturday	1
	Check Total	15

Circumstances

Hit & Run?	0
Intersection Related?	11

Code	JunctionRelation	No.
0	NOT_JUNCTION_RELATED	3
1	INTERSECTION_NON_INTERCHANGE	6
2	INTERSECTION_RELATED_NON_INTERCHANGE	4
3	ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	0
4	RAILWAY_GRADE_CROSSING	0
5	CROSSOVER_RELATED	0
6	FRONTAGE_ROAD_NON_INTERCHANGE	0
7	DRIVEWAY	1
8	ALLEY_ACCESS_RELATED	0
9	UNKNOWN_NON_INTERCHANGE	0
10	THRU_ROADWAY	0
11	INTERSECTION_INTERCHANGE	0
12	INTERSECTION_RELATED_INTERCHANGE	1
13	ENTRANCE_EXIT_RAMP_INTERCHANGE	0
14	FRONTAGE_ROAD_INTERCHANGE	0
15	OTHER_PART_OF_INTERCHANGE	0
16	<not defined>	0
17	UNKNOWN_INTERCHANGE	0
18	UNKNOWN_JUNCTION	0
99	UNKNOWN	0
109	OTHER_NON_INTERCHANGE	0
	Check Total	15

Code	CollisionManner	No.
1	SINGLE_VEHICLE	1
2	ANGLE (front to side)(other than left turn)	4
3	LEFT_TURN	2
4	REAR_END	5
5	HEAD_ON	1
6	SIDESWIPE_SAME_DIRECTION	2
7	SIDESWIPE_OPPOSITE_DIRECTION	0
8	REAR_TO_SIDE	0
9	REAR_TO_REAR	0
97	OTHER	0
99	UNKNOWN	0
	Check Total	15

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

Code	First Harmful Event	No.
1	OVERTURN_ROLLOVER	0
2	FIRE_EXPLOSION	0
3	IMMERSION	0
4	JACKKNIFE	0
5	CARGO_EQUIPMENT_LOSS_SHIFT	0
6	FELL_JUMPED_FROM_VEHICLE	0
7	THROWN_OR_FALLING_OBJECT	0
8	OTHER_NON_COLLISION	0
9	EQUIPMENT_FAILURE~~_TIRES_BRAKES~~	0
10	SEPARATION_OF_UNITS	0
11	RAN_OFF_ROAD_RIGHT	0
12	RAN_OFF_ROAD_LEFT	0
13	CROSS_MEDIAN	0
14	CROSS_CENTERLINE	0
15	DOWNHILL_RUNAWAY	0
16	MOTOR_VEHICLE_IN_TRANSPORT	14
17	PEDESTRIAN	0
18	PEDALCYCLE	0
19	RAILWAY_VEHICLE_TRAIN_ENGINE	0
20	LIGHT_RAILWAY_RAILCAR_VEHICLE	0
21	ANIMAL_WILD_NON_GAME	0
22	ANIMAL_WILD_GAME	0
23	ANIMAL_PET	0
24	ANIMAL_LIVESTOCK	0
25	PARKED_MOTOR_VEHICLE	0
26	WORK_ZONE_MAINTENANCE_EQUIPMENT	0
27	STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	0
28	OTHER_NON_FIXED_OBJECT	0
29	IMPACT_ATTENUATOR_CRASH_CUSHION	0
30	BRIDGE_OVERHEAD_STRUCTURE	0
31	BRIDGE_RAIL	0
32	CULVERT	0
33	CURB	1
34	DITCH	0
35	EMBANKMENT	0
36	GUARDRAIL_FACE	0
37	GUARDRAIL_END	0
38	CONCRETE_TRAFFIC_BARRIER	0
39	CABLE_TRAFFIC_BARRIER	0
40	OTHER_TRAFFIC_BARRIER	0
41	TREE_BUSH_STUMP_STANDING	0
42	TRAFFIC_SIGN_SUPPORT	0
43	TRAFFIC_SIGNAL_SUPPORT	0
44	UTILITY_POLE_LIGHT_SUPPORT	0
45	OTHER_POST_POLE_OR_SUPPORT	0
46	FENCE	0
47	MAILBOX	0
48	BUILDING	0
49	OTHER_FIXED_OBJECT	0
99	UNKNOWN	0
255	Not Reported	0
	Check Total	15

Code	Month	No.
1	January	5
2	February	1
3	March	0
4	April	2
5	May	0
6	June	3
7	July	0
8	August	1
9	September	0
10	October	1
11	November	2
12	December	0
	Total	15

Code	(Unit) SurfaceCondition	No.
1	DRY	28
2	WET	2
3	SNOW	0
4	SLUSH	0
5	ICE_FROST	0
6	WATER_STANDING_MOVING	0
7	SAND	0
8	MUD_DIRT_GRAVEL	0
9	OIL	0
97	OTHER	0
99	UNKNOWN	0
	Total	30

Additional Useful Information

Vehicle Action Codes

1	GOING_STRAIGHT_AHEAD
2	SLOWING_IN_TRAFFICWAY
3	STOPPED_IN_TRAFFICWAY
4	MAKING_LEFT_TURN
5	MAKING_RIGHT_TURN
6	MAKING_U_TURN
7	OVERTAKING_PASSING
8	CHANGING_LANES
9	NEGOTIATING_A_CURVE
10	BACKING
11	Avoiding_Vehicle_Object_Pedestrian
12	ENTERING_PARKING_POSITION
13	LEAVING_PARKING_POSITION
14	PROPERLY_PARKED
15	IMPROPERLY_PARKED
16	DRIVERLESS_MOVING_VEHICLE
17	CROSSING_ROAD
18	WALKING_WITH_TRAFFIC
19	WALKING_AGAINST_TRAFFIC
20	STANDING
21	LYING
22	GETTING_ON_OR_OFF_VEHICLE
23	WORKING_ON_OR_PUSHING_VEHICLE
24	WORKING_ON_ROAD
97	OTHER
99	UNKNOWN

Body Styles

-1	NOT_REPORTED
1	\Passenger Vehicles, including RVs
53	/
54	\TRUCKS
88	/
89	\MOBILEHOME (NOT RVS)
92	/
93	\TRAILERS
120	/
121	\MOTORCYCLES
128	/
254	UNKNOWN
255	NOT REPORTED

13-ZN-2020#2
10/24/2024

Hayden & Princess

SUMMARY BY YEAR

SEVERITY / INCIDENTS	**2020**	**2021**	**2022**	**Totals**	**Checks**
Fatal Injury Incidents					
Non-fatal Injury Incidents	4	2	1	7	
PDO Incidents	3	2	3	8	
TOTALS	7	4	4	15	
Pedestrian Incidents					
Pedestrians Involved					
Bicycle Incidents					
Bicyclists Involved					
SEVERITY / INVOLVMENT					
Fatal Injuries					
Non-Fatal Injuries	12	2	1	15	
PDO Vehicles	6	3	6	15	
Pedestrians Fatally Injured					
Pedestrians Non-Fatally Injured					
Bicyclists Fatally Injured					
Bicyclists Non-Fatally Injured					
COLLISION MANNER					
SINGLE_VEHICLE 1		1		1	
ANGLE 2	3		1	4	
LEFT_TURN 3	1	1		2	
REAR_END 4	3		2	5	
HEAD_ON 5		1		1	
SIDESWIPE_SAME_DIRECTION 6		1	1	2	
IDESWIPE_OPPOSITE_DIRECTION 7					
REAR_TO_SIDE 8					
REAR_TO_REAR 9					
OTHER 97					
UNKNOWN 99					
TOTALS	7	4	4	15	

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CRASH STATISTICS

2020-2022

82nd & Princess

Involvement

	# Incidents	Totals		# Motorists	# Non-Motorists
Incidents	5	10	Veh	16	0
Fatal	0	0	Ppl	0	0
Injury	2	3	Ppl	0	0
PDO	3	6	Veh		

Peds/Bikes Summary

	Incidents	Persons	Injuries Fatal	Injuries Non-Fatal
Pedestrian:	0	0	0	0
Bicycle:	0	0	0	0

LightCondition	Code	No.
DAYLIGHT	1	4
DAWN	2	0
DUSK	3	0
DARK_LIGHTED	4	1
DARK_NOT_LIGHTED	5	0
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		5

Weather	Code	No.
CLEAR	1	5
CLOUDY	2	0
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	0
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	0
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		5

TrafficWayType	Code	No.
ONE_WAY_TRAFFICWAY	1	0
TWO_WAY_NOT_DIVIDED	2	1
ED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	0
_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	3
DED_POSITIVE_MEDIAN_BARRIER	5	1
UNKNOWN	99	0
Check Total		5

Weekday	Code	No.
Sunday	1	1
Monday	2	1
Tuesday	3	1
Wednesday	4	0
Thursday	5	0
Friday	6	1
Saturday	7	1
Check Total		5

Circumstances

Hit & Run?	0
Intersection Related?	4

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	0
INTERSECTION_NON_INTERCHANGE	1	4
INTERSECTION_RELATED_NON_INTERCHANGE	2	0
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	0
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	1
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	0
INTERSECTION_RELATED_INTERCHANGE	12	0
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
<not defined>	16	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		5

CollisionManner	Code	No.
SINGLE_VEHICLE	1	0
ANGLE (front to side)(other than left turn)	2	3
LEFT_TURN	3	0
REAR_END	4	1
HEAD_ON	5	1
SIDESWIPE_SAME_DIRECTION	6	0
SIDESWIPE_OPPOSITE_DIRECTION	7	0
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		5

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE~~_TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	5
PEDESTRIAN	17	0
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	0
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	0
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		5

Month	Code	No.
January	1	0
February	2	1
March	3	0
April	4	1
May	5	0
June	6	0
July	7	1
August	8	0
September	9	1
October	10	1
November	11	0
December	12	0
Total		5

(Unit) SurfaceCondition	Code	No.
DRY	1	10
WET	2	0
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	0
Total		10

Additional Useful Information

Vehicle Action Codes

1	GOING_STRAIGHT_AHEAD
2	SLOWING_IN_TRAFFICWAY
3	STOPPED_IN_TRAFFICWAY
4	MAKING_LEFT_TURN
5	MAKING_RIGHT_TURN
6	MAKING_U_TURN
7	OVERTAKING_PASSING
8	CHANGING_LANES
9	NEGOTIATING_A_CURVE
10	BACKING
11	Avoiding_Vehicle_Object_Pedestrian
12	ENTERING_PARKING_POSITION
13	LEAVING_PARKING_POSITION
14	PROPERLY_PARKED
15	IMPROPERLY_PARKED
16	DRIVERLESS_MOVING_VEHICLE
17	CROSSING_ROAD
18	WALKING_WITH_TRAFFIC
19	WALKING_AGAINST_TRAFFIC
20	STANDING
21	LYING
22	GETTING_ON_OR_OFF_VEHICLE
23	WORKING_ON_OR_PUSHING_VEHICLE
24	WORKING_ON_ROAD
97	OTHER
99	UNKNOWN

Body Styles

-1	NOT_REPORTED
1	\Passenger Vehicles, including RVs
53	/
54	\TRUCKS
88	/
89	\MOBILEHOME (NOT RVS)
92	/
93	\TRAILERS
120	/
121	\MOTORCYCLES
128	/
254	UNKNOWN
255	NOT REPORTED

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82nd & Princess

SUMMARY BY YEAR

SEVERITY / INCIDENTS	**2020**	**2021**	**2022**	**Totals**	**Checks**
Fatal Injury Incidents					
Non-fatal Injury Incidents	1	1		2	
PDO Incidents	2		1	3	
TOTALS	3	1	1	5	
Pedestrian Incidents					
Pedestrians Involved					
Bicycle Incidents					
Bicyclists Involved					
SEVERITY / INVOLVMENT					
Fatal Injuries					
Non-Fatal Injuries	1	2		3	
PDO Vehicles	4		2	6	
Pedestrians Fatally Injured					
Pedestrians Non-Fatally Injured					
Bicyclists Fatally Injured					
Bicyclists Non-Fatally Injured					
COLLISION MANNER					
SINGLE_VEHICLE 1					
ANGLE 2	2		1	3	
LEFT_TURN 3					
REAR_END 4	1			1	
HEAD_ON 5		1		1	
SIDESWIPE_SAME_DIRECTION 6					
IDESWIPE_OPPOSITE_DIRECTION 7					
REAR_TO_SIDE 8					
REAR_TO_REAR 9					
OTHER 97					
UNKNOWN 99					
TOTALS	3	1	1	5	

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CRASH STATISTICS

2020-2022

Perimeter & Princess

Involvement

	# Incidents	Totals		# Motorists	# Non-Motorists
Incidents	8	17	Veh	19	0
Fatal	0	0	Ppl	0	0
Injury	4	6	Ppl	0	0
PDO	4	8	Veh		

Peds/Bikes Summary

	Incidents	Persons	Injuries Fatal	Injuries Non-Fatal
Pedestrian:	0	0	0	0
Bicycle:	0	0	0	0

Circumstances

Hit & Run?	0
Intersection Related?	7

LightCondition	Code	No.
DAYLIGHT	1	7
DAWN	2	0
DUSK	3	0
DARK_LIGHTED	4	1
DARK_NOT_LIGHTED	5	0
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		8

Weather		
CLEAR	1	8
CLOUDY	2	0
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	0
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	0
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		8

TrafficWayType		
ONE_WAY_TRAFFICWAY	1	0
TWO_WAY_NOT_DIVIDED	2	0
ED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	1
_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	6
DED_POSITIVE_MEDIAN_BARRIER	5	1
UNKNOWN	99	0
Check Total		8

Weekday		
Sunday	1	0
Monday	2	2
Tuesday	3	1
Wednesday	4	2
Thursday	5	2
Friday	6	1
Saturday	7	0
Check Total		8

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	1
INTERSECTION_NON_INTERCHANGE	1	5
INTERSECTION_RELATED_NON_INTERCHANGE	2	1
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	0
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	0
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	1
INTERSECTION_RELATED_INTERCHANGE	12	0
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
<not defined>	16	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		8

CollisionManner		
SINGLE_VEHICLE	1	0
ANGLE (front to side)(other than left turn)	2	6
LEFT_TURN	3	0
REAR_END	4	1
HEAD_ON	5	0
SIDESWIPE_SAME_DIRECTION	6	1
SIDESWIPE_OPPOSITE_DIRECTION	7	0
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		8

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE~~_TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	8
PEDESTRIAN	17	0
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	0
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	0
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		8

Month	Code	No.
January	1	1
February	2	0
March	3	0
April	4	1
May	5	0
June	6	2
July	7	0
August	8	0
September	9	1
October	10	2
November	11	1
December	12	0
Total		8

(Unit) SurfaceCondition		
DRY	1	17
WET	2	0
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	0
Total		17

Additional Useful Information

Vehicle Action Codes

1	GOING_STRAIGHT_AHEAD
2	SLOWING_IN_TRAFFICWAY
3	STOPPED_IN_TRAFFICWAY
4	MAKING_LEFT_TURN
5	MAKING_RIGHT_TURN
6	MAKING_U_TURN
7	OVERTAKING_PASSING
8	CHANGING_LANES
9	NEGOTIATING_A_CURVE
10	BACKING
11	Avoiding_Vehicle_Object_Pedestrian
12	ENTERING_PARKING_POSITION
13	LEAVING_PARKING_POSITION
14	PROPERLY_PARKED
15	IMPROPERLY_PARKED
16	DRIVERLESS_MOVING_VEHICLE
17	CROSSING_ROAD
18	WALKING_WITH_TRAFFIC
19	WALKING_AGAINST_TRAFFIC
20	STANDING
21	LYING
22	GETTING_ON_OR_OFF_VEHICLE
23	WORKING_ON_OR_PUSHING_VEHICLE
24	WORKING_ON_ROAD
97	OTHER
99	UNKNOWN

Body Styles

-1	NOT_REPORTED
1	\Passenger Vehicles, including RVs
53	/
54	\TRUCKS
88	/
89	\MOBILEHOME (NOT RVS)
92	/
93	\TRAILERS
120	/
121	\MOTORCYCLES
128	/
254	UNKNOWN
255	NOT REPORTED

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Perimeter & Princess

SUMMARY BY YEAR

SEVERITY / INCIDENTS	2020	2021	2022	Totals	Checks
Fatal Injury Incidents					
Non-fatal Injury Incidents	1	1	2	4	
PDO Incidents	2	2		4	
TOTALS	3	3	2	8	
Pedestrian Incidents					
Pedestrians Involved					
Bicycle Incidents					
Bicyclists Involved					
SEVERITY / INVOLVMENT					
Fatal Injuries					
Non-Fatal Injuries	2	1	3	6	
PDO Vehicles	4	4		8	
Pedestrians Fatally Injured					
Pedestrians Non-Fatally Injured					
Bicyclists Fatally Injured					
Bicyclists Non-Fatally Injured					
COLLISION MANNER					
SINGLE_VEHICLE 1					
ANGLE 2	2	2	2	6	
LEFT_TURN 3					
REAR_END 4		1		1	
HEAD_ON 5					
SIDESWIPE_SAME_DIRECTION 6	1			1	
IDESWIPE_OPPOSITE_DIRECTION 7					
REAR_TO_SIDE 8					
REAR_TO_REAR 9					
OTHER 97					
UNKNOWN 99					
TOTALS	3	3	2	8	

13-ZN-2020#2
10/24/2024

CRASH STATISTICS

2020-2022

Hayden & Loop 101

Involvement

	# Incidents	Totals		# Motorists	# Non-Motorists
Incidents	28	53	Veh	67	0
Fatal	0	0	Ppl	0	0
Injury	9	13	Ppl	0	0
PDO	19	35	Veh		

Peds/Bikes Summary

	Incidents	Persons	Injuries Fatal	Injuries Non-Fatal
Pedestrian:	0	0	0	0
Bicycle:	0	0	0	0

Circumstances

Hit & Run?	0
Intersection Related?	27

Code	LightCondition	No.
1	DAYLIGHT	21
2	DAWN	0
3	DUSK	0
4	DARK_LIGHTED	7
5	DARK_NOT_LIGHTED	0
6	DARK_UNKNOWN_LIGHTING	0
99	UNKNOWN	0
	Check Total	28

Code	Weather	No.
1	CLEAR	26
2	CLOUDY	2
3	SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	0
4	RAIN	0
5	SNOW	0
6	SEVERE_CROSSWINDS	0
7	BLOWING_SAND_SOIL_DIRT	0
8	FOG_SMOG_SMOKE	0
9	BLOWING_SNOW	0
97	OTHER	0
99	UNKNOWN	0
	Check Total	28

Code	TrafficWayType	No.
1	ONE_WAY_TRAFFICWAY	1
2	TWO_WAY_NOT_DIVIDED	1
3	ED_WITH_CONTINUOUS_LEFT_TURN_LANE	0
4	_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4
5	DED_POSITIVE_MEDIAN_BARRIER	19
99	UNKNOWN	3
	Check Total	28

Code	Weekday	No.
1	Sunday	4
2	Monday	4
3	Tuesday	5
4	Wednesday	2
5	Thursday	5
6	Friday	5
7	Saturday	3
	Check Total	28

Code	JunctionRelation	No.
0	NOT_JUNCTION_RELATED	1
1	INTERSECTION_NON_INTERCHANGE	13
2	INTERSECTION_RELATED_NON_INTERCHANGE	11
3	ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	0
4	RAILWAY_GRADE_CROSSING	0
5	CROSSOVER_RELATED	0
6	FRONTAGE_ROAD_NON_INTERCHANGE	0
7	DRIVEWAY	0
8	ALLEY_ACCESS_RELATED	0
9	UNKNOWN_NON_INTERCHANGE	0
10	THRU_ROADWAY	0
11	INTERSECTION_INTERCHANGE	1
12	INTERSECTION_RELATED_INTERCHANGE	2
13	ENTRANCE_EXIT_RAMP_INTERCHANGE	0
14	FRONTAGE_ROAD_INTERCHANGE	0
15	OTHER_PART_OF_INTERCHANGE	0
16	<not defined>	0
17	UNKNOWN_INTERCHANGE	0
18	UNKNOWN_JUNCTION	0
99	UNKNOWN	0
109	OTHER_NON_INTERCHANGE	0
	Check Total	28

Code	CollisionManner	No.
1	SINGLE_VEHICLE	4
2	ANGLE (front to side)(other than left turn)	5
3	LEFT_TURN	4
4	REAR_END	14
5	HEAD_ON	0
6	SIDESWIPE_SAME_DIRECTION	1
7	SIDESWIPE_OPPOSITE_DIRECTION	0
8	REAR_TO_SIDE	0
9	REAR_TO_REAR	0
97	OTHER	0
99	UNKNOWN	0
	Check Total	28

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

Code	First Harmful Event	No.
1	OVERTURN_ROLLOVER	0
2	FIRE_EXPLOSION	0
3	IMMERSION	0
4	JACKKNIFE	0
5	CARGO_EQUIPMENT_LOSS_SHIFT	0
6	FELL_JUMPED_FROM_VEHICLE	0
7	THROWN_OR_FALLING_OBJECT	0
8	OTHER_NON_COLLISION	0
9	EQUIPMENT_FAILURE~~_TIRES_BRAKES~~	0
10	SEPARATION_OF_UNITS	0
11	RAN_OFF_ROAD_RIGHT	0
12	RAN_OFF_ROAD_LEFT	0
13	CROSS_MEDIAN	0
14	CROSS_CENTERLINE	0
15	DOWNHILL_RUNAWAY	0
16	MOTOR_VEHICLE_IN_TRANSPORT	24
17	PEDESTRIAN	0
18	PEDALCYCLE	0
19	RAILWAY_VEHICLE_TRAIN_ENGINE	0
20	LIGHT_RAILWAY_RAILCAR_VEHICLE	0
21	ANIMAL_WILD_NON_GAME	0
22	ANIMAL_WILD_GAME	0
23	ANIMAL_PET	0
24	ANIMAL_LIVESTOCK	0
25	PARKED_MOTOR_VEHICLE	0
26	WORK_ZONE_MAINTENANCE_EQUIPMENT	0
27	STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	0
28	OTHER_NON_FIXED_OBJECT	0
29	IMPACT_ATTENUATOR_CRASH_CUSHION	0
30	BRIDGE_OVERHEAD_STRUCTURE	0
31	BRIDGE_RAIL	0
32	CULVERT	0
33	CURB	1
34	DITCH	0
35	EMBANKMENT	0
36	GUARDRAIL_FACE	0
37	GUARDRAIL_END	0
38	CONCRETE_TRAFFIC_BARRIER	0
39	CABLE_TRAFFIC_BARRIER	0
40	OTHER_TRAFFIC_BARRIER	0
41	TREE_BUSH_STUMP_STANDING	0
42	TRAFFIC_SIGN_SUPPORT	1
43	TRAFFIC_SIGNAL_SUPPORT	0
44	UTILITY_POLE_LIGHT_SUPPORT	1
45	OTHER_POST_POLE_OR_SUPPORT	0
46	FENCE	0
47	MAILBOX	0
48	BUILDING	0
49	OTHER_FIXED_OBJECT	1
99	UNKNOWN	0
255	Not Reported	0
	Check Total	28

Code	Month	No.
1	January	3
2	February	4
3	March	3
4	April	1
5	May	2
6	June	5
7	July	2
8	August	5
9	September	1
10	October	1
11	November	1
12	December	0
	Total	28

Code	(Unit) SurfaceCondition	No.
1	DRY	53
2	WET	0
3	SNOW	0
4	SLUSH	0
5	ICE_FROST	0
6	WATER_STANDING_MOVING	0
7	SAND	0
8	MUD_DIRT_GRAVEL	0
9	OIL	0
97	OTHER	0
99	UNKNOWN	0
	Total	53

Additional Useful Information

Vehicle Action Codes

1	GOING_STRAIGHT_AHEAD
2	SLOWING_IN_TRAFFICWAY
3	STOPPED_IN_TRAFFICWAY
4	MAKING_LEFT_TURN
5	MAKING_RIGHT_TURN
6	MAKING_U_TURN
7	OVERTAKING_PASSING
8	CHANGING_LANES
9	NEGOTIATING_A_CURVE
10	BACKING
11	Avoiding_Vehicle_Object_Pedestrian
12	ENTERING_PARKING_POSITION
13	LEAVING_PARKING_POSITION
14	PROPERLY_PARKED
15	IMPROPERLY_PARKED
16	DRIVERLESS_MOVING_VEHICLE
17	CROSSING_ROAD
18	WALKING_WITH_TRAFFIC
19	WALKING_AGAINST_TRAFFIC
20	STANDING
21	LYING
22	GETTING_ON_OR_OFF_VEHICLE
23	WORKING_ON_OR_PUSHING_VEHICLE
24	WORKING_ON_ROAD
97	OTHER
99	UNKNOWN

Body Styles

-1	NOT_REPORTED
1	\Passenger Vehicles, including RVs
53	/
54	\TRUCKS
88	/
89	\MOBILEHOME (NOT RVS)
92	/
93	\TRAILERS
120	/
121	\MOTORCYCLES
128	/
254	UNKNOWN
255	NOT REPORTED

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10/24/2024

Hayden & Loop 101

SUMMARY BY YEAR

SEVERITY / INCIDENTS	2020	2021	2022	Totals	Checks
Fatal Injury Incidents					
Non-fatal Injury Incidents	1	5	3	9	
PDO Incidents	6	10	3	19	
TOTALS	7	15	6	28	
Pedestrian Incidents					
Pedestrians Involved					
Bicycle Incidents					
Bicyclists Involved					
SEVERITY / INVOLVMENT					
Fatal Injuries					
Non-Fatal Injuries	1	8	4	13	
PDO Vehicles	11	20	4	35	
Pedestrians Fatally Injured					
Pedestrians Non-Fatally Injured					
Bicyclists Fatally Injured					
Bicyclists Non-Fatally Injured					
COLLISION MANNER					
SINGLE_VEHICLE 1	1		3	4	
ANGLE 2	1	4		5	
LEFT_TURN 3	1	1	2	4	
REAR_END 4	4	10		14	
HEAD_ON 5					
SIDESWIPE_SAME_DIRECTION 6			1	1	
IDESWIPE_OPPOSITE_DIRECTION 7					
REAR_TO_SIDE 8					
REAR_TO_REAR 9					
OTHER 97					
UNKNOWN 99					
TOTALS	7	15	6	28	

13-ZN-2020#2
10/24/2024

CRASH STATISTICS

2020-2022

Princess & Loop 101

Involvement

	# Incidents	Totals		# Motorists	# Non-Motorists
Incidents	39	77	Veh	97	0
Fatal	0	0	Ppl	0	0
Injury	6	8	Ppl	0	0
PDO	33	65	Veh		

Peds/Bikes Summary

	Incidents	Persons	Injuries Fatal	Injuries Non-Fatal
Pedestrian:	0	0	0	0
Bicycle:	0	0	0	0

Circumstances

Hit & Run?	4
Intersection Related?	26

Code	No.	JunctionRelation
0	6	NOT_JUNCTION_RELATED
1	13	INTERSECTION_NON_INTERCHANGE
2	11	INTERSECTION_RELATED_NON_INTERCHANGE
3	1	ENTRANCE_EXIT_RAMP_NON_INTERCHANGE
4	0	RAILWAY_GRADE_CROSSING
5	2	CROSSOVER_RELATED
6	4	FRONTAGE_ROAD_NON_INTERCHANGE
7	0	DRIVEWAY
8	0	ALLEY_ACCESS_RELATED
9	0	UNKNOWN_NON_INTERCHANGE
10	0	THRU_ROADWAY
11	0	INTERSECTION_INTERCHANGE
12	2	INTERSECTION_RELATED_INTERCHANGE
13	0	ENTRANCE_EXIT_RAMP_INTERCHANGE
14	0	FRONTAGE_ROAD_INTERCHANGE
15	0	OTHER_PART_OF_INTERCHANGE
16	0	<not defined>
17	0	UNKNOWN_INTERCHANGE
18	0	UNKNOWN_JUNCTION
99	0	UNKNOWN
109	0	OTHER_NON_INTERCHANGE
	39	Check Total

Code	No.	LightCondition
1	28	DAYLIGHT
2	0	DAWN
3	1	DUSK
4	9	DARK_LIGHTED
5	1	DARK_NOT_LIGHTED
6	0	DARK_UNKNOWN_LIGHTING
99	0	UNKNOWN
	39	Check Total

Code	No.	Weather
1	34	CLEAR
2	4	CLOUDY
3	0	SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE
4	1	RAIN
5	0	SNOW
6	0	SEVERE_CROSSWINDS
7	0	BLOWING_SAND_SOIL_DIRT
8	0	FOG_SMOG_SMOKE
9	0	BLOWING_SNOW
97	0	OTHER
99	0	UNKNOWN
	39	Check Total

Code	No.	TrafficWayType
1	14	ONE_WAY_TRAFFICWAY
2	1	TWO_WAY_NOT_DIVIDED
3	0	ED_WITH_CONTINUOUS_LEFT_TURN_LANE
4	7	_UNPROTECTED_PAINTED_4_FEET_MEDIAN
5	17	DED_POSITIVE_MEDIAN_BARRIER
99	0	UNKNOWN
	39	Check Total

Code	No.	Weekday
1	3	Sunday
2	8	Monday
3	6	Tuesday
4	8	Wednesday
5	1	Thursday
6	7	Friday
7	6	Saturday
	39	Check Total

			CollisionManner
1	4		SINGLE_VEHICLE
2	10		ANGLE (front to side)(other than left turn)
3	0		LEFT_TURN
4	19		REAR_END
5	0		HEAD_ON
6	6		SIDESWIPE_SAME_DIRECTION
7	0		SIDESWIPE_OPPOSITE_DIRECTION
8	0		REAR_TO_SIDE
9	0		REAR_TO_REAR
97	0		OTHER
99	0		UNKNOWN
	39		Check Total

			TravelDirection
1	NORTH	N	
2	SOUTH	S	
3	EAST	E	
4	WEST	W	
5	NORTHWEST	NW	
6	NORTHEAST	NE	
7	SOUTHWEST	SW	
8	SOUTHEAST	SE	
99	UNKNOWN	99	

Code	No.	First Harmful Event
1	1	OVERTURN_ROLLOVER
2	0	FIRE_EXPLOSION
3	0	IMMERSION
4	0	JACKKNIFE
5	0	CARGO_EQUIPMENT_LOSS_SHIFT
6	0	FELL_JUMPED_FROM_VEHICLE
7	0	THROWN_OR_FALLING_OBJECT
8	0	OTHER_NON_COLLISION
9	0	EQUIPMENT_FAILURE~~_TIRES_BRAKES~~
10	0	SEPARATION_OF_UNITS
11	0	RAN_OFF_ROAD_RIGHT
12	0	RAN_OFF_ROAD_LEFT
13	0	CROSS_MEDIAN
14	0	CROSS_CENTERLINE
15	0	DOWNHILL_RUNAWAY
16	35	MOTOR_VEHICLE_IN_TRANSPORT
17	0	PEDESTRIAN
18	0	PEDALCYCLE
19	0	RAILWAY_VEHICLE_TRAIN_ENGINE
20	0	LIGHT_RAILWAY_RAILCAR_VEHICLE
21	0	ANIMAL_WILD_NON_GAME
22	0	ANIMAL_WILD_GAME
23	0	ANIMAL_PET
24	0	ANIMAL_LIVESTOCK
25	0	PARKED_MOTOR_VEHICLE
26	0	WORK_ZONE_MAINTENANCE_EQUIPMENT
27	0	STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT
28	0	OTHER_NON_FIXED_OBJECT
29	0	IMPACT_ATTENUATOR_CRASH_CUSHION
30	0	BRIDGE_OVERHEAD_STRUCTURE
31	0	BRIDGE_RAIL
32	0	CULVERT
33	1	CURB
34	0	DITCH
35	0	EMBANKMENT
36	0	GUARDRAIL_FACE
37	0	GUARDRAIL_END
38	0	CONCRETE_TRAFFIC_BARRIER
39	0	CABLE_TRAFFIC_BARRIER
40	0	OTHER_TRAFFIC_BARRIER
41	0	TREE_BUSH_STUMP_STANDING
42	0	TRAFFIC_SIGN_SUPPORT
43	1	TRAFFIC_SIGNAL_SUPPORT
44	0	UTILITY_POLE_LIGHT_SUPPORT
45	0	OTHER_POST_POLE_OR_SUPPORT
46	0	FENCE
47	0	MAILBOX
48	0	BUILDING
49	1	OTHER_FIXED_OBJECT
99	0	UNKNOWN
255	0	Not Reported
	39	Check Total

Code	No.	Month
1	4	January
2	4	February
3	5	March
4	3	April
5	3	May
6	1	June
7	2	July
8	2	August
9	4	September
10	6	October
11	3	November
12	2	December
	39	Total

Code	No.	(Unit) SurfaceCondition
1	73	DRY
2	3	WET
3	0	SNOW
4	0	SLUSH
5	0	ICE_FROST
6	0	WATER_STANDING_MOVING
7	0	SAND
8	0	MUD_DIRT_GRAVEL
9	0	OIL
97	0	OTHER
99	1	UNKNOWN
	77	Total

Additional Useful Information

Vehicle Action Codes

1	GOING_STRAIGHT_AHEAD
2	SLOWING_IN_TRAFFICWAY
3	STOPPED_IN_TRAFFICWAY
4	MAKING_LEFT_TURN
5	MAKING_RIGHT_TURN
6	MAKING_U_TURN
7	OVERTAKING_PASSING
8	CHANGING_LANES
9	NEGOTIATING_A_CURVE
10	BACKING
11	Avoiding_Vehicle_Object_Pedestrian
12	ENTERING_PARKING_POSITION
13	LEAVING_PARKING_POSITION
14	PROPERLY_PARKED
15	IMPROPERLY_PARKED
16	DRIVERLESS_MOVING_VEHICLE
17	CROSSING_ROAD
18	WALKING_WITH_TRAFFIC
19	WALKING_AGAINST_TRAFFIC
20	STANDING
21	LYING
22	GETTING_ON_OR_OFF_VEHICLE
23	WORKING_ON_OR_PUSHING_VEHICLE
24	WORKING_ON_ROAD
97	OTHER
99	UNKNOWN

Body Styles

-1	NOT_REPORTED
1	\Passenger Vehicles, including RVs
53	/
54	\TRUCKS
88	/
89	\MOBILEHOME (NOT RVS)
92	/
93	\TRAILERS
120	/
121	\MOTORCYCLES
128	/
254	UNKNOWN
255	NOT REPORTED

13-ZN-2020#2
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Princess & Loop 101

SUMMARY BY YEAR

SEVERITY / INCIDENTS		2020	2021	2022	Totals	Checks
Fatal Injury Incidents						
Non-fatal Injury Incidents			3	3	6	
PDO Incidents		5	15	13	33	
TOTALS		5	18	16	39	
Pedestrian Incidents						
Pedestrians Involved						
Bicycle Incidents						
Bicyclists Involved						
SEVERITY / INVOLVMENT						
Fatal Injuries						
Non-Fatal Injuries			4	4	8	
PDO Vehicles		10	29	26	65	
Pedestrians Fatally Injured						
Pedestrians Non-Fatally Injured						
Bicyclists Fatally Injured						
Bicyclists Non-Fatally Injured						
COLLISION MANNER						
SINGLE_VEHICLE	1		2	2	4	
ANGLE	2	2	4	4	10	
LEFT_TURN	3					
REAR_END	4	3	8	8	19	
HEAD_ON	5					
SIDESWIPE_SAME_DIRECTION	6		4	2	6	
IDESWIPE_OPPOSITE_DIRECTION	7					
REAR_TO_SIDE	8					
REAR_TO_REAR	9					
OTHER	97					
UNKNOWN	99					
TOTALS		5	18	16	39	

CRASH STATISTICS

2020-2022

Hayden & Legacy

Involvement

	# Incidents	Totals		# Motorists	# Non-Motorists
Incidents	7	14	Veh	21	0
Fatal	0	0	Ppl	0	0
Injury	2	2	Ppl	0	0
PDO	5	9	Veh		

Peds/Bikes Summary

	Incidents	Persons	Injuries Fatal	Injuries Non-Fatal
Pedestrian:	0	0	0	0
Bicycle:	0	0	0	0

Code	LightCondition	No.
1	DAYLIGHT	7
2	DAWN	0
3	DUSK	0
4	DARK_LIGHTED	0
5	DARK_NOT_LIGHTED	0
6	DARK_UNKNOWN_LIGHTING	0
99	UNKNOWN	0
	Check Total	7

	Weather	
1	CLEAR	7
2	CLOUDY	0
3	SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	0
4	RAIN	0
5	SNOW	0
6	SEVERE_CROSSWINDS	0
7	BLOWING_SAND_SOIL_DIRT	0
8	FOG_SMOG_SMOKE	0
9	BLOWING_SNOW	0
97	OTHER	0
99	UNKNOWN	0
	Check Total	7

	TrafficWayType	
1	ONE_WAY_TRAFFICWAY	0
2	TWO_WAY_NOT_DIVIDED	0
3	ED_WITH_CONTINUOUS_LEFT_TURN_LANE	0
4	_UNPROTECTED_PAINTED_4_FEET_MEDIAN	3
5	DED_POSITIVE_MEDIAN_BARRIER	4
99	UNKNOWN	0
	Check Total	7

	Weekday	
1	Sunday	0
2	Monday	2
3	Tuesday	3
4	Wednesday	0
5	Thursday	1
6	Friday	0
7	Saturday	1
	Check Total	7

Circumstances

Hit & Run?	2
Intersection Related?	5

Code	JunctionRelation	No.
0	NOT_JUNCTION_RELATED	2
1	INTERSECTION_NON_INTERCHANGE	2
2	INTERSECTION_RELATED_NON_INTERCHANGE	3
3	ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	0
4	RAILWAY_GRADE_CROSSING	0
5	CROSSOVER_RELATED	0
6	FRONTAGE_ROAD_NON_INTERCHANGE	0
7	DRIVEWAY	0
8	ALLEY_ACCESS_RELATED	0
9	UNKNOWN_NON_INTERCHANGE	0
10	THRU_ROADWAY	0
11	INTERSECTION_INTERCHANGE	0
12	INTERSECTION_RELATED_INTERCHANGE	0
13	ENTRANCE_EXIT_RAMP_INTERCHANGE	0
14	FRONTAGE_ROAD_INTERCHANGE	0
15	OTHER_PART_OF_INTERCHANGE	0
16	<not defined>	0
17	UNKNOWN_INTERCHANGE	0
18	UNKNOWN_JUNCTION	0
99	UNKNOWN	0
109	OTHER_NON_INTERCHANGE	0
	Check Total	7

Code	CollisionManner	No.
1	SINGLE_VEHICLE	1
2	ANGLE (front to side)(other than left turn)	1
3	LEFT_TURN	2
4	REAR_END	1
5	HEAD_ON	0
6	SIDESWIPE_SAME_DIRECTION	1
7	SIDESWIPE_OPPOSITE_DIRECTION	1
8	REAR_TO_SIDE	0
9	REAR_TO_REAR	0
97	OTHER	0
99	UNKNOWN	0
	Check Total	7

	TravelDirection		
1	NORTH	N	
2	SOUTH	S	
3	EAST	E	
4	WEST	W	
5	NORTHWEST	NW	
6	NORTHEAST	NE	
7	SOUTHWEST	SW	
8	SOUTHEAST	SE	
99	UNKNOWN	99	

Code	First Harmful Event	No.
1	OVERTURN_ROLLOVER	0
2	FIRE_EXPLOSION	0
3	IMMERSION	0
4	JACKKNIFE	0
5	CARGO_EQUIPMENT_LOSS_SHIFT	0
6	FELL_JUMPED_FROM_VEHICLE	0
7	THROWN_OR_FALLING_OBJECT	0
8	OTHER_NON_COLLISION	0
9	EQUIPMENT_FAILURE~~_TIRES_BRAKES~~	0
10	SEPARATION_OF_UNITS	0
11	RAN_OFF_ROAD_RIGHT	0
12	RAN_OFF_ROAD_LEFT	0
13	CROSS_MEDIAN	0
14	CROSS_CENTERLINE	0
15	DOWNHILL_RUNAWAY	0
16	MOTOR_VEHICLE_IN_TRANSPORT	6
17	PEDESTRIAN	0
18	PEDALCYCLE	0
19	RAILWAY_VEHICLE_TRAIN_ENGINE	0
20	LIGHT_RAILWAY_RAILCAR_VEHICLE	0
21	ANIMAL_WILD_NON_GAME	0
22	ANIMAL_WILD_GAME	0
23	ANIMAL_PET	0
24	ANIMAL_LIVESTOCK	0
25	PARKED_MOTOR_VEHICLE	0
26	WORK_ZONE_MAINTENANCE_EQUIPMENT	0
27	STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	0
28	OTHER_NON_FIXED_OBJECT	0
29	IMPACT_ATTENUATOR_CRASH_CUSHION	0
30	BRIDGE_OVERHEAD_STRUCTURE	0
31	BRIDGE_RAIL	0
32	CULVERT	0
33	CURB	0
34	DITCH	0
35	EMBANKMENT	0
36	GUARDRAIL_FACE	0
37	GUARDRAIL_END	0
38	CONCRETE_TRAFFIC_BARRIER	1
39	CABLE_TRAFFIC_BARRIER	0
40	OTHER_TRAFFIC_BARRIER	0
41	TREE_BUSH_STUMP_STANDING	0
42	TRAFFIC_SIGN_SUPPORT	0
43	TRAFFIC_SIGNAL_SUPPORT	0
44	UTILITY_POLE_LIGHT_SUPPORT	0
45	OTHER_POST_POLE_OR_SUPPORT	0
46	FENCE	0
47	MAILBOX	0
48	BUILDING	0
49	OTHER_FIXED_OBJECT	0
99	UNKNOWN	0
255	Not Reported	0
	Check Total	7

Code	Month	No.
1	January	0
2	February	0
3	March	0
4	April	1
5	May	1
6	June	1
7	July	2
8	August	0
9	September	1
10	October	1
11	November	0
12	December	0
	Total	7

Code	(Unit) SurfaceCondition	No.
1	DRY	13
2	WET	0
3	SNOW	0
4	SLUSH	0
5	ICE_FROST	0
6	WATER_STANDING_MOVING	0
7	SAND	0
8	MUD_DIRT_GRAVEL	1
9	OIL	0
97	OTHER	0
99	UNKNOWN	0
	Total	14

Additional Useful Information

Vehicle Action Codes

1	GOING_STRAIGHT_AHEAD
2	SLOWING_IN_TRAFFICWAY
3	STOPPED_IN_TRAFFICWAY
4	MAKING_LEFT_TURN
5	MAKING_RIGHT_TURN
6	MAKING_U_TURN
7	OVERTAKING_PASSING
8	CHANGING_LANES
9	NEGOTIATING_A_CURVE
10	BACKING
11	Avoiding_Vehicle_Object_Pedestrian
12	ENTERING_PARKING_POSITION
13	LEAVING_PARKING_POSITION
14	PROPERLY_PARKED
15	IMPROPERLY_PARKED
16	DRIVERLESS_MOVING_VEHICLE
17	CROSSING_ROAD
18	WALKING_WITH_TRAFFIC
19	WALKING_AGAINST_TRAFFIC
20	STANDING
21	LYING
22	GETTING_ON_OR_OFF_VEHICLE
23	WORKING_ON_OR_PUSHING_VEHICLE
24	WORKING_ON_ROAD
97	OTHER
99	UNKNOWN

Body Styles

-1	NOT_REPORTED
1	\Passenger Vehicles, including RVs
53	/
54	\TRUCKS
88	/
89	\MOBILEHOME (NOT RVS)
92	/
93	\TRAILERS
120	/
121	\MOTORCYCLES
128	/
254	UNKNOWN
255	NOT REPORTED

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10/24/2024

Hayden & Legacy

SUMMARY BY YEAR

SEVERITY / INCIDENTS	**2020**	**2021**	**2022**	**Totals**	**Checks**
Fatal Injury Incidents					
Non-fatal Injury Incidents	1		1	2	
PDO Incidents	4		1	5	
TOTALS	5		2	7	
Pedestrian Incidents					
Pedestrians Involved					
Bicycle Incidents					
Bicyclists Involved					
SEVERITY / INVOLVMENT					
Fatal Injuries					
Non-Fatal Injuries	1		1	2	
PDO Vehicles	7		2	9	
Pedestrians Fatally Injured					
Pedestrians Non-Fatally Injured					
Bicyclists Fatally Injured					
Bicyclists Non-Fatally Injured					
COLLISION MANNER					
SINGLE_VEHICLE 1	1			1	
ANGLE 2	1			1	
LEFT_TURN 3	2			2	
REAR_END 4			1	1	
HEAD_ON 5					
SIDESWIPE_SAME_DIRECTION 6	1			1	
IDESWIPE_OPPOSITE_DIRECTION 7			1	1	
REAR_TO_SIDE 8					
REAR_TO_REAR 9					
OTHER 97					
UNKNOWN 99					
TOTALS	5		2	7	

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APPENDIX D

EXISTING PEAK HOUR ANALYSIS

13-ZN-2020#2
10/24/2024

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	11	6	349	916	23
Future Vol, veh/h	25	11	6	349	916	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	300	0	195	-	-	185
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	12	7	388	1018	26

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1226	509	1044	0	-	0
Stage 1	1018	-	-	-	-	-
Stage 2	208	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	*540	*711	1047	-	-	-
Stage 1	*671	-	-	-	-	-
Stage 2	*892	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	*536	*711	1047	-	-	-
Mov Cap-2 Maneuver	*536	-	-	-	-	-
Stage 1	*666	-	-	-	-	-
Stage 2	*892	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1047	-	536	711	-	-
HCM Lane V/C Ratio	0.006	-	0.052	0.017	-	-
HCM Control Delay (s)	8.5	-	12.1	10.2	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	0.1	-	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	38	10	11	1038	590	13
Future Vol, veh/h	38	10	11	1038	590	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	300	0	195	-	-	185
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	11	12	1153	656	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1257	328	670	0	-	0
Stage 1	656	-	-	-	-	-
Stage 2	601	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	*449	*841	*1258	-	-	-
Stage 1	*794	-	-	-	-	-
Stage 2	*622	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	*444	*841	*1258	-	-	-
Mov Cap-2 Maneuver	*444	-	-	-	-	-
Stage 1	*786	-	-	-	-	-
Stage 2	*622	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	* 1258	-	444	841	-	-
HCM Lane V/C Ratio	0.01	-	0.095	0.013	-	-
HCM Control Delay (s)	7.9	-	14	9.3	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	0	-	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

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Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	112	22	1	26	18	3
Future Vol, veh/h	112	22	1	26	18	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	124	24	1	29	20	3
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	7.3	7.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	86%	0%	4%
Vol Thru, %	0%	84%	96%
Vol Right, %	14%	16%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	21	134	27
LT Vol	18	0	1
Through Vol	0	112	26
RT Vol	3	22	0
Lane Flow Rate	23	149	30
Geometry Grp	1	1	1
Degree of Util (X)	0.028	0.161	0.034
Departure Headway (Hd)	4.328	3.9	4.094
Convergence, Y/N	Yes	Yes	Yes
Cap	819	920	871
Service Time	2.397	1.919	2.133
HCM Lane V/C Ratio	0.028	0.162	0.034
HCM Control Delay	7.5	7.7	7.3
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.6	0.1

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	86	11	3	215	22	2
Future Vol, veh/h	86	11	3	215	22	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	96	12	3	239	24	2
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	8.7	8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	92%	0%	1%
Vol Thru, %	0%	89%	99%
Vol Right, %	8%	11%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	24	97	218
LT Vol	22	0	3
Through Vol	0	86	215
RT Vol	2	11	0
Lane Flow Rate	27	108	242
Geometry Grp	1	1	1
Degree of Util (X)	0.036	0.123	0.274
Departure Headway (Hd)	4.821	4.094	4.065
Convergence, Y/N	Yes	Yes	Yes
Cap	747	865	879
Service Time	2.821	2.169	2.112
HCM Lane V/C Ratio	0.036	0.125	0.275
HCM Control Delay	8	7.8	8.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.4	1.1

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Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2	99	1	1	25	0
Future Vol, veh/h	2	99	1	1	25	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	-	125	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	110	1	1	28	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	112	0	5	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	3	-
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	-	1017	1082
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	1020	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1478	-	1016	1082
Mov Cap-2 Maneuver	-	-	-	-	1016	-
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	1019	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.7	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	1016	-	-	-	1478	-
HCM Lane V/C Ratio	0.027	-	-	-	0.001	-
HCM Control Delay (s)	8.6	0	-	-	7.4	0
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0	-

Intersection	
Int Delay, s/veh	6.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1	105	2	0	199	1
Future Vol, veh/h	1	105	2	0	199	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	-	125	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	117	2	0	221	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	118	0	5	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	4	-
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	-	1017	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1019	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1470	-	1016	1084
Mov Cap-2 Maneuver	-	-	-	-	1016	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1018	-

Approach	EB	WB	NB
HCM Control Delay, s	0	7.5	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	1016	1084	-	-	1470	-
HCM Lane V/C Ratio	0.218	0.001	-	-	0.002	-
HCM Control Delay (s)	9.5	8.3	-	-	7.5	0
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0.8	0	-	-	0	-

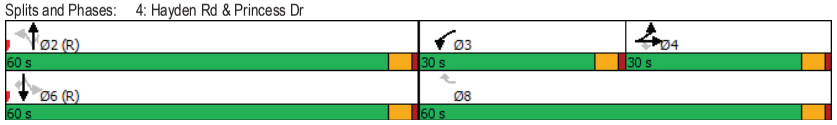
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Lane Group	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	34	59	176	47	33	281	135	122	637	49
Future Volume (vph)	34	59	176	47	33	281	135	122	637	49
Turn Type	NA	Perm	Prot	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4		3			2			6	
Permitted Phases		4		8	2		2	6		6
Detector Phase	4	4	3	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	22.5	22.5	36.5	36.5	36.5	36.5	36.5	36.5
Total Split (s)	30.0	30.0	30.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	25.0%	25.0%	25.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes							
Recall Mode	Max	Max	None	None	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 7 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 4: Hayden Rd & Princess Dr

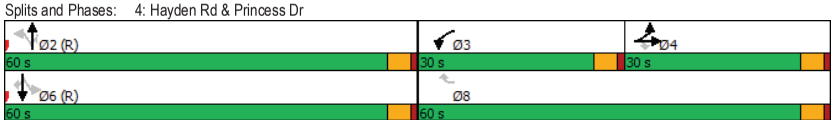


Lane Group	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	29	53	285	176	80	695	132	40	349	60
Future Volume (vph)	29	53	285	176	80	695	132	40	349	60
Turn Type	NA	Perm	Prot	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4		3			2			6	
Permitted Phases		4		8	2		2	6		6
Detector Phase	4	4	3	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	9.5	44.0	44.0	44.0	37.5	37.5	37.5
Total Split (s)	30.0	30.0	30.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	25.0%	25.0%	25.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes							
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 57 (48%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 4: Hayden Rd & Princess Dr



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	34	59	176	0	47	33	281	135	122	637	49
Future Volume (veh/h)	29	34	59	176	0	47	33	281	135	122	637	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	32	37	34	191	0	26	37	312	74	133	708	27
Peak Hour Factor	0.90	0.92	0.90	0.92	0.92	0.92	0.90	0.90	0.92	0.92	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	180	208	337	0	0	0	523	2532	1129	743	2532	1129
Arrive On Green	0.21	0.21	0.21	0.00	0.00	0.00	0.71	0.71	0.71	0.71	0.71	0.71
Sat Flow, veh/h	848	980	1585		0		722	3554	1585	997	3554	1585
Grp Volume(v), veh/h	69	0	34		0.0		37	312	74	133	708	27
Grp Sat Flow(s),veh/h/ln	1828	0	1585				722	1777	1585	997	1777	1585
Q Serve(g_s), s	3.7	0.0	2.1				2.3	3.3	1.7	5.8	8.6	0.6
Cycle Q Clear(g_c), s	3.7	0.0	2.1				10.9	3.3	1.7	9.1	8.6	0.6
Prop In Lane	0.46		1.00				1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	388	0	337				523	2532	1129	743	2532	1129
V/C Ratio(X)	0.18	0.00	0.10				0.07	0.12	0.07	0.18	0.28	0.02
Avail Cap(c_a), veh/h	388	0	337				523	2532	1129	743	2532	1129
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.7	0.0	38.0				8.2	5.4	5.2	6.9	6.2	5.0
Incr Delay (d2), s/veh	1.0	0.0	0.6				0.3	0.1	0.1	0.5	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.2	0.0	1.6				0.7	2.1	1.0	2.3	5.5	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.7	0.0	38.6				8.4	5.5	5.3	7.4	6.5	5.1
LnGrp LOS	D	A	D				A	A	A	A	A	A
Approach Vol, veh/h		103						423			868	
Approach Delay, s/veh		39.3						5.7			6.6	
Approach LOS		D						A			A	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		90.0		30.0		90.0						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		55.5		25.5		55.5						
Max Q Clear Time (g_c+I1), s		12.9		5.7		11.1						
Green Ext Time (p_c), s		2.8		0.4		6.8						

Intersection Summary	
HCM 6th Ctrl Delay	8.7
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	29	53	285	0	176	80	695	132	40	349	60
Future Volume (veh/h)	24	29	53	285	0	176	80	695	132	40	349	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	27	32	30	317	0	98	89	772	74	44	388	34
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	66	78	125	0	0	0	858	3006	1341	583	3006	1341
Arrive On Green	0.08	0.08	0.08	0.00	0.00	0.00	0.85	0.85	0.85	0.85	0.85	0.85
Sat Flow, veh/h	837	992	1585		0		965	3554	1585	651	3554	1585
Grp Volume(v), veh/h	59	0	30		0.0		89	772	74	44	388	34
Grp Sat Flow(s),veh/h/ln	1829	0	1585				965	1777	1585	651	1777	1585
Q Serve(g_s), s	3.7	0.0	2.1				2.1	5.1	0.9	1.7	2.3	0.4
Cycle Q Clear(g_c), s	3.7	0.0	2.1				4.4	5.1	0.9	6.8	2.3	0.4
Prop In Lane	0.46		1.00				1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	145	0	125				858	3006	1341	583	3006	1341
V/C Ratio(X)	0.41	0.00	0.24				0.10	0.26	0.06	0.08	0.13	0.03
Avail Cap(c_a), veh/h	389	0	337				858	3006	1341	583	3006	1341
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.6	0.0	51.9				2.0	1.8	1.5	2.5	1.6	1.5
Incr Delay (d2), s/veh	1.8	0.0	1.0				0.2	0.2	0.1	0.3	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.2	0.0	1.6				0.6	2.1	0.4	0.4	0.9	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.4	0.0	52.8				2.2	2.0	1.6	2.7	1.7	1.5
LnGrp LOS	D	A	D				A	A	A	A	A	A
Approach Vol, veh/h		89						935			466	
Approach Delay, s/veh		53.9						2.0			1.8	
Approach LOS		D						A			A	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		106.0		14.0		106.0						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		55.5		25.5		55.5						
Max Q Clear Time (g_c+I1), s		7.1		5.7		8.8						
Green Ext Time (p_c), s		7.5		0.3		3.5						

Intersection Summary	
HCM 6th Ctrl Delay	5.0
HCM 6th LOS	A

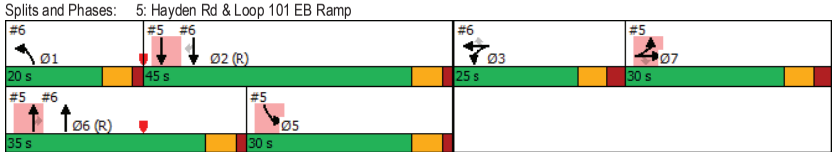
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Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	561	0	544	319	42	428	399		
Future Volume (vph)	561	0	544	319	42	428	399		
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA		
Protected Phases	7	7		6		5	2	1	3
Permitted Phases			7		6				
Detector Phase	7	7	7	6	6	5	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	16.0	12.0	5.0	7.0
Minimum Split (s)	29.0	29.0	29.0	26.0	26.0	22.0	26.0	11.0	24.0
Total Split (s)	30.0	30.0	30.0	35.0	35.0	30.0	45.0	20.0	25.0
Total Split (%)	25.0%	25.0%	25.0%	29.2%	29.2%	25.0%	37.5%	17%	21%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	None	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 98 (82%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated

Splits and Phases: 5: Hayden Rd & Loop 101 EB Ramp

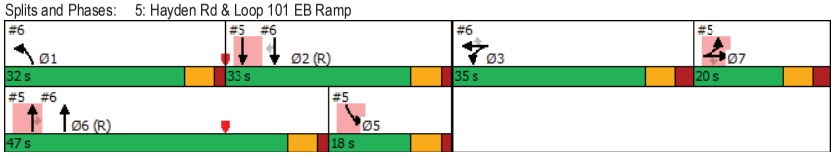


Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	299	3	266	1039	41	394	340		
Future Volume (vph)	299	3	266	1039	41	394	340		
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA		
Protected Phases	7	7		6		5	2	1	3
Permitted Phases			7		6				
Detector Phase	7	7	7	6	6	5	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	12.0	5.0	7.0
Minimum Split (s)	19.0	19.0	19.0	26.0	26.0	18.0	26.0	11.0	34.0
Total Split (s)	20.0	20.0	20.0	47.0	47.0	18.0	33.0	32.0	35.0
Total Split (%)	16.7%	16.7%	16.7%	39.2%	39.2%	15.0%	27.5%	27%	29%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	None	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 26 (22%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated

Splits and Phases: 5: Hayden Rd & Loop 101 EB Ramp



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	561	0	544	0	0	0	0	319	42	428	399	0
Future Volume (vph)	561	0	544	0	0	0	0	319	42	428	399	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.92	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1527	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1527	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.80	0.85	0.85	0.90
Adj. Flow (vph)	623	0	604	0	0	0	0	375	52	504	469	0
RTOR Reduction (vph)	0	151	296	0	0	0	0	0	40	0	0	0
Lane Group Flow (vph)	424	259	97	0	0	0	0	375	13	504	469	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	29.5	29.5	29.5					29.0	29.0	24.0	39.0	
Effective Green, g (s)	29.5	29.5	29.5					29.0	29.0	24.0	39.0	
Actuated g/C Ratio	0.25	0.25	0.25					0.24	0.24	0.20	0.32	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0					5.0	5.0	2.0	2.0	
Lane Grp Cap (vph)	413	375	369					1228	382	686	1150	
v/s Ratio Prot	c0.25	0.17						c0.07		c0.15	c0.13	
v/s Ratio Perm			0.06						0.01			
v/c Ratio	1.03	0.69	0.26					0.31	0.03	0.73	0.41	
Uniform Delay, d1	45.2	41.1	36.5					37.3	34.8	45.0	31.5	
Progression Factor	1.00	1.00	1.00					0.64	1.00	0.49	0.39	
Incremental Delay, d2	51.3	4.4	0.1					0.6	0.2	3.4	1.0	
Delay (s)	96.5	45.5	36.6					24.6	34.9	25.3	13.5	
Level of Service	F	D	D					C	C	C	B	
Approach Delay (s)		60.3			0.0			25.9			19.6	
Approach LOS		E			A			C			B	

Intersection Summary				
HCM 2000 Control Delay	39.6	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)	26.0	
Intersection Capacity Utilization	60.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	299	3	266	0	0	0	0	1039	41	394	340	0
Future Volume (vph)	299	3	266	0	0	0	0	1039	41	394	340	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.93	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.97	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1540	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.97	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1540	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.85	0.80	0.85	0.90	0.90	0.90	0.90	0.90	0.80	0.85	0.85	0.90
Adj. Flow (vph)	352	4	313	0	0	0	0	1154	51	464	400	0
RTOR Reduction (vph)	0	21	163	0	0	0	0	0	33	0	0	0
Lane Group Flow (vph)	232	203	50	0	0	0	0	1154	18	464	400	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	28.1	28.1	28.1					42.5	42.5	12.0	27.1	
Effective Green, g (s)	28.1	28.1	28.1					42.5	42.5	12.0	27.1	
Actuated g/C Ratio	0.23	0.23	0.23					0.35	0.35	0.10	0.23	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0					5.0	5.0	2.0	2.0	
Lane Grp Cap (vph)	393	360	352					1800	560	343	799	
v/s Ratio Prot	c0.14	0.13						c0.23		c0.14	0.11	
v/s Ratio Perm			0.03						0.01			
v/c Ratio	0.59	0.56	0.14					0.64	0.03	1.35	0.50	
Uniform Delay, d1	40.8	40.6	36.4					32.4	25.3	54.0	40.5	
Progression Factor	1.00	1.00	1.00					0.96	1.00	0.41	0.36	
Incremental Delay, d2	1.6	1.2	0.1					1.7	0.1	174.8	2.0	
Delay (s)	42.4	41.8	36.5					32.8	25.4	196.7	16.4	
Level of Service	D	D	D					C	C	F	B	
Approach Delay (s)		40.3			0.0			32.5			113.3	
Approach LOS		D			A			C			F	

Intersection Summary				
HCM 2000 Control Delay	59.9	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	76.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

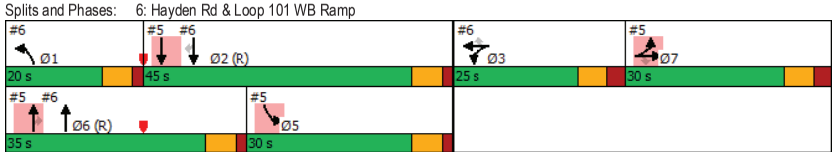
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Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	76	22	469	208	673	742	268		
Future Volume (vph)	76	22	469	208	673	742	268		
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm		
Protected Phases	3	3		1	6	2		5	7
Permitted Phases			3				2		
Detector Phase	3	3	3	1	6	2	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	5.0	12.0	12.0	12.0	16.0	7.0
Minimum Split (s)	24.0	24.0	24.0	11.0	26.0	26.0	26.0	22.0	29.0
Total Split (s)	25.0	25.0	25.0	20.0	35.0	45.0	45.0	30.0	30.0
Total Split (%)	20.8%	20.8%	20.8%	16.7%	29.2%	37.5%	37.5%	25%	25%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 98 (82%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated

Splits and Phases: 6: Hayden Rd & Loop 101 WB Ramp

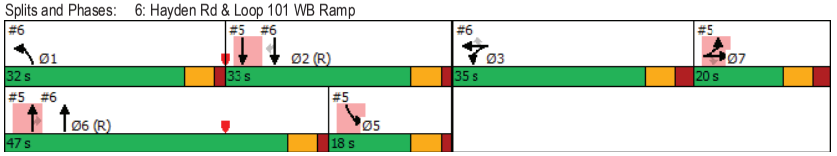


Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	74	4	395	571	767	659	373		
Future Volume (vph)	74	4	395	571	767	659	373		
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm		
Protected Phases	3	3		1	6	2		5	7
Permitted Phases			3				2		
Detector Phase	3	3	3	1	6	2	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	5.0	12.0	12.0	12.0	12.0	7.0
Minimum Split (s)	34.0	34.0	34.0	11.0	26.0	26.0	26.0	18.0	19.0
Total Split (s)	35.0	35.0	35.0	32.0	47.0	33.0	33.0	18.0	20.0
Total Split (%)	29.2%	29.2%	29.2%	26.7%	39.2%	27.5%	27.5%	15%	17%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 26 (22%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated

Splits and Phases: 6: Hayden Rd & Loop 101 WB Ramp



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	76	22	469	208	673	0	0	742	268
Future Volume (vph)	0	0	0	76	22	469	208	673	0	0	742	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.87	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2779	1441	1770	3539			6408	1583
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1610	2779	1441	1770	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.80	0.90	0.85	0.90	0.90	0.90	0.90	0.85
Adj. Flow (vph)	0	0	0	89	28	521	245	748	0	0	824	315
RTOR Reduction (vph)	0	0	0	0	236	235	0	0	0	0	0	213
Lane Group Flow (vph)	0	0	0	80	62	25	245	748	0	0	824	102
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				11.5	11.5	11.5	14.0	29.0			39.0	39.0
Effective Green, g (s)				11.5	11.5	11.5	14.0	29.0			39.0	39.0
Actuated g/C Ratio				0.10	0.10	0.10	0.12	0.24			0.32	0.32
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				2.0	2.0	2.0	5.0	5.0			2.0	2.0
Lane Grp Cap (vph)				154	266	138	206	855			2082	514
v/s Ratio Prot				c0.05	0.02		c0.14	c0.21			c0.13	
v/s Ratio Perm						0.02						0.06
v/c Ratio				0.52	0.23	0.18	1.19	0.87			0.40	0.20
Uniform Delay, d1				51.6	50.2	49.9	53.0	43.8			31.4	29.2
Progression Factor				1.00	1.00	1.00	0.69	0.81			0.97	1.44
Incremental Delay, d2				1.2	0.2	0.2	113.7	8.8			0.5	0.8
Delay (s)				52.9	50.3	50.1	150.4	44.1			31.0	42.9
Level of Service				D	D	D	F	D			C	D
Approach Delay (s)		0.0			50.6			70.3			34.3	
Approach LOS		A			D			E			C	

Intersection Summary				
HCM 2000 Control Delay	51.0	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	60.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	74	4	395	571	767	0	0	659	373
Future Volume (vph)	0	0	0	74	4	395	571	767	0	0	659	373
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.86	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2747	1441	1770	3539			6408	1583
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1610	2747	1441	1770	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.80	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	92	5	439	634	852	0	0	775	414
RTOR Reduction (vph)	0	0	0	0	199	198	0	0	0	0	0	321
Lane Group Flow (vph)	0	0	0	84	35	21	634	852	0	0	775	93
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				11.4	11.4	11.4	27.4	42.5			27.1	27.1
Effective Green, g (s)				11.4	11.4	11.4	27.4	42.5			27.1	27.1
Actuated g/C Ratio				0.10	0.10	0.10	0.23	0.35			0.23	0.23
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				2.0	2.0	2.0	5.0	5.0			2.0	2.0
Lane Grp Cap (vph)				152	260	136	404	1253			1447	357
v/s Ratio Prot				c0.05	0.01		c0.36	c0.24			c0.12	
v/s Ratio Perm						0.01						0.06
v/c Ratio				0.55	0.13	0.15	1.57	0.68			0.54	0.26
Uniform Delay, d1				51.9	49.8	49.9	46.3	33.0			40.9	38.2
Progression Factor				1.00	1.00	1.00	0.71	0.42			1.04	1.43
Incremental Delay, d2				2.5	0.1	0.2	265.4	2.3			1.4	1.8
Delay (s)				54.3	49.9	50.1	298.1	16.2			43.9	56.4
Level of Service				D	D	D	F	B			D	E
Approach Delay (s)		0.0			50.6			136.4			48.2	
Approach LOS		A			D			F			D	

Intersection Summary				
HCM 2000 Control Delay	89.4	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	76.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

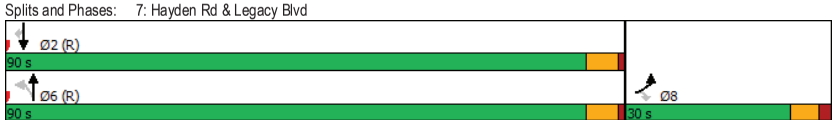
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Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	1	14	4	890	1004
Future Volume (vph)	1	14	4	890	1004
Turn Type	Prot	Perm	Perm	NA	NA
Protected Phases	8			6	2
Permitted Phases		8	6		
Detector Phase	8	8	6	6	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	15.7	15.7	30.7
Total Split (s)	30.0	30.0	90.0	90.0	90.0
Total Split (%)	25.0%	25.0%	75.0%	75.0%	75.0%
Yellow Time (s)	4.0	4.0	4.7	4.7	4.7
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.7	5.7	5.7
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 10 (8%), Referenced to phase 2:SBT and 6:NBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 7: Hayden Rd & Legacy Blvd

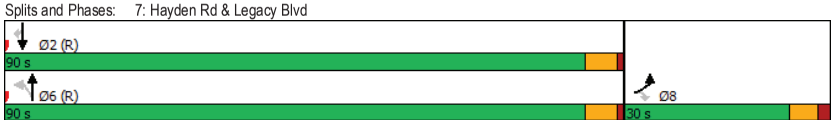


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	2	6	1140	826	1
Future Volume (vph)	5	2	6	1140	826	1
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	8			6	2	
Permitted Phases		8	6			2
Detector Phase	8	8	6	6	2	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	15.7	15.7	30.7	30.7
Total Split (s)	30.0	30.0	90.0	90.0	90.0	90.0
Total Split (%)	25.0%	25.0%	75.0%	75.0%	75.0%	75.0%
Yellow Time (s)	4.0	4.0	4.7	4.7	4.7	4.7
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.7	5.7	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 6 (5%), Referenced to phase 2:SBT and 6:NBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 7: Hayden Rd & Legacy Blvd



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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	14	4	890	1004	0
Future Volume (veh/h)	1	14	4	890	1004	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1	8	4	989	1116	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	27	24	482	3153	3153	1407
Arrive On Green	0.02	0.02	0.89	0.89	0.89	0.00
Sat Flow, veh/h	1781	1585	505	3647	3647	1585
Grp Volume(v), veh/h	1	8	4	989	1116	0
Grp Sat Flow(s),veh/h/ln	1781	1585	505	1777	1777	1585
Q Serve(g_s), s	0.1	0.6	0.2	5.2	6.2	0.0
Cycle Q Clear(g_c), s	0.1	0.6	6.3	5.2	6.2	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	27	24	482	3153	3153	1407
V/C Ratio(X)	0.04	0.33	0.01	0.31	0.35	0.00
Avail Cap(c_a), veh/h	356	317	482	3153	3153	1407
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.2	58.5	1.6	1.1	1.1	0.0
Incr Delay (d2), s/veh	0.2	3.0	0.0	0.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.1	0.5	0.0	1.3	1.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	58.4	61.5	1.7	1.3	1.4	0.0
LnGrp LOS	E	E	A	A	A	A
Approach Vol, veh/h	9			993	1116	
Approach Delay, s/veh	61.1			1.3	1.4	
Approach LOS	E			A	A	

Timer - Assigned Phs		2				6	8
Phs Duration (G+Y+Rc), s		112.2				112.2	7.8
Change Period (Y+Rc), s		5.7				5.7	6.0
Max Green Setting (Gmax), s		84.3				84.3	24.0
Max Q Clear Time (g_c+I1), s		8.2				8.3	2.6
Green Ext Time (p_c), s		6.8				5.7	0.0

Intersection Summary			
HCM 6th Ctrl Delay		1.6	
HCM 6th LOS		A	



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	2	6	1140	826	1
Future Volume (veh/h)	5	2	6	1140	826	1
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	6	1	7	1267	918	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	22	19	578	3164	3164	1411
Arrive On Green	0.01	0.01	0.89	0.89	0.89	0.89
Sat Flow, veh/h	1781	1585	608	3647	3647	1585
Grp Volume(v), veh/h	6	1	7	1267	918	1
Grp Sat Flow(s),veh/h/ln	1781	1585	608	1777	1777	1585
Q Serve(g_s), s	0.4	0.1	0.2	7.3	4.6	0.0
Cycle Q Clear(g_c), s	0.4	0.1	4.8	7.3	4.6	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	22	19	578	3164	3164	1411
V/C Ratio(X)	0.28	0.05	0.01	0.40	0.29	0.00
Avail Cap(c_a), veh/h	356	317	578	3164	3164	1411
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.7	58.6	1.3	1.1	1.0	0.7
Incr Delay (d2), s/veh	2.5	0.4	0.0	0.4	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	0.1	0.0	1.7	1.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	61.3	59.0	1.4	1.5	1.2	0.7
LnGrp LOS	E	E	A	A	A	A
Approach Vol, veh/h	7			1274	919	
Approach Delay, s/veh	61.0			1.5	1.2	
Approach LOS	E			A	A	

Timer - Assigned Phs		2				6	8
Phs Duration (G+Y+Rc), s		112.5				112.5	7.5
Change Period (Y+Rc), s		5.7				5.7	6.0
Max Green Setting (Gmax), s		84.3				84.3	24.0
Max Q Clear Time (g_c+I1), s		6.6				9.3	2.4
Green Ext Time (p_c), s		5.1				8.4	0.0

Intersection Summary			
HCM 6th Ctrl Delay		1.6	
HCM 6th LOS		A	

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Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	34	474	13	7	249	33	3	0	9	39	2	34
Future Vol, veh/h	34	474	13	7	249	33	3	0	9	39	2	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	85	-	-	105	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	527	14	8	277	37	3	0	10	43	2	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	314	0	0	541	0	0	766	940	271	652	929	157
Stage 1	-	-	-	-	-	-	610	610	-	312	312	-
Stage 2	-	-	-	-	-	-	156	330	-	340	617	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1243	-	-	1024	-	-	292	262	727	353	266	861
Stage 1	-	-	-	-	-	-	448	483	-	673	656	-
Stage 2	-	-	-	-	-	-	831	644	-	648	479	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1243	-	-	1024	-	-	269	252	727	338	256	861
Mov Cap-2 Maneuver	-	-	-	-	-	-	269	252	-	338	256	-
Stage 1	-	-	-	-	-	-	434	468	-	652	651	-
Stage 2	-	-	-	-	-	-	786	639	-	620	464	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.2	12.2	13.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	269	727	1243	-	-	1024	-	-	338	761
HCM Lane V/C Ratio	0.012	0.014	0.03	-	-	0.008	-	-	0.128	0.053
HCM Control Delay (s)	18.6	10	8	-	-	8.5	-	-	17.2	10
HCM Lane LOS	C	B	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0	0	0.1	-	-	0	-	-	0.4	0.2

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	68	257	15	22	581	52	14	1	4	34	3	61
Future Vol, veh/h	68	257	15	22	581	52	14	1	4	34	3	61
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	85	-	-	105	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	76	286	17	24	646	58	16	1	4	38	3	68

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	704	0	0	303	0	0	820	1199	152	1019	1178	352
Stage 1	-	-	-	-	-	-	447	447	-	723	723	-
Stage 2	-	-	-	-	-	-	373	752	-	296	455	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	890	-	-	1255	-	-	267	184	867	191	189	644
Stage 1	-	-	-	-	-	-	560	572	-	384	429	-
Stage 2	-	-	-	-	-	-	620	416	-	688	567	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	890	-	-	1255	-	-	217	165	867	174	170	644
Mov Cap-2 Maneuver	-	-	-	-	-	-	217	165	-	174	170	-
Stage 1	-	-	-	-	-	-	512	523	-	351	421	-
Stage 2	-	-	-	-	-	-	540	408	-	625	519	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.3	20.2	18.8
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	217	468	890	-	-	1255	-	-	174	570
HCM Lane V/C Ratio	0.072	0.012	0.085	-	-	0.019	-	-	0.217	0.125
HCM Control Delay (s)	22.9	12.8	9.4	-	-	7.9	-	-	31.3	12.2
HCM Lane LOS	C	B	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	0.2	0	0.3	-	-	0.1	-	-	0.8	0.4

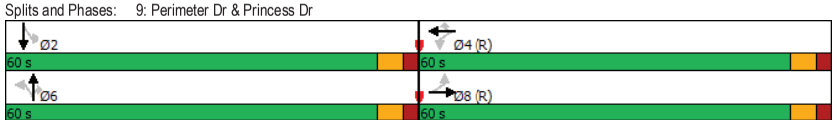
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Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	74	199	288	334	114	99	35	81	17	12
Future Volume (vph)	74	199	288	334	114	99	35	81	17	12
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		8		4			6			2
Permitted Phases	8		4		4	6		6	2	
Detector Phase	8	8	4	4	4	6	6	6	2	2
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	46.0	46.0	46.0	46.0	46.0	36.0	36.0	36.0	36.0	36.0
Total Split (s)	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:WBTL and 8:EBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 9: Perimeter Dr & Princess Dr

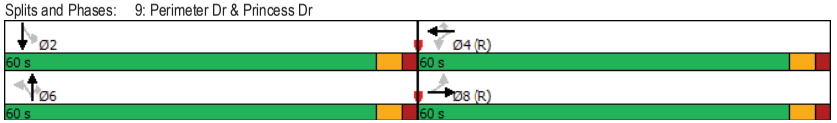


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	73	312	70	254	61	167	20	284	173	24
Future Volume (vph)	73	312	70	254	61	167	20	284	173	24
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		8		4			6			2
Permitted Phases	8		4		4	6		6	2	
Detector Phase	8	8	4	4	4	6	6	6	2	2
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	46.6	46.6	46.6	46.6	46.6	36.0	36.0	36.0	36.0	36.0
Total Split (s)	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:WBTL and 8:EBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 9: Perimeter Dr & Princess Dr



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	199	80	288	334	114	99	35	81	17	12	12
Future Volume (veh/h)	74	199	80	288	334	114	99	35	81	17	12	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	41	221	67	320	371	64	110	39	46	19	13	10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	428	1776	506	513	1599	713	679	1599	713	643	908	621
Arrive On Green	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Sat Flow, veh/h	954	3947	1125	1091	3554	1585	1388	3554	1585	1313	2019	1380
Grp Volume(v), veh/h	41	189	99	320	371	64	110	39	46	19	11	12
Grp Sat Flow(s),veh/h/ln	954	1702	1668	1091	1777	1585	1388	1777	1585	1313	1777	1622
Q Serve(g_s), s	3.3	3.9	4.2	29.1	7.7	2.8	5.7	0.7	2.0	1.0	0.4	0.5
Cycle Q Clear(g_c), s	11.0	3.9	4.2	33.3	7.7	2.8	6.2	0.7	2.0	1.7	0.4	0.5
Prop In Lane	1.00		0.67	1.00		1.00	1.00		1.00	1.00		0.85
Lane Grp Cap(c), veh/h	428	1532	751	513	1599	713	679	1599	713	643	800	730
V/C Ratio(X)	0.10	0.12	0.13	0.62	0.23	0.09	0.16	0.02	0.06	0.03	0.01	0.02
Avail Cap(c_a), veh/h	428	1532	751	513	1599	713	679	1599	713	643	800	730
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.6	19.2	19.3	29.0	20.3	18.9	20.0	18.4	18.7	18.8	18.3	18.3
Incr Delay (d2), s/veh	0.4	0.2	0.4	5.6	0.3	0.2	0.5	0.0	0.2	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.5	2.8	3.1	13.1	5.9	1.9	3.5	0.6	1.4	0.6	0.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.1	19.4	19.7	34.7	20.6	19.2	20.5	18.4	18.9	18.9	18.3	18.3
LnGrp LOS	C	B	B	C	C	B	C	B	B	B	B	B
Approach Vol, veh/h		329			755			195			42	
Approach Delay, s/veh		20.1			26.4			19.7			18.6	
Approach LOS		C			C			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		60.0		60.0		60.0		60.0				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		54.0		54.0		54.0		54.0				
Max Q Clear Time (g_c+I1), s		3.7		35.3		8.2		13.0				
Green Ext Time (p_c), s		0.1		0.6		0.4		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			23.6									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	312	30	70	254	61	167	20	284	173	24	95
Future Volume (veh/h)	73	312	30	70	254	61	167	20	284	173	24	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	41	347	25	78	282	35	186	22	158	192	27	80
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	488	2190	156	471	1599	713	601	1599	713	598	800	713
Arrive On Green	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Sat Flow, veh/h	1063	4866	346	1010	3554	1585	1287	3554	1585	1204	1777	1585
Grp Volume(v), veh/h	41	241	131	78	282	35	186	22	158	192	27	80
Grp Sat Flow(s),veh/h/ln	1063	1702	1808	1010	1777	1585	1287	1777	1585	1204	1777	1585
Q Serve(g_s), s	2.9	5.0	5.1	6.0	5.7	1.5	11.7	0.4	7.3	12.6	1.0	3.5
Cycle Q Clear(g_c), s	8.6	5.0	5.1	11.1	5.7	1.5	15.3	0.4	7.3	13.0	1.0	3.5
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	488	1532	814	471	1599	713	601	1599	713	598	800	713
V/C Ratio(X)	0.08	0.16	0.16	0.17	0.18	0.05	0.31	0.01	0.22	0.32	0.03	0.11
Avail Cap(c_a), veh/h	488	1532	814	471	1599	713	601	1599	713	598	800	713
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.3	19.5	19.6	22.9	19.7	18.6	23.5	18.3	20.2	21.9	18.4	19.1
Incr Delay (d2), s/veh	0.3	0.2	0.4	0.8	0.2	0.1	1.3	0.0	0.7	1.4	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	3.7	4.1	2.7	4.3	1.0	6.8	0.3	5.1	6.8	0.8	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.6	19.8	20.0	23.6	20.0	18.7	24.9	18.3	20.9	23.3	18.5	19.4
LnGrp LOS	C	B	B	C	B	B	C	B	C	C	B	B
Approach Vol, veh/h		413			395			366			299	
Approach Delay, s/veh		20.1			20.6			22.7			21.8	
Approach LOS		C			C			C			C	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		60.0		60.0		60.0		60.0				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		54.0		54.0		54.0		54.0				
Max Q Clear Time (g_c+I1), s		15.0		13.1		17.3		10.6				
Green Ext Time (p_c), s		0.8		0.4		0.7		0.5				
Intersection Summary												
HCM 6th Ctrl Delay			21.2									
HCM 6th LOS			C									

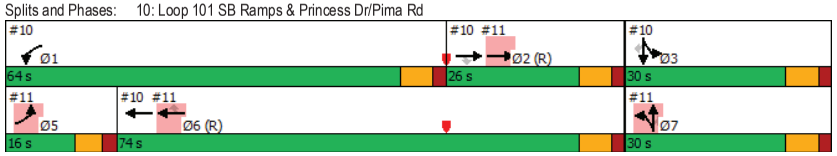
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Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	203	109	1196	496	436	545	194		
Future Volume (vph)	203	109	1196	496	436	545	194		
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm		
Protected Phases	2		1	6	3	3		5	7
Permitted Phases		2					3		
Detector Phase	2	2	1	6	3	3	3		
Switch Phase									
Minimum Initial (s)	1.0	1.0	7.0	1.0	10.0	10.0	10.0	5.0	7.0
Minimum Split (s)	7.7	7.7	13.7	7.7	19.0	19.0	19.0	11.0	13.7
Total Split (s)	26.0	26.0	64.0	74.0	30.0	30.0	30.0	16.0	30.0
Total Split (%)	21.7%	21.7%	53.3%	61.7%	25.0%	25.0%	25.0%	13%	25%
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lag	Lag	Lead	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max	Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated

Splits and Phases: 10: Loop 101 SB Ramps & Princess Dr/Pima Rd

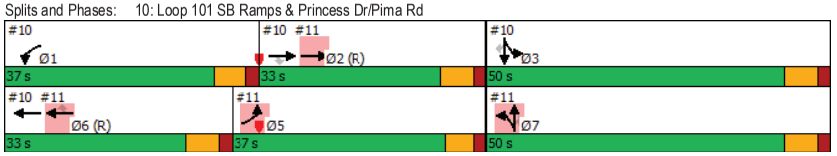


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	476	354	809	277	318	273	88		
Future Volume (vph)	476	354	809	277	318	273	88		
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm		
Protected Phases	2		1	6	3	3		5	7
Permitted Phases		2					3		
Detector Phase	2	2	1	6	3	3	3		
Switch Phase									
Minimum Initial (s)	1.0	1.0	7.0	1.0	10.0	10.0	10.0	5.0	7.0
Minimum Split (s)	7.7	7.7	13.7	7.7	23.7	23.7	23.7	11.0	13.7
Total Split (s)	33.0	33.0	37.0	33.0	50.0	50.0	50.0	37.0	50.0
Total Split (%)	27.5%	27.5%	30.8%	27.5%	41.7%	41.7%	41.7%	31%	42%
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lag	Lag	Lead	Lead				Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max	Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated

Splits and Phases: 10: Loop 101 SB Ramps & Princess Dr/Pima Rd



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	203	109	1196	496	0	0	0	0	436	545	194
Future Volume (vph)	0	203	109	1196	496	0	0	0	0	436	545	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3167	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3167	1441
Peak-hour factor, PHF	0.90	0.80	0.80	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	254	136	1329	584	0	0	0	0	484	641	228
RTOR Reduction (vph)	0	0	110	0	0	0	0	0	0	0	2	165
Lane Group Flow (vph)	0	254	26	1329	584	0	0	0	0	373	773	40
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		23.3	23.3	53.3	69.6					23.3	23.3	23.3
Effective Green, g (s)		23.3	23.3	53.3	69.6					23.3	23.3	23.3
Actuated g/C Ratio		0.19	0.19	0.44	0.58					0.19	0.19	0.19
Clearance Time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		987	541	1524	2949					312	614	279
v/s Ratio Prot		c0.05		c0.39	0.11					0.23	c0.24	
v/s Ratio Perm			0.01									0.03
v/c Ratio		0.26	0.05	0.87	0.20					1.20	1.26	0.14
Uniform Delay, d1		41.0	39.3	30.3	12.0					48.4	48.4	40.1
Progression Factor		1.31	3.27	0.71	0.62					1.00	1.00	1.00
Incremental Delay, d2		0.6	0.2	5.2	0.1					115.0	129.6	1.1
Delay (s)		54.2	128.6	26.7	7.6					163.3	178.0	41.1
Level of Service		D	F	C	A					F	F	D
Approach Delay (s)		80.1			20.8			0.0			153.2	
Approach LOS		F			C			A			F	

Intersection Summary				
HCM 2000 Control Delay	76.2	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	87.0%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	476	354	809	277	0	0	0	0	318	273	88
Future Volume (vph)	0	476	354	809	277	0	0	0	0	318	273	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3149	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3149	1441
Peak-hour factor, PHF	0.90	0.85	0.85	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	560	416	899	326	0	0	0	0	353	321	104
RTOR Reduction (vph)	0	0	299	0	0	0	0	0	0	0	1	60
Lane Group Flow (vph)	0	560	117	899	326	0	0	0	0	222	461	34
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		26.3	26.3	30.3	26.3					43.3	43.3	43.3
Effective Green, g (s)		26.3	26.3	30.3	26.3					43.3	43.3	43.3
Actuated g/C Ratio		0.22	0.22	0.25	0.22					0.36	0.36	0.36
Clearance Time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Vehicle Extension (s)		2.0	2.0	2.0	2.0					2.0	2.0	2.0
Lane Grp Cap (vph)		1114	610	866	1114					580	1136	519
v/s Ratio Prot		c0.11		c0.26	0.06					0.14	c0.15	
v/s Ratio Perm			0.04									0.02
v/c Ratio		0.50	0.19	1.04	0.29					0.38	0.41	0.07
Uniform Delay, d1		41.1	38.2	44.9	39.1					28.4	28.7	25.1
Progression Factor		1.22	2.62	0.50	0.65					1.00	1.00	1.00
Incremental Delay, d2		1.6	0.7	34.4	0.4					1.9	1.1	0.2
Delay (s)		51.6	100.6	56.7	25.8					30.4	29.8	25.3
Level of Service		D	F	E	C					C	C	C
Approach Delay (s)		72.5			48.5			0.0			29.4	
Approach LOS		E			D			A			C	

Intersection Summary				
HCM 2000 Control Delay	51.4	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)	20.1	
Intersection Capacity Utilization	87.1%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

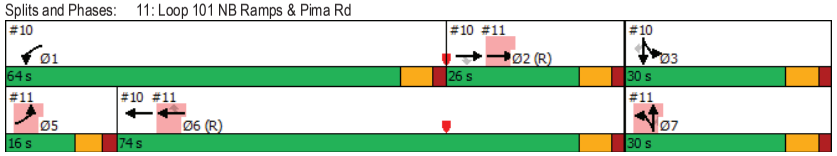
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Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	59	580	1423	330	269	411	965		
Future Volume (vph)	59	580	1423	330	269	411	965		
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm		
Protected Phases	5	2	6		7	7		1	3
Permitted Phases				6			7		
Detector Phase	5	2	6	6	7	7	7		
Switch Phase									
Minimum Initial (s)	5.0	1.0	1.0	1.0	7.0	7.0	7.0	7.0	10.0
Minimum Split (s)	11.0	7.7	7.7	7.7	13.7	13.7	13.7	13.7	19.0
Total Split (s)	16.0	26.0	74.0	74.0	30.0	30.0	30.0	64.0	30.0
Total Split (%)	13.3%	21.7%	61.7%	61.7%	25.0%	25.0%	25.0%	53%	25%
Yellow Time (s)	4.0	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lead	Lag	Lag	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None	None	Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated

Splits and Phases: 11: Loop 101 NB Ramps & Pima Rd

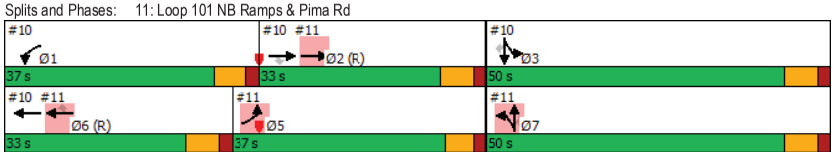


Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	225	564	998	292	121	508	975		
Future Volume (vph)	225	564	998	292	121	508	975		
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm		
Protected Phases	5	2	6		7	7		1	3
Permitted Phases				6			7		
Detector Phase	5	2	6	6	7	7	7		
Switch Phase									
Minimum Initial (s)	5.0	1.0	1.0	1.0	7.0	7.0	7.0	7.0	10.0
Minimum Split (s)	11.0	7.7	7.7	7.7	13.7	13.7	13.7	13.7	23.7
Total Split (s)	37.0	33.0	33.0	33.0	50.0	50.0	50.0	37.0	50.0
Total Split (%)	30.8%	27.5%	27.5%	27.5%	41.7%	41.7%	41.7%	31%	42%
Yellow Time (s)	4.0	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lag	Lag	Lead	Lead				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None	None	Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated

Splits and Phases: 11: Loop 101 NB Ramps & Pima Rd



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	580	0	0	1423	330	269	411	965	0	0	0
Future Volume (vph)	59	580	0	0	1423	330	269	411	965	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3372	1583			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3372	1583			
Peak-hour factor, PHF	0.80	0.85	0.90	0.90	0.90	0.90	0.85	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	74	682	0	0	1581	367	316	484	1072	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	55	0	0	639	0	0	0
Lane Group Flow (vph)	74	682	0	0	1581	312	259	541	433	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	7.7	23.3			69.6	69.6	23.3	23.3	23.3			
Effective Green, g (s)	7.7	23.3			69.6	69.6	23.3	23.3	23.3			
Actuated g/C Ratio	0.06	0.19			0.58	0.58	0.19	0.19	0.19			
Clearance Time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	113	687			3716	918	312	654	307			
v/s Ratio Prot	c0.04	c0.19			c0.25		0.16	0.16				
v/s Ratio Perm						0.20			c0.27			
v/c Ratio	0.65	0.99			0.43	0.34	0.83	0.83	1.41			
Uniform Delay, d1	54.9	48.3			14.1	13.2	46.4	46.4	48.4			
Progression Factor	0.46	1.12			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	6.5	22.2			0.4	1.0	16.8	8.5	203.0			
Delay (s)	31.7	76.1			14.4	14.2	63.3	54.9	251.3			
Level of Service	C	E			B	B	E	D	F			
Approach Delay (s)		71.7			14.4			168.5			0.0	
Approach LOS		E			B			F			A	

Intersection Summary				
HCM 2000 Control Delay	86.9	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	87.0%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	564	0	0	998	292	121	508	975	0	0	0
Future Volume (vph)	225	564	0	0	998	292	121	508	975	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3386	1583			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3386	1583			
Peak-hour factor, PHF	0.85	0.85	0.90	0.90	0.85	0.85	0.85	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	265	664	0	0	1174	344	142	598	1083	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	144	0	0	354	0	0	0
Lane Group Flow (vph)	265	664	0	0	1174	200	128	612	729	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	31.0	26.3			26.3	26.3	43.3	43.3	43.3			
Effective Green, g (s)	31.0	26.3			26.3	26.3	43.3	43.3	43.3			
Actuated g/C Ratio	0.26	0.22			0.22	0.22	0.36	0.36	0.36			
Clearance Time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lane Grp Cap (vph)	457	775			1404	346	580	1221	571			
v/s Ratio Prot	c0.15	c0.19			c0.18		0.08	0.18				
v/s Ratio Perm						0.13			c0.46			
v/c Ratio	0.58	0.86			0.84	0.58	0.22	0.50	1.28			
Uniform Delay, d1	38.8	45.0			44.8	41.9	26.6	29.9	38.4			
Progression Factor	0.71	0.68			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	1.0	10.8			6.0	6.8	0.1	0.1	137.6			
Delay (s)	28.6	41.4			50.8	48.7	26.7	30.0	176.0			
Level of Service	C	D			D	D	C	C	F			
Approach Delay (s)		37.7			50.4			116.5			0.0	
Approach LOS		D			D			F			A	

Intersection Summary				
HCM 2000 Control Delay	75.8	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	87.1%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

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Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	1	44	9	0	34	18	282	13	114	801	12
Future Vol, veh/h	40	1	44	9	0	34	18	282	13	114	801	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	235	-	145	370	-	120
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	44	1	49	10	0	38	20	313	14	127	890	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1341	1511	445	1053	1510	157	903	0	0	327	0	0
Stage 1	1144	1144	-	353	353	-	-	-	-	-	-	-
Stage 2	197	367	-	700	1157	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	*417	275	*763	*614	275	*971	1121	-	-	1430	-	-
Stage 1	*442	438	-	*860	766	-	-	-	-	-	-	-
Stage 2	*916	754	-	*719	430	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	*368	246	*763	*527	246	*971	1121	-	-	1430	-	-
Mov Cap-2 Maneuver	*368	246	-	*527	246	-	-	-	-	-	-	-
Stage 1	*434	399	-	*845	752	-	-	-	-	-	-	-
Stage 2	*864	741	-	*612	391	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.9	9.6	0.5	1
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1121	-	-	499	825	1430	-	-
HCM Lane V/C Ratio	0.018	-	-	0.189	0.058	0.089	-	-
HCM Control Delay (s)	8.3	-	-	13.9	9.6	7.8	-	-
HCM Lane LOS	A	-	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	0.2	0.3	-	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	1	33	15	2	219	41	803	3	92	447	60
Future Vol, veh/h	26	1	33	15	2	219	41	803	3	92	447	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	235	-	145	370	-	120
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	1	37	17	2	243	46	892	3	102	497	67

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1240	1688	249	1437	1752	446	564	0	0	895	0	0
Stage 1	701	701	-	984	984	-	-	-	-	-	-	-
Stage 2	539	987	-	453	768	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	*565	220	*919	*427	189	*763	1233	-	-	1131	-	-
Stage 1	*587	569	-	*599	550	-	-	-	-	-	-	-
Stage 2	*719	548	-	*867	525	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	*344	193	*919	*369	165	*763	1233	-	-	1131	-	-
Mov Cap-2 Maneuver	*344	193	-	*369	165	-	-	-	-	-	-	-
Stage 1	*566	517	-	*577	530	-	-	-	-	-	-	-
Stage 2	*470	528	-	*755	478	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13	13.3	0.4	1.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1233	-	-	514	695	1131	-	-
HCM Lane V/C Ratio	0.037	-	-	0.13	0.377	0.09	-	-
HCM Control Delay (s)	8	-	-	13	13.3	8.5	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	1.8	0.3	-	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

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21-0551 Axon Crossroads
Existing AM

4: Hayden Rd & Princess Dr
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	34	59	176	0	47	33	281	135	122	637	49
Future Volume (vph)	29	34	59	176	0	47	33	281	135	122	637	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	1.00	0.97		1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85	1.00		0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1821	1583	3433		1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.98	1.00	0.95		1.00	0.17	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)		1821	1583	3433		1583	324	3539	1583	915	3539	1583
Peak-hour factor, PHF	0.90	0.92	0.90	0.92	0.92	0.92	0.90	0.90	0.92	0.92	0.90	0.90
Adj. Flow (vph)	32	37	66	191	0	51	37	312	147	133	708	54
RTOR Reduction (vph)	0	0	32	0	0	18	0	0	106	0	0	39
Lane Group Flow (vph)	0	69	34	191	0	33	37	312	41	133	708	15
Turn Type	Split	NA	Perm	Prot		Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4	4		3				2			6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)		61.2	61.2	12.0		77.7	33.3	33.3	33.3	33.3	33.3	33.3
Effective Green, g (s)		61.2	61.2	12.0		77.7	33.3	33.3	33.3	33.3	33.3	33.3
Actuated g/C Ratio		0.51	0.51	0.10		0.65	0.28	0.28	0.28	0.28	0.28	0.28
Clearance Time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		928	807	343		1024	89	982	439	253	982	439
v/s Ratio Prot		c0.04		c0.06				0.09			c0.20	
v/s Ratio Perm			0.02			0.02	0.11		0.03	0.15		0.01
v/c Ratio		0.07	0.04	0.56		0.03	0.42	0.32	0.09	0.53	0.72	0.03
Uniform Delay, d1		15.0	14.7	51.5		7.6	35.4	34.3	32.1	36.7	39.2	31.6
Progression Factor		1.00	1.00	1.38		0.67	1.00	1.00	1.00	1.06	1.06	1.79
Incremental Delay, d2		0.2	0.1	1.9		0.0	13.7	0.9	0.4	6.7	4.0	0.1
Delay (s)		15.1	14.8	72.9		5.1	49.1	35.2	32.6	45.7	45.6	56.9
Level of Service		B	B	E		A	D	D	C	D	D	E
Approach Delay (s)		15.0			58.7			35.5			46.3	
Approach LOS		B			E			D			D	

Intersection Summary				
HCM 2000 Control Delay	42.6	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	44.3%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

21-0551 Axon Crossroads
Existing PM

4: Hayden Rd & Princess Dr
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	29	53	285	0	176	80	695	132	40	349	60
Future Volume (vph)	24	29	53	285	0	176	80	695	132	40	349	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	1.00	0.97		1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85	1.00		0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1821	1583	3433		1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.98	1.00	0.95		1.00	0.52	1.00	1.00	0.33	1.00	1.00
Satd. Flow (perm)		1821	1583	3433		1583	968	3539	1583	614	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	27	32	59	317	0	196	89	772	147	44	388	67
RTOR Reduction (vph)	0	0	55	0	0	91	0	0	47	0	0	21
Lane Group Flow (vph)	0	59	4	317	0	106	89	772	100	44	388	46
Turn Type	Split	NA	Perm	Prot		Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4	4		3				2			6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)		8.7	8.7	16.3		29.5	81.5	81.5	81.5	81.5	81.5	81.5
Effective Green, g (s)		8.7	8.7	16.3		29.5	81.5	81.5	81.5	81.5	81.5	81.5
Actuated g/C Ratio		0.07	0.07	0.14		0.25	0.68	0.68	0.68	0.68	0.68	0.68
Clearance Time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		132	114	466		389	657	2403	1075	417	2403	1075
v/s Ratio Prot		c0.03		c0.09				c0.22			0.11	
v/s Ratio Perm			0.00			0.07	0.09		0.06	0.07		0.03
v/c Ratio		0.45	0.04	0.68		0.27	0.14	0.32	0.09	0.11	0.16	0.04
Uniform Delay, d1		53.3	51.8	49.4		36.6	6.8	7.9	6.6	6.7	6.9	6.4
Progression Factor		1.00	1.00	1.09		0.99	1.00	1.00	1.00	2.01	2.07	4.59
Incremental Delay, d2		2.4	0.1	4.0		0.4	0.4	0.4	0.2	0.5	0.1	0.1
Delay (s)		55.7	51.9	57.9		36.4	7.2	8.3	6.8	13.8	14.5	29.2
Level of Service		E	D	E		D	A	A	A	B	B	C
Approach Delay (s)		53.8			49.7			7.9			16.4	
Approach LOS		D			D			A			B	

Intersection Summary				
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	49.7%	ICU Level of Service	A	
Analysis Period (min)	15			

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	561	0	544	0	0	0	0	319	42	428	399	0
Future Volume (vph)	561	0	544	0	0	0	0	319	42	428	399	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.92	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1527	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1527	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.80	0.85	0.85	0.90
Adj. Flow (vph)	623	0	604	0	0	0	0	375	52	504	469	0
RTOR Reduction (vph)	0	151	296	0	0	0	0	0	40	0	0	0
Lane Group Flow (vph)	424	259	97	0	0	0	0	375	13	504	469	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	29.5	29.5	29.5					29.0	29.0	24.0	39.0	
Effective Green, g (s)	29.5	29.5	29.5					29.0	29.0	24.0	39.0	
Actuated g/C Ratio	0.25	0.25	0.25					0.24	0.24	0.20	0.32	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0					5.0	5.0	2.0	2.0	
Lane Grp Cap (vph)	413	375	369					1228	382	686	1150	
v/s Ratio Prot	c0.25	0.17						c0.07		c0.15	c0.13	
v/s Ratio Perm			0.06						0.01			
v/c Ratio	1.03	0.69	0.26					0.31	0.03	0.73	0.41	
Uniform Delay, d1	45.2	41.1	36.5					37.3	34.8	45.0	31.5	
Progression Factor	1.00	1.00	1.00					0.70	1.00	0.49	0.39	
Incremental Delay, d2	51.3	4.4	0.1					0.6	0.2	3.4	1.0	
Delay (s)	96.5	45.5	36.6					26.8	34.9	25.3	13.5	
Level of Service	F	D	D					C	C	C	B	
Approach Delay (s)		60.3			0.0			27.8			19.6	
Approach LOS		E			A			C			B	

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)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	60.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	299	3	266	0	0	0	0	1039	41	394	340	0
Future Volume (vph)	299	3	266	0	0	0	0	1039	41	394	340	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.93	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.97	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1540	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.97	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1540	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.85	0.80	0.85	0.90	0.90	0.90	0.90	0.90	0.80	0.85	0.85	0.90
Adj. Flow (vph)	352	4	313	0	0	0	0	1154	51	464	400	0
RTOR Reduction (vph)	0	21	163	0	0	0	0	0	33	0	0	0
Lane Group Flow (vph)	232	203	50	0	0	0	0	1154	18	464	400	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	28.1	28.1	28.1					42.5	42.5	12.0	27.1	
Effective Green, g (s)	28.1	28.1	28.1					42.5	42.5	12.0	27.1	
Actuated g/C Ratio	0.23	0.23	0.23					0.35	0.35	0.10	0.23	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0					5.0	5.0	2.0	2.0	
Lane Grp Cap (vph)	393	360	352					1800	560	343	799	
v/s Ratio Prot	c0.14	0.13						c0.23		c0.14	0.11	
v/s Ratio Perm			0.03						0.01			
v/c Ratio	0.59	0.56	0.14					0.64	0.03	1.35	0.50	
Uniform Delay, d1	40.8	40.6	36.4					32.4	25.3	54.0	40.5	
Progression Factor	1.00	1.00	1.00					0.84	1.00	0.41	0.36	
Incremental Delay, d2	1.6	1.2	0.1					1.7	0.1	174.8	2.0	
Delay (s)	42.4	41.8	36.5					28.9	25.4	196.7	16.4	
Level of Service	D	D	D					C	C	F	B	
Approach Delay (s)		40.3			0.0			28.8			113.3	
Approach LOS		D			A			C			F	

Intersection Summary				
HCM 2000 Control Delay	58.2	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	76.4%	ICU Level of Service	D	
Analysis Period (min)	15			

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	76	22	469	208	673	0	0	742	268
Future Volume (vph)	0	0	0	76	22	469	208	673	0	0	742	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.87	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2779	1441	1770	3539			6408	1583
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1610	2779	1441	1770	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.80	0.90	0.85	0.90	0.90	0.90	0.90	0.85
Adj. Flow (vph)	0	0	0	89	28	521	245	748	0	0	824	315
RTOR Reduction (vph)	0	0	0	0	236	235	0	0	0	0	0	213
Lane Group Flow (vph)	0	0	0	80	62	25	245	748	0	0	824	102
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				11.5	11.5	11.5	14.0	29.0			39.0	39.0
Effective Green, g (s)				11.5	11.5	11.5	14.0	29.0			39.0	39.0
Actuated g/C Ratio				0.10	0.10	0.10	0.12	0.24			0.32	0.32
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				2.0	2.0	2.0	5.0	5.0			2.0	2.0
Lane Grp Cap (vph)				154	266	138	206	855			2082	514
v/s Ratio Prot				c0.05	0.02		c0.14	c0.21			c0.13	
v/s Ratio Perm						0.02						0.06
v/c Ratio				0.52	0.23	0.18	1.19	0.87			0.40	0.20
Uniform Delay, d1				51.6	50.2	49.9	53.0	43.8			31.4	29.2
Progression Factor				1.00	1.00	1.00	0.69	0.80			0.97	1.44
Incremental Delay, d2				1.2	0.2	0.2	113.7	8.8			0.5	0.8
Delay (s)				52.9	50.3	50.1	150.1	43.9			31.0	42.9
Level of Service				D	D	D	F	D			C	D
Approach Delay (s)		0.0			50.6			70.1			34.3	
Approach LOS		A			D			E			C	

Intersection Summary				
HCM 2000 Control Delay	50.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	60.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	74	4	395	571	767	0	0	659	373
Future Volume (vph)	0	0	0	74	4	395	571	767	0	0	659	373
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.86	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2747	1441	1770	3539			6408	1583
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1610	2747	1441	1770	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.80	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	92	5	439	634	852	0	0	775	414
RTOR Reduction (vph)	0	0	0	0	199	198	0	0	0	0	0	321
Lane Group Flow (vph)	0	0	0	84	35	21	634	852	0	0	775	93
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				11.4	11.4	11.4	27.4	42.5			27.1	27.1
Effective Green, g (s)				11.4	11.4	11.4	27.4	42.5			27.1	27.1
Actuated g/C Ratio				0.10	0.10	0.10	0.23	0.35			0.23	0.23
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				2.0	2.0	2.0	5.0	5.0			2.0	2.0
Lane Grp Cap (vph)				152	260	136	404	1253			1447	357
v/s Ratio Prot				c0.05	0.01		c0.36	c0.24			c0.12	
v/s Ratio Perm						0.01						0.06
v/c Ratio				0.55	0.13	0.15	1.57	0.68			0.54	0.26
Uniform Delay, d1				51.9	49.8	49.9	46.3	33.0			40.9	38.2
Progression Factor				1.00	1.00	1.00	0.63	0.28			1.04	1.43
Incremental Delay, d2				2.5	0.1	0.2	265.4	2.3			1.4	1.8
Delay (s)				54.3	49.9	50.1	294.5	11.7			43.9	56.4
Level of Service				D	D	D	F	B			D	E
Approach Delay (s)		0.0			50.6			132.4			48.2	
Approach LOS		A			D			F			D	

Intersection Summary				
HCM 2000 Control Delay	87.6	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	76.4%	ICU Level of Service	D	
Analysis Period (min)	15			

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1	14	4	890	1004	0
Future Volume (vph)	1	14	4	890	1004	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	5.7	5.7	5.7	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3539	
Flt Permitted	0.95	1.00	0.25	1.00	1.00	
Satd. Flow (perm)	1770	1583	470	3539	3539	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1	16	4	989	1116	0
RTOR Reduction (vph)	0	16	0	0	0	0
Lane Group Flow (vph)	1	0	4	989	1116	0
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	8			6	2	
Permitted Phases		8	6			2
Actuated Green, G (s)	2.8	2.8	105.5	105.5	105.5	
Effective Green, g (s)	2.8	2.8	105.5	105.5	105.5	
Actuated g/C Ratio	0.02	0.02	0.88	0.88	0.88	
Clearance Time (s)	6.0	6.0	5.7	5.7	5.7	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	41	36	413	3111	3111	
v/s Ratio Prot	c0.00			0.28	c0.32	
v/s Ratio Perm		0.00	0.01			
v/c Ratio	0.02	0.01	0.01	0.32	0.36	
Uniform Delay, d1	57.3	57.2	0.9	1.2	1.3	
Progression Factor	1.00	1.00	0.38	0.26	1.00	
Incremental Delay, d2	0.1	0.0	0.0	0.2	0.3	
Delay (s)	57.4	57.3	0.4	0.5	1.6	
Level of Service	E	E	A	A	A	
Approach Delay (s)	57.3			0.5	1.6	
Approach LOS	E			A	A	

Intersection Summary				
HCM 2000 Control Delay	1.5	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.35			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.7	
Intersection Capacity Utilization	43.3%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	2	6	1140	826	1
Future Volume (vph)	5	2	6	1140	826	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	5.7	5.7	5.7	5.7
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.31	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	579	3539	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	2	7	1267	918	1
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	6	0	7	1267	918	1
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	8			6	2	
Permitted Phases		8	6			2
Actuated Green, G (s)	1.4	1.4	106.9	106.9	106.9	106.9
Effective Green, g (s)	1.4	1.4	106.9	106.9	106.9	106.9
Actuated g/C Ratio	0.01	0.01	0.89	0.89	0.89	0.89
Clearance Time (s)	6.0	6.0	5.7	5.7	5.7	5.7
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	20	18	515	3152	3152	1410
v/s Ratio Prot	c0.00			c0.36	0.26	
v/s Ratio Perm		0.00	0.01			0.00
v/c Ratio	0.30	0.00	0.01	0.40	0.29	0.00
Uniform Delay, d1	58.8	58.6	0.7	1.1	1.0	0.7
Progression Factor	1.00	1.00	0.77	0.69	1.00	1.00
Incremental Delay, d2	3.1	0.0	0.0	0.3	0.2	0.0
Delay (s)	61.9	58.6	0.6	1.1	1.2	0.7
Level of Service	E	E	A	A	A	A
Approach Delay (s)	61.1			1.1	1.2	
Approach LOS	E			A	A	

Intersection Summary				
HCM 2000 Control Delay	1.3	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.7	
Intersection Capacity Utilization	47.1%	ICU Level of Service	A	
Analysis Period (min)	15			

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	199	80	288	334	114	99	35	81	17	12	12
Future Volume (vph)	74	199	80	288	334	114	99	35	81	17	12	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	
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)	1770	4866		1770	3539	1583	1770	3539	1583	1770	3274	
Flt Permitted	0.51	1.00		0.56	1.00	1.00	0.74	1.00	1.00	0.73	1.00	
Satd. Flow (perm)	952	4866		1036	3539	1583	1377	3539	1583	1360	3274	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	41	221	89	320	371	127	110	39	90	19	13	13
RTOR Reduction (vph)	0	49	0	0	0	70	0	0	50	0	7	0
Lane Group Flow (vph)	41	261	0	320	371	57	110	39	41	19	19	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4		4	6		6	2		
Actuated Green, G (s)	54.0	54.0		54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	
Effective Green, g (s)	54.0	54.0		54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	
Actuated g/C Ratio	0.45	0.45		0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	0.2	0.2		0.2	0.2	0.2	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	428	2189		466	1592	712	619	1592	712	612	1473	
v/s Ratio Prot		0.05			0.10			0.01			0.01	
v/s Ratio Perm	0.04			c0.31		0.04	c0.08		0.03	0.01		
v/c Ratio	0.10	0.12		0.69	0.23	0.08	0.18	0.02	0.06	0.03	0.01	
Uniform Delay, d1	19.0	19.2		26.3	20.3	18.8	19.7	18.4	18.6	18.4	18.3	
Progression Factor	1.16	1.22		0.78	0.64	0.77	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.1		7.8	0.3	0.2	0.6	0.0	0.2	0.1	0.0	
Delay (s)	22.5	23.5		28.4	13.3	14.7	20.4	18.4	18.8	18.5	18.3	
Level of Service	C	C		C	B	B	C	B	B	B	B	
Approach Delay (s)		23.4			19.4			19.4			18.4	
Approach LOS		C			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	20.4	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)	12.0	
Intersection Capacity Utilization	51.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	312	30	70	254	61	167	20	284	173	24	95
Future Volume (vph)	73	312	30	70	254	61	167	20	284	173	24	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	
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)	1770	5019		1770	3539	1583	1770	3539	1583	1770	3116	
Flt Permitted	0.58	1.00		0.52	1.00	1.00	0.67	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1078	5019		965	3539	1583	1244	3539	1583	1383	3116	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	41	347	33	78	282	68	186	22	316	192	27	106
RTOR Reduction (vph)	0	9	0	0	0	37	0	0	174	0	58	0
Lane Group Flow (vph)	41	371	0	78	282	31	186	22	142	192	75	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4		4	6		6	2		
Actuated Green, G (s)	54.0	54.0		54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	
Effective Green, g (s)	54.0	54.0		54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	
Actuated g/C Ratio	0.45	0.45		0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	0.2	0.2		0.2	0.2	0.2	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	485	2258		434	1592	712	559	1592	712	622	1402	
v/s Ratio Prot		0.07			0.08			0.01			0.02	
v/s Ratio Perm	0.04			c0.08		0.02	c0.15		0.09	0.14		
v/c Ratio	0.08	0.16		0.18	0.18	0.04	0.33	0.01	0.20	0.31	0.05	
Uniform Delay, d1	18.9	19.6		19.7	19.7	18.5	21.3	18.3	19.9	21.1	18.6	
Progression Factor	0.96	0.99		0.43	0.40	0.31	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.2		0.9	0.2	0.1	1.6	0.0	0.6	1.3	0.1	
Delay (s)	18.5	19.5		9.3	8.1	5.8	22.9	18.3	20.6	22.4	18.7	
Level of Service	B	B		A	A	A	C	B	C	C	B	
Approach Delay (s)		19.4			7.9			21.3			20.9	
Approach LOS		B			A			C			C	

Intersection Summary				
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.26			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	50.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	203	109	1196	496	0	0	0	0	436	545	194
Future Volume (vph)	0	203	109	1196	496	0	0	0	0	436	545	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3167	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3167	1441
Peak-hour factor, PHF	0.90	0.80	0.80	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	254	136	1329	584	0	0	0	0	484	641	228
RTOR Reduction (vph)	0	0	110	0	0	0	0	0	0	0	2	165
Lane Group Flow (vph)	0	254	26	1329	584	0	0	0	0	373	773	40
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		23.3	23.3	53.3	69.6					23.3	23.3	23.3
Effective Green, g (s)		23.3	23.3	53.3	69.6					23.3	23.3	23.3
Actuated g/C Ratio		0.19	0.19	0.44	0.58					0.19	0.19	0.19
Clearance Time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		987	541	1524	2949					312	614	279
v/s Ratio Prot		c0.05		c0.39	0.11					0.23	c0.24	
v/s Ratio Perm			0.01									0.03
v/c Ratio		0.26	0.05	0.87	0.20					1.20	1.26	0.14
Uniform Delay, d1		41.0	39.3	30.3	12.0					48.4	48.4	40.1
Progression Factor		1.31	3.27	0.71	0.62					1.00	1.00	1.00
Incremental Delay, d2		0.6	0.2	5.2	0.1					115.0	129.6	1.1
Delay (s)		54.2	128.6	26.7	7.6					163.3	178.0	41.1
Level of Service		D	F	C	A					F	F	D
Approach Delay (s)		80.1			20.8			0.0			153.2	
Approach LOS		F			C			A			F	

Intersection Summary				
HCM 2000 Control Delay	76.2	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	87.0%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	476	354	809	277	0	0	0	0	318	273	88
Future Volume (vph)	0	476	354	809	277	0	0	0	0	318	273	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3149	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3149	1441
Peak-hour factor, PHF	0.90	0.85	0.85	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	560	416	899	326	0	0	0	0	353	321	104
RTOR Reduction (vph)	0	0	299	0	0	0	0	0	0	0	1	60
Lane Group Flow (vph)	0	560	117	899	326	0	0	0	0	222	461	34
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		26.3	26.3	30.3	26.3					43.3	43.3	43.3
Effective Green, g (s)		26.3	26.3	30.3	26.3					43.3	43.3	43.3
Actuated g/C Ratio		0.22	0.22	0.25	0.22					0.36	0.36	0.36
Clearance Time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Vehicle Extension (s)		2.0	2.0	2.0	2.0					2.0	2.0	2.0
Lane Grp Cap (vph)		1114	610	866	1114					580	1136	519
v/s Ratio Prot		c0.11		c0.26	0.06					0.14	c0.15	
v/s Ratio Perm			0.04									0.02
v/c Ratio		0.50	0.19	1.04	0.29					0.38	0.41	0.07
Uniform Delay, d1		41.1	38.2	44.9	39.1					28.4	28.7	25.1
Progression Factor		1.22	2.62	0.50	0.65					1.00	1.00	1.00
Incremental Delay, d2		1.6	0.7	34.4	0.4					1.9	1.1	0.2
Delay (s)		51.6	100.6	56.7	25.8					30.4	29.8	25.3
Level of Service		D	F	E	C					C	C	C
Approach Delay (s)		72.5			48.5			0.0			29.4	
Approach LOS		E			D			A			C	

Intersection Summary				
HCM 2000 Control Delay	51.4	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)	20.1	
Intersection Capacity Utilization	87.1%	ICU Level of Service	E	
Analysis Period (min)	15			

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	580	0	0	1423	330	269	411	965	0	0	0
Future Volume (vph)	59	580	0	0	1423	330	269	411	965	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3372	1583			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3372	1583			
Peak-hour factor, PHF	0.80	0.85	0.90	0.90	0.90	0.90	0.85	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	74	682	0	0	1581	367	316	484	1072	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	55	0	0	639	0	0	0
Lane Group Flow (vph)	74	682	0	0	1581	312	259	541	433	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	7.7	23.3			69.6	69.6	23.3	23.3	23.3			
Effective Green, g (s)	7.7	23.3			69.6	69.6	23.3	23.3	23.3			
Actuated g/C Ratio	0.06	0.19			0.58	0.58	0.19	0.19	0.19			
Clearance Time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	113	687			3716	918	312	654	307			
v/s Ratio Prot	c0.04	c0.19			c0.25		0.16	0.16				
v/s Ratio Perm						0.20			c0.27			
v/c Ratio	0.65	0.99			0.43	0.34	0.83	0.83	1.41			
Uniform Delay, d1	54.9	48.3			14.1	13.2	46.4	46.4	48.4			
Progression Factor	0.46	1.12			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	6.5	22.2			0.4	1.0	16.8	8.5	203.0			
Delay (s)	31.7	76.1			14.4	14.2	63.3	54.9	251.3			
Level of Service	C	E			B	B	E	D	F			
Approach Delay (s)		71.7			14.4			168.5			0.0	
Approach LOS		E			B			F			A	

Intersection Summary				
HCM 2000 Control Delay	86.9	HCM 2000 Level of Service		F
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		20.1
Intersection Capacity Utilization	87.0%	ICU Level of Service		E
Analysis Period (min)	15			

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	564	0	0	998	292	121	508	975	0	0	0
Future Volume (vph)	225	564	0	0	998	292	121	508	975	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3386	1583			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3386	1583			
Peak-hour factor, PHF	0.85	0.85	0.90	0.90	0.85	0.85	0.85	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	265	664	0	0	1174	344	142	598	1083	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	144	0	0	354	0	0	0
Lane Group Flow (vph)	265	664	0	0	1174	200	128	612	729	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	31.0	26.3			26.3	26.3	43.3	43.3	43.3			
Effective Green, g (s)	31.0	26.3			26.3	26.3	43.3	43.3	43.3			
Actuated g/C Ratio	0.26	0.22			0.22	0.22	0.36	0.36	0.36			
Clearance Time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lane Grp Cap (vph)	457	775			1404	346	580	1221	571			
v/s Ratio Prot	c0.15	c0.19			c0.18		0.08	0.18				
v/s Ratio Perm						0.13			c0.46			
v/c Ratio	0.58	0.86			0.84	0.58	0.22	0.50	1.28			
Uniform Delay, d1	38.8	45.0			44.8	41.9	26.6	29.9	38.4			
Progression Factor	0.71	0.68			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	1.0	10.8			6.0	6.8	0.1	0.1	137.6			
Delay (s)	28.6	41.4			50.8	48.7	26.7	30.0	176.0			
Level of Service	C	D			D	D	C	C	F			
Approach Delay (s)		37.7			50.4			116.5			0.0	
Approach LOS		D			D			F			A	

Intersection Summary				
HCM 2000 Control Delay	75.8	HCM 2000 Level of Service		E
HCM 2000 Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		20.1
Intersection Capacity Utilization	87.1%	ICU Level of Service		E
Analysis Period (min)	15			

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APPENDIX E

TRIP GENERATION & INTERNAL CAPTURE CALCULATIONS

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Methodology Overview

This form facilitates trip generation estimation using data within the Institute of Transportation Engineer's (ITE) Trip Generation Manual, 11th 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
Phase 2 (All)				
MR-Apartments No Rail	1,965	Dwelling Units	221	Multifamily Housing (Mid-Rise Not Close to Rail)
Shop Plaza	49.486	1,000 square feet	821	Shopping Plaza (40-150k) - Supermarket - No
Business Hotel	435	Rooms	312	Business Hotel
Building A				
MR-Apartments No Rail	717	Dwelling Units	221	Multifamily Housing (Mid-Rise Not Close to Rail)
Building B				
MR-Apartments No Rail	390	Dwelling Units	221	Multifamily Housing (Mid-Rise Not Close to Rail)
Building C				
MR-Apartments No Rail	231	Dwelling Units	221	Multifamily Housing (Mid-Rise Not Close to Rail)
Shop Plaza	40.957	1,000 square feet	821	Shopping Plaza (40-150k) - Supermarket - No
Building D				
Business Hotel	435	Rooms	312	Business Hotel
Shop Plaza	8.529	1,000 square feet	821	Shopping Plaza (40-150k) - Supermarket - No
Building E				
MR-Apartments No Rail	627	Dwelling Units	221	Multifamily Housing (Mid-Rise Not Close to Rail)

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	
			Available	Used	Available	Used	Available	Used
MR-Apartments No Rail	General Urban/Suburban	G	G D	G	G D C	G	G D C	G
Shop Plaza	General Urban/Suburban	G	G	G	G	G	G D	G
Business Hotel	General Urban/Suburban	G	G C	G	G D C	G	G C	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."

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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
MR-Apartments No Rail	FC: T=4.77*X-46.46 [4.75]	FC: T=0.44*X-11.61 [0.43]	FC: T=0.39*X+0.34 [0.39]
Shop Plaza	WA: T=X*67.52 [67.52]	WA: T=X*1.73 [1.73]	WA: T=X*5.19 [5.19]
Business Hotel	FC: T=2.9*X+151.69 [3.25]	FC: T=0.3*X+6.94 [0.32]	FC: T=0.21*X+12.03 [0.24]

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			
	% In	In	Out	Total	% In	In	Out	Total	% In	In	Out	Total
Phase 2 (All)												
MR-Apartments No Rail	50%	4,663	4,663	9,326	23%	196	657	853	61%	468	299	767
Shop Plaza	50%	1,671	1,671	3,342	62%	53	33	86	49%	126	131	257
Business Hotel	50%	707	707	1,414	39%	53	84	137	55%	57	46	103
Phase 2 Totals		***7,041***	***7,041***	***14,082***		***302***	***774***	***1,076***		***651***	***476***	***1,127***
Building A												
MR-Apartments No Rail	50%	***1,702***	***1,702***	***3,404***	23%	***72***	***239***	***311***	61%	***171***	***109***	***280***
Building B												
MR-Apartments No Rail	50%	***926***	***926***	***1,852***	23%	***39***	***130***	***169***	61%	***93***	***59***	***152***
Building C												
MR-Apartments No Rail	50%	548	548	1,096	23%	23	77	100	61%	55	35	90
Shop Plaza	50%	1,385	1,385	2,770	62%	44	27	71	49%	104	109	213
Building C Totals		***1,933***	***1,933***	***3,866***		***67***	***104***	***171***		***159***	***144***	***303***
Building D												
Business Hotel	50%	707	707	1,414	39%	53	84	137	55%	57	46	103
Shop Plaza	50%	290	290	580	62%	9	6	15	49%	22	22	44
Building D Totals		***997***	***997***	***1,994***		***62***	***90***	***152***		***79***	***68***	***147***
Building E												
MR-Apartments No Rail	50%	1,488	1,488	2,976	23%	63	209	272	61%	149	96	245
Bldg E, Option B Totals		***1,488***	***1,488***	***2,976***		***63***	***209***	***272***		***149***	***96***	***245***
Totals (Option B)		**7,046**	**7,046**	**14,092**		**303**	**772**	**1,075**		**651**	**476**	**1,127**

If vehicle trip reductions are not applied for internal capture and alternative mode, vehicle trips may be separtated 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.

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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 capure 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			
	Percent	In	Out	Total	Percent	In	Out	Total	Percent	In	Out	Total
Phase 2 (All)												
Shop Plaza	40%	668	668	1,336	40%	21	13	34	40%	50	53	103
Business Hotel	35%	247	247	494	35%	19	29	48	35%	20	16	36
Phase 2 Totals		***915***	***915***	***1,830***		***40***	***42***	***82***		***70***	***69***	***139***
Building C												
Shop Plaza	40%	554	554	1,108	40%	18	10	28	40%	42	43	85
Building D												
Business Hotel	35%	247	247	494	35%	19	29	48	35%	20	16	36
Shop Plaza	40%	116	116	232	40%	4	2	6	40%	9	9	18
Building D Totals		***363***	***363***	***726***		***23***	***31***	***54***		***29***	***25***	***54***
Totals (Option B)		**363**	**363**	**726**		**23**	**31**	**54**		**29**	**25**	**54**

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

Alternate mode reductions are applied to account for trips to/from the study site made any means except as the driver of a personal vehicle (though carpooling is separate in Box 9). Alternative mode reductions, with respect to trips entering/existing the site, include trips where more than one mode is used as long as the trip is not in a vehicle when crossing the boundary of the study site. The reduction is applied as a percent of vehicular trips removed from total external trips. The reduction percentage used does not include any amount of alternate mode trips that are accounted for in the baseline rates; the Dense Multi-Urban Use and City Core settings already account for alternate mode trips, though further reduction may still be reasonable in specific circumstances. The table below presents the alternative mode percentages and trips in units of vehicle trips. CivTech can provide trips in units of persons if requested.

Adjustments for Alternate Mode Trips

Proposed Use	ADT				AM Peak Hour				PM Peak Hour			
	Percent	In	Out	Total	Percent	In	Out	Total	Percent	In	Out	Total
Phase 2 (All)												
MR-Apartments No Rail	5%	235	235	470	5%	10	33	43	5%	23	15	38
Phase 2 Totals		***235***	***235***	***470***		***10***	***33***	***43***		***23***	***15***	***38***
Building A												
MR-Apartments No Rail	5%	***85***	***85***	***170***	5%	***4***	***12***	***16***	5%	***9***	***5***	***14***
Building B												
MR-Apartments No Rail	5%	***46***	***46***	***92***	5%	***2***	***6***	***8***	5%	***5***	***3***	***8***
Building C												
MR-Apartments No Rail	5%	27	27	54	5%	1	4	5	5%	3	2	5
Building C Totals		***27***	***27***	***54***		***1***	***4***	***5***		***3***	***2***	***5***
Building E												
MR-Apartments No Rail	5%	74	74	148	5%	3	11	14	5%	7	5	12
Totals (Option B)		**232**	**232**	**464**		**10**	**33**	**43**		**24**	**15**	**39**

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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% (= 90% - 0%) to produce the external vehicle trips.

External Vehicular Trips

Proposed Use	ADT				AM Peak Hour				PM Peak Hour			
		In	Out	Total		In	Out	Total		In	Out	Total
Phase 2 (All)												
MR-Apartments No Rail		4,428	4,428	8,856		186	624	810		445	284	729
Shop Plaza		1,003	1,003	2,006		32	20	52		76	78	154
Business Hotel		460	460	920		34	55	89		37	30	67
Phase 2 Totals		***5,891***	***5,891***	***11,782***		***252***	***699***	***951***		***558***	***392***	***950***
Building A												
MR-Apartments No Rail		***1,617***	***1,617***	***3,234***		***68***	***227***	***295***		***162***	***104***	***266***
Building B												
MR-Apartments No Rail		***880***	***880***	***1,760***		***37***	***124***	***161***		***88***	***56***	***144***
Building C												
MR-Apartments No Rail		521	521	1,042		22	73	95		52	33	85
Shop Plaza		831	831	1,662		26	17	43		62	66	128
Building C Totals		***1,352***	***1,352***	***2,704***		***48***	***90***	***138***		***114***	***99***	***213***
Building D												
Business Hotel		460	460	920		34	55	89		37	30	67
Shop Plaza		174	174	348		5	4	9		13	13	26
Building D Totals		***634***	***634***	***1,268***		***39***	***59***	***98***		***50***	***43***	***93***
Building E												
MR-Apartments No Rail		1,414	1,414	2,828		60	198	258		142	91	233
Totals (Option B)		**5,897**	**5,897**	**11,794**		**252**	**698**	**950**		**556**	**393**	**949**

Box 10 - Estimate Vehicle Trip Subsets Pass-by/Diverted Trips, Truck Trips (Pass-By Trips)

Pass-By Trips. Some trips may be classified as "pass-by" trips, where some vehicle trips generated by the study site are already traveling on an adjacent road and make a stop while passing by. These trips do not add traffic volume to the roadway. The Handbook does not specify that a 'pair' of pass-by trips must enter and exit the same driveway. The current edition of the Handbook indicates that pass-by trips should have directional distribution applied (%in/%out), though reviewers often comment when pass-by trip "pairs" do not occur within a the specified time period. This is likely due to ease of calculation and traditional methodology found in the first edition of the Handbook. As such, the analyst may ignore the direction distribution divide the total pass-by trip volume by 2 to apply pass-by "pairs". In addition, the analyst may consider pass-by rates at a reduced rate. Data is not available for all land use codes and all periods, assumtions are highlighted. The percentage is applied to total external vehicle trips.

Pass-By Trips

Proposed Use	ADT				AM Peak Hour				PM Peak Hour			
	Percent	In	Out	Total	Percent	In	Out	Total	Percent	In	Out	Total
Phase 2 (All)												
MR-Apartments No Rail	0	0	0	0	0	0	0	0	0	0	0	0
Shop Plaza	0	0	0	0	0	0	0	0	0.34	26	26	52
Business Hotel	0	0	0	0	0	0	0	0	0	0	0	0
Phase 2 Totals		***0***	***0***	***0***		***0***	***0***	***0***		***26***	***26***	***52***
Building A												
MR-Apartments No Rail	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Building B												
MR-Apartments No Rail	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Building C												
MR-Apartments No Rail	0	0	0	0	0	0	0	0	0	0	0	0
Shop Plaza	0	0	0	0	0	0	0	0	0	22	22	44
Building C Totals		***0***	***0***	***0***		***0***	***0***	***0***		***22***	***22***	***44***
Building D												
Business Hotel	0	0	0	0	0	0	0	0	0	0	0	0
Shop Plaza	0	0	0	0	0	0	0	0	0	4	4	8
Building D Totals		***0***	***0***	***0***		***0***	***0***	***0***		***4***	***4***	***8***
Building E												
MR-Apartments No Rail	0	0	0	0	0	0	0	0	0	0	0	0
Totals (Option B)		**0**	**0**	**0**		**0**	**0**	**0**		**26**	**26**	**52**

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Net New Trips. Pass-by trips and truck trips may be subtracted from the total external vehicle trips, if applicable/data available. Diverted link trips may also be separated, but are often (conservatively) grouped with primary trips.

Net New [Non-Truck] Trips

Proposed Use	ADT			AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Phase 2 (All)									
MR-Apartments No Rail	4,428	4,428	8,856	186	624	810	445	284	729
Shop Plaza	1,003	1,003	2,006	32	20	52	50	52	102
Business Hotel	460	460	920	34	55	89	37	30	67
Phase 2 Totals	***5,891***	***5,891***	***11,782***	***252***	***699***	***951***	***532***	***366***	***898***
Building A									
MR-Apartments No Rail	***1,617***	***1,617***	***3,234***	***68***	***227***	***295***	***162***	***104***	***266***
Building B									
MR-Apartments No Rail	***880***	***880***	***1,760***	***37***	***124***	***161***	***88***	***56***	***144***
Building C									
MR-Apartments No Rail	521	521	1,042	22	73	95	52	33	85
Shop Plaza	831	831	1,662	26	17	43	40	44	84
Building C Totals	***1,352***	***1,352***	***2,704***	***48***	***90***	***138***	***92***	***77***	***169***
Building D									
Business Hotel	460	460	920	34	55	89	37	30	67
Shop Plaza	174	174	348	5	4	9	9	9	18
Building D Totals	***634***	***634***	***1,268***	***39***	***59***	***98***	***46***	***39***	***85***
Building E									
MR-Apartments No Rail	1,414	1,414	2,828	60	198	258	142	91	233
Totals (Option B)	**5,897**	**5,897**	**11,794**	**252**	**698**	**950**	**530**	**367**	**897**

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NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Axon HQ	**Organization:**	**CivTech Inc.**
Project Location:	Hayden Rd & Axon Wy	**Performed By:**	ha
Scenario Description:	2030 Total	**Date:**	6/24/2024
Analysis Year:		**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			156	142	14
Retail			86	53	33
Restaurant					
Cinema/Entertainment					
Residential			857	197	660
Hotel			134	52	82
All Other Land Uses[2]					
			1,233	444	789

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		4				
Retail	6				4	
Restaurant						
Cinema/Entertainment						
Residential	4	7				
Hotel	4	2				

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	1,233	444	789
Internal Capture Percentage	5%	7%	4%
External Vehicle-Trips[5]	1,171	413	758
External Transit-Trips[6]			
External Non-Motorized Trips[6]			

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	10%	29%
Retail	25%	30%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	2%	2%
Hotel		7%

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

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

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

[4]Enter 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.

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

[6]Person-Trips

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

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Axon HQ	**Organization:**	**CivTech Inc.**
Project Location:	Hayden Rd & Axon Wy	**Performed By:**	ha
Scenario Description:	2030 Total	**Date:**	6/24/2024
Analysis Year:		**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			94	10	84
Retail			257	126	131
Restaurant					
Cinema/Entertainment					
Residential			771	470	301
Hotel			101	56	45
All Other Land Uses[2]					
			1,223	662	561

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		10			2	
Retail	3				34	7
Restaurant						
Cinema/Entertainment						
Residential	6	13				7
Hotel		3				

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	1,223	662	561
Internal Capture Percentage	14%	13%	15%
External Vehicle-Trips[5]	1,053	577	476
External Transit-Trips[6]			
External Non-Motorized Trips[6]			

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	90%	14%
Retail	21%	34%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	8%	9%
Hotel	25%	7%

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

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

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

[4]Enter vehicle occupancy assumed in Table 1-P vehicle

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

[6]Person-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 CALCULATIONS

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Quadrant	2030 Population	2030 Percent	2030 Employment	2030 Percent	2040 Population	2040 Percent	2040 Employment	2040 Percent
North Northwest	65,664	7.9%	33,343	6.2%	82,244	9.2%	37,813	6.6%
North Northeast	32,920	3.9%	15,715	2.9%	36,581	4.1%	17,242	3.0%
North	98,584	11.8%	49,058	9.1%	118,825	**13.3%**	55,055	**9.6%**
East Northeast	27,920	3.3%	18,788	3.5%	30,611	3.4%	21,461	3.7%
East Southeast	59,560	7.1%	32,251	6.0%	61,219	6.9%	35,285	6.1%
East	87,480	10.4%	51,039	9.5%	91,830	**10.3%**	56,746	**9.8%**
South Southeast	51,477	6.2%	57,153	10.7%	52,560	5.9%	61,300	10.6%
South Southwest	190,967	22.9%	173,280	32.5%	198,939	22.4%	185,072	32.1%
South	242,444	29.1%	230,433	43.2%	251,499	**28.3%**	246,372	**42.7%**
West Southwest	231,712	27.8%	113,378	21.2%	236,245	26.6%	119,965	20.8%
West Northwest	173,673	20.8%	89,904	16.8%	191,158	21.5%	98,785	17.1%
West	405,385	48.6%	203,282	38.0%	427,403	**48.1%**	218,750	**37.9%**
Totals	833,893	99.9%	533,812	99.8%	889,557	100.0%	576,923	100.0%

Radii

Population radius: 12 miles
Employment radius: 12 miles

Select Analysis Year (2030, 2040, 2050)

2030

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12-mile radius

RAZ	MPA	2030 Population	2040 Population	% of TAZ	2030 Adjusted	2040 Adjusted	RAZ	MPA	2030 Population	2040 Population	% of TAZ	2030 Adjusted	2040 Adjusted
ENE							ESE						
230	SC	38,882	43,580	50%	19,441	21,790	230	SC	38,882	43,580	20%	7,776	8,716
250	FH	26,173	26,649	10%	2,617	2,665	248	SC	38,468	38,807	15%	5,770	5,821
231	MC	2,852	2,872	85%	2,424	2,441	249	SC	22,543	22,768	95%	21,416	21,630
229	SC	25,221	27,864	10%	2,522	2,786	250	FH	26,173	26,649	90%	23,556	23,984
345	MC	6,032	6,120	15%	905	918	251	FM	1,055	1,055	3%	32	32
251	FM	1,055	1,055	1%	11	11	264	SR	5,708	5,820	15%	856	873
		-	-		-	-	247	SC	15,420	16,342	1%	154	163
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
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		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
From ENE					27,920	30,611	From ESE					59,560	61,219
From East												87,480	91,830

Axon Mixed-Use, Scottsdale
Traffic Impact (and Mitigation) Analysis/Study

12-mile radius

RAZ	MPA	2030 Population	2040 Population	% of TAZ	2030 Adjusted	2040 Adjusted	RAZ	MPA	2030 Population	2040 Population	% of TAZ	2030 Adjusted	2040 Adjusted
NNW							NNE						
230	SC	38,882	43,580	10%	3,888	4,358	230	SC	38,882	43,580	15%	5,832	6,537
228	PH	27,844	41,054	60%	16,706	24,632	229	SC	25,221	27,864	80%	20,177	22,291
229	SC	25,221	27,864	10%	2,522	2,786	209	SC	13,961	14,512	15%	2,094	2,177
209	SC	13,961	14,512	80%	11,169	11,610	210	SC	10,463	12,339	40%	4,185	4,936
218	PH	18,080	19,394	95%	17,176	18,424	345	MC	6,032	6,120	10%	603	612
219	PH	13,803	21,652	70%	9,662	15,156	231	MC	2,852	2,872	1%	29	29
227	PH	62,395	68,782	5%	3,120	3,439			-	-		-	-
208	CF	4,128	4,208	5%	206	210			-	-		-	-
217	PH	24,287	32,553	5%	1,214	1,628			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
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		-	-		-	-			-	-		-	-
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		-	-		-	-			-	-		-	-
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		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
From NNW					65,664	82,244	From NNE					32,920	36,581
From North												98,584	118,825

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12-mile radius

RAZ	MPA	2030 Population	2040 Population	% of TAZ	2030 Adjusted	2040 Adjusted	RAZ	MPA	2030 Population	2040 Population	% of TAZ	2030 Adjusted	2040 Adjusted
WSW							WNW						
247	SC	15,420	16,342	10%	1,542	1,634	247	SC	15,420	16,342	1%	154	163
246	PH	62,638	63,884	85%	53,242	54,301	230	SC	38,882	43,580	5%	1,944	2,179
245	PH	59,810	60,177	95%	56,820	57,168	246	PH	62,638	63,884	10%	6,264	6,388
261	PH	37,490	39,383	80%	29,992	31,506	228	PH	27,844	41,054	40%	11,138	16,422
260	PH	65,550	69,005	5%	3,278	3,450	227	PH	62,395	68,782	95%	59,275	65,343
244	PH	58,707	59,498	95%	55,772	56,523	242	PH	31,046	31,677	10%	3,105	3,168
242	PH	31,046	31,677	90%	27,941	28,509	226	PH	75,841	76,004	90%	68,257	68,404
241	PH	47,345	47,840	5%	2,367	2,392	225	PH	28,641	32,206	55%	15,753	17,713
226	PH	75,841	76,004	1%	758	760	217	PH	24,287	32,553	15%	3,643	4,883
		-	-		-	-	219	PH	13,803	21,652	30%	4,141	6,496
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
From WSW					231,712	236,245	From WNW					173,673	191,158
From West												405,385	427,403

12-mile radius

RAZ	MPA	2030 Population	2040 Population	% of TAZ	2030 Adjusted	2040 Adjusted	RAZ	MPA	2030 Population	2040 Population	% of TAZ	2030 Adjusted	2040 Adjusted
SSE							SSW						
247	SC	15,420	16,342	10%	1,542	1,634	247	SC	15,420	16,342	78%	12,028	12,747
263	SC	37,002	37,252	15%	5,550	5,588	246	PH	62,638	63,884	5%	3,132	3,194
248	SC	38,468	38,807	85%	32,698	32,986	263	SC	37,002	37,252	85%	31,452	31,664
264	SR	5,708	5,820	45%	2,569	2,619	262	PV	14,716	15,118	95%	13,980	14,362
272	SC	79,910	85,942	10%	7,991	8,594	349	MC	384	387	100%	384	387
249	SC	22,543	22,768	5%	1,127	1,138	261	PH	37,490	39,383	15%	5,624	5,907
		-	-		-	-	271	PH	72,039	73,678	80%	57,631	58,942
		-	-		-	-	276	PH	56,183	59,625	5%	2,809	2,981
		-	-		-	-	272	SC	79,910	85,942	80%	63,928	68,754
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
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		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
From SSE					51,477	52,560	From SSW					190,967	198,939
From South												242,444	251,499

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12-mile radius

RAZ	MPA	2030 Employment	2040 Employment	% of TAZ	2030 Adjusted	2040 Adjusted	RAZ	MPA	2030 Employment	2040 Employment	% of TAZ	2030 Adjusted	2040 Adjusted
ENE							ESE						
230	SC	32,112	36,968	50%	16,056	18,484	230	SC	32,112	36,968	20%	6,422	7,394
250	FH	9,148	9,819	10%	915	982	248	SC	33,285	34,001	15%	4,993	5,100
231	MC	654	720	85%	556	612	249	SC	8,179	8,684	95%	7,770	8,250
229	SC	11,231	11,962	10%	1,123	1,196	250	FH	9,148	9,819	90%	8,233	8,837
345	MC	757	1,075	15%	114	161	251	FM	2,449	2,530	3%	73	76
251	FM	2,449	2,530	1%	24	25	264	SR	28,215	33,871	15%	4,232	5,081
		-	-		-	-	247	SC	52,652	54,822	1%	527	548
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
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		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
From ENE					18,788	21,461	From ESE					32,251	35,285
From East												51,039	56,746

CivTech

Axon Mixed-Use, Scottsdale
Traffic Impact (and Mitigation) Analysis/Study

12-mile radius

RAZ	MPA	2030 Employment	2040 Employment	% of TAZ	2030 Adjusted	2040 Adjusted	RAZ	MPA	2030 Employment	2040 Employment	% of TAZ	2030 Adjusted	2040 Adjusted
NNW							NNE						
230	SC	32,112	36,968	10%	3,211	3,697	230	SC	32,112	36,968	15%	4,817	5,545
228	PH	29,254	32,792	60%	17,552	19,675	229	SC	11,231	11,962	80%	8,985	9,570
229	SC	11,231	11,962	10%	1,123	1,196	209	SC	4,851	5,174	15%	728	776
209	SC	4,851	5,174	80%	3,881	4,139	210	SC	2,759	3,091	40%	1,104	1,236
218	PH	3,920	4,271	95%	3,724	4,057	345	MC	757	1,075	10%	76	108
219	PH	3,399	4,719	70%	2,379	3,303	231	MC	654	720	1%	7	7
227	PH	18,618	21,380	5%	931	1,069			-	-		-	-
208	CF	2,102	2,395	5%	105	120			-	-		-	-
217	PH	8,720	11,114	5%	436	556			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
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		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
From NNW					33,343	37,813	From NNE					15,715	17,242
From North												49,058	55,055

CivTech

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12-mile radius

RAZ	MPA	2030 Employment	2040 Employment	% of TAZ	2030 Adjusted	2040 Adjusted	RAZ	MPA	2030 Employment	2040 Employment	% of TAZ	2030 Adjusted	2040 Adjusted
WSW							**WNW**						
247	SC	52,652	54,822	10%	5,265	5,482	247	SC	52,652	54,822	1%	527	548
246	PH	38,455	40,333	85%	32,687	34,283	230	SC	32,112	36,968	5%	1,606	1,848
245	PH	18,942	19,901	95%	17,995	18,906	246	PH	38,455	40,333	10%	3,846	4,033
261	PH	36,509	38,927	80%	29,207	31,142	228	PH	29,254	32,792	40%	11,702	13,117
260	PH	23,179	25,494	5%	1,159	1,275	227	PH	18,618	21,380	95%	17,687	20,311
244	PH	17,524	18,787	95%	16,648	17,848	242	PH	10,621	11,216	10%	1,062	1,122
242	PH	10,621	11,216	90%	9,559	10,094	226	PH	23,507	24,262	90%	21,156	21,836
241	PH	12,459	13,847	5%	623	692	225	PH	54,530	59,795	55%	29,992	32,887
226	PH	23,507	24,262	1%	235	243	217	PH	8,720	11,114	15%	1,308	1,667
		-	-		-	-	219	PH	3,399	4,719	30%	1,020	1,416
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
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		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
From WSW					**113,378**	**119,965**	**From WNW**					**89,904**	**98,785**
From West												**203,282**	**218,750**

12-mile radius

RAZ	MPA	2030 Employment	2040 Employment	% of TAZ	2030 Adjusted	2040 Adjusted	RAZ	MPA	2030 Employment	2040 Employment	% of TAZ	2030 Adjusted	2040 Adjusted
SSE							**SSW**						
247	SC	52,652	54,822	10%	5,265	5,482	247	SC	52,652	54,822	78%	41,069	42,761
263	SC	28,903	30,245	15%	4,335	4,537	246	PH	38,455	40,333	5%	1,923	2,017
248	SC	33,285	34,001	85%	28,292	28,901	263	SC	28,903	30,245	85%	24,568	25,708
264	SR	28,215	33,871	45%	12,697	15,242	262	PV	6,788	7,115	95%	6,449	6,759
272	SC	61,540	67,039	10%	6,154	6,704	349	MC	33	36	100%	33	36
249	SC	8,179	8,684	5%	409	434	261	PH	36,509	38,927	15%	5,476	5,839
		-	-		-	-	271	PH	54,144	58,703	80%	43,315	46,962
		-	-		-	-	276	PH	24,321	27,156	5%	1,216	1,358
		-	-		-	-	272	SC	61,540	67,039	80%	49,232	53,631
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
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		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
From SSE					**57,153**	**61,300**	**From SSW**					**173,280**	**185,072**
From South												**230,433**	**246,372**

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APPENDIX G

BACKGROUND GROWTH

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Growth Rate Used	1.0%
Per-Year Multiplier	1.010

Year	Expansion Factor(s)	
2023	1.000	
2024	1.010	
2025	**1.020**	**Opening**
2026	1.030	
2027	1.041	
2028	1.051	
2029	1.062	
2030	**1.072**	**Horizon Year**
2031	1.083	
2032	1.094	
2033	1.105	
2034	1.116	
2035	1.127	
2036	1.138	
2037	1.149	
2038	1.161	
2039	1.173	
2040	1.184	
2041	1.196	
2042	1.208	
2043	1.220	
2044	1.232	
2045	1.245	
2046	1.257	
2047	1.270	
2048	1.282	
2049	1.295	
2050	1.308	
2051	1.321	
2052	1.335	
2053	1.348	
2054	1.361	
2055	1.375	

Automated license plate recognition (ALPR) technology was used count traffic to Axon's Scottsdale HQ from Tuesday, May 28th to Friday, May 31st each time a vehicle entered or exited the parking lot

Time increment	of Total	mulative Total	%	Count
12: 00AM - 12: 15AM	0%	0%		0
12: 15AM - 12: 30AM	0%	0%		1
12: 30AM - 12: 45AM	0%	0%		0
12: 45AM - 1: 00AM	0%	1%		3
1: 00AM - 1: 15AM	0%	1%		2
1: 15AM - 1: 30AM	0%	1%		0
1: 30AM - 1: 45AM	0%	1%		2
1: 45AM - 2: 00AM	0%	1%		0
2: 00AM - 2: 15AM	0%	1%		1
2: 15AM - 2: 30AM	0%	1%		0
2: 30AM - 2: 45AM	0%	1%		0
2: 45AM - 3: 00AM	0%	1%		0
3: 00AM - 3: 15AM	0%	1%		0
3: 15AM - 3: 30AM	0%	1%		0
3: 30AM - 3: 45AM	0%	2%		2
3: 45AM - 4: 00AM	0%	2%		2
4: 00AM - 4: 15AM	0%	2%		0
4: 15AM - 4: 30AM	0%	2%		0
4: 30AM - 4: 45AM	1%	3%		7
4: 45AM - 5: 00AM	1%	4%		5
5: 00AM - 5: 15AM	4%	8%		22
5: 15AM - 5: 30AM	5%	13%		31
5: 30AM - 5: 45AM	3%	16%		18
5: 45AM - 6: 00AM	3%	19%		20
6: 00AM - 6: 15AM	0%	19%		3
6: 15AM - 6: 30AM	0%	20%		1
6: 30AM - 6: 45AM	0%	20%		2
6: 45AM - 7: 00AM	0%	20%		1
7: 00AM - 7: 15AM	1%	21%		5
7: 15AM - 7: 30AM	2%	23%		10
7: 30AM - 7: 45AM	2%	24%		10
7: 45AM - 8: 00AM	2%	26%		11
8: 00AM - 8: 15AM	1%	27%		5
8: 15AM - 8: 30AM	1%	28%		9
8: 30AM - 8: 45AM	2%	30%		10
8: 45AM - 9: 00AM	2%	32%		10
9: 00AM - 9: 15AM	1%	33%		9
9: 15AM - 9: 30AM	1%	34%		8
9: 30AM - 9: 45AM	1%	35%		6
9: 45AM - 10: 00AM	2%	37%		10
10: 00AM - 10: 15AM	0%	37%		2
10: 15AM - 10: 30AM	2%	39%		11
10: 30AM - 10: 45AM	1%	40%		8
10: 45AM - 11: 00AM	1%	41%		6
11: 00AM - 11: 15AM	1%	42%		4
11: 15AM - 11: 30AM	2%	44%		11
11: 30AM - 11: 45AM	2%	46%		11
11: 45AM - 12: 00PM	1%	47%		7
12: 00PM - 12: 15PM	1%	48%		5
12: 15PM - 12: 30PM	0%	48%		2
12: 30PM - 12: 45PM	2%	50%		12
12: 45PM - 1: 00PM	2%	52%		10
1: 00PM - 1: 15PM	2%	53%		11
1: 15PM - 1: 30PM	3%	56%		17
1: 30PM - 1: 45PM	2%	58%		11
1: 45PM - 2: 00PM	4%	62%		23
2: 00PM - 2: 15PM	1%	63%		5
2: 15PM - 2: 30PM	2%	64%		12
2: 30PM - 2: 45PM	2%	67%		13
2: 45PM - 3: 00PM	1%	68%		6
3: 00PM - 3: 15PM	0%	68%		3
3: 15PM - 3: 30PM	1%	69%		5
3: 30PM - 3: 45PM	1%	70%		7
3: 45PM - 4: 00PM	1%	71%		4
4: 00PM - 4: 15PM	1%	71%		4
4: 15PM - 4: 30PM	0%	72%		3
4: 30PM - 4: 45PM	1%	73%		8
4: 45PM - 5: 00PM	1%	74%		8
5: 00PM - 5: 15PM	1%	75%		4
5: 15PM - 5: 30PM	0%	76%		3
5: 30PM - 5: 45PM	0%	76%		1
5: 45PM - 6: 00PM	0%	76%		0
6: 00PM - 6: 15PM	1%	77%		7
6: 15PM - 6: 30PM	1%	78%		6
6: 30PM - 6: 45PM	0%	78%		0
6: 45PM - 7: 00PM	0%	78%		2
7: 00PM - 7: 15PM	1%	79%		4
7: 15PM - 7: 30PM	0%	79%		0
7: 30PM - 7: 45PM	0%	79%		0
7: 45PM - 8: 00PM	0%	79%		1
8: 00PM - 8: 15PM	0%	79%		2
8: 15PM - 8: 30PM	1%	80%		6
8: 30PM - 8: 45PM	1%	82%		9
8: 45PM - 9: 00PM	0%	82%		3
9: 00PM - 9: 15PM	1%	84%		8
9: 15PM - 9: 30PM	1%	85%		8
9: 30PM - 9: 45PM	5%	90%		31
9: 45PM - 10: 00PM	8%	98%		47
10: 00PM - 10: 15PM	1%	98%		4
10: 15PM - 10: 30PM	0%	99%		3
10: 30PM - 10: 45PM	1%	100%		4
10: 45PM - 11: 00PM	0%	100%		0
11: 00PM - 11: 15PM	0%	100%		1
11: 15PM - 11: 30PM	0%	100%		1
11: 30PM - 11: 45PM	0%	100%		1
11: 45PM - 12: 00AM	0%	100%		0
Total	100%	100%		611

Methodology Overview

This form facilitates trip generation estimation using data within the Institute of Transportation Engineer's (ITE) Trip Generation Manual, 11th 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
Corporate Building	225.740	1,000 square feet	714	Corporate Headquarters Building
General Light Industrial	147.840	1,000 square feet	110	General Light Industrial

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	
		Available	Used	Available	Used	Available	Used
Axon HQ	General Urban/Suburban G	G	G	G	G	G	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
Corporate Building	C: T=X*6.721 [6.72]	C: T=X*0.418 [0.42]	C: T=X*0.253 [0.25]
General Light Industrial	C: T=X*6.721 [6.72]	C: T=X*0.418 [0.42]	C: T=X*0.253 [0.25]

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

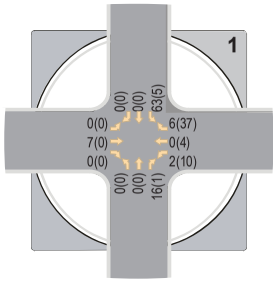
Baseline Vehicular Trips

Proposed Use	ADT				AM Peak Hour				PM Peak Hour			
	% In	In	Out	Total	% In	In	Out	Total	% In	In	Out	Total
Corporate Building	50%	759	759	1,518	93%	87	7	94	9%	5	52	57
General Light Industrial	50%	497	497	994	88%	55	7	62	14%	5	32	37
Totals	50%	1,256	1,256	2,512	0%	142	14	156	0%	10	84	94

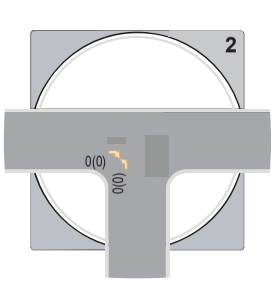
If vehicle trip reductions are not applied for internal capture and alternative mode, vehicle trips may be separtated into vehicle trip subsets (pass-by trips, diverted trips, truck trips, new passenger vehicle trips) as part of Box 10. If vehicle trip reductions are to be applied, continue to Box 6.

Corp Bldg per submitted TIMA	1,467	1,467	2,934	431	32	463	40	410	450
General Light Industrial+Corporate Building	1,256	1,256	2,512	142	14	156	10	84	94
Differences:	211	211	422	289	18	307	30	326	356

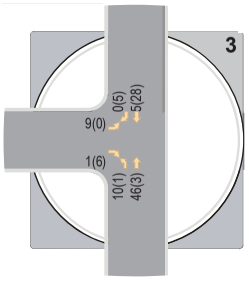
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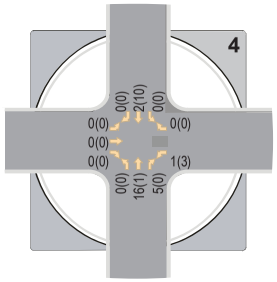
Hayden Rd & Mayo Blvd/Axon Wy



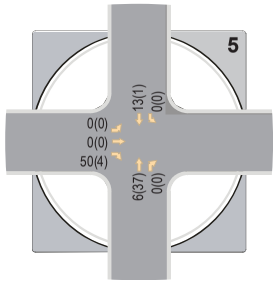
82nd St & Axon Wy



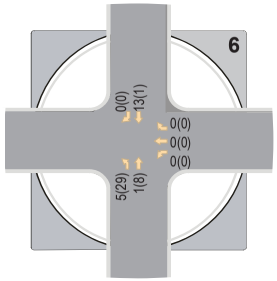
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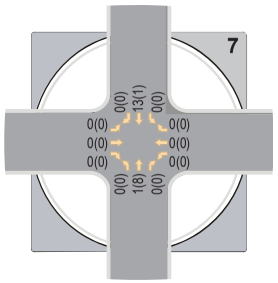
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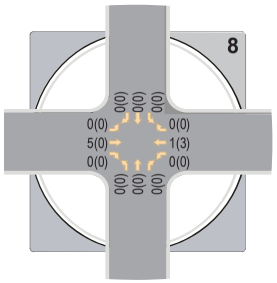
Hayden Rd & Loop 101 EB Ramps



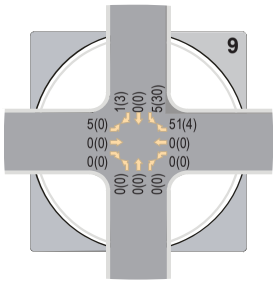
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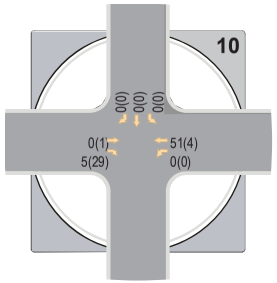
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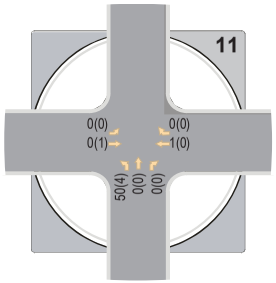
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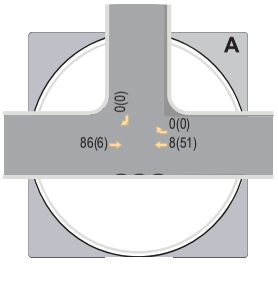
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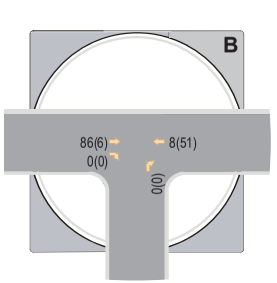
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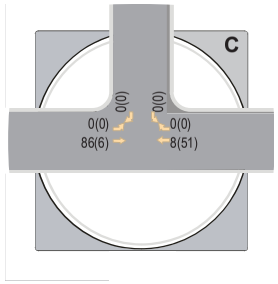
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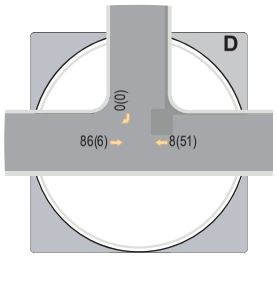
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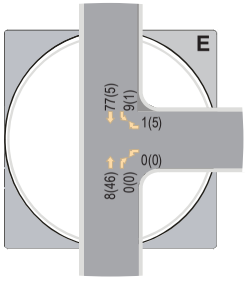
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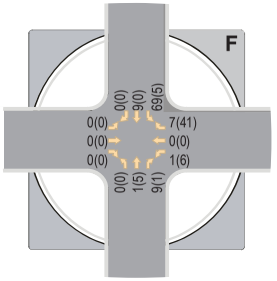
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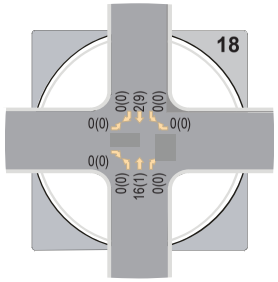
Access D & Axon Wy



Axon Wy & Access E



Axon Wy & Access F



Hayden Rd & Union Hills/Mayo Blvd

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Axon HQ Site Vols

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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.

The project site will consist of 6 buildings in total with some retail on the ground floor. Three of the buildings will contain 9 stories of residential dwelling units, which is considered a mid-rise building (LUC 221); the other three buildings will be 10-story buildings which are considered high rise (LUC 222). Additionally, around 36,000 square feet of retail will be provided on-site at the ground level of a few of the buildings. Since less than 40,000 sf of retail will be provided the ITE LUC 822 for a strip retail plaza may be used. The retail component of the site is aimed more towards resident use; however, non-residents are also permitted to use this retail so an internal capture reduction has been applied to account for the internal use of the retail. A 30% reduction has been applied, although this internal capture will likely be much higher due to the nature of the site, 30% has been used in order to be conservative.

The anticipated trip generation is summarized in **Table 4**. Detailed trip generation calculations are provided in **Appendix E**.

Table 4 – Trip Generation

Proposed Use	ITE	Size	Units	Weekday Trips						
				Daily	AM Peak Hour			PM Peak Hour		
	LUC			Total	In	Out	Total	In	Out	Total
Building 1	222	278	DU	1,262	26	49	75	50	39	89
Building 2	222	238	DU	1,080	22	42	64	43	33	76
Building 3	221	209	DU	948	18	59	77	50	32	82
Building 4	221	211	DU	958	18	60	78	50	32	82
Building 5	221	209	DU	948	18	59	77	50	32	82
Building 6	222	245	DU	1,112	22	44	66	44	34	78
Retail Plaza	822	36,000	SF	1,748	40	27	67	97	96	193
Subtotals				**8,056**	**164**	**340**	**504**	**384**	**298**	**682**
Internal Capture Reduction (Retail)				*(524)*	*(10)*	*(10)*	*(20)*	*(29)*	*(29)*	*(58)*
Total External Trips				**7,532**	**154**	**330**	**484**	**355**	**269**	**624**

The proposed development it anticipated to generate up to 7,532 external weekday daily trips with 484 trips occurring during the AM Peak Hour (154 in/330 out) and 624 trips occurring during the PM Peak Hour (355 in/269 out).

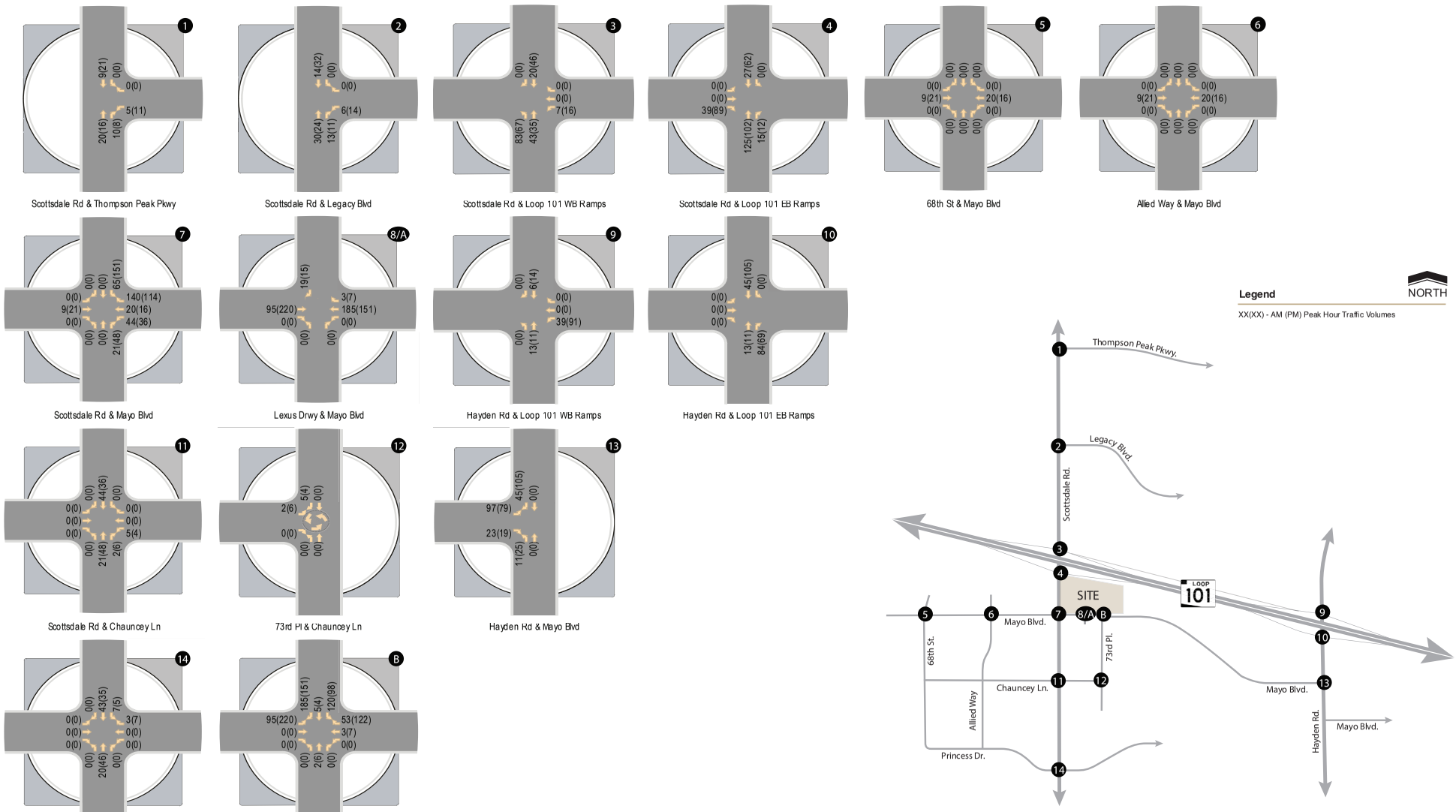


Figure 6: Scenario 1 Site Traffic Volumes

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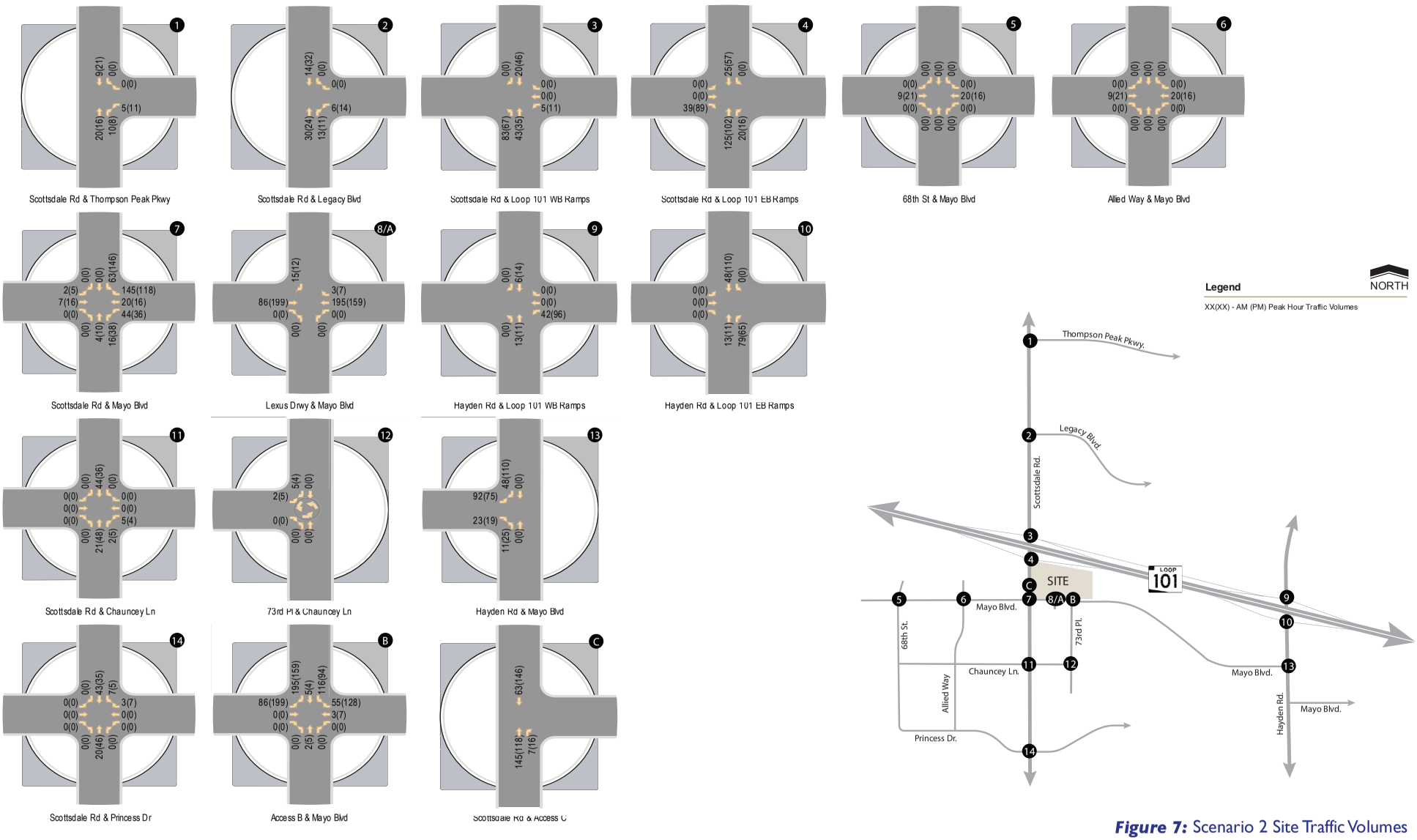
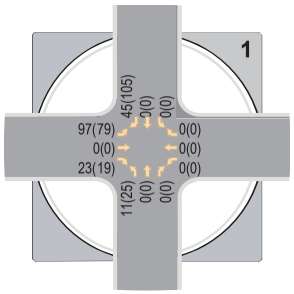
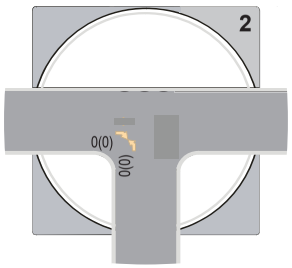


Figure 7: Scenario 2 Site Traffic Volumes

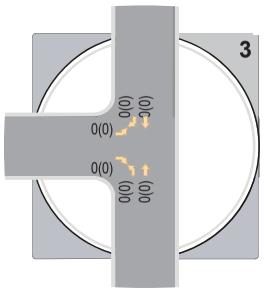
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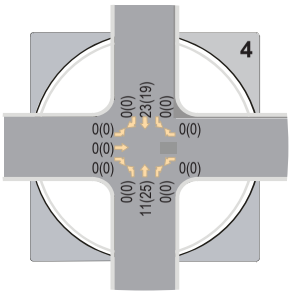
Hayden Rd & Mayo Blvd/Axon Wy



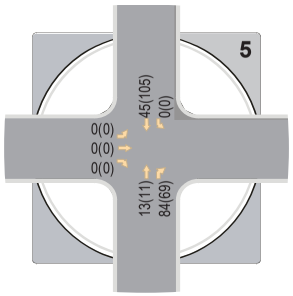
82nd St & Axon Wy



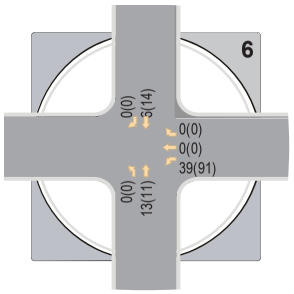
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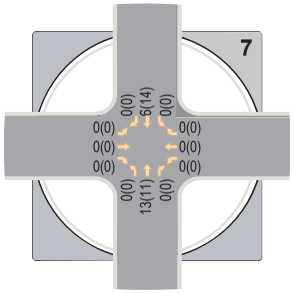
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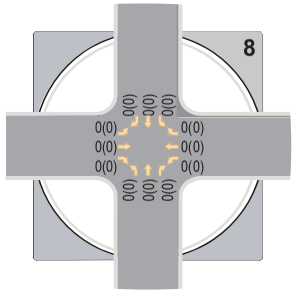
Hayden Rd & Loop 101 EB Ramps



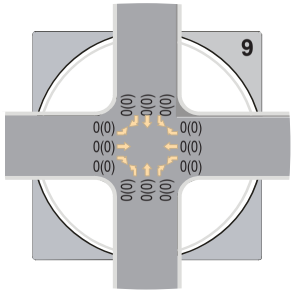
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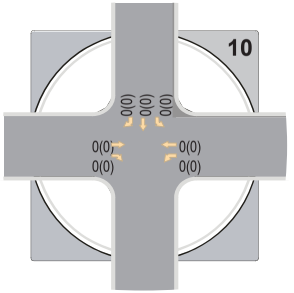
Hayden Rd & Legacy Blvd



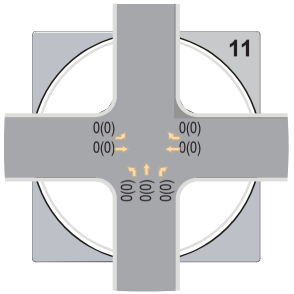
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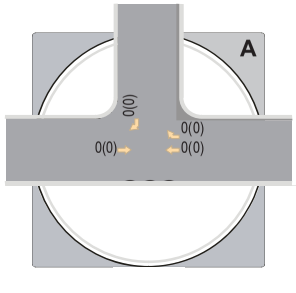
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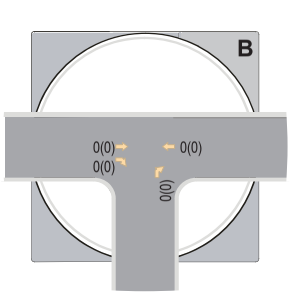
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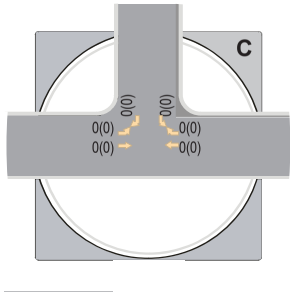
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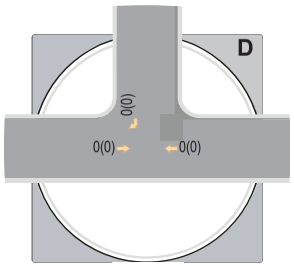
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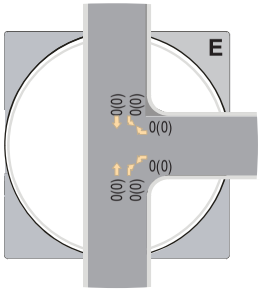
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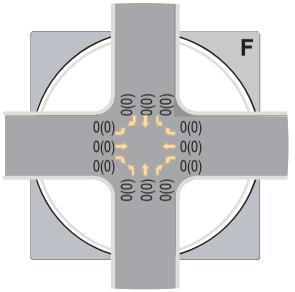
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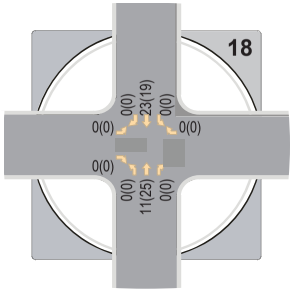
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Axon Wy & Access E



Axon Wy & Access F



Hayden Rd & Union Hills/Mayo Blvd

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Surrounding Developments Optima Vols

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The methodology discussed was utilized to develop trip rates associated with each land use for the planned Cavasson Phase I densities and intensities. This was primarily conducted using fitted curve equation rates with exception of the fast food restaurant which required the use of land use average trip rates from the ITE manual were applied. **Table 3** depicts the trip generation rates applied for each land use type within the proposed Cavasson development.

Table 3 –Trip Rates and Directional Splits

Land Use	ITE Code	Size		Weekday Generated Trip Rates and Splits						
				Daily	AM Peak Hour			PM Peak Hour		
		Quantity	Units	Rate	*Enter*	*Exit*	Total	*Enter*	*Exit*	Total
Hotel	310	135	Keys	8.36	*59%*	*41%*	0.49	*51%*	*49%*	0.68
Apartment	220	350	DU	7.53	*23%*	*77%*	0.42	*63%*	*37%*	0.44
General Office	710	740,000	SF	9.73	*86%*	*14%*	0.95	*16%*	*84%*	0.99
Shopping Center	820	11,000	SF	48.16	*57%*	*43%*	1.26	*52%*	*48%*	4.54
Fast Food	930	6,000	SF	315.17	*67%*	*33%*	2.07	*55%*	*45%*	14.13

Opening Year 2020 - Phase I Trip Generation

By opening year 2020, it is anticipated that the Phase I development will be fully constructed. Utilizing the ITE guidelines for development of trip generation rates, the trips generated by the Cavasson Phase I development are summarized in **Table 4**. Detailed trip generation calculation worksheets for the Phase I Cavasson development are provided in **Appendix F**.

Table 4 – Phase I Trip Generation

Land Use	ITE Code	Size		Weekday Generated Trips						
				Daily	AM Peak Hour			PM Peak Hour		
		Quantity	Units	Total	Enter	Exit	Total	Enter	Exit	Total
Hotel	310	135	Keys	1,128	39	27	66	47	45	92
Apartment	220	350	DU	2,636	34	113	147	97	57	154
General Office	710	740,000	SF	7,200	605	98	703	117	616	733
Shopping Center	820	11,000	SF	530	8	6	14	26	24	50
Fast Food Restaurant	930	6,000	SF	1,892	8	4	12	47	38	85
Total				**13,386**	**694**	**248**	**942**	**334**	**780**	**1,114**
Internal Capture Reductions				*(936)*	*(20)*	*(7)*	*(27)*	*(14)*	*(30)*	*(44)*
Total External Trips				**12,450**	**674**	**241**	**915**	**320**	**750**	**1,070**

As shown in **Table 5**, Phase I of the Cavasson Development is anticipated to generate 12,4506 daily trips to the external roadway system, with 915 occurring during the AM peak hour and 1,070 occurring during the PM peak hour. These are the anticipated trips which will be assigned to the external street network surrounding the study area.

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Horizon year 2030 - Phase II (Buildout) Trip Generation

By horizon year 2030, it is anticipated that Phase II of the Cavasson development will be fully built-out. Utilizing the trip generation equations for the proposed land uses and using ITE guidelines for development of trip generation rates, the trips generated by the Cavasson Phase II development are summarized in **Table 5**. Detailed trip generation calculation worksheets for the Cavasson development are provided in **Appendix F**.

Table 5 – Buildout Trip Generation

Land Use	ITE Code	Size		Weekday Generated Trips						
				Daily	AM Peak Hour			PM Peak Hour		
		Quantity	Units	Total	Enter	Exit	Total	Enter	Exit	Total
Hotel	310	400	Keys	3,344	116	80	196	139	133	272
Apartment	220	1,600	DU	12,048	155	517	672	444	260	704
General Office	710	1,800,000	SF	17,514	1,471	239	1,710	285	1,497	1,782
Shopping Center	820	194,000	SF	9,344	139	105	244	458	423	881
Fast Food Restaurant	930	12,000	SF	3,782	17	8	25	94	76	170
Total				**46,032**	**1,898**	**949**	**2,847**	**1,420**	**2,389**	**3,809**
Internal Capture Reductions				*(11,048)*	*(191)*	*(94)*	*(285)*	*(255)*	*(431)*	*(686)*
Total External Trips				**34,984**	**1,707**	**855**	**2,562**	**1,165**	**1,958**	**3,123**

As shown in **Table 5**, Phase I and Phase II (full build) of the Cavasson Development is anticipated to generate 34,984 daily trips to the external roadway system, with 2,562 occurring during the AM peak hour and 3,123 occurring during the PM peak hour. These are the anticipated trips which will be assigned to the external street network surrounding the study area.

TRIP DISTRIBUTION

Daily trips were distributed to the roadway network based on the Maricopa Association of Governments (MAG) estimate of total employment and population within a 10-mile radius of the site. The radius selected is based on the average trip length to this land use as discussed in the Nationwide Public Transportation Survey Urban Travel Patterns report (December 1999). It was determined that the major travel pattern for the site-generated traffic is primarily to the south and west.

By horizon year 2030, it is assumed that a portion of study area will be constructed. As the surrounding Crossroads East development builds out, the internal collector roads and adjacent arterial roads will be constructed and will be utilized to disperse site generated traffic. This includes the following improvements and extensions:

- ***64th Street***, extension from Bell Road to Jomax Road.
- ***Legacy Boulevard***, extension from Scottsdale Road to 56th Street and from Hayden Road to Pima Road.
- ***Miller Road***, underpass built at Loop 101.
- ***Deer Valley Drive (Thompson Peak Parkway),*** extension from 56th Street to Scottsdale Road.
- ***Internal Collectors***, full construction of all internal collectors to the Crossroads East development.

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Cavasson - Phase 1 Remaining Trips

Trip Generation
July 2018
Appendix D

Land Use Types and Size

Parcel	LUC	Setting/Location	Proposed Use	Amount	Units	ITE LUC	ITE Land Use Name
	310	General	Hotel or motel	135	Rooms	310	Hotel
	220	General	Apartments	350	Dwelling Units	220	Multifamily Housing (Low-Rise)
	820	General	Shopping Center	11.000	KSF	820	Shopping Center
	930	General	Fast Casual Restaurant	6.000	KSF	930	Fast Casual Restaurant
	710	General	General Office Building	740.000	KSF	710	General Office Building

-Abbreviations: ITE = Institute of Transportation Engineers, LUC = land use code, SF = square feet, KSF = 1,000 square feet, DU = Dwelling Units, Keys = keyed gu

Weighted Average Rate or Fitted Curve Equation Used in Analysis?

Parcel	Proposed Use	ADT	Rate	Trips	AM	Rate	Trips	PM	Rate	Trips
	Hotel or motel	T=11.29(X)-426.97	8.36	1,128	T=0.50(X)-5.34	0.49	66	T=0.75(X)-26.02	0.68	92
	Apartments	T=7.56*X-40.86	7.53	2,636	LN(T=0.95*LN(X)-0.51	0.42	147	LN(T)=0.89*LN(X)-0.02	0.44	154
	Shopping Center	LN(T)=0.68*LN(X)+5.57	48.16	530	T=0.5(X)+151.78	1.26	14	LN(T)=0.74*LN(X)+2.89	4.54	50
	Fast Casual Restaurant	Weighted Average	315.17	1,892	Weighted Average	2.07	12	Weighted Average	14.13	85
	General Office Building	LN(T)=0.97*LN(X)+2.50	9.73	7,200	T=0.94(X)+26.94	0.95	703	LN(T)=0.95*LN(X)+0.36	0.99	733

Notes: -ITE methodology per the *Trip Generation Handbook* is the basis for deciding which rate/equation to use. Exceptions are highlighted.

Base Trips

Parcel	Proposed Use	ADT % In	ADT In	ADT Out	ADT Total	AM % In	AM In	AM Out	AM Total	PM % In	PM In	PM Out	PM Total
	Hotel or motel	50%	564	564	1,128	59%	39	27	66	51%	47	45	92
	Apartments	50%	1,318	1,318	2,636	23%	34	113	147	63%	97	57	154
	Shopping Center	50%	265	265	530	57%	8	6	14	52%	26	24	50
	Fast Casual Restaurant	50%	946	946	1,892	67%	8	4	12	55%	47	38	85
	General Office Building	50%	3,600	3,600	7,200	86%	605	98	703	16%	117	616	733
	Totals		**6,693**	**6,693**	**13,386**		**694**	**248**	**942**		**334**	**780**	**1,114**

Adjustments for Internal Trips

Parcel	Proposed Use	ADT	ADT In	ADT Out	ADT Total	AM	AM In	AM Out	AM Total	PM	PM In	PM Out	PM Total
	Hotel or motel	7%	39	39	78	3%	1	1	2	4%	2	2	4
	Apartments	7%	92	92	184	3%	1	3	4	4%	4	2	6
	Shopping Center	7%	19	19	38	3%	0	0	0	4%	1	1	2
	Fast Casual Restaurant	7%	66	66	132	3%	0	0	0	4%	2	1	3
	General Office Building	7%	252	252	504	3%	18	3	21	4%	5	24	29
	Totals		**468**	**468**	**936**		**20**	**7**	**27**		**14**	**30**	**44**

External Vehicular Trips

Parcel	Proposed Use	ADT In	ADT Out	ADT Total	AM In	AM Out	AM Total	PM In	PM Out	PM Total
	Hotel or motel	525	525	1,050	38	26	64	45	43	88
	Apartments	1,226	1,226	2,452	33	110	143	93	55	148
	Shopping Center	246	246	492	8	6	14	25	23	48
	Fast Casual Restaurant	880	880	1,760	8	4	12	45	37	82
	General Office Building	3,348	3,348	6,696	587	95	682	112	592	704
	Totals	**6,225**	**6,225**	**12,450**	**674**	**241**	**915**	**320**	**750**	**1,070**

Remaining Vehicular Trips

Parcel	Proposed Use	% In-complete	ADT In	ADT Out	ADT Total	AM In	AM Out	AM Total	PM In	PM Out	PM Total
	Hotel or motel	0%	0	0	0	0	0	0	0	0	0
	Apartments	100%	1,226	1,226	2,452	33	110	143	93	55	148
	Shopping Center	0%	0	0	0	0	0	0	0	0	0
	Fast Casual Restaurant	0%	0	0	0	0	0	0	0	0	0
	General Office Building*	15%	502	502	1,004	88	14	102	17	89	106
	Total trips remaining		**1,728**	**1,728**	**3,456**	**121**	**124**	**245**	**110**	**144**	**254**

* Assessor records show 2 of 3 buildings complete: 465.485 ksf + 161.955 ksf = 627.240 ksf ÷ 740 ksf = 15.24% incomplete

The purpose of this spreadsheet is to estimate the trips remaining for Cavasson Phase 1, so as to not double-count trips already on the roads for already-opened buildings.

The bottom table was added to the Phase 1-only land uses from project 17-0315.

The Total trips remaining wewre then added into the Traffix model, which was adapted to make the common intersections have the same ID numbers as in the Axon study.

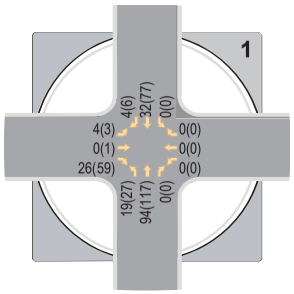
CivTech

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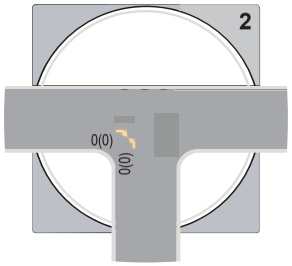
Cavasson Trips (60% Total - Phase 1 Occupied)

	Daily Total	In	Out	Total	In	Out	Total
Full Buildout	34984	1707	855	2562	1165	1958	3123
Phase 1 Occupied	8994	553	117	670	210	606	816
60% of Full Build	20990	1024	513	1537	699	1175	1874
60% Full Build - Phase 1 Occupied	**11996**	**471**	**396**	**867**	**489**	**569**	**1058**
Phase 1 Remaining	3456	121	124	245	110	144	254
Other Phases Remaining	8540	350	272	622	379	425	804

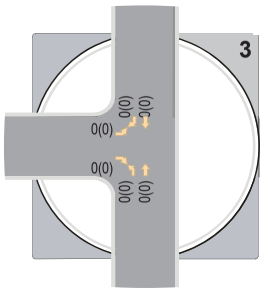
13-ZN-2020#2
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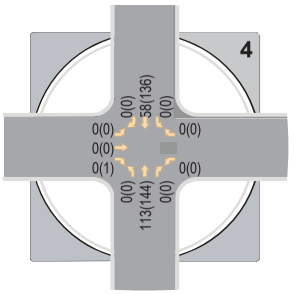
Hayden Rd & Mayo Blvd/Axon Wy



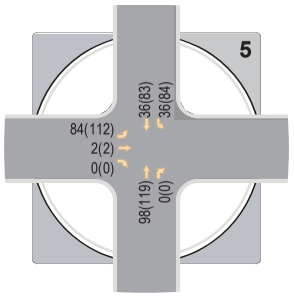
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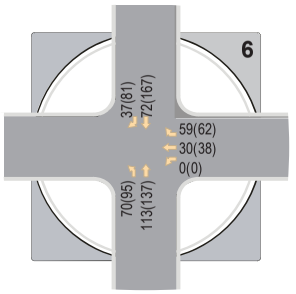
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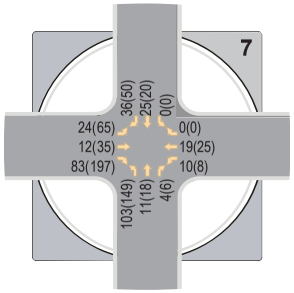
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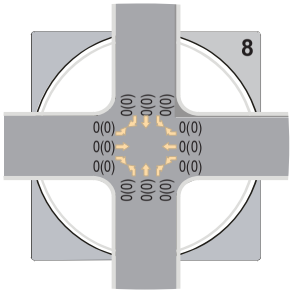
Hayden Rd & Loop 101 EB Ramps



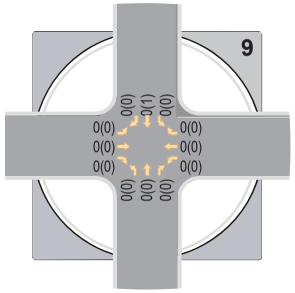
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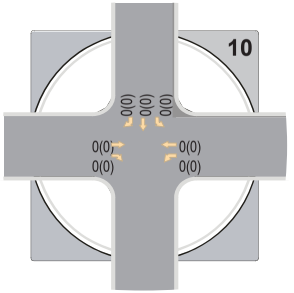
Hayden Rd & Legacy Blvd



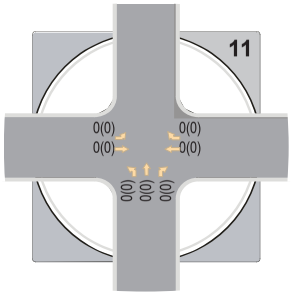
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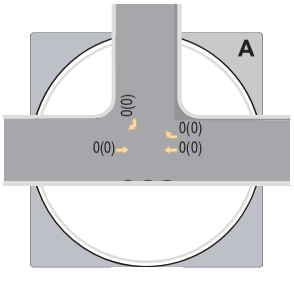
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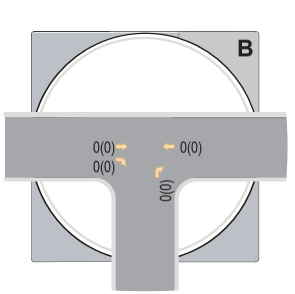
Loop 101 SB Ramps @ Princess Dr/Pima Rd



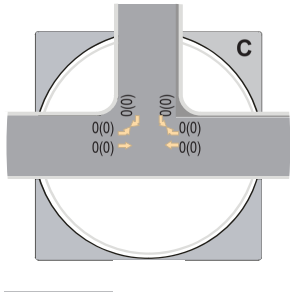
Loop 101 NB Ramps @ Princess Dr/Pima Rd



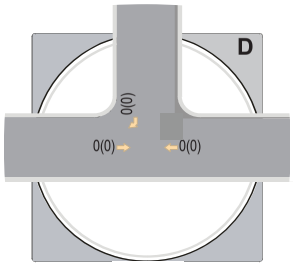
Access A & Axon Wy



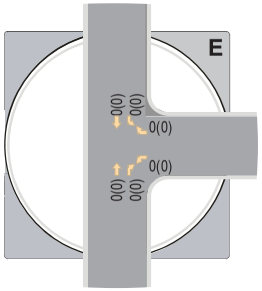
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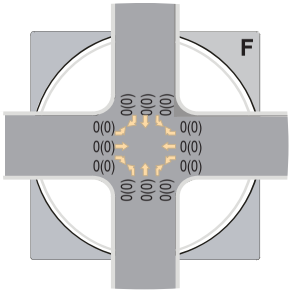
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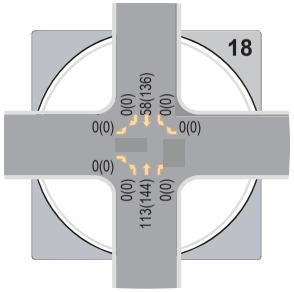
Access D & Axon Wy



Axon Wy & Access E



Axon Wy & Access F



Hayden Rd & Union Hills/Mayo Blvd

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Cavasson Surrounding Development Vols

CivTech

5.0 PROJECTED TRAFFIC

5.1 SITE TRAFFIC FORECASTS

5.1.1 TRIP GENERATION

The Institute of Transportation Engineers' (ITE) *Trip Generation, 11th Edition* was used to obtain daily and peak hour trip generation rates and inbound-outbound percentages, which were then used to estimate the number of daily and peak hour trips that can be attributed to the proposed development. The trip generation characteristics of the site are summarized in **Table 6**. Trip generation calculations can be found in the **Appendix**.

Table 6. Project Trip Generation

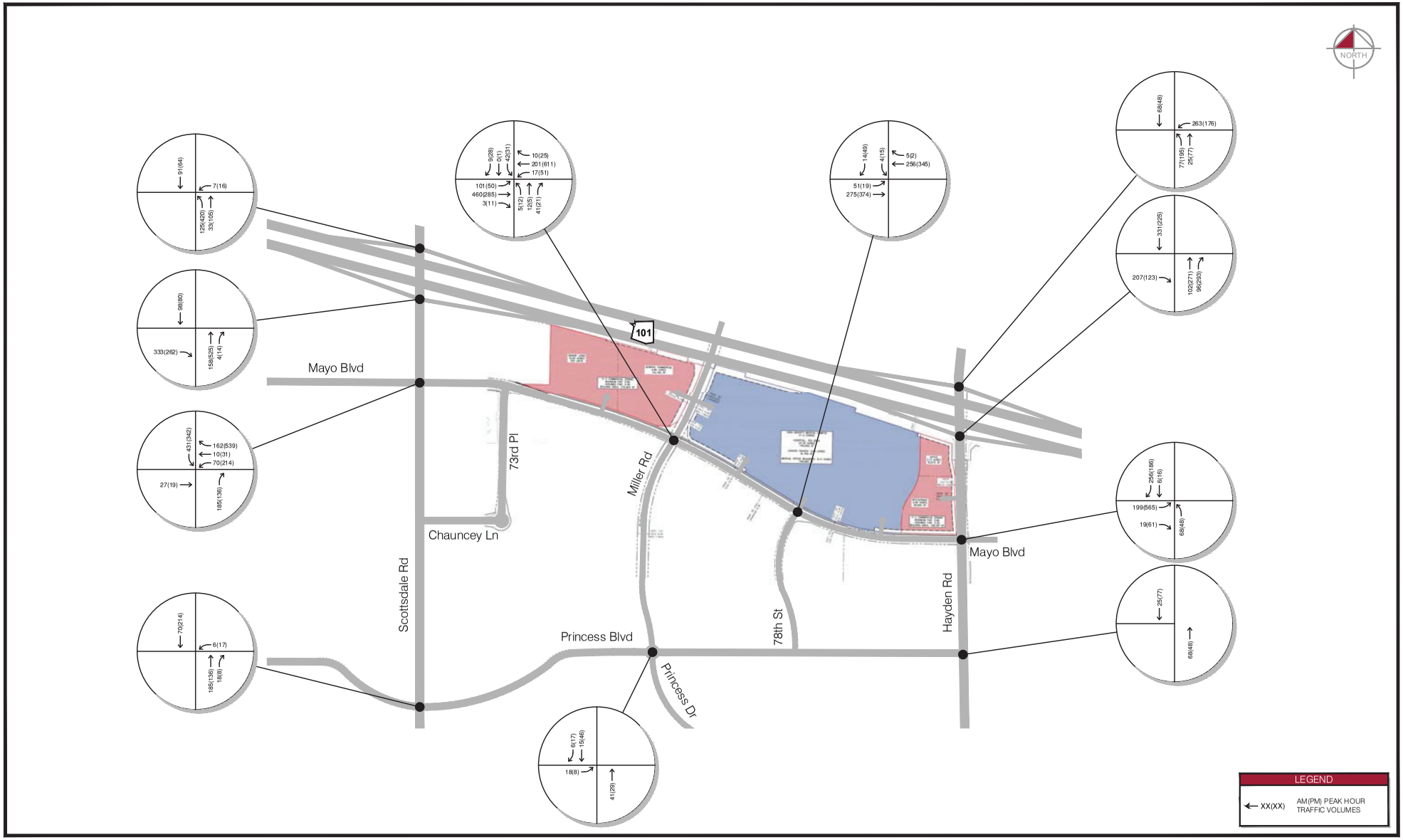
Land Use	ITE Code	Quantity	Units	Daily Total	AM Peak			PM Peak		
					In	Out	Total	In	Out	Total
Senior Adult Housing-Multifamily	252	250	DUs	810	17	33	50	35	28	63
Hospital	610	352	Beds	7,858	454	176	630	196	399	595
General Office Building	710	32,760	SF	440	56	8	64	11	55	66
Medical-Dental Office Building	720	276,100	SF	9,700	607	142	749	209	626	835
Shopping Plaza (40-150k)	821	144,780	SF	9,776	155	95	250	368	383	751
High-Turnover (Sit-Down) Restaurant	932	30,000	SF	3,216	158	129	287	166	106	272
Trips Subtotal				**31,800**	**1,447**	**583**	**2,030**	**985**	**1,596**	**2,581**
Internal Capture Trip Reductions				-946	-76	-76	-152	-6	-6	-12
Total Trips				**30,854**	**1,371**	**507**	**1,878**	**979**	**1,591**	**2,570**

The proposed development is expected to generate 31,800 daily trips, with 2,030 trips occurring in the AM peak hour and 2,581 trips occurring in the PM peak hour. Owing to the proposed land uses, trip reductions are anticipated and justified below.

5.1.2 TRIP REDUCTIONS

It is reasonable to expect that internal trip interaction will result considering the hospital, medical office building, office building, and restaurant land uses. To account for this interaction, the methodology for estimating internally captured trips described in the *ITE Trip Generation Handbook, 3rd Edition* was used. The worksheets calculating internal capture using the ITE method and the resulting internal trip generation are shown in the **Appendix**. Interaction is also anticipated with the retail and senior adult residential uses; however, reductions were not considered for those uses to remain conservative since the uses are anticipated to be located on the west side of Miller Road.

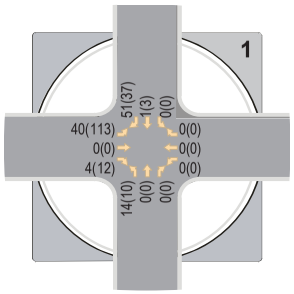
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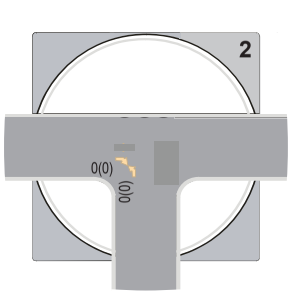
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Figure 5
Site Traffic Assignment

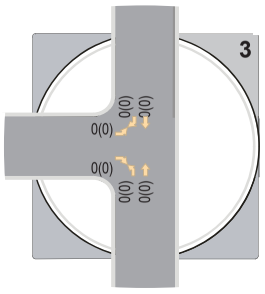
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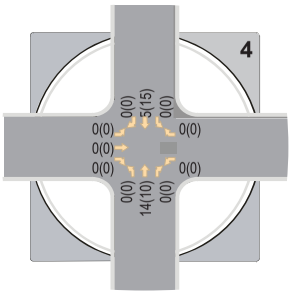
Hayden Rd & Mayo Blvd/Axon Wy



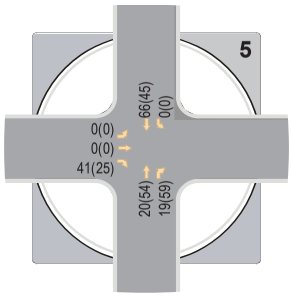
82nd St & Axon Wy



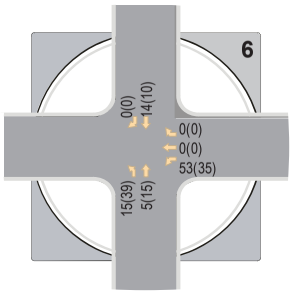
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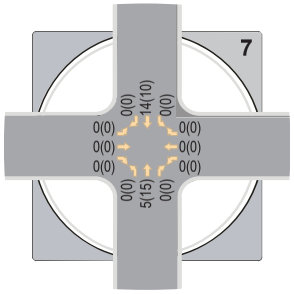
Hayden Rd & Princess Dr



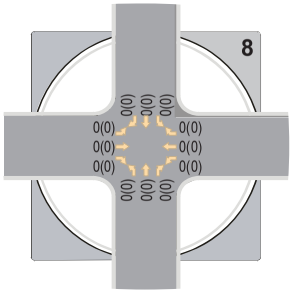
Hayden Rd & Loop 101 EB Ramps



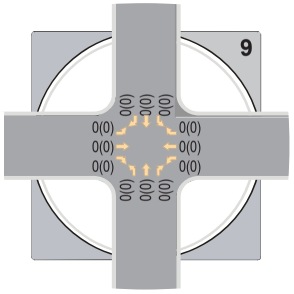
Hayden Rd & Loop 101 WB Ramps



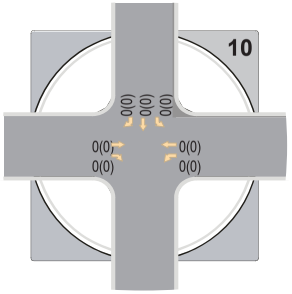
Hayden Rd & Legacy Blvd



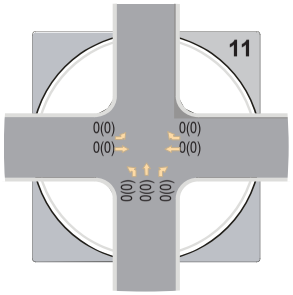
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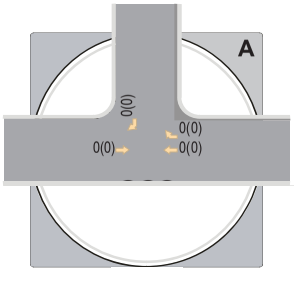
Perimeter Dr & Princess Dr



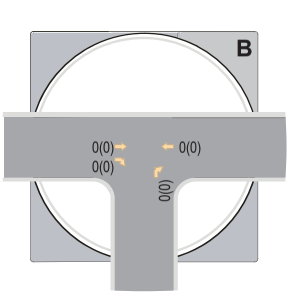
Loop 101 SB Ramps @ Princess Dr/Pima Rd



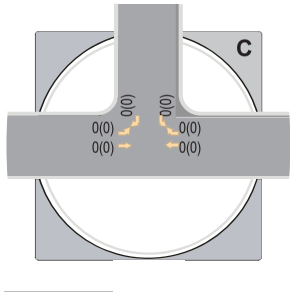
Loop 101 NB Ramps @ Princess Dr/Pima Rd



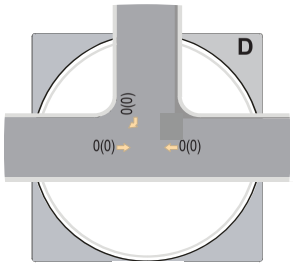
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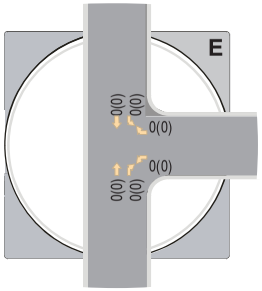
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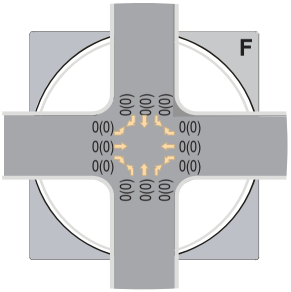
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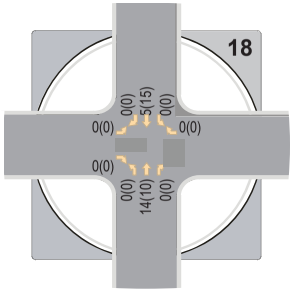
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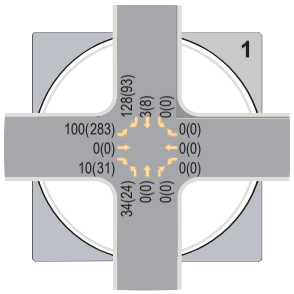
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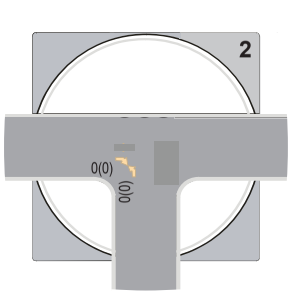
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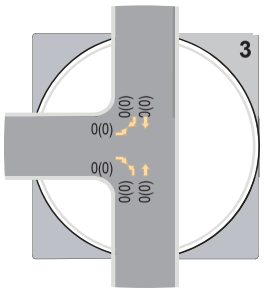
Hayden Rd & Union Hills/Mayo Blvd



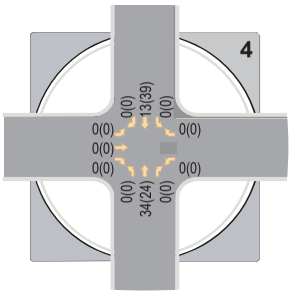
Hayden Rd & Mayo Blvd/Axon Wy



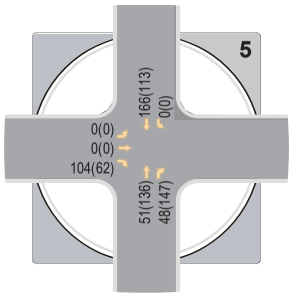
82nd St & Axon Wy



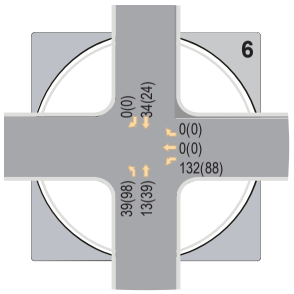
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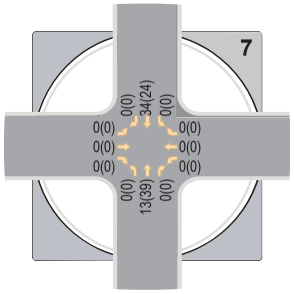
Hayden Rd & Princess Dr



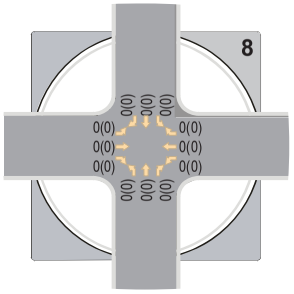
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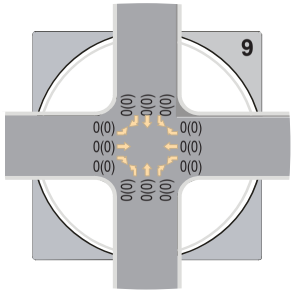
Hayden Rd & Loop 101 WB Ramps



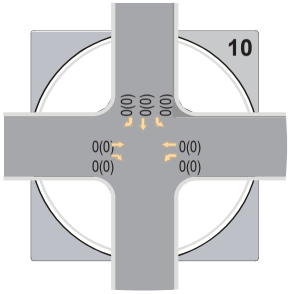
Hayden Rd & Legacy Blvd



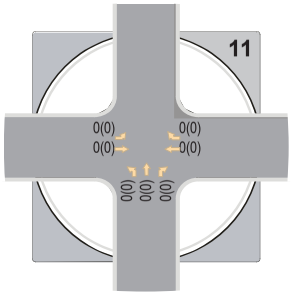
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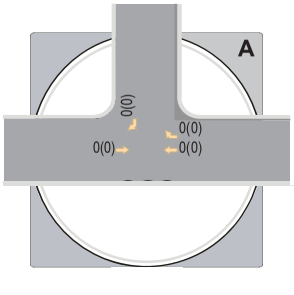
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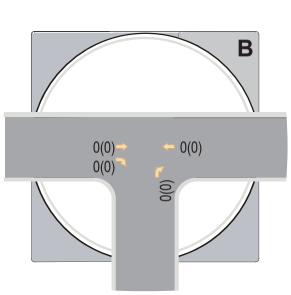
Loop 101 SB Ramps @ Princess Dr/Pima Rd



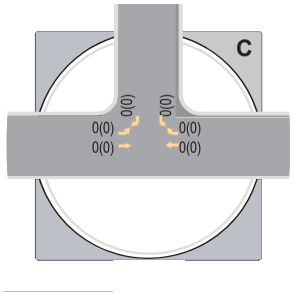
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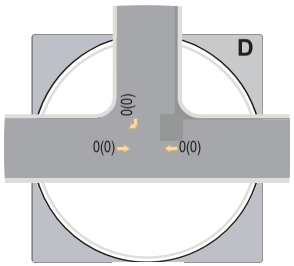
Access A & Axon Wy



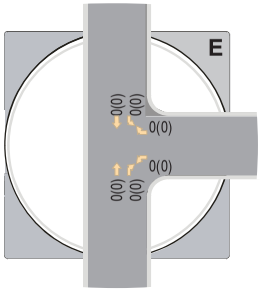
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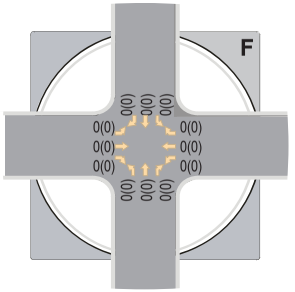
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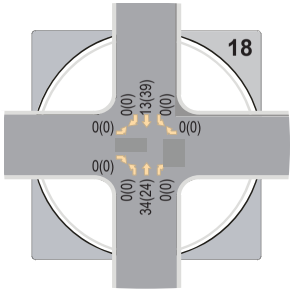
Access D & Axon Wy



Axon Wy & Access E



Axon Wy & Access F



Hayden Rd & Union Hills/Mayo Blvd

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CivTech

Boulevard as a four-lane road in this area. For the purposes of this Report, the driveways are assumed to have a speed limit of 25 mph with two-lane roads at the driveway entrances.

Traffic Volumes and Conditions

The anticipated 2040 traffic volumes for this area were obtained and adjusted by Kimley Horn from the 2035 MAG model as described in the Kimley Horn TIMA (see **Appendix E**). These volumes were combined with the trips generated by the surrounding developments and were provided to Dibble. The combined volumes are used as the background traffic in this Report.

Transit Service

There are existing bus services along Mayo Boulevard to the west of this site, along Scottsdale Road, and along Bell Road south of this site. The closest bus stop is located at Scottsdale Road & Mayo Boulevard about 2/3 of a mile away from this site. There are no plans at this time to extend the bus route along Mayo Boulevard according to the City of Scottsdale Transportation Master Plan, 2008.

IV. PROJECTED TRAFFIC

A. Site Traffic

Trip Generation

The trip generation for this project was calculated using the ITE Trip Generation Manual, 11th edition. These values are for the typical peak hour times of the adjacent street (between 7:00 and 9:00 for the morning peak hour and between 4:00 and 6:00 for the afternoon peak hour). The medical-dental office building land use code was used for the trip generation calculations since it seems to best align with the proposed development. This corresponds with land use 720.

The trips generated by the MOB+ development is shown in **Table 2**. The total trips generated are slightly less than the trips generated in the Kimley Horn TIMA. Kimley Horn used planning level numbers prior to having a developed site plan for the development to calculate the trip generation numbers.

Table 2 –Trip Generation

General Suburban - Fitted Curve												
LUC	Description	Units	Quant	Weekday			AM Peak			PM Peak		
				Total	Ingress	Egress	Total	Ingress	Egress	Total	Ingress	Egress
720	Medical-Dental Office Building	1000 Sq. Ft. GFA	168.2	5858	2929	2929	456	369	87	506	126	380

Trip Distribution

The trip distribution was assessed based on the surrounding population within a 5-10 mile radius. It is assumed that most people will attempt to exit the same way they had entered with minor changes due to limited access driveways. When reviewing the surrounding street network, the main freeway used to access the study area is the Loop 101 with the closest exit ramps located both east and west of the site at Hayden Road and Scottsdale Road. The main arterials and collectors are Scottsdale Road, Hayden Road, and Mayo Boulevard. To access the site, the traffic will either enter from Miller Road, Mayo Boulevard, or Hayden Road. The trip distribution is summarized in **Figure 4**.

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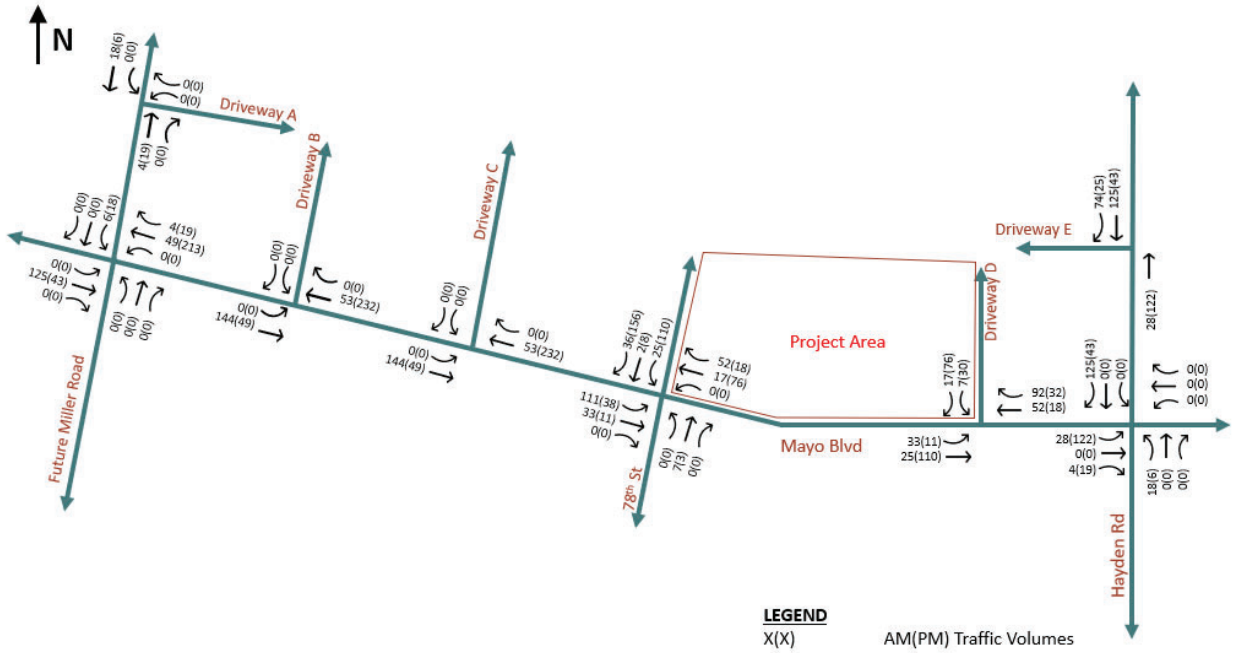


Figure 5 – Trip Assignment

B. Background Traffic

Method of Projections

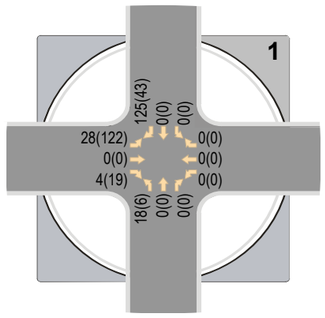
There are two horizon years projected for the purposes of this Report. The first is the anticipated opening year of 2026 for the MOB+. The traffic studies for the surrounding developments from the Kimley Horn TIMA indicate that the surrounding developments are anticipated to be completed after the 2026 opening year. To account for other potential growth in the area, a 0.5% growth rate was applied to the 2022 collected counts for 4 years to determine the background traffic for 2026.

The second horizon year is for 2040 with the full build out of the Overall Site. The anticipated 2040 traffic volumes for this area were obtained and adjusted by Kimley Horn from the 2035 MAG model as described in Kimley Horn TIMA. These volumes were combined with the trips generated by the surrounding developments. These combined volumes are used as the background traffic in this Report. Note that the trips generated by the parcels to the east of this site along Hayden Road were assigned to use two of the driveways studied in this Report as well as a driveway not studied in this Report.

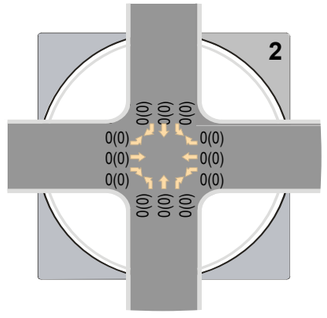
Estimated Volumes

Figure 6, **Figure 7** and **Figure 8** show the calculated background traffic volumes used for the anticipated Opening Day and for the Future (2040) analysis with and without the Axon development. This is when all four phases of the Overall Site are anticipated to be completed.

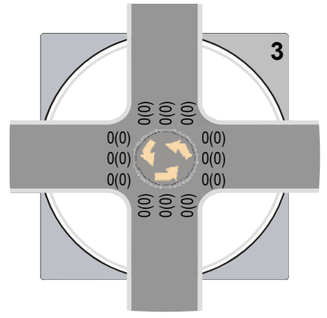
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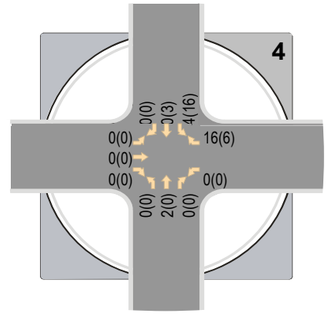
Hayden Rd & Mayo Blvd/Axon Wy



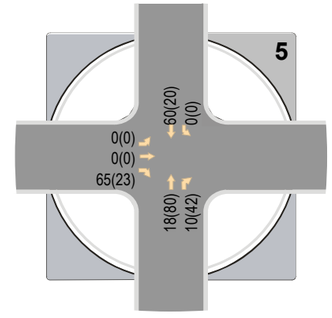
82nd St & Axon Wy



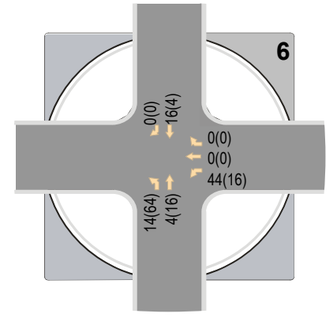
Perimeter Dr & Axon Wy



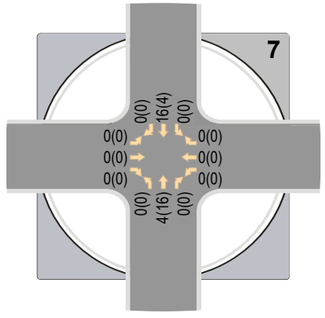
Hayden Rd & Princess Dr



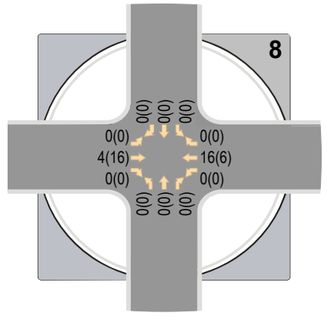
Hayden Rd & Loop 101 EB Ramps



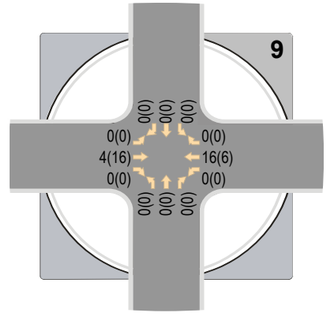
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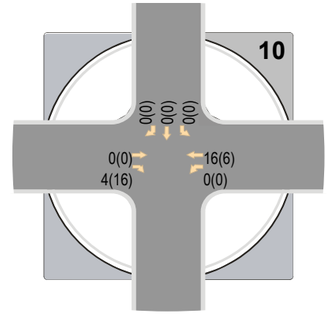
Hayden Rd & Legacy Blvd



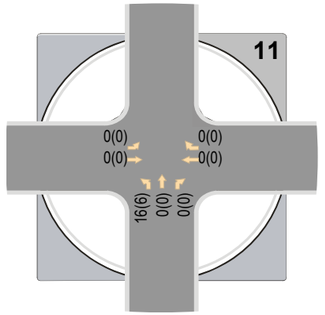
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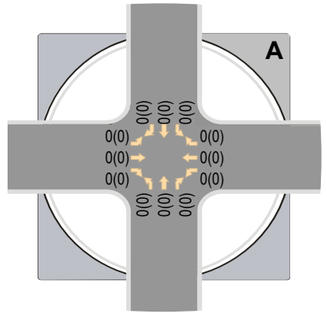
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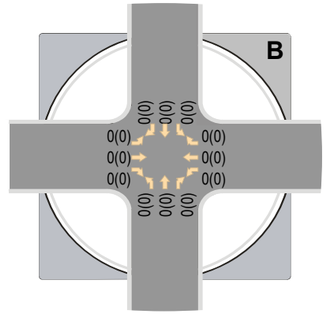
Loop 101 SB Ramps @ Princess Dr/Pima Rd



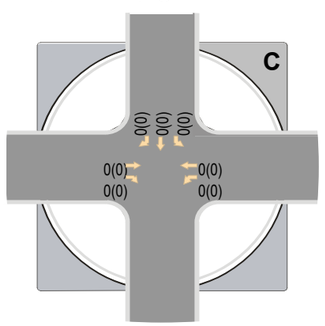
Loop 101 NB Ramps @ Princess Dr/Pima Rd



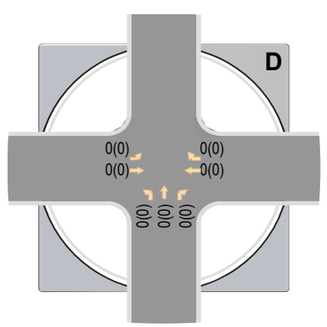
Access A & Axon Wy



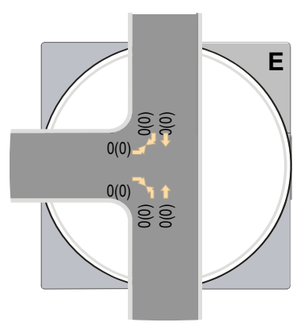
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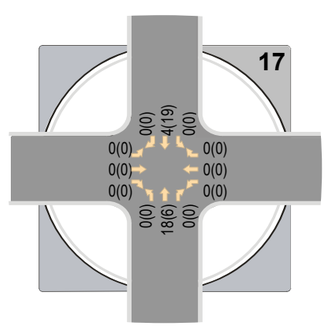
Access C & Axon Wy



Axon Wy & Access D



Axon Wy & Access E



Hayden Rd & Union Hills/Mayo Blvd

APPENDIX H

2025 PEAK HOUR ANALYSIS

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Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	167	7	4	0	30	50	426	28	169	861	123
Future Volume (vph)	167	7	4	0	30	50	426	28	169	861	123
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8			2			6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	4	4	8	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	44.0	44.0	44.0	44.0	44.0	76.0	76.0	76.0	76.0	76.0	76.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%	63.3%	63.3%	63.3%	63.3%	63.3%	63.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	Min	Min	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 82 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 1: Hayden Rd & Mayo Blvd/Axon Way

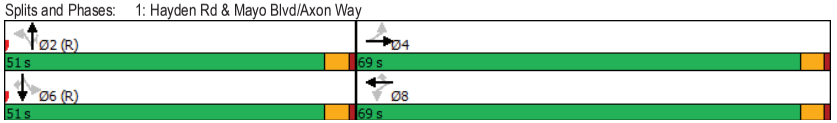


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	234	1	31	4	237	73	976	10	86	601	161
Future Volume (vph)	234	1	31	4	237	73	976	10	86	601	161
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8			2			6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	4	4	8	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	69.0	69.0	69.0	69.0	69.0	51.0	51.0	51.0	51.0	51.0	51.0
Total Split (%)	57.5%	57.5%	57.5%	57.5%	57.5%	42.5%	42.5%	42.5%	42.5%	42.5%	42.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	Min	Min	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 84 (70%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 1: Hayden Rd & Mayo Blvd/Axon Way



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	167	7	64	4	0	30	50	426	28	169	861	123
Future Volume (veh/h)	167	7	64	4	0	30	50	426	28	169	861	123
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	186	8	53	4	0	16	56	473	15	188	957	69
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	275	33	216	222	0	487	438	2741	1223	738	2741	1223
Arrive On Green	0.15	0.15	0.15	0.15	0.00	0.15	0.77	0.77	0.77	0.77	0.77	0.77
Sat Flow, veh/h	1397	212	1405	1341	0	3170	550	3554	1585	921	3554	1585
Grp Volume(v), veh/h	186	0	61	4	0	16	56	473	15	188	957	69
Grp Sat Flow(s),veh/h/ln	1397	0	1617	1341	0	1585	550	1777	1585	921	1777	1585
Q Serve(g_s), s	15.6	0.0	4.0	0.3	0.0	0.5	4.3	4.2	0.3	8.1	10.1	1.2
Cycle Q Clear(g_c), s	15.6	0.0	4.0	4.3	0.0	0.5	14.4	4.2	0.3	12.3	10.1	1.2
Prop In Lane	1.00		0.87	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	275	0	249	222	0	487	438	2741	1223	738	2741	1223
V/C Ratio(X)	0.68	0.00	0.25	0.02	0.00	0.03	0.13	0.17	0.01	0.25	0.35	0.06
Avail Cap(c_a), veh/h	520	0	532	457	0	1043	438	2741	1223	738	2741	1223
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.6	0.0	44.7	46.6	0.0	43.2	6.5	3.6	3.2	5.2	4.3	3.3
Incr Delay (d2), s/veh	2.9	0.0	0.5	0.0	0.0	0.0	0.6	0.1	0.0	0.8	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.6	0.0	3.0	0.2	0.0	0.4	1.0	2.4	0.1	2.8	5.8	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.5	0.0	45.2	46.6	0.0	43.2	7.1	3.8	3.2	6.1	4.6	3.4
LnGrp LOS	D	A	D	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		247			20			544			1214	
Approach Delay, s/veh		50.7			43.9			4.1			4.8	
Approach LOS		D			D			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		97.1		22.9		97.1		22.9				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		71.5		39.5		71.5		39.5				
Max Q Clear Time (g_c+I1), s		16.4		17.6		14.3		6.3				
Green Ext Time (p_c), s		4.5		0.8		11.1		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			10.6									
HCM 6th LOS			B									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	234	1	100	31	4	237	73	976	10	86	601	161
Future Volume (veh/h)	234	1	100	31	4	237	73	976	10	86	601	161
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	260	1	83	34	0	135	81	1084	9	96	668	90
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	349	4	361	306	0	730	501	2469	1101	352	2469	1101
Arrive On Green	0.23	0.23	0.23	0.23	0.00	0.23	0.69	0.69	0.69	0.69	0.69	0.69
Sat Flow, veh/h	1254	19	1569	1314	0	3170	707	3554	1585	520	3554	1585
Grp Volume(v), veh/h	260	0	84	34	0	135	81	1084	9	96	668	90
Grp Sat Flow(s),veh/h/ln	1254	0	1588	1314	0	1585	707	1777	1585	520	1777	1585
Q Serve(g_s), s	24.1	0.0	5.2	2.6	0.0	4.1	5.8	16.1	0.2	11.9	8.5	2.2
Cycle Q Clear(g_c), s	24.1	0.0	5.2	7.7	0.0	4.1	14.3	16.1	0.2	28.0	8.5	2.2
Prop In Lane	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	349	0	366	306	0	730	501	2469	1101	352	2469	1101
V/C Ratio(X)	0.75	0.00	0.23	0.11	0.00	0.18	0.16	0.44	0.01	0.27	0.27	0.08
Avail Cap(c_a), veh/h	734	0	854	710	0	1704	501	2469	1101	352	2469	1101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.8	0.0	37.5	40.7	0.0	37.1	9.6	8.1	5.6	14.2	6.9	5.9
Incr Delay (d2), s/veh	3.2	0.0	0.3	0.2	0.0	0.1	0.7	0.6	0.0	1.9	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.3	0.0	3.7	1.5	0.0	2.9	1.8	9.9	0.1	2.8	5.6	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.0	0.0	37.8	40.8	0.0	37.2	10.3	8.6	5.6	16.1	7.2	6.1
LnGrp LOS	D	A	D	D	A	D	B	A	A	B	A	A
Approach Vol, veh/h		344			169			1174			854	
Approach Delay, s/veh		45.5			38.0			8.7			8.1	
Approach LOS		D			D			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		87.9		32.1		87.9		32.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		46.5		64.5		46.5		64.5				
Max Q Clear Time (g_c+I1), s		18.1		26.1		30.0		9.7				
Green Ext Time (p_c), s		10.2		1.5		5.6		0.7				
Intersection Summary												
HCM 6th Ctrl Delay			15.4									
HCM 6th LOS			B									

Notes

User approved volume balancing among the lanes for turning movement.

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Intersection	
Intersection Delay, s/veh	3.2
Intersection LOS	A

Approach	EB	NB	SB
Entry Lanes	2	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	123	91	6
Demand Flow Rate, veh/h	125	93	6
Vehicles Circulating, veh/h	6	10	41
Vehicles Exiting, veh/h	41	121	62
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.2	3.2	2.8
Approach LOS	A	A	A

Lane	Left	Right	Left	Left
Designated Moves	L	TR	LT	TR
Assumed Moves	L	TR	LT	TR
RT Channelized				
Lane Util	0.080	0.920	1.000	1.000
Follow-Up Headway, s	2.535	2.535	2.609	2.609
Critical Headway, s	4.544	4.544	4.976	4.976
Entry Flow, veh/h	10	115	93	6
Cap Entry Lane, veh/h	1412	1412	1366	1323
Entry HV Adj Factor	1.000	0.983	0.978	0.980
Flow Entry, veh/h	10	113	91	6
Cap Entry, veh/h	1412	1388	1336	1297
V/C Ratio	0.007	0.081	0.068	0.005
Control Delay, s/veh	2.6	3.2	3.2	2.8
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0

Intersection	
Intersection Delay, s/veh	3.8
Intersection LOS	A

Approach	EB	NB	SB
Entry Lanes	2	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	126	230	37
Demand Flow Rate, veh/h	129	235	38
Vehicles Circulating, veh/h	32	0	232
Vehicles Exiting, veh/h	238	161	3
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.4	4.1	3.7
Approach LOS	A	A	A

Lane	Left	Right	Left	Left
Designated Moves	L	TR	LT	TR
Assumed Moves	L	TR	LT	TR
RT Channelized				
Lane Util	0.000	1.000	1.000	1.000
Follow-Up Headway, s	2.535	2.535	2.609	2.609
Critical Headway, s	4.544	4.544	4.976	4.976
Entry Flow, veh/h	0	129	235	38
Cap Entry Lane, veh/h	1379	1379	1380	1089
Entry HV Adj Factor	1.000	0.977	0.978	0.983
Flow Entry, veh/h	0	126	230	37
Cap Entry, veh/h	1379	1347	1350	1071
V/C Ratio	0.000	0.094	0.170	0.035
Control Delay, s/veh	2.6	3.4	4.1	3.7
LOS	A	A	A	A
95th %tile Queue, veh	0	0	1	0

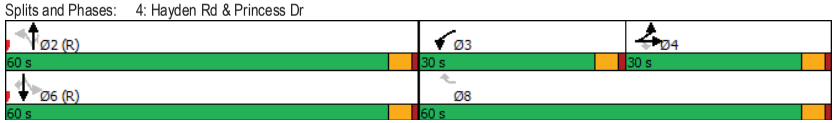
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Lane Group	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	35	60	181	48	34	441	143	124	738	50
Future Volume (vph)	35	60	181	48	34	441	143	124	738	50
Turn Type	NA	Perm	Prot	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4		3			2			6	
Permitted Phases		4		8	2		2	6		6
Detector Phase	4	4	3	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	36.5	36.5	36.5	36.5	36.5	36.5
Total Split (s)	30.0	30.0	30.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	25.0%	25.0%	25.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes							
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 4: Hayden Rd & Princess Dr

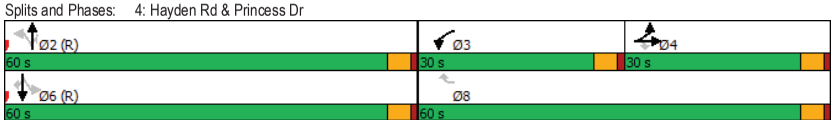


Lane Group	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	30	55	294	180	82	889	135	41	536	61
Future Volume (vph)	30	55	294	180	82	889	135	41	536	61
Turn Type	NA	Perm	Prot	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4		3			2			6	
Permitted Phases		4		8	2		2	6		6
Detector Phase	4	4	3	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	36.5	36.5	36.5	36.5	36.5	36.5
Total Split (s)	30.0	30.0	30.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	25.0%	25.0%	25.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes							
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 4: Hayden Rd & Princess Dr



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	35	60	181	0	48	34	441	143	124	738	50
Future Volume (veh/h)	30	35	60	181	0	48	34	441	143	124	738	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	39	34	201	0	26	38	490	80	138	820	28
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	68	80	128	0	0	0	578	3000	1338	750	3000	1338
Arrive On Green	0.08	0.08	0.08	0.00	0.00	0.00	0.84	0.84	0.84	0.84	0.84	0.84
Sat Flow, veh/h	838	990	1585		0		650	3554	1585	842	3554	1585
Grp Volume(v), veh/h	72	0	34		0.0		38	490	80	138	820	28
Grp Sat Flow(s),veh/h/ln	1828	0	1585				650	1777	1585	842	1777	1585
Q Serve(g_s), s	4.5	0.0	2.4				1.5	3.0	1.0	4.3	5.6	0.3
Cycle Q Clear(g_c), s	4.5	0.0	2.4				7.1	3.0	1.0	7.2	5.6	0.3
Prop In Lane	0.46		1.00				1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	148	0	128				578	3000	1338	750	3000	1338
V/C Ratio(X)	0.49	0.00	0.27				0.07	0.16	0.06	0.18	0.27	0.02
Avail Cap(c_a), veh/h	389	0	337				578	3000	1338	750	3000	1338
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.8	0.0	51.8				2.6	1.7	1.5	2.3	1.9	1.5
Incr Delay (d2), s/veh	2.5	0.0	1.1				0.2	0.1	0.1	0.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.9	0.0	1.8				0.3	1.3	0.4	1.1	2.4	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.2	0.0	52.9				2.8	1.8	1.6	2.9	2.1	1.5
LnGrp LOS	E	A	D				A	A	A	A	A	A
Approach Vol, veh/h		106						608			986	
Approach Delay, s/veh		54.5						1.8			2.2	
Approach LOS		D						A			A	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		105.8		14.2		105.8						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		55.5		25.5		55.5						
Max Q Clear Time (g_c+I1), s		9.1		6.5		9.2						
Green Ext Time (p_c), s		4.4		0.4		8.5						

Intersection Summary												
HCM 6th Ctrl Delay			5.3									
HCM 6th LOS			A									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	30	55	294	0	180	82	889	135	41	536	61
Future Volume (veh/h)	24	30	55	294	0	180	82	889	135	41	536	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	27	33	31	327	0	100	91	988	76	46	596	35
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	65	80	126	0	0	0	708	3005	1340	477	3005	1340
Arrive On Green	0.08	0.08	0.08	0.00	0.00	0.00	0.85	0.85	0.85	0.85	0.85	0.85
Sat Flow, veh/h	823	1006	1585		0		796	3554	1585	530	3554	1585
Grp Volume(v), veh/h	60	0	31		0.0		91	988	76	46	596	35
Grp Sat Flow(s),veh/h/ln	1829	0	1585				796	1777	1585	530	1777	1585
Q Serve(g_s), s	3.7	0.0	2.2				2.9	7.1	0.9	2.4	3.7	0.4
Cycle Q Clear(g_c), s	3.7	0.0	2.2				6.6	7.1	0.9	9.6	3.7	0.4
Prop In Lane	0.45		1.00				1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	145	0	126				708	3005	1340	477	3005	1340
V/C Ratio(X)	0.41	0.00	0.25				0.13	0.33	0.06	0.10	0.20	0.03
Avail Cap(c_a), veh/h	389	0	337				708	3005	1340	477	3005	1340
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.6	0.0	51.9				2.3	2.0	1.5	3.0	1.7	1.5
Incr Delay (d2), s/veh	1.9	0.0	1.0				0.4	0.3	0.1	0.4	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.2	0.0	1.6				0.7	3.0	0.4	0.5	1.6	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.5	0.0	52.9				2.7	2.3	1.6	3.4	1.9	1.5
LnGrp LOS	D	A	D				A	A	A	A	A	A
Approach Vol, veh/h		91						1155			677	
Approach Delay, s/veh		53.9						2.3			2.0	
Approach LOS		D						A			A	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		106.0		14.0		106.0						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		55.5		25.5		55.5						
Max Q Clear Time (g_c+I1), s		9.1		5.7		11.6						
Green Ext Time (p_c), s		10.6		0.3		5.5						

Intersection Summary												
HCM 6th Ctrl Delay			4.6									
HCM 6th LOS			A									

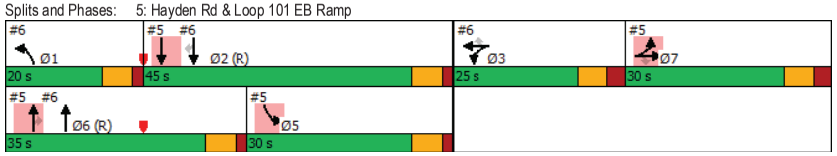
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Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	656	2	646	462	146	473	567		
Future Volume (vph)	656	2	646	462	146	473	567		
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA		
Protected Phases	7	7		6		5	2	1	3
Permitted Phases			7		6				
Detector Phase	7	7	7	6	6	5	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	16.0	12.0	5.0	7.0
Minimum Split (s)	29.0	29.0	29.0	26.0	26.0	22.0	26.0	11.0	24.0
Total Split (s)	30.0	30.0	30.0	35.0	35.0	30.0	45.0	20.0	25.0
Total Split (%)	25.0%	25.0%	25.0%	29.2%	29.2%	25.0%	37.5%	17%	21%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	None	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated

Splits and Phases: 5: Hayden Rd & Loop 101 EB Ramp

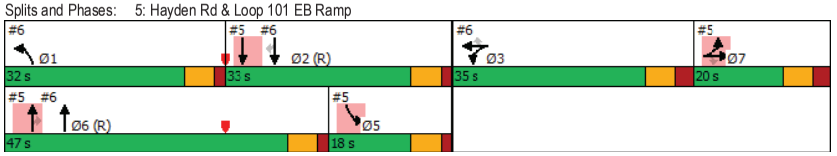


Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	417	5	300	1281	170	486	581		
Future Volume (vph)	417	5	300	1281	170	486	581		
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA		
Protected Phases	7	7		6		5	2	1	3
Permitted Phases			7		6				
Detector Phase	7	7	7	6	6	5	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	12.0	5.0	7.0
Minimum Split (s)	19.0	19.0	19.0	26.0	26.0	18.0	26.0	11.0	34.0
Total Split (s)	20.0	20.0	20.0	47.0	47.0	18.0	33.0	32.0	35.0
Total Split (%)	16.7%	16.7%	16.7%	39.2%	39.2%	15.0%	27.5%	27%	29%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	None	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated

Splits and Phases: 5: Hayden Rd & Loop 101 EB Ramp



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	656	2	646	0	0	0	0	462	146	473	567	0
Future Volume (vph)	656	2	646	0	0	0	0	462	146	473	567	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.92	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1525	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1525	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.85	0.90
Adj. Flow (vph)	729	2	718	0	0	0	0	544	172	556	667	0
RTOR Reduction (vph)	0	34	368	0	0	0	0	0	130	0	0	0
Lane Group Flow (vph)	503	452	92	0	0	0	0	544	42	556	667	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	23.9	23.9	23.9					29.0	29.0	24.0	39.0	
Effective Green, g (s)	23.9	23.9	23.9					29.0	29.0	24.0	39.0	
Actuated g/C Ratio	0.20	0.20	0.20					0.24	0.24	0.20	0.32	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	334	303	299					1228	382	686	1150	
v/s Ratio Prot	c0.30	0.30						c0.11		c0.16	c0.19	
v/s Ratio Perm			0.06						0.03			
v/c Ratio	1.51	1.49	0.31					0.44	0.11	0.81	0.58	
Uniform Delay, d1	48.0	48.0	41.0					38.6	35.4	45.8	33.7	
Progression Factor	1.00	1.00	1.00					0.78	0.95	0.41	0.31	
Incremental Delay, d2	242.7	238.6	0.6					1.1	0.6	6.3	1.8	
Delay (s)	290.8	286.6	41.6					31.1	34.2	25.0	12.2	
Level of Service	F	F	D					C	C	C	B	
Approach Delay (s)		210.3			0.0			31.8			18.0	
Approach LOS		F			A			C			B	

Intersection Summary				
HCM 2000 Control Delay	103.2	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	64.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	417	5	300	0	0	0	0	1281	170	486	581	0
Future Volume (vph)	417	5	300	0	0	0	0	1281	170	486	581	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.96	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.97	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1567	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.97	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1567	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.90	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.90
Adj. Flow (vph)	463	6	333	0	0	0	0	1423	200	572	684	0
RTOR Reduction (vph)	0	12	211	0	0	0	0	0	113	0	0	0
Lane Group Flow (vph)	278	259	42	0	0	0	0	1423	87	572	684	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	19.7	19.7	19.7					41.0	41.0	12.0	27.0	
Effective Green, g (s)	19.7	19.7	19.7					41.0	41.0	12.0	27.0	
Actuated g/C Ratio	0.16	0.16	0.16					0.34	0.34	0.10	0.22	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)	275	257	246					1737	540	343	796	
v/s Ratio Prot	0.17	c0.17						c0.28		c0.17	c0.19	
v/s Ratio Perm			0.03						0.06			
v/c Ratio	1.01	1.01	0.17					0.82	0.16	1.67	0.86	
Uniform Delay, d1	50.1	50.1	43.1					36.1	27.5	54.0	44.7	
Progression Factor	1.00	1.00	1.00					0.89	0.73	0.53	0.52	
Incremental Delay, d2	57.1	58.4	0.3					4.2	0.6	309.9	9.0	
Delay (s)	107.2	108.6	43.4					36.1	20.7	338.7	32.0	
Level of Service	F	F	D					D	C	F	C	
Approach Delay (s)		87.6			0.0			34.2			171.7	
Approach LOS		F			A			C			F	

Intersection Summary				
HCM 2000 Control Delay	92.8	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	92.6%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

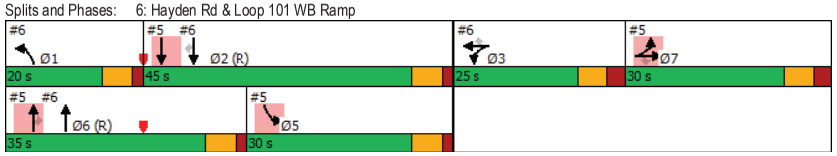
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Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	170	52	537	302	818	862	310		
Future Volume (vph)	170	52	537	302	818	862	310		
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm		
Protected Phases	3	3		1	6	2		5	7
Permitted Phases			3				2		
Detector Phase	3	3	3	1	6	2	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	5.0	12.0	12.0	12.0	16.0	7.0
Minimum Split (s)	24.0	24.0	24.0	11.0	26.0	26.0	26.0	22.0	29.0
Total Split (s)	25.0	25.0	25.0	20.0	35.0	45.0	45.0	30.0	30.0
Total Split (%)	20.8%	20.8%	20.8%	16.7%	29.2%	37.5%	37.5%	25%	25%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated

Splits and Phases: 6: Hayden Rd & Loop 101 WB Ramp

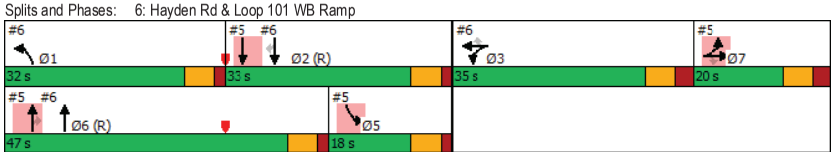


Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	201	42	465	745	953	864	461		
Future Volume (vph)	201	42	465	745	953	864	461		
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm		
Protected Phases	3	3		1	6	2		5	7
Permitted Phases			3				2		
Detector Phase	3	3	3	1	6	2	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	5.0	12.0	12.0	12.0	12.0	7.0
Minimum Split (s)	34.0	34.0	34.0	11.0	26.0	26.0	26.0	18.0	19.0
Total Split (s)	35.0	35.0	35.0	32.0	47.0	33.0	33.0	18.0	20.0
Total Split (%)	29.2%	29.2%	29.2%	26.7%	39.2%	27.5%	27.5%	15%	17%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated

Splits and Phases: 6: Hayden Rd & Loop 101 WB Ramp



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	170	52	537	302	818	0	0	862	310
Future Volume (vph)	0	0	0	170	52	537	302	818	0	0	862	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.88	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2822	1441	1770	3539			6408	1583
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1610	2822	1441	1770	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	200	65	597	336	909	0	0	1014	344
RTOR Reduction (vph)	0	0	0	0	256	256	0	0	0	0	0	232
Lane Group Flow (vph)	0	0	0	180	128	42	336	909	0	0	1014	112
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				17.1	17.1	17.1	14.0	29.0			39.0	39.0
Effective Green, g (s)				17.1	17.1	17.1	14.0	29.0			39.0	39.0
Actuated g/C Ratio				0.14	0.14	0.14	0.12	0.24			0.32	0.32
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				229	402	205	206	855			2082	514
v/s Ratio Prot				c0.11	0.05		c0.19	c0.26			c0.16	
v/s Ratio Perm						0.03						0.07
v/c Ratio				0.79	0.32	0.21	1.63	1.06			0.49	0.22
Uniform Delay, d1				49.7	46.2	45.5	53.0	45.5			32.5	29.4
Progression Factor				1.00	1.00	1.00	0.75	0.34			1.37	7.10
Incremental Delay, d2				16.1	0.5	0.5	286.0	31.3			0.8	0.9
Delay (s)				65.8	46.7	46.0	325.8	46.9			45.3	209.7
Level of Service				E	D	D	F	D			D	F
Approach Delay (s)		0.0			50.4			122.2			87.0	
Approach LOS		A			D			F			F	

Intersection Summary				
HCM 2000 Control Delay	90.5	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	64.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	201	42	465	745	953	0	0	864	461
Future Volume (vph)	0	0	0	201	42	465	745	953	0	0	864	461
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.89	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2837	1441	1770	3539			6408	1583
Flt Permitted				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1610	2837	1441	1770	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	236	52	517	828	1059	0	0	1016	512
RTOR Reduction (vph)	0	0	0	0	213	212	0	0	0	0	0	397
Lane Group Flow (vph)	0	0	0	191	144	46	828	1059	0	0	1016	115
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				21.3	21.3	21.3	26.0	41.0			27.0	27.0
Effective Green, g (s)				21.3	21.3	21.3	26.0	41.0			27.0	27.0
Actuated g/C Ratio				0.18	0.18	0.18	0.22	0.34			0.22	0.22
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				285	503	255	383	1209			1441	356
v/s Ratio Prot				c0.12	0.05		c0.47	c0.30			c0.16	
v/s Ratio Perm						0.03						0.07
v/c Ratio				0.67	0.29	0.18	2.16	0.88			0.71	0.32
Uniform Delay, d1				46.1	42.8	41.9	47.0	37.1			42.8	38.9
Progression Factor				1.00	1.00	1.00	0.88	0.31			1.07	4.99
Incremental Delay, d2				6.1	0.3	0.3	527.0	4.6			2.8	2.3
Delay (s)				52.1	43.1	42.3	568.3	15.9			48.6	196.1
Level of Service				D	D	D	F	B			D	F
Approach Delay (s)		0.0			45.0			258.3			98.0	
Approach LOS		A			D			F			F	

Intersection Summary				
HCM 2000 Control Delay	159.6	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.96			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	92.6%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

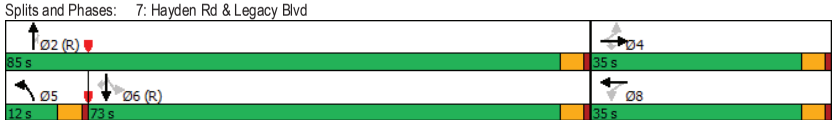
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Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	25	12	97	10	19	107	938	4	1082	36
Future Volume (vph)	25	12	97	10	19	107	938	4	1082	36
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	NA	Perm
Protected Phases		4			8	5	2		6	
Permitted Phases	4		4	8				2		6
Detector Phase	4	4	4	8	8	5	2	2	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	9.5	9.5	9.5	9.5	9.5
Total Split (s)	35.0	35.0	35.0	35.0	35.0	12.0	85.0	85.0	73.0	73.0
Total Split (%)	29.2%	29.2%	29.2%	29.2%	29.2%	10.0%	70.8%	70.8%	60.8%	60.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						Lead			Lag	Lag
Lead-Lag Optimize?						Yes			Yes	Yes
Recall Mode	None	None	None	Max	Max	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 7: Hayden Rd & Legacy Blvd

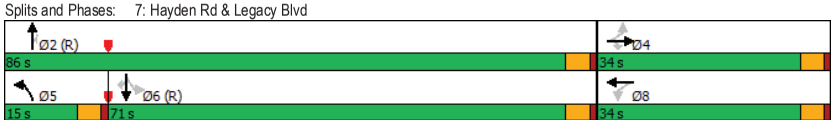


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	70	35	199	8	25	155	1215	6	888	51
Future Volume (vph)	70	35	199	8	25	155	1215	6	888	51
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	NA	Perm
Protected Phases		4			8	5	2		6	
Permitted Phases	4		4	8				2		6
Detector Phase	4	4	4	8	8	5	2	2	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	9.5	9.5	9.5	9.5	9.5
Total Split (s)	34.0	34.0	34.0	34.0	34.0	15.0	86.0	86.0	71.0	71.0
Total Split (%)	28.3%	28.3%	28.3%	28.3%	28.3%	12.5%	71.7%	71.7%	59.2%	59.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						Lead			Lag	Lag
Lead-Lag Optimize?						Yes			Yes	Yes
Recall Mode	None	None	None	Max	Max	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 7: Hayden Rd & Legacy Blvd



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	12	97	10	19	0	107	938	4	0	1082	36
Future Volume (veh/h)	25	12	97	10	19	0	107	938	4	0	1082	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	28	13	55	11	21	0	119	1042	2	0	1202	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	407	903	403	412	903	0	111	2384	1063	60	2915	905
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.00	0.06	0.67	0.67	0.00	0.57	0.57
Sat Flow, veh/h	1391	3554	1585	1401	3647	0	1781	3554	1585	541	5106	1585
Grp Volume(v), veh/h	28	13	55	11	21	0	119	1042	2	0	1202	20
Grp Sat Flow(s),veh/h/ln	1391	1777	1585	1401	1777	0	1781	1777	1585	541	1702	1585
Q Serve(g_s), s	1.8	0.3	3.2	0.7	0.5	0.0	7.5	16.4	0.0	0.0	15.9	0.7
Cycle Q Clear(g_c), s	2.4	0.3	3.2	1.0	0.5	0.0	7.5	16.4	0.0	0.0	15.9	0.7
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	407	903	403	412	903	0	111	2384	1063	60	2915	905
V/C Ratio(X)	0.07	0.01	0.14	0.03	0.02	0.00	1.07	0.44	0.00	0.00	0.41	0.02
Avail Cap(c_a), veh/h	407	903	403	412	903	0	111	2384	1063	60	2915	905
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	34.5	33.5	34.6	33.9	33.6	0.0	56.3	9.2	6.5	0.0	14.5	11.2
Incr Delay (d2), s/veh	0.1	0.0	0.2	0.1	0.0	0.0	105.0	0.6	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	0.3	2.3	0.5	0.4	0.0	11.1	10.2	0.0	0.0	10.1	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.5	33.5	34.7	34.0	33.6	0.0	161.3	9.8	6.5	0.0	14.9	11.2
LnGrp LOS	C	C	C	C	C	A	F	A	A	A	B	B
Approach Vol, veh/h		96			32			1163			1222	
Approach Delay, s/veh		34.5			33.8			25.3			14.8	
Approach LOS		C			C			C			B	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		85.0		35.0	12.0	73.0		35.0				
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		80.5		30.5	7.5	68.5		30.5				
Max Q Clear Time (g_c+I1), s		18.4		5.2	9.5	17.9		3.0				
Green Ext Time (p_c), s		10.2		0.3	0.0	12.1		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			20.7									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	35	199	8	25	0	155	1215	6	0	888	51
Future Volume (veh/h)	70	35	199	8	25	0	155	1215	6	0	888	51
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	78	39	111	9	28	0	172	1350	4	0	987	29
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	391	874	390	385	874	0	156	2414	1077	60	2830	878
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.00	0.09	0.68	0.68	0.00	0.55	0.55
Sat Flow, veh/h	1382	3554	1585	1368	3647	0	1781	3554	1585	404	5106	1585
Grp Volume(v), veh/h	78	39	111	9	28	0	172	1350	4	0	987	29
Grp Sat Flow(s),veh/h/ln	1382	1777	1585	1368	1777	0	1781	1777	1585	404	1702	1585
Q Serve(g_s), s	5.5	1.0	6.8	0.6	0.7	0.0	10.5	23.6	0.1	0.0	12.8	1.0
Cycle Q Clear(g_c), s	6.2	1.0	6.8	1.6	0.7	0.0	10.5	23.6	0.1	0.0	12.8	1.0
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	391	874	390	385	874	0	156	2414	1077	60	2830	878
V/C Ratio(X)	0.20	0.04	0.28	0.02	0.03	0.00	1.10	0.56	0.00	0.00	0.35	0.03
Avail Cap(c_a), veh/h	391	874	390	385	874	0	156	2414	1077	60	2830	878
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	36.7	34.5	36.7	35.1	34.4	0.0	54.8	10.0	6.2	0.0	14.8	12.1
Incr Delay (d2), s/veh	0.2	0.0	0.4	0.1	0.1	0.0	102.5	0.9	0.0	0.0	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.4	0.8	4.9	0.4	0.6	0.0	14.6	13.7	0.1	0.0	8.6	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.0	34.5	37.1	35.2	34.5	0.0	157.3	10.9	6.2	0.0	15.1	12.2
LnGrp LOS	D	C	D	D	C	A	F	B	A	A	B	B
Approach Vol, veh/h		228			37			1526			1016	
Approach Delay, s/veh		36.6			34.7			27.4			15.0	
Approach LOS		D			C			C			B	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		86.0		34.0	15.0	71.0		34.0				
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		81.5		29.5	10.5	66.5		29.5				
Max Q Clear Time (g_c+I1), s		25.6		8.8	12.5	14.8		3.6				
Green Ext Time (p_c), s		15.5		0.7	0.0	9.2		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			23.8									
HCM 6th LOS			C									

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Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	35	488	13	7	255	34	3	0	9	40	2	35
Future Vol, veh/h	35	488	13	7	255	34	3	0	9	40	2	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	85	-	-	105	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	39	542	14	8	283	38	3	0	10	44	2	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	321	0	0	556	0	0	786	964	278	667	952	161
Stage 1	-	-	-	-	-	-	627	627	-	318	318	-
Stage 2	-	-	-	-	-	-	159	337	-	349	634	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1236	-	-	1011	-	-	283	254	719	344	258	855
Stage 1	-	-	-	-	-	-	438	474	-	668	652	-
Stage 2	-	-	-	-	-	-	827	640	-	640	471	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1236	-	-	1011	-	-	260	244	719	329	248	855
Mov Cap-2 Maneuver	-	-	-	-	-	-	260	244	-	329	248	-
Stage 1	-	-	-	-	-	-	424	459	-	647	647	-
Stage 2	-	-	-	-	-	-	780	635	-	611	456	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.2	12.3	13.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	260	719	1236	-	-	1011	-	-	329	755
HCM Lane V/C Ratio	0.013	0.014	0.031	-	-	0.008	-	-	0.135	0.054
HCM Control Delay (s)	19	10.1	8	-	-	8.6	-	-	17.6	10
HCM Lane LOS	C	B	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0	0	0.1	-	-	0	-	-	0.5	0.2

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	262	15	22	596	53	14	1	4	35	3	62
Future Vol, veh/h	69	262	15	22	596	53	14	1	4	35	3	62
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	85	-	-	105	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	77	291	17	24	662	59	16	1	4	39	3	69

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	721	0	0	308	0	0	835	1223	154	1040	1202	361
Stage 1	-	-	-	-	-	-	454	454	-	740	740	-
Stage 2	-	-	-	-	-	-	381	769	-	300	462	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	877	-	-	1249	-	-	260	178	864	185	183	636
Stage 1	-	-	-	-	-	-	555	568	-	375	421	-
Stage 2	-	-	-	-	-	-	613	409	-	684	563	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	877	-	-	1249	-	-	210	159	864	168	164	636
Mov Cap-2 Maneuver	-	-	-	-	-	-	210	159	-	168	164	-
Stage 1	-	-	-	-	-	-	506	518	-	342	413	-
Stage 2	-	-	-	-	-	-	532	401	-	619	513	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.3	20.7	19.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	210	458	877	-	-	1249	-	-	168	561
HCM Lane V/C Ratio	0.074	0.012	0.087	-	-	0.02	-	-	0.231	0.129
HCM Control Delay (s)	23.5	13	9.5	-	-	7.9	-	-	32.8	12.4
HCM Lane LOS	C	B	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	0.2	0	0.3	-	-	0.1	-	-	0.9	0.4

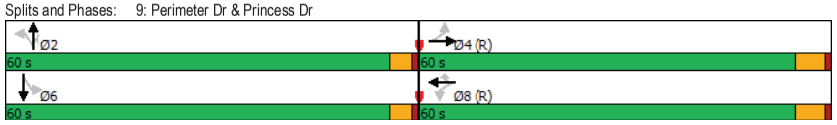
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Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	80	203	294	341	167	101	36	83	22	12
Future Volume (vph)	80	203	294	341	167	101	36	83	22	12
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		4		8			2			6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	2	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	22.5	22.5
Total Split (s)	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.2	3.2	3.2	3.2	3.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 9: Perimeter Dr & Princess Dr

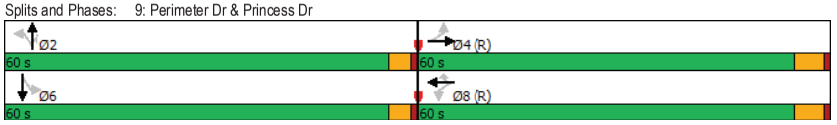


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	74	318	71	259	66	170	20	290	206	25
Future Volume (vph)	74	318	71	259	66	170	20	290	206	25
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		4		8			2			6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	2	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	22.5	22.5
Total Split (s)	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.2	3.2	3.2	3.2	3.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 9: Perimeter Dr & Princess Dr



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	203	82	294	341	167	101	36	83	22	12	13
Future Volume (veh/h)	80	203	82	294	341	167	101	36	83	22	12	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	44	226	68	327	379	94	112	40	46	24	13	11
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	420	1802	510	516	1620	723	699	1652	737	662	903	672
Arrive On Green	0.46	0.46	0.46	0.46	0.46	0.46	0.47	0.47	0.47	0.47	0.47	0.47
Sat Flow, veh/h	921	3954	1119	1085	3554	1585	1387	3554	1585	1311	1942	1445
Grp Volume(v), veh/h	44	193	101	327	379	94	112	40	46	24	12	12
Grp Sat Flow(s),veh/h/ln	921	1702	1669	1085	1777	1585	1387	1777	1585	1311	1777	1610
Q Serve(g_s), s	3.7	3.9	4.2	30.0	7.8	4.1	5.7	0.7	1.9	1.2	0.4	0.5
Cycle Q Clear(g_c), s	11.5	3.9	4.2	34.2	7.8	4.1	6.2	0.7	1.9	1.9	0.4	0.5
Prop In Lane	1.00		0.67	1.00		1.00	1.00		1.00	1.00		0.90
Lane Grp Cap(c), veh/h	420	1552	761	516	1620	723	699	1652	737	662	826	749
V/C Ratio(X)	0.10	0.12	0.13	0.63	0.23	0.13	0.16	0.02	0.06	0.04	0.01	0.02
Avail Cap(c_a), veh/h	420	1552	761	516	1620	723	699	1652	737	662	826	749
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.4	18.8	18.9	28.8	19.9	18.9	19.0	17.4	17.7	17.9	17.3	17.3
Incr Delay (d2), s/veh	0.5	0.2	0.4	5.8	0.3	0.4	0.5	0.0	0.2	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.6	2.9	3.1	13.3	6.0	2.9	3.5	0.6	1.3	0.7	0.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.9	19.0	19.3	34.6	20.2	19.3	19.5	17.4	17.8	18.0	17.3	17.3
LnGrp LOS	C	B	B	C	C	B	B	B	B	B	B	B
Approach Vol, veh/h		338			800			198			48	
Approach Delay, s/veh		19.7			26.0			18.7			17.7	
Approach LOS		B			C			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		60.0		60.0		60.0		60.0				
Change Period (Y+Rc), s		* 4.2		5.3		* 4.2		5.3				
Max Green Setting (Gmax), s		* 56		54.7		* 56		54.7				
Max Q Clear Time (g_c+I1), s		8.2		13.5		3.9		36.2				
Green Ext Time (p_c), s		0.7		2.3		0.2		4.2				
Intersection Summary												
HCM 6th Ctrl Delay			23.1									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	318	31	71	259	66	170	20	290	206	25	100
Future Volume (veh/h)	74	318	31	71	259	66	170	20	290	206	25	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	41	353	26	79	288	36	189	22	161	229	28	83
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	491	2214	161	474	1620	723	618	1652	737	614	826	737
Arrive On Green	0.46	0.46	0.46	0.46	0.46	0.46	0.47	0.47	0.47	0.47	0.47	0.47
Sat Flow, veh/h	1056	4858	353	1004	3554	1585	1282	3554	1585	1201	1777	1585
Grp Volume(v), veh/h	41	246	133	79	288	36	189	22	161	229	28	83
Grp Sat Flow(s),veh/h/ln	1056	1702	1807	1004	1777	1585	1282	1777	1585	1201	1777	1585
Q Serve(g_s), s	2.9	5.1	5.2	6.0	5.8	1.5	11.7	0.4	7.3	15.2	1.0	3.5
Cycle Q Clear(g_c), s	8.6	5.1	5.2	11.2	5.8	1.5	15.3	0.4	7.3	15.6	1.0	3.5
Prop In Lane	1.00		0.20	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	491	1552	824	474	1620	723	618	1652	737	614	826	737
V/C Ratio(X)	0.08	0.16	0.16	0.17	0.18	0.05	0.31	0.01	0.22	0.37	0.03	0.11
Avail Cap(c_a), veh/h	491	1552	824	474	1620	723	618	1652	737	614	826	737
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.9	19.2	19.2	22.5	19.3	18.2	22.4	17.3	19.1	21.5	17.4	18.1
Incr Delay (d2), s/veh	0.3	0.2	0.4	0.8	0.2	0.1	1.3	0.0	0.7	1.7	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	3.7	4.1	2.8	4.4	1.1	6.8	0.3	5.1	8.0	0.8	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.2	19.4	19.6	23.2	19.6	18.3	23.7	17.3	19.8	23.2	17.5	18.4
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		420			403			372			340	
Approach Delay, s/veh		19.7			20.2			21.6			21.6	
Approach LOS		B			C			C			C	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		60.0		60.0		60.0		60.0				
Change Period (Y+Rc), s		* 4.2		5.3		* 4.2		5.3				
Max Green Setting (Gmax), s		* 56		54.7		* 56		54.7				
Max Q Clear Time (g_c+I1), s		17.3		10.6		17.6		13.2				
Green Ext Time (p_c), s		1.3		2.8		1.6		2.6				
Intersection Summary												
HCM 6th Ctrl Delay			20.7									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

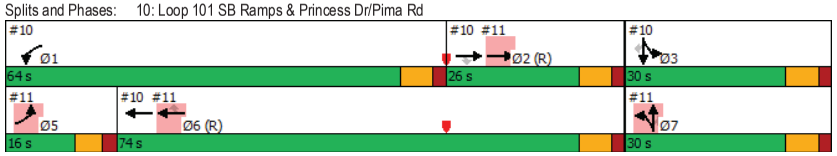
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Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	207	116	1220	557	445	556	198		
Future Volume (vph)	207	116	1220	557	445	556	198		
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm		
Protected Phases	2		1	6	3	3		5	7
Permitted Phases		2					3		
Detector Phase	2	2	1	6	3	3	3		
Switch Phase									
Minimum Initial (s)	1.0	1.0	7.0	1.0	10.0	10.0	10.0	5.0	7.0
Minimum Split (s)	7.7	7.7	13.7	7.7	19.0	19.0	19.0	11.0	13.7
Total Split (s)	26.0	26.0	64.0	74.0	30.0	30.0	30.0	16.0	30.0
Total Split (%)	21.7%	21.7%	53.3%	61.7%	25.0%	25.0%	25.0%	13%	25%
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lag	Lag	Lead	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated

Splits and Phases: 10: Loop 101 SB Ramps & Princess Dr/Pima Rd

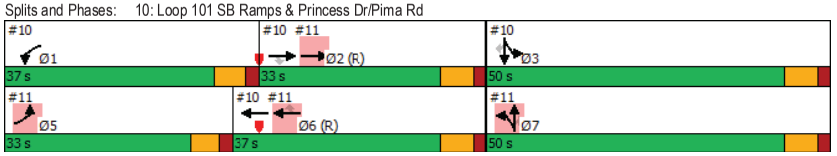


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	487	390	825	287	324	278	90		
Future Volume (vph)	487	390	825	287	324	278	90		
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm		
Protected Phases	2		1	6	3	3		5	7
Permitted Phases		2					3		
Detector Phase	2	2	1	6	3	3	3		
Switch Phase									
Minimum Initial (s)	1.0	1.0	7.0	1.0	10.0	10.0	10.0	5.0	7.0
Minimum Split (s)	7.7	7.7	13.7	7.7	19.0	19.0	19.0	11.0	13.7
Total Split (s)	33.0	33.0	37.0	37.0	50.0	50.0	50.0	33.0	50.0
Total Split (%)	27.5%	27.5%	30.8%	30.8%	41.7%	41.7%	41.7%	28%	42%
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lag	Lag	Lead	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 10: Loop 101 SB Ramps & Princess Dr/Pima Rd



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10: Loop 101 SB Ramps & Princess Dr/Pima Rd

HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	207	116	1220	557	0	0	0	0	445	556	198
Future Volume (vph)	0	207	116	1220	557	0	0	0	0	445	556	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3167	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3167	1441
Peak-hour factor, PHF	0.90	0.80	0.80	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	259	145	1356	655	0	0	0	0	494	654	233
RTOR Reduction (vph)	0	0	117	0	0	0	0	0	0	0	2	169
Lane Group Flow (vph)	0	259	28	1356	655	0	0	0	0	380	789	41
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		22.8	22.8	53.8	69.5					23.3	23.3	23.3
Effective Green, g (s)		22.8	22.8	53.8	69.5					23.3	23.3	23.3
Actuated g/C Ratio		0.19	0.19	0.45	0.58					0.19	0.19	0.19
Clearance Time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		966	529	1539	2945					312	614	279
v/s Ratio Prot		c0.05		c0.39	0.13					0.24	c0.25	
v/s Ratio Perm			0.01									0.03
v/c Ratio		0.27	0.05	0.88	0.22					1.22	1.29	0.15
Uniform Delay, d1		41.5	39.8	30.2	12.2					48.4	48.4	40.1
Progression Factor		1.24	2.58	0.70	0.64					1.00	1.00	1.00
Incremental Delay, d2		0.7	0.2	5.6	0.2					123.6	140.6	0.2
Delay (s)		52.1	102.7	26.8	8.0					172.0	189.0	40.3
Level of Service		D	F	C	A					F	F	D
Approach Delay (s)		70.2			20.7			0.0			161.7	
Approach LOS		E			C			A			F	

Intersection Summary				
HCM 2000 Control Delay	77.2	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	75.9%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

10: Loop 101 SB Ramps & Princess Dr/Pima Rd

HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	487	390	825	287	0	0	0	0	324	278	90
Future Volume (vph)	0	487	390	825	287	0	0	0	0	324	278	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3148	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3148	1441
Peak-hour factor, PHF	0.90	0.85	0.85	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	573	459	917	338	0	0	0	0	360	327	106
RTOR Reduction (vph)	0	0	290	0	0	0	0	0	0	0	1	64
Lane Group Flow (vph)	0	573	169	917	338	0	0	0	0	227	470	31
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		26.3	26.3	34.0	38.4					39.6	39.6	39.6
Effective Green, g (s)		26.3	26.3	34.0	38.4					39.6	39.6	39.6
Actuated g/C Ratio		0.22	0.22	0.28	0.32					0.33	0.33	0.33
Clearance Time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1114	610	972	1627					531	1038	475
v/s Ratio Prot		c0.11		c0.27	0.07					0.14	c0.15	
v/s Ratio Perm			0.06									0.02
v/c Ratio		0.51	0.28	0.94	0.21					0.43	0.45	0.07
Uniform Delay, d1		41.2	39.0	42.1	29.7					31.4	31.7	27.5
Progression Factor		1.18	1.89	1.69	0.53					1.00	1.00	1.00
Incremental Delay, d2		1.7	1.1	14.9	0.2					0.6	0.3	0.1
Delay (s)		50.2	74.7	86.0	16.1					31.9	32.0	27.6
Level of Service		D	E	F	B					C	C	C
Approach Delay (s)		61.1			67.2			0.0			31.4	
Approach LOS		E			E			A			C	

Intersection Summary				
HCM 2000 Control Delay	55.9	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	66.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

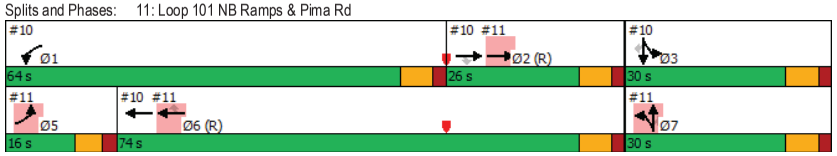
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Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	60	592	1452	337	324	419	984		
Future Volume (vph)	60	592	1452	337	324	419	984		
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm		
Protected Phases	5	2	6		7	7		1	3
Permitted Phases				6			7		
Detector Phase	5	2	6	6	7	7	7		
Switch Phase									
Minimum Initial (s)	5.0	1.0	1.0	1.0	7.0	7.0	7.0	7.0	10.0
Minimum Split (s)	11.0	7.7	7.7	7.7	13.7	13.7	13.7	13.7	19.0
Total Split (s)	16.0	26.0	74.0	74.0	30.0	30.0	30.0	64.0	30.0
Total Split (%)	13.3%	21.7%	61.7%	61.7%	25.0%	25.0%	25.0%	53%	25%
Yellow Time (s)	4.0	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lead	Lag	Lag	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated

Splits and Phases: 11: Loop 101 NB Ramps & Pima Rd

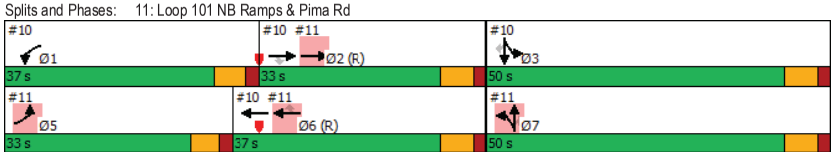


Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	230	576	1018	298	127	518	995		
Future Volume (vph)	230	576	1018	298	127	518	995		
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm		
Protected Phases	5	2	6		7	7		1	3
Permitted Phases				6			7		
Detector Phase	5	2	6	6	7	7	7		
Switch Phase									
Minimum Initial (s)	5.0	1.0	1.0	1.0	7.0	7.0	7.0	7.0	10.0
Minimum Split (s)	11.0	7.7	7.7	7.7	13.7	13.7	13.7	13.7	19.0
Total Split (s)	33.0	33.0	37.0	37.0	50.0	50.0	50.0	37.0	50.0
Total Split (%)	27.5%	27.5%	30.8%	30.8%	41.7%	41.7%	41.7%	31%	42%
Yellow Time (s)	4.0	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lead	Lag	Lag	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 11: Loop 101 NB Ramps & Pima Rd



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	592	0	0	1452	337	324	419	984	0	0	0
Future Volume (vph)	60	592	0	0	1452	337	324	419	984	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3366	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3366	2787			
Peak-hour factor, PHF	0.80	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	75	696	0	0	1613	374	360	493	1093	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	53	0	0	881	0	0	0
Lane Group Flow (vph)	75	696	0	0	1613	321	277	576	212	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	7.8	22.8			69.5	69.5	23.3	23.3	23.3			
Effective Green, g (s)	7.8	22.8			69.5	69.5	23.3	23.3	23.3			
Actuated g/C Ratio	0.06	0.19			0.58	0.58	0.19	0.19	0.19			
Clearance Time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	115	672			3711	916	312	653	541			
v/s Ratio Prot	c0.04	c0.20			c0.25		c0.17	0.17				
v/s Ratio Perm						0.20			0.08			
v/c Ratio	0.65	1.04			0.43	0.35	0.89	0.88	0.39			
Uniform Delay, d1	54.8	48.6			14.2	13.3	47.1	47.0	42.2			
Progression Factor	0.46	1.11			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	5.9	33.1			0.4	1.1	24.8	13.3	0.5			
Delay (s)	31.0	87.2			14.6	14.4	71.8	60.3	42.6			
Level of Service	C	F			B	B	E	E	D			
Approach Delay (s)		81.7			14.5			52.0			0.0	
Approach LOS		F			B			D			A	

Intersection Summary				
HCM 2000 Control Delay	41.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	75.9%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	576	0	0	1018	298	127	518	995	0	0	0
Future Volume (vph)	230	576	0	0	1018	298	127	518	995	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3386	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3386	2787			
Peak-hour factor, PHF	0.85	0.85	0.90	0.90	0.85	0.85	0.85	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	271	678	0	0	1198	351	149	609	1106	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	108	0	0	661	0	0	0
Lane Group Flow (vph)	271	678	0	0	1198	243	134	624	445	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	22.6	26.3			38.4	38.4	39.6	39.6	39.6			
Effective Green, g (s)	22.6	26.3			38.4	38.4	39.6	39.6	39.6			
Actuated g/C Ratio	0.19	0.22			0.32	0.32	0.33	0.33	0.33			
Clearance Time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	333	775			2050	506	531	1117	919			
v/s Ratio Prot	c0.15	c0.19			c0.19		0.08	c0.18				
v/s Ratio Perm						0.15			0.16			
v/c Ratio	0.81	0.87			0.58	0.48	0.25	0.56	0.48			
Uniform Delay, d1	46.7	45.3			34.1	32.8	29.4	33.0	32.1			
Progression Factor	1.27	0.69			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	12.9	12.1			1.2	3.2	0.3	0.6	0.4			
Delay (s)	72.0	43.1			35.4	36.0	29.6	33.6	32.5			
Level of Service	E	D			D	D	C	C	C			
Approach Delay (s)		51.4			35.5			32.7			0.0	
Approach LOS		D			D			C			A	

Intersection Summary				
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	66.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

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Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	41	1	45	6	0	10	18	454	1	10	908	12
Future Vol, veh/h	41	1	45	6	0	10	18	454	1	10	908	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	235	-	145	370	-	120
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	46	1	50	7	0	11	20	504	1	11	1009	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1323	1576	505	1071	1588	252	1022	0	0	505	0	0
Stage 1	1031	1031	-	544	544	-	-	-	-	-	-	-
Stage 2	292	545	-	527	1044	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	*326	*200	*711	*609	195	748	*1063	-	-	1056	-	-
Stage 1	*670	*587	-	*491	517	-	-	-	-	-	-	-
Stage 2	*692	*517	-	*670	576	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1		1	-	-		-	-
Mov Cap-1 Maneuver	*314	*194	*711	*551	189	748	*1063	-	-	1056	-	-
Mov Cap-2 Maneuver	*314	*194	-	*551	189	-	-	-	-	-	-	-
Stage 1	*657	*581	-	*482	507	-	-	-	-	-	-	-
Stage 2	*669	*507	-	*615	570	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.6	10.6	0.3	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 1063	-	-	437	660	1056	-	-
HCM Lane V/C Ratio	0.019	-	-	0.221	0.027	0.011	-	-
HCM Control Delay (s)	8.5	-	-	15.6	10.6	8.4	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.8	0.1	0	-	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	1	34	4	0	12	42	1008	1	13	657	61
Future Vol, veh/h	27	1	34	4	0	12	42	1008	1	13	657	61
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	235	-	145	370	-	120
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	1	38	4	0	13	47	1120	1	14	730	68

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1412	1973	365	1608	2040	560	798	0	0	1121	0	0
Stage 1	758	758	-	1214	1214	-	-	-	-	-	-	-
Stage 2	654	1215	-	394	826	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	179	75	*815	*115	66	472	1147	-	-	619	-	-
Stage 1	749	661	-	*193	253	-	-	-	-	-	-	-
Stage 2	422	252	-	*768	604	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1		1	-	-		-	-
Mov Cap-1 Maneuver	166	71	*815	*103	62	472	1147	-	-	619	-	-
Mov Cap-2 Maneuver	166	71	-	*103	62	-	-	-	-	-	-	-
Stage 1	718	645	-	*185	243	-	-	-	-	-	-	-
Stage 2	393	242	-	*715	590	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.7	20.6	0.3	0.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1147	-	-	284	249	619	-	-
HCM Lane V/C Ratio	0.041	-	-	0.243	0.071	0.023	-	-
HCM Control Delay (s)	8.3	-	-	21.7	20.6	11	-	-
HCM Lane LOS	A	-	-	C	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.9	0.2	0.1	-	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

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Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	1	36	0	9	194
Future Vol, veh/h	0	1	36	0	9	194
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1	40	0	10	216

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	168	20	0	0	40	0
Stage 1	40	-	-	-	-	-
Stage 2	128	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	806	1053	-	-	1568	-
Stage 1	977	-	-	-	-	-
Stage 2	884	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	801	1053	-	-	1568	-
Mov Cap-2 Maneuver	801	-	-	-	-	-
Stage 1	977	-	-	-	-	-
Stage 2	879	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.4	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 1053	1568	-
HCM Lane V/C Ratio	-	- 0.001	0.006	-
HCM Control Delay (s)	-	- 8.4	7.3	-
HCM Lane LOS	-	- A	A	-
HCM 95th %tile Q(veh)	-	- 0	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	268	0	1	95
Future Vol, veh/h	0	5	268	0	1	95
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	6	298	0	1	106

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	353	149	0	0	298	0
Stage 1	298	-	-	-	-	-
Stage 2	55	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	618	871	-	-	1260	-
Stage 1	727	-	-	-	-	-
Stage 2	961	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	617	871	-	-	1260	-
Mov Cap-2 Maneuver	617	-	-	-	-	-
Stage 1	727	-	-	-	-	-
Stage 2	960	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 871	1260	-
HCM Lane V/C Ratio	-	- 0.006	0.001	-
HCM Control Delay (s)	-	- 9.2	7.9	-
HCM Lane LOS	-	- A	A	-
HCM 95th %tile Q(veh)	-	- 0	0	-

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Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	1	0	17	0	29	9	69	126	0
Future Vol, veh/h	0	0	0	1	0	17	0	29	9	69	126	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	1	0	19	0	32	10	77	140	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	310	336	70	261	331	21	140	0	0	42	0	0
Stage 1	294	294	-	37	37	-	-	-	-	-	-	-
Stage 2	16	42	-	224	294	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	619	583	978	671	587	1051	1441	-	-	1565	-	-
Stage 1	690	668	-	974	864	-	-	-	-	-	-	-
Stage 2	1001	859	-	758	668	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	585	554	978	646	558	1051	1441	-	-	1565	-	-
Mov Cap-2 Maneuver	585	554	-	646	558	-	-	-	-	-	-	-
Stage 1	690	635	-	974	864	-	-	-	-	-	-	-
Stage 2	983	859	-	721	635	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	8.6	0	2.6
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1441	-	-	-	1016	1565	-	-
HCM Lane V/C Ratio	-	-	-	-	0.02	0.049	-	-
HCM Control Delay (s)	0	-	-	0	8.6	7.4	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	6	0	41	0	227	1	5	90	0
Future Vol, veh/h	0	0	0	6	0	41	0	227	1	5	90	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	7	0	46	0	252	1	6	100	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	238	365	50	315	365	127	100	0	0	253	0	0
Stage 1	112	112	-	253	253	-	-	-	-	-	-	-
Stage 2	126	253	-	62	112	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	696	562	1008	614	562	900	1490	-	-	1309	-	-
Stage 1	881	802	-	729	696	-	-	-	-	-	-	-
Stage 2	865	696	-	942	802	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	658	559	1008	612	559	900	1490	-	-	1309	-	-
Mov Cap-2 Maneuver	658	559	-	612	559	-	-	-	-	-	-	-
Stage 1	881	798	-	729	696	-	-	-	-	-	-	-
Stage 2	821	696	-	938	798	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	9.5	0	0.4
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1490	-	-	-	849	1309	-	-
HCM Lane V/C Ratio	-	-	-	-	0.062	0.004	-	-
HCM Control Delay (s)	0	-	-	0	9.5	7.8	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0	-	-

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21-0551 Axon Crossroad
2025 Background AM

1: Hayden Rd & Mayo Blvd/Axon Way
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	7	64	4	0	30	50	426	28	169	861	123
Future Volume (vph)	167	7	64	4	0	30	50	426	28	169	861	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.87		1.00	0.85	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1612		1770	1504	1504	1770	3539	1583	1770	3539	1583
Flt Permitted	0.75	1.00		0.70	1.00	1.00	0.27	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)	1389	1612		1313	1504	1504	511	3539	1583	892	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	186	8	71	4	0	33	56	473	31	188	957	137
RTOR Reduction (vph)	0	58	0	0	14	13	0	0	8	0	0	35
Lane Group Flow (vph)	186	21	0	4	3	3	56	473	23	188	957	102
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	21.5	21.5		21.5	21.5	21.5	89.5	89.5	89.5	89.5	89.5	89.5
Effective Green, g (s)	21.5	21.5		21.5	21.5	21.5	89.5	89.5	89.5	89.5	89.5	89.5
Actuated g/C Ratio	0.18	0.18		0.18	0.18	0.18	0.75	0.75	0.75	0.75	0.75	0.75
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	248	288		235	269	269	381	2639	1180	665	2639	1180
v/s Ratio Prot		0.01			0.00			0.13			c0.27	
v/s Ratio Perm	c0.13			0.00		0.00	0.11		0.01	0.21		0.06
v/c Ratio	0.75	0.07		0.02	0.01	0.01	0.15	0.18	0.02	0.28	0.36	0.09
Uniform Delay, d1	46.7	41.0		40.5	40.5	40.5	4.4	4.5	3.9	4.9	5.3	4.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.84	1.81	3.04	2.18	2.26	6.27
Incremental Delay, d2	12.0	0.1		0.0	0.0	0.0	0.8	0.1	0.0	0.6	0.2	0.1
Delay (s)	58.7	41.1		40.6	40.5	40.5	8.8	8.2	12.0	11.4	12.2	26.1
Level of Service	E	D		D	D	D	A	A	B	B	B	C
Approach Delay (s)		53.4			40.5			8.5			13.6	
Approach LOS		D			D			A			B	

Intersection Summary				
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	55.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

21-0551 Axon Crossroads
2025 Background PM

1: Hayden Rd & Mayo Blvd/Axon Way
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	234	1	100	31	4	237	73	976	10	86	601	161
Future Volume (vph)	234	1	100	31	4	237	73	976	10	86	601	161
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.85		1.00	0.85	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1586		1770	1512	1504	1770	3539	1583	1770	3539	1583
Flt Permitted	0.61	1.00		0.66	1.00	1.00	0.37	1.00	1.00	0.21	1.00	1.00
Satd. Flow (perm)	1134	1586		1225	1512	1504	688	3539	1583	398	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	260	1	111	34	4	263	81	1084	11	96	668	179
RTOR Reduction (vph)	0	81	0	0	17	17	0	0	4	0	0	62
Lane Group Flow (vph)	260	31	0	34	116	117	81	1084	7	96	668	117
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	32.6	32.6		32.6	32.6	32.6	78.4	78.4	78.4	78.4	78.4	78.4
Effective Green, g (s)	32.6	32.6		32.6	32.6	32.6	78.4	78.4	78.4	78.4	78.4	78.4
Actuated g/C Ratio	0.27	0.27		0.27	0.27	0.27	0.65	0.65	0.65	0.65	0.65	0.65
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	308	430		332	410	408	449	2312	1034	260	2312	1034
v/s Ratio Prot		0.02			0.08			c0.31			0.19	
v/s Ratio Perm	c0.23			0.03		0.08	0.12		0.00	0.24		0.07
v/c Ratio	0.84	0.07		0.10	0.28	0.29	0.18	0.47	0.01	0.37	0.29	0.11
Uniform Delay, d1	41.3	32.5		32.7	34.5	34.5	8.2	10.4	7.2	9.5	8.9	7.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.79	0.92	0.49	1.97	1.98	6.45
Incremental Delay, d2	18.6	0.1		0.1	0.4	0.4	0.8	0.7	0.0	2.3	0.2	0.1
Delay (s)	59.9	32.5		32.9	34.8	34.9	7.3	10.2	3.5	21.1	17.7	50.4
Level of Service	E	C		C	C	C	A	B	A	C	B	D
Approach Delay (s)		51.7			34.6			10.0			24.3	
Approach LOS		D			C			A			C	

Intersection Summary				
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	62.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	35	60	181	0	48	34	441	143	124	738	50
Future Volume (vph)	30	35	60	181	0	48	34	441	143	124	738	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	1.00	0.97		1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85	1.00		0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1821	1583	3433		1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.98	1.00	0.95		1.00	0.32	1.00	1.00	0.47	1.00	1.00
Satd. Flow (perm)		1821	1583	3433		1583	589	3539	1583	867	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	33	39	67	201	0	53	38	490	159	138	820	56
RTOR Reduction (vph)	0	0	62	0	0	41	0	0	47	0	0	16
Lane Group Flow (vph)	0	72	5	201	0	12	38	490	112	138	820	40
Turn Type	Split	NA	Perm	Prot		Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4	4		3				2			6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)		9.2	9.2	12.4		26.1	84.9	84.9	84.9	84.9	84.9	84.9
Effective Green, g (s)		9.2	9.2	12.4		26.1	84.9	84.9	84.9	84.9	84.9	84.9
Actuated g/C Ratio		0.08	0.08	0.10		0.22	0.71	0.71	0.71	0.71	0.71	0.71
Clearance Time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		139	121	354		344	416	2503	1119	613	2503	1119
v/s Ratio Prot		c0.04		c0.06				0.14			c0.23	
v/s Ratio Perm			0.00			0.01	0.06		0.07	0.16		0.03
v/c Ratio		0.52	0.04	0.57		0.03	0.09	0.20	0.10	0.23	0.33	0.04
Uniform Delay, d1		53.3	51.3	51.2		37.0	5.5	6.0	5.5	6.1	6.7	5.3
Progression Factor		1.00	1.00	1.37		0.27	1.00	1.00	1.00	0.65	0.64	0.31
Incremental Delay, d2		3.2	0.1	2.1		0.0	0.4	0.2	0.2	0.8	0.3	0.1
Delay (s)		56.5	51.5	72.1		9.8	5.9	6.1	5.7	4.8	4.6	1.7
Level of Service		E	D	E		A	A	A	A	A	A	A
Approach Delay (s)		54.1			59.1			6.0			4.5	
Approach LOS		D			E			A			A	

Intersection Summary				
HCM 2000 Control Delay	14.9	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)	13.5	
Intersection Capacity Utilization	47.2%	ICU Level of Service	A	
Analysis Period (min)	15			

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	30	55	294	0	180	82	889	135	41	536	61
Future Volume (vph)	24	30	55	294	0	180	82	889	135	41	536	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	1.00	0.97		1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85	1.00		0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1822	1583	3433		1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.98	1.00	0.95		1.00	0.41	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)		1822	1583	3433		1583	759	3539	1583	465	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	27	33	61	327	0	200	91	988	150	46	596	68
RTOR Reduction (vph)	0	0	57	0	0	47	0	0	49	0	0	22
Lane Group Flow (vph)	0	60	4	327	0	153	91	988	101	46	596	46
Turn Type	Split	NA	Perm	Prot		Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4	4		3				2			6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)		8.7	8.7	16.7		29.9	81.1	81.1	81.1	81.1	81.1	81.1
Effective Green, g (s)		8.7	8.7	16.7		29.9	81.1	81.1	81.1	81.1	81.1	81.1
Actuated g/C Ratio		0.07	0.07	0.14		0.25	0.68	0.68	0.68	0.68	0.68	0.68
Clearance Time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		132	114	477		394	512	2391	1069	314	2391	1069
v/s Ratio Prot		0.03		c0.10				c0.28			0.17	
v/s Ratio Perm			0.00			c0.10	0.12		0.06	0.10		0.03
v/c Ratio		0.45	0.04	0.69		0.39	0.18	0.41	0.09	0.15	0.25	0.04
Uniform Delay, d1		53.4	51.8	49.2		37.4	7.2	8.7	6.7	7.0	7.6	6.5
Progression Factor		1.00	1.00	1.03		1.31	1.00	1.00	1.00	0.34	0.34	0.11
Incremental Delay, d2		2.5	0.1	4.0		0.6	0.8	0.5	0.2	1.0	0.2	0.1
Delay (s)		55.8	51.9	54.7		49.6	7.9	9.3	6.9	3.3	2.8	0.8
Level of Service		E	D	D		D	A	A	A	A	A	A
Approach Delay (s)		53.9			52.8			8.9			2.6	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	55.3%	ICU Level of Service	B	
Analysis Period (min)	15			

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	656	2	646	0	0	0	0	462	146	473	567	0
Future Volume (vph)	656	2	646	0	0	0	0	462	146	473	567	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.92	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1525	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1525	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.85	0.90
Adj. Flow (vph)	729	2	718	0	0	0	0	544	172	556	667	0
RTOR Reduction (vph)	0	34	368	0	0	0	0	0	130	0	0	0
Lane Group Flow (vph)	503	452	92	0	0	0	0	544	42	556	667	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	23.9	23.9	23.9					29.0	29.0	24.0	39.0	
Effective Green, g (s)	23.9	23.9	23.9					29.0	29.0	24.0	39.0	
Actuated g/C Ratio	0.20	0.20	0.20					0.24	0.24	0.20	0.32	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	334	303	299					1228	382	686	1150	
v/s Ratio Prot	c0.30	0.30						c0.11		c0.16	c0.19	
v/s Ratio Perm			0.06						0.03			
v/c Ratio	1.51	1.49	0.31					0.44	0.11	0.81	0.58	
Uniform Delay, d1	48.0	48.0	41.0					38.6	35.4	45.8	33.7	
Progression Factor	1.00	1.00	1.00					0.78	0.95	0.41	0.31	
Incremental Delay, d2	242.7	238.6	0.6					1.1	0.6	6.3	1.8	
Delay (s)	290.8	286.6	41.6					31.1	34.2	25.0	12.2	
Level of Service	F	F	D					C	C	C	B	
Approach Delay (s)		210.3			0.0			31.8			18.0	
Approach LOS		F			A			C			B	

Intersection Summary				
HCM 2000 Control Delay	103.2	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	64.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	417	5	300	0	0	0	0	1281	170	486	581	0
Future Volume (vph)	417	5	300	0	0	0	0	1281	170	486	581	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.96	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.97	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1567	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.97	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1567	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.90	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.90
Adj. Flow (vph)	463	6	333	0	0	0	0	1423	200	572	684	0
RTOR Reduction (vph)	0	12	211	0	0	0	0	0	113	0	0	0
Lane Group Flow (vph)	278	259	42	0	0	0	0	1423	87	572	684	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	19.7	19.7	19.7					41.0	41.0	12.0	27.0	
Effective Green, g (s)	19.7	19.7	19.7					41.0	41.0	12.0	27.0	
Actuated g/C Ratio	0.16	0.16	0.16					0.34	0.34	0.10	0.22	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)	275	257	246					1737	540	343	796	
v/s Ratio Prot	0.17	c0.17						c0.28		c0.17	c0.19	
v/s Ratio Perm			0.03						0.06			
v/c Ratio	1.01	1.01	0.17					0.82	0.16	1.67	0.86	
Uniform Delay, d1	50.1	50.1	43.1					36.1	27.5	54.0	44.7	
Progression Factor	1.00	1.00	1.00					0.89	0.73	0.53	0.52	
Incremental Delay, d2	57.1	58.4	0.3					4.2	0.6	309.9	9.0	
Delay (s)	107.2	108.6	43.4					36.1	20.7	338.7	32.0	
Level of Service	F	F	D					D	C	F	C	
Approach Delay (s)		87.6			0.0			34.2			171.7	
Approach LOS		F			A			C			F	

Intersection Summary				
HCM 2000 Control Delay	92.8	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	92.6%	ICU Level of Service	F	
Analysis Period (min)	15			

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	170	52	537	302	818	0	0	862	310
Future Volume (vph)	0	0	0	170	52	537	302	818	0	0	862	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.88	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2822	1441	1770	3539			6408	1583
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1610	2822	1441	1770	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	200	65	597	336	909	0	0	1014	344
RTOR Reduction (vph)	0	0	0	0	256	256	0	0	0	0	0	232
Lane Group Flow (vph)	0	0	0	180	128	42	336	909	0	0	1014	112
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				17.1	17.1	17.1	14.0	29.0			39.0	39.0
Effective Green, g (s)				17.1	17.1	17.1	14.0	29.0			39.0	39.0
Actuated g/C Ratio				0.14	0.14	0.14	0.12	0.24			0.32	0.32
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				229	402	205	206	855			2082	514
v/s Ratio Prot				c0.11	0.05		c0.19	c0.26			c0.16	
v/s Ratio Perm						0.03						0.07
v/c Ratio				0.79	0.32	0.21	1.63	1.06			0.49	0.22
Uniform Delay, d1				49.7	46.2	45.5	53.0	45.5			32.5	29.4
Progression Factor				1.00	1.00	1.00	0.75	0.34			1.37	7.10
Incremental Delay, d2				16.1	0.5	0.5	286.0	31.3			0.8	0.9
Delay (s)				65.8	46.7	46.0	325.8	46.9			45.3	209.7
Level of Service				E	D	D	F	D			D	F
Approach Delay (s)		0.0			50.4			122.2			87.0	
Approach LOS		A			D			F			F	

Intersection Summary				
HCM 2000 Control Delay	90.5	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	64.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	201	42	465	745	953	0	0	864	461
Future Volume (vph)	0	0	0	201	42	465	745	953	0	0	864	461
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.89	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2837	1441	1770	3539			6408	1583
Flt Permitted				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1610	2837	1441	1770	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	236	52	517	828	1059	0	0	1016	512
RTOR Reduction (vph)	0	0	0	0	213	212	0	0	0	0	0	397
Lane Group Flow (vph)	0	0	0	191	144	46	828	1059	0	0	1016	115
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				21.3	21.3	21.3	26.0	41.0			27.0	27.0
Effective Green, g (s)				21.3	21.3	21.3	26.0	41.0			27.0	27.0
Actuated g/C Ratio				0.18	0.18	0.18	0.22	0.34			0.22	0.22
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				285	503	255	383	1209			1441	356
v/s Ratio Prot				c0.12	0.05		c0.47	c0.30			c0.16	
v/s Ratio Perm						0.03						0.07
v/c Ratio				0.67	0.29	0.18	2.16	0.88			0.71	0.32
Uniform Delay, d1				46.1	42.8	41.9	47.0	37.1			42.8	38.9
Progression Factor				1.00	1.00	1.00	0.88	0.31			1.07	4.99
Incremental Delay, d2				6.1	0.3	0.3	527.0	4.6			2.8	2.3
Delay (s)				52.1	43.1	42.3	568.3	15.9			48.6	196.1
Level of Service				D	D	D	F	B			D	F
Approach Delay (s)		0.0			45.0			258.3			98.0	
Approach LOS		A			D			F			F	

Intersection Summary				
HCM 2000 Control Delay	159.6	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.96			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	92.6%	ICU Level of Service	F	
Analysis Period (min)	15			

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	12	97	10	19	0	107	938	4	0	1082	36
Future Volume (vph)	25	12	97	10	19	0	107	938	4	0	1082	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00		0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539		1770	3539	1583		5085	1583
Flt Permitted	0.74	1.00	1.00	0.75	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1384	3539	1583	1394	3539		1770	3539	1583		5085	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	28	13	108	11	21	0	119	1042	4	0	1202	40
RTOR Reduction (vph)	0	0	81	0	0	0	0	0	1	0	0	17
Lane Group Flow (vph)	28	13	27	11	21	0	119	1042	3	0	1202	23
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8					2	6		6
Actuated Green, G (s)	30.5	30.5	30.5	30.5	30.5		7.5	80.5	80.5		68.5	68.5
Effective Green, g (s)	30.5	30.5	30.5	30.5	30.5		7.5	80.5	80.5		68.5	68.5
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25		0.06	0.67	0.67		0.57	0.57
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	351	899	402	354	899		110	2374	1061		2902	903
v/s Ratio Prot		0.00			0.01		c0.07	c0.29			0.24	
v/s Ratio Perm	c0.02		0.02	0.01					0.00			0.01
v/c Ratio	0.08	0.01	0.07	0.03	0.02		1.08	0.44	0.00		0.41	0.03
Uniform Delay, d1	34.1	33.5	34.0	33.6	33.6		56.2	9.2	6.5		14.5	11.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.96	0.31	0.04		1.00	1.00
Incremental Delay, d2	0.1	0.0	0.1	0.2	0.0		81.0	0.3	0.0		0.4	0.1
Delay (s)	34.2	33.5	34.0	33.8	33.6		135.2	3.2	0.3		14.9	11.3
Level of Service	C	C	C	C	C		F	A	A		B	B
Approach Delay (s)		34.0			33.7			16.6			14.8	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	49.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	35	199	8	25	0	155	1215	6	0	888	51
Future Volume (vph)	70	35	199	8	25	0	155	1215	6	0	888	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00		0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539		1770	3539	1583		5085	1583
Flt Permitted	0.74	1.00	1.00	0.73	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1375	3539	1583	1360	3539		1770	3539	1583		5085	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	78	39	221	9	28	0	172	1350	7	0	987	57
RTOR Reduction (vph)	0	0	167	0	0	0	0	0	2	0	0	25
Lane Group Flow (vph)	78	39	54	9	28	0	172	1350	5	0	987	32
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8					2	6		6
Actuated Green, G (s)	29.5	29.5	29.5	29.5	29.5		10.5	81.5	81.5		66.5	66.5
Effective Green, g (s)	29.5	29.5	29.5	29.5	29.5		10.5	81.5	81.5		66.5	66.5
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25		0.09	0.68	0.68		0.55	0.55
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	338	870	389	334	870		154	2403	1075		2817	877
v/s Ratio Prot		0.01			0.01		c0.10	c0.38			0.19	
v/s Ratio Perm	c0.06		0.03	0.01					0.00			0.02
v/c Ratio	0.23	0.04	0.14	0.03	0.03		1.12	0.56	0.00		0.35	0.04
Uniform Delay, d1	36.2	34.5	35.3	34.4	34.4		54.8	10.0	6.2		14.8	12.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.06	0.38	0.33		1.00	1.00
Incremental Delay, d2	0.4	0.0	0.2	0.1	0.1		93.8	0.6	0.0		0.3	0.1
Delay (s)	36.5	34.5	35.5	34.5	34.5		151.8	4.5	2.1		15.1	12.2
Level of Service	D	C	D	C	C		F	A	A		B	B
Approach Delay (s)		35.6			34.5			21.0			15.0	
Approach LOS		D			C			C			B	

Intersection Summary				
HCM 2000 Control Delay	20.7	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)	13.5	
Intersection Capacity Utilization	59.5%	ICU Level of Service	B	
Analysis Period (min)	15			

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	203	82	294	341	167	101	36	83	22	12	13
Future Volume (vph)	80	203	82	294	341	167	101	36	83	22	12	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2	
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92	
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)	1770	4866		1770	3539	1583	1770	3539	1583	1770	3264	
Flt Permitted	0.50	1.00		0.55	1.00	1.00	0.74	1.00	1.00	0.73	1.00	
Satd. Flow (perm)	931	4866		1028	3539	1583	1376	3539	1583	1359	3264	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	44	226	91	327	379	186	112	40	92	24	13	14
RTOR Reduction (vph)	0	50	0	0	0	101	0	0	49	0	7	0
Lane Group Flow (vph)	44	267	0	327	379	85	112	40	43	24	20	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	54.7	54.7		54.7	54.7	54.7	55.8	55.8	55.8	55.8	55.8	
Effective Green, g (s)	54.7	54.7		54.7	54.7	54.7	55.8	55.8	55.8	55.8	55.8	
Actuated g/C Ratio	0.46	0.46		0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	
Clearance Time (s)	5.3	5.3		5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	424	2218		468	1613	721	639	1645	736	631	1517	
v/s Ratio Prot		0.05			0.11			0.01			0.01	
v/s Ratio Perm	0.05			c0.32		0.05	c0.08		0.03	0.02		
v/c Ratio	0.10	0.12		0.70	0.23	0.12	0.18	0.02	0.06	0.04	0.01	
Uniform Delay, d1	18.6	18.8		26.1	19.9	18.8	18.7	17.4	17.7	17.5	17.3	
Progression Factor	0.96	0.92		0.80	0.64	1.06	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.1		8.1	0.3	0.3	0.6	0.0	0.2	0.1	0.0	
Delay (s)	18.3	17.4		28.9	13.0	20.2	19.3	17.4	17.8	17.6	17.3	
Level of Service	B	B		C	B	C	B	B	B	B	B	
Approach Delay (s)		17.6			20.3			18.4			17.4	
Approach LOS		B			C			B			B	

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)	9.5	
Intersection Capacity Utilization	46.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	318	31	71	259	66	170	20	290	206	25	100
Future Volume (vph)	74	318	31	71	259	66	170	20	290	206	25	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2	
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	
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)	1770	5018		1770	3539	1583	1770	3539	1583	1770	3115	
Flt Permitted	0.57	1.00		0.51	1.00	1.00	0.66	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1058	5018		953	3539	1583	1237	3539	1583	1383	3115	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	41	353	34	79	288	73	189	22	322	229	28	111
RTOR Reduction (vph)	0	9	0	0	0	40	0	0	172	0	59	0
Lane Group Flow (vph)	41	378	0	79	288	33	189	22	150	229	80	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	54.7	54.7		54.7	54.7	54.7	55.8	55.8	55.8	55.8	55.8	
Effective Green, g (s)	54.7	54.7		54.7	54.7	54.7	55.8	55.8	55.8	55.8	55.8	
Actuated g/C Ratio	0.46	0.46		0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	
Clearance Time (s)	5.3	5.3		5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	482	2287		434	1613	721	575	1645	736	643	1448	
v/s Ratio Prot		0.08			0.08			0.01			0.03	
v/s Ratio Perm	0.04			c0.08		0.02	0.15		0.09	c0.17		
v/c Ratio	0.09	0.17		0.18	0.18	0.05	0.33	0.01	0.20	0.36	0.05	
Uniform Delay, d1	18.5	19.2		19.4	19.3	18.1	20.3	17.3	19.0	20.6	17.6	
Progression Factor	1.04	1.01		0.55	0.52	0.41	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.2		0.9	0.2	0.1	1.5	0.0	0.6	1.5	0.1	
Delay (s)	19.5	19.6		11.6	10.2	7.6	21.8	17.3	19.6	22.1	17.7	
Level of Service	B	B		B	B	A	C	B	B	C	B	
Approach Delay (s)		19.6			10.0			20.3			20.5	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	17.6	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)	9.5	
Intersection Capacity Utilization	47.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	207	116	1220	557	0	0	0	0	445	556	198
Future Volume (vph)	0	207	116	1220	557	0	0	0	0	445	556	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3167	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3167	1441
Peak-hour factor, PHF	0.90	0.80	0.80	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	259	145	1356	655	0	0	0	0	494	654	233
RTOR Reduction (vph)	0	0	117	0	0	0	0	0	0	0	2	169
Lane Group Flow (vph)	0	259	28	1356	655	0	0	0	0	380	789	41
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		22.8	22.8	53.8	69.5					23.3	23.3	23.3
Effective Green, g (s)		22.8	22.8	53.8	69.5					23.3	23.3	23.3
Actuated g/C Ratio		0.19	0.19	0.45	0.58					0.19	0.19	0.19
Clearance Time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		966	529	1539	2945					312	614	279
v/s Ratio Prot		c0.05		c0.39	0.13					0.24	c0.25	
v/s Ratio Perm			0.01									0.03
v/c Ratio		0.27	0.05	0.88	0.22					1.22	1.29	0.15
Uniform Delay, d1		41.5	39.8	30.2	12.2					48.4	48.4	40.1
Progression Factor		1.24	2.58	0.70	0.64					1.00	1.00	1.00
Incremental Delay, d2		0.7	0.2	5.6	0.2					123.6	140.6	0.2
Delay (s)		52.1	102.7	26.8	8.0					172.0	189.0	40.3
Level of Service		D	F	C	A					F	F	D
Approach Delay (s)		70.2			20.7			0.0			161.7	
Approach LOS		E			C			A			F	

Intersection Summary				
HCM 2000 Control Delay	77.2	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	75.9%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	487	390	825	287	0	0	0	0	324	278	90
Future Volume (vph)	0	487	390	825	287	0	0	0	0	324	278	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3148	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3148	1441
Peak-hour factor, PHF	0.90	0.85	0.85	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	573	459	917	338	0	0	0	0	360	327	106
RTOR Reduction (vph)	0	0	290	0	0	0	0	0	0	0	1	64
Lane Group Flow (vph)	0	573	169	917	338	0	0	0	0	227	470	31
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		26.3	26.3	34.0	38.4					39.6	39.6	39.6
Effective Green, g (s)		26.3	26.3	34.0	38.4					39.6	39.6	39.6
Actuated g/C Ratio		0.22	0.22	0.28	0.32					0.33	0.33	0.33
Clearance Time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1114	610	972	1627					531	1038	475
v/s Ratio Prot		c0.11		c0.27	0.07					0.14	c0.15	
v/s Ratio Perm			0.06									0.02
v/c Ratio		0.51	0.28	0.94	0.21					0.43	0.45	0.07
Uniform Delay, d1		41.2	39.0	42.1	29.7					31.4	31.7	27.5
Progression Factor		1.18	1.89	1.69	0.53					1.00	1.00	1.00
Incremental Delay, d2		1.7	1.1	14.9	0.2					0.6	0.3	0.1
Delay (s)		50.2	74.7	86.0	16.1					31.9	32.0	27.6
Level of Service		D	E	F	B					C	C	C
Approach Delay (s)		61.1			67.2			0.0			31.4	
Approach LOS		E			E			A			C	

Intersection Summary				
HCM 2000 Control Delay	55.9	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	66.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	592	0	0	1452	337	324	419	984	0	0	0
Future Volume (vph)	60	592	0	0	1452	337	324	419	984	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3366	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3366	2787			
Peak-hour factor, PHF	0.80	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	75	696	0	0	1613	374	360	493	1093	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	53	0	0	881	0	0	0
Lane Group Flow (vph)	75	696	0	0	1613	321	277	576	212	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	7.8	22.8			69.5	69.5	23.3	23.3	23.3			
Effective Green, g (s)	7.8	22.8			69.5	69.5	23.3	23.3	23.3			
Actuated g/C Ratio	0.06	0.19			0.58	0.58	0.19	0.19	0.19			
Clearance Time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	115	672			3711	916	312	653	541			
v/s Ratio Prot	c0.04	c0.20			c0.25		c0.17	0.17				
v/s Ratio Perm						0.20			0.08			
v/c Ratio	0.65	1.04			0.43	0.35	0.89	0.88	0.39			
Uniform Delay, d1	54.8	48.6			14.2	13.3	47.1	47.0	42.2			
Progression Factor	0.46	1.11			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	5.9	33.1			0.4	1.1	24.8	13.3	0.5			
Delay (s)	31.0	87.2			14.6	14.4	71.8	60.3	42.6			
Level of Service	C	F			B	B	E	E	D			
Approach Delay (s)		81.7			14.5			52.0			0.0	
Approach LOS		F			B			D			A	

Intersection Summary				
HCM 2000 Control Delay	41.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	75.9%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	576	0	0	1018	298	127	518	995	0	0	0
Future Volume (vph)	230	576	0	0	1018	298	127	518	995	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3386	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3386	2787			
Peak-hour factor, PHF	0.85	0.85	0.90	0.90	0.85	0.85	0.85	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	271	678	0	0	1198	351	149	609	1106	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	108	0	0	661	0	0	0
Lane Group Flow (vph)	271	678	0	0	1198	243	134	624	445	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	22.6	26.3			38.4	38.4	39.6	39.6	39.6			
Effective Green, g (s)	22.6	26.3			38.4	38.4	39.6	39.6	39.6			
Actuated g/C Ratio	0.19	0.22			0.32	0.32	0.33	0.33	0.33			
Clearance Time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	333	775			2050	506	531	1117	919			
v/s Ratio Prot	c0.15	c0.19			c0.19		0.08	c0.18				
v/s Ratio Perm						0.15			0.16			
v/c Ratio	0.81	0.87			0.58	0.48	0.25	0.56	0.48			
Uniform Delay, d1	46.7	45.3			34.1	32.8	29.4	33.0	32.1			
Progression Factor	1.27	0.69			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	12.9	12.1			1.2	3.2	0.3	0.6	0.4			
Delay (s)	72.0	43.1			35.4	36.0	29.6	33.6	32.5			
Level of Service	E	D			D	D	C	C	C			
Approach Delay (s)		51.4			35.5			32.7			0.0	
Approach LOS		D			D			C			A	

Intersection Summary				
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	66.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

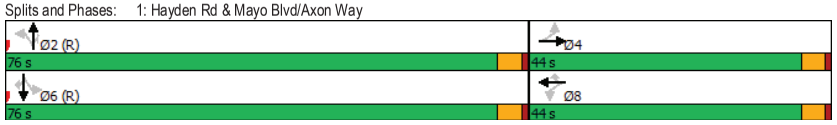
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Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	167	20	144	35	513	51	426	78	337	861	123
Future Volume (vph)	167	20	144	35	513	51	426	78	337	861	123
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8			2			6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	4	4	8	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	44.0	44.0	44.0	44.0	44.0	76.0	76.0	76.0	76.0	76.0	76.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%	63.3%	63.3%	63.3%	63.3%	63.3%	63.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	Min	Min	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 82 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 1: Hayden Rd & Mayo Blvd/Axon Way

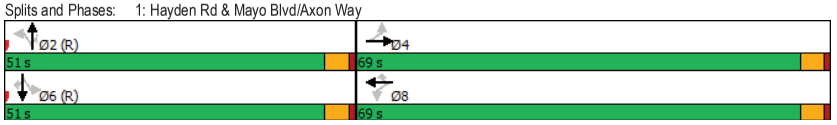


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	234	28	115	22	505	74	960	132	459	591	161
Future Volume (vph)	234	28	115	22	505	74	960	132	459	591	161
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8			2			6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	4	4	8	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	69.0	69.0	69.0	69.0	69.0	51.0	51.0	51.0	51.0	51.0	51.0
Total Split (%)	57.5%	57.5%	57.5%	57.5%	57.5%	42.5%	42.5%	42.5%	42.5%	42.5%	42.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	Min	Min	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 84 (70%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 1: Hayden Rd & Mayo Blvd/Axon Way



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	167	20	64	144	35	513	51	426	78	337	861	123
Future Volume (veh/h)	167	20	64	144	35	513	51	426	78	337	861	123
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	186	22	53	160	0	312	57	473	44	374	957	69
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	95	229	269	0	620	461	2592	1156	693	2592	1156
Arrive On Green	0.20	0.20	0.20	0.20	0.00	0.20	0.73	0.73	0.73	1.00	1.00	1.00
Sat Flow, veh/h	1067	487	1173	1325	0	3170	550	3554	1585	921	3554	1585
Grp Volume(v), veh/h	186	0	75	160	0	312	57	473	44	374	957	69
Grp Sat Flow(s),veh/h/ln	1067	0	1659	1325	0	1585	550	1777	1585	921	1777	1585
Q Serve(g_s), s	20.4	0.0	4.6	13.9	0.0	10.5	3.8	5.0	0.9	6.3	0.0	0.0
Cycle Q Clear(g_c), s	20.4	0.0	4.6	18.5	0.0	10.5	3.8	5.0	0.9	11.3	0.0	0.0
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	269	0	325	269	0	620	461	2592	1156	693	2592	1156
V/C Ratio(X)	0.69	0.00	0.23	0.60	0.00	0.50	0.12	0.18	0.04	0.54	0.37	0.06
Avail Cap(c_a), veh/h	411	0	546	446	0	1043	461	2592	1156	693	2592	1156
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.0	0.0	40.7	48.4	0.0	43.1	4.9	5.1	4.5	0.3	0.0	0.0
Incr Delay (d2), s/veh	3.2	0.0	0.4	2.1	0.0	0.6	0.6	0.2	0.1	3.0	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.5	0.0	3.4	8.3	0.0	7.6	0.8	3.1	0.5	1.0	0.3	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.2	0.0	41.0	50.5	0.0	43.7	5.5	5.2	4.6	3.3	0.4	0.1
LnGrp LOS	D	A	D	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		261			472			574			1400	
Approach Delay, s/veh		47.6			46.0			5.2			1.2	
Approach LOS		D			D			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		92.0		28.0		92.0		28.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		71.5		39.5		71.5		39.5				
Max Q Clear Time (g_c+I1), s		7.0		22.4		13.3		20.5				
Green Ext Time (p_c), s		4.6		1.1		13.6		1.7				
Intersection Summary												
HCM 6th Ctrl Delay			14.3									
HCM 6th LOS			B									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	234	28	100	115	22	505	74	960	132	459	591	161
Future Volume (veh/h)	234	28	100	115	22	505	74	960	132	459	591	161
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	260	31	83	128	0	297	82	1067	74	510	657	90
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	347	119	319	330	0	841	531	2344	1046	332	2344	1046
Arrive On Green	0.27	0.27	0.27	0.27	0.00	0.27	0.66	0.66	0.66	1.00	1.00	1.00
Sat Flow, veh/h	1082	450	1204	1279	0	3170	714	3554	1585	529	3554	1585
Grp Volume(v), veh/h	260	0	114	128	0	297	82	1067	74	510	657	90
Grp Sat Flow(s),veh/h/ln	1082	0	1654	1279	0	1585	714	1777	1585	529	1777	1585
Q Serve(g_s), s	27.9	0.0	6.5	10.5	0.0	9.1	5.3	17.5	2.0	61.6	0.0	0.0
Cycle Q Clear(g_c), s	27.9	0.0	6.5	17.1	0.0	9.1	5.3	17.5	2.0	79.2	0.0	0.0
Prop In Lane	1.00		0.73	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	347	0	439	330	0	841	531	2344	1046	332	2344	1046
V/C Ratio(X)	0.75	0.00	0.26	0.39	0.00	0.35	0.15	0.46	0.07	1.54	0.28	0.09
Avail Cap(c_a), veh/h	642	0	889	678	0	1704	531	2344	1046	332	2344	1046
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.6	0.0	34.8	41.5	0.0	35.7	7.8	9.9	7.3	14.3	0.0	0.0
Incr Delay (d2), s/veh	3.3	0.0	0.3	0.7	0.0	0.3	0.6	0.6	0.1	256.6	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.3	0.0	4.8	6.1	0.0	6.4	1.6	10.9	1.2	55.6	0.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.9	0.0	35.1	42.3	0.0	36.0	8.5	10.6	7.4	271.0	0.3	0.2
LnGrp LOS	D	A	D	D	A	D	A	B	A	F	A	A
Approach Vol, veh/h		374			425			1223			1257	
Approach Delay, s/veh		42.6			37.9			10.2			110.1	
Approach LOS		D			D			B			F	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		83.7		36.3		83.7		36.3				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		46.5		64.5		46.5		64.5				
Max Q Clear Time (g_c+I1), s		19.5		29.9		81.2		19.1				
Green Ext Time (p_c), s		10.1		2.0		0.0		1.7				
Intersection Summary												
HCM 6th Ctrl Delay			55.8									
HCM 6th LOS			E									

Notes

User approved volume balancing among the lanes for turning movement.

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Intersection	
Intersection Delay, s/veh	3.4
Intersection LOS	A

Approach	EB	NB	SB
Entry Lanes	2	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	170	114	6
Demand Flow Rate, veh/h	173	116	6
Vehicles Circulating, veh/h	6	10	64
Vehicles Exiting, veh/h	64	169	62
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.5	3.4	2.9
Approach LOS	A	A	A

Lane	Left	Right	Left	Left
Designated Moves	L	TR	LT	TR
Assumed Moves	L	TR	LT	TR
RT Channelized				
Lane Util	0.058	0.942	1.000	1.000
Follow-Up Headway, s	2.535	2.535	2.609	2.609
Critical Headway, s	4.544	4.544	4.976	4.976
Entry Flow, veh/h	10	163	116	6
Cap Entry Lane, veh/h	1412	1412	1366	1293
Entry HV Adj Factor	1.000	0.982	0.983	0.980
Flow Entry, veh/h	10	160	114	6
Cap Entry, veh/h	1412	1386	1342	1267
V/C Ratio	0.007	0.115	0.085	0.005
Control Delay, s/veh	2.6	3.5	3.4	2.9
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0

Intersection	
Intersection Delay, s/veh	4.0
Intersection LOS	A

Approach	EB	NB	SB
Entry Lanes	2	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	152	269	37
Demand Flow Rate, veh/h	155	274	38
Vehicles Circulating, veh/h	32	0	271
Vehicles Exiting, veh/h	277	187	3
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.6	4.3	3.8
Approach LOS	A	A	A

Lane	Left	Right	Left	Left
Designated Moves	L	TR	LT	TR
Assumed Moves	L	TR	LT	TR
RT Channelized				
Lane Util	0.000	1.000	1.000	1.000
Follow-Up Headway, s	2.535	2.535	2.609	2.609
Critical Headway, s	4.544	4.544	4.976	4.976
Entry Flow, veh/h	0	155	274	38
Cap Entry Lane, veh/h	1379	1379	1380	1047
Entry HV Adj Factor	1.000	0.981	0.982	0.983
Flow Entry, veh/h	0	152	269	37
Cap Entry, veh/h	1379	1353	1354	1029
V/C Ratio	0.000	0.112	0.199	0.036
Control Delay, s/veh	2.6	3.6	4.3	3.8
LOS	A	A	A	A
95th %tile Queue, veh	0	0	1	0

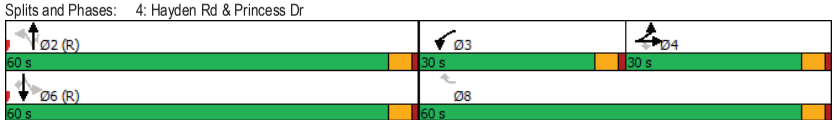
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Lane Group	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	35	60	186	48	34	491	143	134	873	50
Future Volume (vph)	35	60	186	48	34	491	143	134	873	50
Turn Type	NA	Perm	Prot	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4		3			2			6	
Permitted Phases		4		8	2		2	6		6
Detector Phase	4	4	3	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	36.5	36.5	36.5	36.5	36.5	36.5
Total Split (s)	30.0	30.0	30.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	25.0%	25.0%	25.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes							
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 4: Hayden Rd & Princess Dr

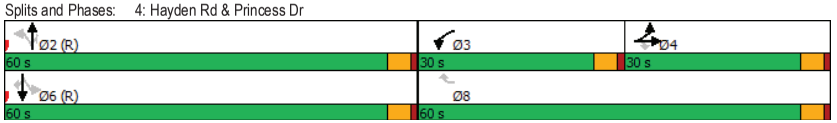


Lane Group	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	30	55	297	180	82	995	135	54	607	61
Future Volume (vph)	30	55	297	180	82	995	135	54	607	61
Turn Type	NA	Perm	Prot	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4		3			2			6	
Permitted Phases		4		8	2		2	6		6
Detector Phase	4	4	3	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	36.5	36.5	36.5	36.5	36.5	36.5
Total Split (s)	30.0	30.0	30.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	25.0%	25.0%	25.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes							
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 4: Hayden Rd & Princess Dr



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21-0551 Axon Crossroad
2025 Total AM

4: Hayden Rd & Princess Dr
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	35	60	186	0	48	34	491	143	134	873	50
Future Volume (veh/h)	30	35	60	186	0	48	34	491	143	134	873	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	39	34	207	0	26	38	546	80	149	970	28
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	68	80	128	0	0	0	503	3000	1338	712	3000	1338
Arrive On Green	0.08	0.08	0.08	0.00	0.00	0.00	0.84	0.84	0.84	0.84	0.84	0.84
Sat Flow, veh/h	838	990	1585		0		564	3554	1585	799	3554	1585
Grp Volume(v), veh/h	72	0	34		0.0		38	546	80	149	970	28
Grp Sat Flow(s),veh/h/ln	1828	0	1585				564	1777	1585	799	1777	1585
Q Serve(g_s), s	4.5	0.0	2.4				1.9	3.4	1.0	5.1	7.0	0.3
Cycle Q Clear(g_c), s	4.5	0.0	2.4				8.9	3.4	1.0	8.5	7.0	0.3
Prop In Lane	0.46		1.00				1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	148	0	128				503	3000	1338	712	3000	1338
V/C Ratio(X)	0.49	0.00	0.27				0.08	0.18	0.06	0.21	0.32	0.02
Avail Cap(c_a), veh/h	389	0	337				503	3000	1338	712	3000	1338
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.8	0.0	51.8				3.0	1.7	1.5	2.5	2.0	1.5
Incr Delay (d2), s/veh	2.5	0.0	1.1				0.3	0.1	0.1	0.7	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.9	0.0	1.8				0.4	1.5	0.4	1.3	3.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.2	0.0	52.9				3.2	1.9	1.6	3.2	2.3	1.5
LnGrp LOS	E	A	D				A	A	A	A	A	A
Approach Vol, veh/h		106						664			1147	
Approach Delay, s/veh		54.5						1.9			2.4	
Approach LOS		D						A			A	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		105.8		14.2		105.8						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		55.5		25.5		55.5						
Max Q Clear Time (g_c+I1), s		10.9		6.5		10.5						
Green Ext Time (p_c), s		5.1		0.4		10.7						

Intersection Summary												
HCM 6th Ctrl Delay			5.1									
HCM 6th LOS			A									

21-0551 Axon Crossroads
2025 Total PM

4: Hayden Rd & Princess Dr
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	30	55	297	0	180	82	995	135	54	607	61
Future Volume (veh/h)	24	30	55	297	0	180	82	995	135	54	607	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	27	33	31	330	0	100	91	1106	76	60	674	35
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	65	80	126	0	0	0	659	3005	1340	428	3005	1340
Arrive On Green	0.08	0.08	0.08	0.00	0.00	0.00	0.85	0.85	0.85	0.85	0.85	0.85
Sat Flow, veh/h	823	1006	1585		0		740	3554	1585	474	3554	1585
Grp Volume(v), veh/h	60	0	31		0.0		91	1106	76	60	674	35
Grp Sat Flow(s),veh/h/ln	1829	0	1585				740	1777	1585	474	1777	1585
Q Serve(g_s), s	3.7	0.0	2.2				3.2	8.4	0.9	3.9	4.3	0.4
Cycle Q Clear(g_c), s	3.7	0.0	2.2				7.5	8.4	0.9	12.3	4.3	0.4
Prop In Lane	0.45		1.00				1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	145	0	126				659	3005	1340	428	3005	1340
V/C Ratio(X)	0.41	0.00	0.25				0.14	0.37	0.06	0.14	0.22	0.03
Avail Cap(c_a), veh/h	389	0	337				659	3005	1340	428	3005	1340
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.6	0.0	51.9				2.5	2.1	1.5	3.4	1.8	1.5
Incr Delay (d2), s/veh	1.9	0.0	1.0				0.4	0.3	0.1	0.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.2	0.0	1.6				0.8	3.6	0.4	0.7	1.8	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.5	0.0	52.9				2.9	2.4	1.6	4.1	1.9	1.5
LnGrp LOS	D	A	D				A	A	A	A	A	A
Approach Vol, veh/h		91						1273			769	
Approach Delay, s/veh		53.9						2.4			2.1	
Approach LOS		D						A			A	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		106.0		14.0		106.0						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		55.5		25.5		55.5						
Max Q Clear Time (g_c+I1), s		10.4		5.7		14.3						
Green Ext Time (p_c), s		12.4		0.3		6.7						

Intersection Summary												
HCM 6th Ctrl Delay			4.5									
HCM 6th LOS			A									

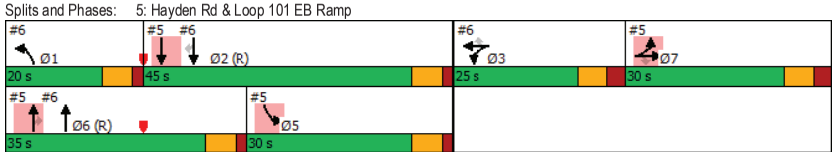
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Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	656	2	757	777	314	473	624		
Future Volume (vph)	656	2	757	777	314	473	624		
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA		
Protected Phases	7	7		6		5	2	1	3
Permitted Phases			7		6				
Detector Phase	7	7	7	6	6	5	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	16.0	12.0	5.0	7.0
Minimum Split (s)	29.0	29.0	29.0	26.0	26.0	22.0	26.0	11.0	24.0
Total Split (s)	30.0	30.0	30.0	35.0	35.0	30.0	45.0	20.0	25.0
Total Split (%)	25.0%	25.0%	25.0%	29.2%	29.2%	25.0%	37.5%	17%	21%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	None	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated

Splits and Phases: 5: Hayden Rd & Loop 101 EB Ramp

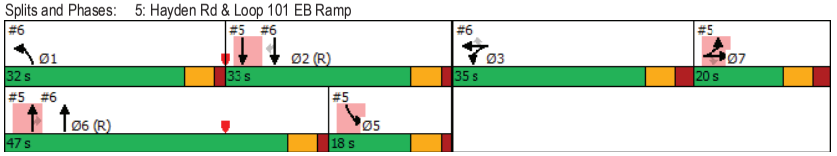


Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	417	5	535	1447	256	486	710		
Future Volume (vph)	417	5	535	1447	256	486	710		
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA		
Protected Phases	7	7		6		5	2	1	3
Permitted Phases			7		6				
Detector Phase	7	7	7	6	6	5	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	12.0	5.0	7.0
Minimum Split (s)	19.0	19.0	19.0	26.0	26.0	18.0	26.0	11.0	34.0
Total Split (s)	20.0	20.0	20.0	47.0	47.0	18.0	33.0	32.0	35.0
Total Split (%)	16.7%	16.7%	16.7%	39.2%	39.2%	15.0%	27.5%	27%	29%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	None	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated

Splits and Phases: 5: Hayden Rd & Loop 101 EB Ramp



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	656	2	757	0	0	0	0	777	314	473	624	0
Future Volume (vph)	656	2	757	0	0	0	0	777	314	473	624	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.90	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1504	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1504	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.90	0.85	0.90	0.90
Adj. Flow (vph)	729	2	841	0	0	0	0	914	349	556	693	0
RTOR Reduction (vph)	0	55	407	0	0	0	0	0	265	0	0	0
Lane Group Flow (vph)	547	465	98	0	0	0	0	914	84	556	693	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	23.3	23.3	23.3					29.0	29.0	24.0	39.0	
Effective Green, g (s)	23.3	23.3	23.3					29.0	29.0	24.0	39.0	
Actuated g/C Ratio	0.19	0.19	0.19					0.24	0.24	0.20	0.32	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	326	292	292					1228	382	686	1150	
v/s Ratio Prot	c0.33	0.31						c0.18		c0.16	0.20	
v/s Ratio Perm			0.07						0.05			
v/c Ratio	1.68	1.59	0.34					0.74	0.22	0.81	0.60	
Uniform Delay, d1	48.4	48.4	41.7					42.1	36.4	45.8	34.0	
Progression Factor	1.00	1.00	1.00					0.79	0.57	0.43	0.33	
Incremental Delay, d2	318.2	282.6	0.7					3.8	1.2	6.1	2.0	
Delay (s)	366.5	330.9	42.4					37.2	22.2	25.7	13.2	
Level of Service	F	F	D					D	C	C	B	
Approach Delay (s)		250.6			0.0			33.0			18.8	
Approach LOS		F			A			C			B	

Intersection Summary				
HCM 2000 Control Delay	112.4	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	74.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	417	5	535	0	0	0	0	1447	256	486	710	0
Future Volume (vph)	417	5	535	0	0	0	0	1447	256	486	710	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.89	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1492	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1492	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.90	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.90	0.90
Adj. Flow (vph)	463	6	594	0	0	0	0	1608	301	572	789	0
RTOR Reduction (vph)	0	74	289	0	0	0	0	0	150	0	0	0
Lane Group Flow (vph)	370	280	50	0	0	0	0	1608	151	572	789	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	17.7	17.7	17.7					41.0	41.0	12.0	27.0	
Effective Green, g (s)	17.7	17.7	17.7					41.0	41.0	12.0	27.0	
Actuated g/C Ratio	0.15	0.15	0.15					0.34	0.34	0.10	0.22	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	247	220	221					1737	540	343	796	
v/s Ratio Prot	c0.22	0.19						c0.32		c0.17	c0.22	
v/s Ratio Perm			0.03						0.10			
v/c Ratio	1.50	1.27	0.23					0.93	0.28	1.67	0.99	
Uniform Delay, d1	51.1	51.1	45.1					38.0	28.7	54.0	46.4	
Progression Factor	1.00	1.00	1.00					0.93	1.08	0.63	0.61	
Incremental Delay, d2	244.2	153.0	0.5					9.1	1.1	309.3	24.6	
Delay (s)	295.4	204.1	45.6					44.3	32.3	343.2	53.0	
Level of Service	F	F	D					D	C	F	D	
Approach Delay (s)		185.3			0.0			42.4			175.0	
Approach LOS		F			A			D			F	

Intersection Summary				
HCM 2000 Control Delay	119.1	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	102.3%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

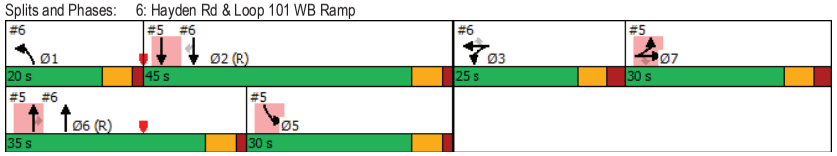
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Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	202	52	537	547	888	887	310		
Future Volume (vph)	202	52	537	547	888	887	310		
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm		
Protected Phases	3	3		1	6	2		5	7
Permitted Phases			3				2		
Detector Phase	3	3	3	1	6	2	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	5.0	12.0	12.0	12.0	16.0	7.0
Minimum Split (s)	24.0	24.0	24.0	11.0	26.0	26.0	26.0	22.0	29.0
Total Split (s)	25.0	25.0	25.0	20.0	35.0	45.0	45.0	30.0	30.0
Total Split (%)	20.8%	20.8%	20.8%	16.7%	29.2%	37.5%	37.5%	25%	25%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated

Splits and Phases: 6: Hayden Rd & Loop 101 WB Ramp

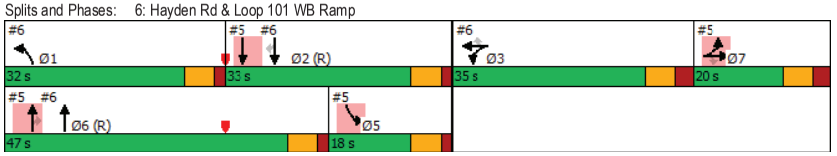


Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	277	42	465	874	990	917	461		
Future Volume (vph)	277	42	465	874	990	917	461		
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm		
Protected Phases	3	3		1	6	2		5	7
Permitted Phases			3				2		
Detector Phase	3	3	3	1	6	2	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	5.0	12.0	12.0	12.0	12.0	7.0
Minimum Split (s)	34.0	34.0	34.0	11.0	26.0	26.0	26.0	18.0	19.0
Total Split (s)	35.0	35.0	35.0	32.0	47.0	33.0	33.0	18.0	20.0
Total Split (%)	29.2%	29.2%	29.2%	26.7%	39.2%	27.5%	27.5%	15%	17%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated

Splits and Phases: 6: Hayden Rd & Loop 101 WB Ramp



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	202	52	537	547	888	0	0	887	310
Future Volume (vph)	0	0	0	202	52	537	547	888	0	0	887	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.89	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2826	1441	1770	3539			6408	1583
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1610	2826	1441	1770	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	238	65	597	608	987	0	0	1044	344
RTOR Reduction (vph)	0	0	0	0	255	254	0	0	0	0	0	232
Lane Group Flow (vph)	0	0	0	212	135	44	608	987	0	0	1044	112
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				17.7	17.7	17.7	14.0	29.0			39.0	39.0
Effective Green, g (s)				17.7	17.7	17.7	14.0	29.0			39.0	39.0
Actuated g/C Ratio				0.15	0.15	0.15	0.12	0.24			0.32	0.32
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				237	416	212	206	855			2082	514
v/s Ratio Prot				c0.13	0.05		c0.34	c0.28			c0.16	
v/s Ratio Perm						0.03						0.07
v/c Ratio				0.89	0.32	0.21	2.95	1.15			0.50	0.22
Uniform Delay, d1				50.2	45.8	45.0	53.0	45.5			32.7	29.4
Progression Factor				1.00	1.00	1.00	1.01	0.37			1.37	7.07
Incremental Delay, d2				31.8	0.5	0.5	879.3	70.9			0.8	0.9
Delay (s)				82.0	46.3	45.5	933.0	87.5			45.6	208.9
Level of Service				F	D	D	F	F			D	F
Approach Delay (s)		0.0			54.4			409.8			86.0	
Approach LOS		A			D			F			F	

Intersection Summary				
HCM 2000 Control Delay	211.7	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	74.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	277	42	465	874	990	0	0	917	461
Future Volume (vph)	0	0	0	277	42	465	874	990	0	0	917	461
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.91	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2869	1441	1770	3539			6408	1583
Flt Permitted				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1610	2869	1441	1770	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	326	52	517	971	1100	0	0	1079	512
RTOR Reduction (vph)	0	0	0	0	209	208	0	0	0	0	0	397
Lane Group Flow (vph)	0	0	0	222	207	50	971	1100	0	0	1079	115
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				23.3	23.3	23.3	26.0	41.0			27.0	27.0
Effective Green, g (s)				23.3	23.3	23.3	26.0	41.0			27.0	27.0
Actuated g/C Ratio				0.19	0.19	0.19	0.22	0.34			0.22	0.22
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				312	557	279	383	1209			1441	356
v/s Ratio Prot				c0.14	0.07		c0.55	c0.31			c0.17	
v/s Ratio Perm						0.03						0.07
v/c Ratio				0.71	0.37	0.18	2.54	0.91			0.75	0.32
Uniform Delay, d1				45.2	42.0	40.4	47.0	37.7			43.3	38.9
Progression Factor				1.00	1.00	1.00	0.96	0.40			1.07	5.04
Incremental Delay, d2				7.5	0.4	0.3	691.6	1.3			3.5	2.3
Delay (s)				52.7	42.4	40.7	736.7	16.4			49.8	198.4
Level of Service				D	D	D	F	B			D	F
Approach Delay (s)		0.0			44.5			354.1			97.6	
Approach LOS		A			D			F			F	

Intersection Summary				
HCM 2000 Control Delay	203.7	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.10			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	102.3%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

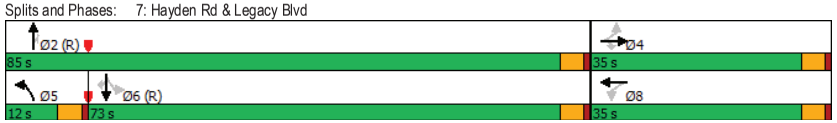
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Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	25	12	97	10	19	107	1008	4	1107	36
Future Volume (vph)	25	12	97	10	19	107	1008	4	1107	36
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	NA	Perm
Protected Phases		4			8	5	2		6	
Permitted Phases	4		4	8				2		6
Detector Phase	4	4	4	8	8	5	2	2	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	9.5	9.5	9.5	9.5	9.5
Total Split (s)	35.0	35.0	35.0	35.0	35.0	12.0	85.0	85.0	73.0	73.0
Total Split (%)	29.2%	29.2%	29.2%	29.2%	29.2%	10.0%	70.8%	70.8%	60.8%	60.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						Lead			Lag	Lag
Lead-Lag Optimize?						Yes			Yes	Yes
Recall Mode	None	None	None	Max	Max	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 7: Hayden Rd & Legacy Blvd

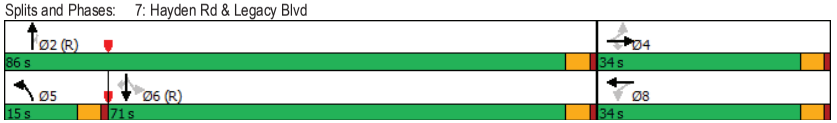


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	70	35	199	8	25	155	1252	6	941	51
Future Volume (vph)	70	35	199	8	25	155	1252	6	941	51
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	NA	Perm
Protected Phases		4			8	5	2		6	
Permitted Phases	4		4	8				2		6
Detector Phase	4	4	4	8	8	5	2	2	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	9.5	9.5	9.5	9.5	9.5
Total Split (s)	34.0	34.0	34.0	34.0	34.0	15.0	86.0	86.0	71.0	71.0
Total Split (%)	28.3%	28.3%	28.3%	28.3%	28.3%	12.5%	71.7%	71.7%	59.2%	59.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						Lead			Lag	Lag
Lead-Lag Optimize?						Yes			Yes	Yes
Recall Mode	None	None	None	Max	Max	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 7: Hayden Rd & Legacy Blvd



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	12	97	10	19	0	107	1008	4	0	1107	36
Future Volume (veh/h)	25	12	97	10	19	0	107	1008	4	0	1107	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	28	13	55	11	21	0	119	1120	2	0	1230	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	407	903	403	412	903	0	111	2384	1063	60	2915	905
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.00	0.06	0.67	0.67	0.00	0.57	0.57
Sat Flow, veh/h	1391	3554	1585	1401	3647	0	1781	3554	1585	503	5106	1585
Grp Volume(v), veh/h	28	13	55	11	21	0	119	1120	2	0	1230	20
Grp Sat Flow(s),veh/h/ln	1391	1777	1585	1401	1777	0	1781	1777	1585	503	1702	1585
Q Serve(g_s), s	1.8	0.3	3.2	0.7	0.5	0.0	7.5	18.2	0.0	0.0	16.3	0.7
Cycle Q Clear(g_c), s	2.4	0.3	3.2	1.0	0.5	0.0	7.5	18.2	0.0	0.0	16.3	0.7
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	407	903	403	412	903	0	111	2384	1063	60	2915	905
V/C Ratio(X)	0.07	0.01	0.14	0.03	0.02	0.00	1.07	0.47	0.00	0.00	0.42	0.02
Avail Cap(c_a), veh/h	407	903	403	412	903	0	111	2384	1063	60	2915	905
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	34.5	33.5	34.6	33.9	33.6	0.0	56.3	9.5	6.5	0.0	14.6	11.2
Incr Delay (d2), s/veh	0.1	0.0	0.2	0.1	0.0	0.0	105.0	0.7	0.0	0.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	0.3	2.3	0.5	0.4	0.0	11.1	11.1	0.0	0.0	10.4	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.5	33.5	34.7	34.0	33.6	0.0	161.3	10.2	6.5	0.0	15.0	11.2
LnGrp LOS	C	C	C	C	C	A	F	B	A	A	B	B
Approach Vol, veh/h		96			32			1241			1250	
Approach Delay, s/veh		34.5			33.8			24.6			14.9	
Approach LOS		C			C			C			B	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		85.0		35.0	12.0	73.0		35.0				
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		80.5		30.5	7.5	68.5		30.5				
Max Q Clear Time (g_c+I1), s		20.2		5.2	9.5	18.3		3.0				
Green Ext Time (p_c), s		11.4		0.3	0.0	12.5		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			20.5									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	35	199	8	25	0	155	1252	6	0	941	51
Future Volume (veh/h)	70	35	199	8	25	0	155	1252	6	0	941	51
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	78	39	167	9	28	0	172	1391	4	0	1046	29
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	391	874	390	385	874	0	156	2414	1077	60	2830	878
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.00	0.09	0.68	0.68	0.00	0.55	0.55
Sat Flow, veh/h	1382	3554	1585	1368	3647	0	1781	3554	1585	389	5106	1585
Grp Volume(v), veh/h	78	39	167	9	28	0	172	1391	4	0	1046	29
Grp Sat Flow(s),veh/h/ln	1382	1777	1585	1368	1777	0	1781	1777	1585	389	1702	1585
Q Serve(g_s), s	5.5	1.0	10.7	0.6	0.7	0.0	10.5	24.8	0.1	0.0	13.8	1.0
Cycle Q Clear(g_c), s	6.2	1.0	10.7	1.6	0.7	0.0	10.5	24.8	0.1	0.0	13.8	1.0
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	391	874	390	385	874	0	156	2414	1077	60	2830	878
V/C Ratio(X)	0.20	0.04	0.43	0.02	0.03	0.00	1.10	0.58	0.00	0.00	0.37	0.03
Avail Cap(c_a), veh/h	391	874	390	385	874	0	156	2414	1077	60	2830	878
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	36.7	34.5	38.1	35.1	34.4	0.0	54.8	10.1	6.2	0.0	15.0	12.1
Incr Delay (d2), s/veh	0.2	0.0	0.7	0.1	0.1	0.0	102.5	1.0	0.0	0.0	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.4	0.8	7.6	0.4	0.6	0.0	14.6	14.2	0.1	0.0	9.1	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.0	34.5	38.9	35.2	34.5	0.0	157.3	11.2	6.2	0.0	15.4	12.2
LnGrp LOS	D	C	D	D	C	A	F	B	A	A	B	B
Approach Vol, veh/h		284			37			1567			1075	
Approach Delay, s/veh		37.8			34.7			27.2			15.3	
Approach LOS		D			C			C			B	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		86.0		34.0	15.0	71.0		34.0				
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		81.5		29.5	10.5	66.5		29.5				
Max Q Clear Time (g_c+I1), s		26.8		12.7	12.5	15.8		3.6				
Green Ext Time (p_c), s		16.2		0.9	0.0	9.9		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			24.0									
HCM 6th LOS			C									

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Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	488	13	7	255	34	3	0	9	40	2	40
Future Vol, veh/h	44	488	13	7	255	34	3	0	9	40	2	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	85	-	-	105	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	542	14	8	283	38	3	0	10	44	2	44

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	321	0	0	556	0	0	806	984	278	687	972	161
Stage 1	-	-	-	-	-	-	647	647	-	318	318	-
Stage 2	-	-	-	-	-	-	159	337	-	369	654	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1236	-	-	1011	-	-	273	247	719	333	251	855
Stage 1	-	-	-	-	-	-	426	465	-	668	652	-
Stage 2	-	-	-	-	-	-	827	640	-	623	461	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1236	-	-	1011	-	-	248	235	719	317	239	855
Mov Cap-2 Maneuver	-	-	-	-	-	-	248	235	-	317	239	-
Stage 1	-	-	-	-	-	-	409	446	-	641	647	-
Stage 2	-	-	-	-	-	-	775	635	-	590	443	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0.2	12.5	14
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	248	719	1236	-	-	1011	-	-	317	762
HCM Lane V/C Ratio	0.013	0.014	0.04	-	-	0.008	-	-	0.14	0.061
HCM Control Delay (s)	19.7	10.1	8	-	-	8.6	-	-	18.2	10
HCM Lane LOS	C	B	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0	0	0.1	-	-	0	-	-	0.5	0.2

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	80	262	15	22	596	53	14	1	4	35	3	65
Future Vol, veh/h	80	262	15	22	596	53	14	1	4	35	3	65
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	85	-	-	105	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	89	291	17	24	662	59	16	1	4	39	3	72

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	721	0	0	308	0	0	859	1247	154	1064	1226	361
Stage 1	-	-	-	-	-	-	478	478	-	740	740	-
Stage 2	-	-	-	-	-	-	381	769	-	324	486	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	877	-	-	1249	-	-	250	172	864	177	177	636
Stage 1	-	-	-	-	-	-	537	554	-	375	421	-
Stage 2	-	-	-	-	-	-	613	409	-	662	549	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	877	-	-	1249	-	-	198	152	864	159	156	636
Mov Cap-2 Maneuver	-	-	-	-	-	-	198	152	-	159	156	-
Stage 1	-	-	-	-	-	-	483	498	-	337	413	-
Stage 2	-	-	-	-	-	-	529	401	-	590	494	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.1	0.3	21.7	20
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	198	446	877	-	-	1249	-	-	159	560
HCM Lane V/C Ratio	0.079	0.012	0.101	-	-	0.02	-	-	0.245	0.135
HCM Control Delay (s)	24.7	13.2	9.6	-	-	7.9	-	-	34.8	12.4
HCM Lane LOS	C	B	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	0.3	0	0.3	-	-	0.1	-	-	0.9	0.5

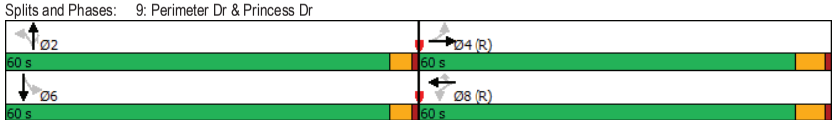
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Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	80	203	294	341	188	101	36	83	64	12
Future Volume (vph)	80	203	294	341	188	101	36	83	64	12
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		4		8			2			6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	2	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	22.5	22.5
Total Split (s)	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.2	3.2	3.2	3.2	3.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 9: Perimeter Dr & Princess Dr

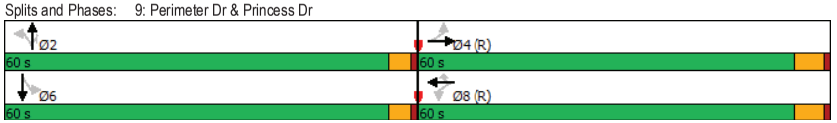


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	74	318	71	259	101	170	20	290	230	25
Future Volume (vph)	74	318	71	259	101	170	20	290	230	25
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		4		8			2			6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	2	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	22.5	22.5
Total Split (s)	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.2	3.2	3.2	3.2	3.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 9: Perimeter Dr & Princess Dr



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	203	82	294	341	188	101	36	83	64	12	13
Future Volume (veh/h)	80	203	82	294	341	188	101	36	83	64	12	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	44	226	69	327	379	105	112	40	46	71	13	11
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	416	1796	516	516	1620	723	699	1652	737	662	903	672
Arrive On Green	0.46	0.46	0.46	0.46	0.46	0.46	0.47	0.47	0.47	0.47	0.47	0.47
Sat Flow, veh/h	911	3940	1131	1084	3554	1585	1387	3554	1585	1311	1942	1445
Grp Volume(v), veh/h	44	193	102	327	379	105	112	40	46	71	12	12
Grp Sat Flow(s),veh/h/ln	911	1702	1667	1084	1777	1585	1387	1777	1585	1311	1777	1610
Q Serve(g_s), s	3.7	3.9	4.2	30.0	7.8	4.6	5.7	0.7	1.9	3.7	0.4	0.5
Cycle Q Clear(g_c), s	11.5	3.9	4.2	34.3	7.8	4.6	6.2	0.7	1.9	4.4	0.4	0.5
Prop In Lane	1.00		0.68	1.00		1.00	1.00		1.00	1.00		0.90
Lane Grp Cap(c), veh/h	416	1552	760	516	1620	723	699	1652	737	662	826	749
V/C Ratio(X)	0.11	0.12	0.13	0.63	0.23	0.15	0.16	0.02	0.06	0.11	0.01	0.02
Avail Cap(c_a), veh/h	416	1552	760	516	1620	723	699	1652	737	662	826	749
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.4	18.8	18.9	28.9	19.9	19.0	19.0	17.4	17.7	18.6	17.3	17.3
Incr Delay (d2), s/veh	0.5	0.2	0.4	5.8	0.3	0.4	0.5	0.0	0.2	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.6	2.9	3.1	13.3	6.0	3.2	3.5	0.6	1.3	2.2	0.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.9	19.0	19.3	34.7	20.2	19.5	19.5	17.4	17.8	18.9	17.3	17.3
LnGrp LOS	C	B	B	C	C	B	B	B	B	B	B	B
Approach Vol, veh/h		339			811			198			95	
Approach Delay, s/veh		19.7			26.0			18.7			18.5	
Approach LOS		B			C			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		60.0		60.0		60.0		60.0				
Change Period (Y+Rc), s		* 4.2		5.3		* 4.2		5.3				
Max Green Setting (Gmax), s		* 56		54.7		* 56		54.7				
Max Q Clear Time (g_c+I1), s		8.2		13.5		6.4		36.3				
Green Ext Time (p_c), s		0.7		2.3		0.4		4.2				
Intersection Summary												
HCM 6th Ctrl Delay			23.0									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	318	31	71	259	101	170	20	290	230	25	100
Future Volume (veh/h)	74	318	31	71	259	101	170	20	290	230	25	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	41	353	26	79	288	56	189	22	161	256	28	83
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	483	2214	161	474	1620	723	618	1652	737	614	826	737
Arrive On Green	0.46	0.46	0.46	0.46	0.46	0.46	0.47	0.47	0.47	0.47	0.47	0.47
Sat Flow, veh/h	1037	4858	353	1004	3554	1585	1282	3554	1585	1201	1777	1585
Grp Volume(v), veh/h	41	246	133	79	288	56	189	22	161	256	28	83
Grp Sat Flow(s),veh/h/ln	1037	1702	1807	1004	1777	1585	1282	1777	1585	1201	1777	1585
Q Serve(g_s), s	2.9	5.1	5.2	6.0	5.8	2.4	11.7	0.4	7.3	17.5	1.0	3.5
Cycle Q Clear(g_c), s	8.7	5.1	5.2	11.2	5.8	2.4	15.3	0.4	7.3	17.9	1.0	3.5
Prop In Lane	1.00		0.20	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	483	1552	824	474	1620	723	618	1652	737	614	826	737
V/C Ratio(X)	0.08	0.16	0.16	0.17	0.18	0.08	0.31	0.01	0.22	0.42	0.03	0.11
Avail Cap(c_a), veh/h	483	1552	824	474	1620	723	618	1652	737	614	826	737
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.9	19.2	19.2	22.5	19.3	18.4	22.4	17.3	19.1	22.1	17.4	18.1
Incr Delay (d2), s/veh	0.3	0.2	0.4	0.8	0.2	0.2	1.3	0.0	0.7	2.1	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	3.7	4.1	2.8	4.4	1.7	6.8	0.3	5.1	9.0	0.8	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.3	19.4	19.6	23.2	19.6	18.6	23.7	17.3	19.8	24.2	17.5	18.4
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		420			423			372			367	
Approach Delay, s/veh		19.7			20.1			21.6			22.4	
Approach LOS		B			C			C			C	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		60.0		60.0		60.0		60.0				
Change Period (Y+Rc), s		* 4.2		5.3		* 4.2		5.3				
Max Green Setting (Gmax), s		* 56		54.7		* 56		54.7				
Max Q Clear Time (g_c+I1), s		17.3		10.7		19.9		13.2				
Green Ext Time (p_c), s		1.3		2.8		1.7		2.6				
Intersection Summary												
HCM 6th Ctrl Delay			20.9									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

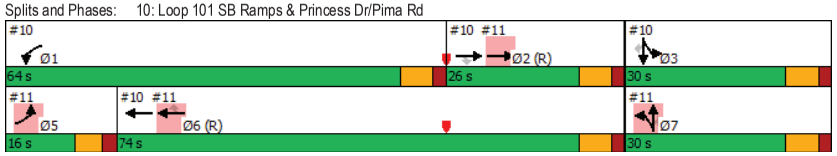
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Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	207	158	1220	578	445	556	198		
Future Volume (vph)	207	158	1220	578	445	556	198		
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm		
Protected Phases	2		1	6	3	3		5	7
Permitted Phases		2					3		
Detector Phase	2	2	1	6	3	3	3		
Switch Phase									
Minimum Initial (s)	1.0	1.0	7.0	1.0	10.0	10.0	10.0	5.0	7.0
Minimum Split (s)	7.7	7.7	13.7	7.7	19.0	19.0	19.0	11.0	13.7
Total Split (s)	26.0	26.0	64.0	74.0	30.0	30.0	30.0	16.0	30.0
Total Split (%)	21.7%	21.7%	53.3%	61.7%	25.0%	25.0%	25.0%	13%	25%
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lag	Lag	Lead	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated

Splits and Phases: 10: Loop 101 SB Ramps & Princess Dr/Pima Rd

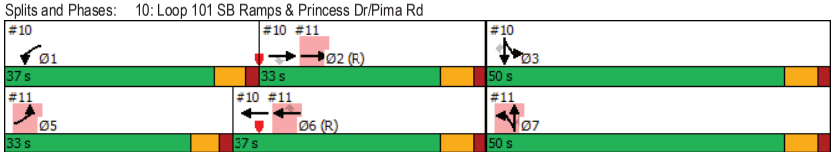


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	487	414	825	322	324	278	90		
Future Volume (vph)	487	414	825	322	324	278	90		
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm		
Protected Phases	2		1	6	3	3		5	7
Permitted Phases		2					3		
Detector Phase	2	2	1	6	3	3	3		
Switch Phase									
Minimum Initial (s)	1.0	1.0	7.0	1.0	10.0	10.0	10.0	5.0	7.0
Minimum Split (s)	7.7	7.7	13.7	7.7	19.0	19.0	19.0	11.0	13.7
Total Split (s)	33.0	33.0	37.0	37.0	50.0	50.0	50.0	33.0	50.0
Total Split (%)	27.5%	27.5%	30.8%	30.8%	41.7%	41.7%	41.7%	28%	42%
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lag	Lag	Lead	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 10: Loop 101 SB Ramps & Princess Dr/Pima Rd



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	207	158	1220	578	0	0	0	0	445	556	198
Future Volume (vph)	0	207	158	1220	578	0	0	0	0	445	556	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3167	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3167	1441
Peak-hour factor, PHF	0.90	0.80	0.85	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	259	186	1356	680	0	0	0	0	494	654	233
RTOR Reduction (vph)	0	0	121	0	0	0	0	0	0	0	2	169
Lane Group Flow (vph)	0	259	65	1356	680	0	0	0	0	380	789	41
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		22.8	22.8	53.8	69.5					23.3	23.3	23.3
Effective Green, g (s)		22.8	22.8	53.8	69.5					23.3	23.3	23.3
Actuated g/C Ratio		0.19	0.19	0.45	0.58					0.19	0.19	0.19
Clearance Time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		966	529	1539	2945					312	614	279
v/s Ratio Prot		c0.05		c0.39	0.13					0.24	c0.25	
v/s Ratio Perm			0.02									0.03
v/c Ratio		0.27	0.12	0.88	0.23					1.22	1.29	0.15
Uniform Delay, d1		41.5	40.3	30.2	12.3					48.4	48.4	40.1
Progression Factor		1.17	1.71	0.70	0.66					1.00	1.00	1.00
Incremental Delay, d2		0.7	0.5	5.5	0.2					123.6	140.6	0.2
Delay (s)		49.4	69.3	26.6	8.2					172.0	189.0	40.3
Level of Service		D	E	C	A					F	F	D
Approach Delay (s)		57.7			20.5			0.0			161.7	
Approach LOS		E			C			A			F	

Intersection Summary				
HCM 2000 Control Delay	75.3	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	77.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	487	414	825	322	0	0	0	0	324	278	90
Future Volume (vph)	0	487	414	825	322	0	0	0	0	324	278	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3148	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3148	1441
Peak-hour factor, PHF	0.90	0.85	0.85	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	573	487	917	379	0	0	0	0	360	327	106
RTOR Reduction (vph)	0	0	290	0	0	0	0	0	0	0	1	63
Lane Group Flow (vph)	0	573	197	917	379	0	0	0	0	227	470	32
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		26.3	26.3	33.8	38.2					39.8	39.8	39.8
Effective Green, g (s)		26.3	26.3	33.8	38.2					39.8	39.8	39.8
Actuated g/C Ratio		0.22	0.22	0.28	0.32					0.33	0.33	0.33
Clearance Time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1114	610	966	1618					533	1044	477
v/s Ratio Prot		c0.11		c0.27	0.07					0.14	c0.15	
v/s Ratio Perm			0.07									0.02
v/c Ratio		0.51	0.32	0.95	0.23					0.43	0.45	0.07
Uniform Delay, d1		41.2	39.4	42.3	30.1					31.2	31.5	27.4
Progression Factor		1.16	1.69	1.66	0.56					1.00	1.00	1.00
Incremental Delay, d2		1.7	1.4	15.7	0.3					0.5	0.3	0.1
Delay (s)		49.4	68.0	85.7	17.3					31.8	31.8	27.5
Level of Service		D	E	F	B					C	C	C
Approach Delay (s)		57.9			65.7			0.0			31.3	
Approach LOS		E			E			A			C	

Intersection Summary				
HCM 2000 Control Delay	54.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	66.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

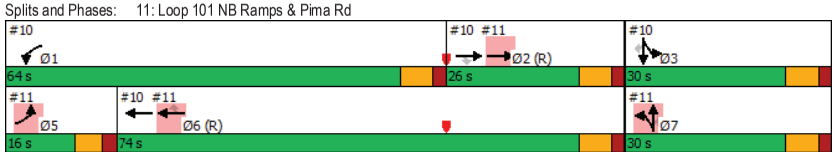
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Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	60	592	1452	337	345	419	984		
Future Volume (vph)	60	592	1452	337	345	419	984		
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm		
Protected Phases	5	2	6		7	7		1	3
Permitted Phases				6			7		
Detector Phase	5	2	6	6	7	7	7		
Switch Phase									
Minimum Initial (s)	5.0	1.0	1.0	1.0	7.0	7.0	7.0	7.0	10.0
Minimum Split (s)	11.0	7.7	7.7	7.7	13.7	13.7	13.7	13.7	19.0
Total Split (s)	16.0	26.0	74.0	74.0	30.0	30.0	30.0	64.0	30.0
Total Split (%)	13.3%	21.7%	61.7%	61.7%	25.0%	25.0%	25.0%	53%	25%
Yellow Time (s)	4.0	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lead	Lag	Lag	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated

Splits and Phases: 11: Loop 101 NB Ramps & Pima Rd

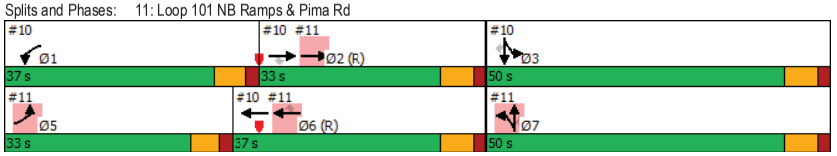


Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	230	576	1018	298	162	518	995		
Future Volume (vph)	230	576	1018	298	162	518	995		
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm		
Protected Phases	5	2	6		7	7		1	3
Permitted Phases				6			7		
Detector Phase	5	2	6	6	7	7	7		
Switch Phase									
Minimum Initial (s)	5.0	1.0	1.0	1.0	7.0	7.0	7.0	7.0	10.0
Minimum Split (s)	11.0	7.7	7.7	7.7	13.7	13.7	13.7	13.7	19.0
Total Split (s)	33.0	33.0	37.0	37.0	50.0	50.0	50.0	37.0	50.0
Total Split (%)	27.5%	27.5%	30.8%	30.8%	41.7%	41.7%	41.7%	31%	42%
Yellow Time (s)	4.0	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lead	Lag	Lag	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 11: Loop 101 NB Ramps & Pima Rd



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	592	0	0	1452	337	345	419	984	0	0	0
Future Volume (vph)	60	592	0	0	1452	337	345	419	984	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3362	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3362	2787			
Peak-hour factor, PHF	0.80	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	75	696	0	0	1613	374	383	493	1093	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	53	0	0	881	0	0	0
Lane Group Flow (vph)	75	696	0	0	1613	321	283	593	212	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	7.8	22.8			69.5	69.5	23.3	23.3	23.3			
Effective Green, g (s)	7.8	22.8			69.5	69.5	23.3	23.3	23.3			
Actuated g/C Ratio	0.06	0.19			0.58	0.58	0.19	0.19	0.19			
Clearance Time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	115	672			3711	916	312	652	541			
v/s Ratio Prot	c0.04	c0.20			c0.25		0.18	c0.18				
v/s Ratio Perm						0.20			0.08			
v/c Ratio	0.65	1.04			0.43	0.35	0.91	0.91	0.39			
Uniform Delay, d1	54.8	48.6			14.2	13.3	47.3	47.3	42.2			
Progression Factor	0.46	1.11			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	5.9	33.1			0.4	1.1	28.2	16.6	0.5			
Delay (s)	31.1	87.3			14.6	14.4	75.5	63.9	42.6			
Level of Service	C	F			B	B	E	E	D			
Approach Delay (s)		81.8			14.5			53.8			0.0	
Approach LOS		F			B			D			A	

Intersection Summary				
HCM 2000 Control Delay	41.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	77.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	576	0	0	1018	298	162	518	995	0	0	0
Future Volume (vph)	230	576	0	0	1018	298	162	518	995	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3385	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3385	2787			
Peak-hour factor, PHF	0.85	0.85	0.90	0.90	0.85	0.85	0.85	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	271	678	0	0	1198	351	191	609	1106	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	108	0	0	659	0	0	0
Lane Group Flow (vph)	271	678	0	0	1198	243	172	628	447	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	22.6	26.3			38.2	38.2	39.8	39.8	39.8			
Effective Green, g (s)	22.6	26.3			38.2	38.2	39.8	39.8	39.8			
Actuated g/C Ratio	0.19	0.22			0.32	0.32	0.33	0.33	0.33			
Clearance Time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	333	775			2039	503	533	1122	924			
v/s Ratio Prot	c0.15	c0.19			c0.19		0.11	c0.19				
v/s Ratio Perm						0.15			0.16			
v/c Ratio	0.81	0.87			0.59	0.48	0.32	0.56	0.48			
Uniform Delay, d1	46.7	45.3			34.3	32.9	30.0	32.9	31.9			
Progression Factor	1.27	0.69			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	12.9	12.1			1.2	3.3	0.4	0.6	0.4			
Delay (s)	72.1	43.1			35.5	36.2	30.4	33.5	32.3			
Level of Service	E	D			D	D	C	C	C			
Approach Delay (s)		51.4			35.7			32.5			0.0	
Approach LOS		D			D			C			A	

Intersection Summary				
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	66.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

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Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↱			↱
Traffic Vol, veh/h	0	434	340	1	0	355
Future Vol, veh/h	0	434	340	1	0	355
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	482	378	1	0	394

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	190
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	820
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	820
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.4
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	820
HCM Lane V/C Ratio	-	-	-	0.481
HCM Control Delay (s)	-	-	-	13.4
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	2.6

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↱			↱
Traffic Vol, veh/h	0	618	444	2	0	200
Future Vol, veh/h	0	618	444	2	0	200
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	687	493	2	0	222

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	248
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	752
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	752
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	752
HCM Lane V/C Ratio	-	-	-	0.296
HCM Control Delay (s)	-	-	-	11.8
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	1.2

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Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	394	40	0	341	0	6
Future Vol, veh/h	394	40	0	341	0	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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	438	44	0	379	0	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	241
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	760
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	760
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	760	-	-	-
HCM Lane V/C Ratio	0.009	-	-	-
HCM Control Delay (s)	9.8	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	523	95	0	446	0	3
Future Vol, veh/h	523	95	0	446	0	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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	581	106	0	496	0	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	344
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	652
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	652
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	652	-	-	-
HCM Lane V/C Ratio	0.005	-	-	-
HCM Control Delay (s)	10.6	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

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Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	156	244	251	8	18	90
Future Vol, veh/h	156	244	251	8	18	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	173	271	279	9	20	100

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	288	0	-	0	766	144
Stage 1	-	-	-	-	284	-
Stage 2	-	-	-	-	482	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1271	-	-	-	339	877
Stage 1	-	-	-	-	739	-
Stage 2	-	-	-	-	587	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1271	-	-	-	293	877
Mov Cap-2 Maneuver	-	-	-	-	293	-
Stage 1	-	-	-	-	638	-
Stage 2	-	-	-	-	587	-

Approach	EB	WB	SB
HCM Control Delay, s	3.2	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1271	-	-	-	658
HCM Lane V/C Ratio	0.136	-	-	-	0.182
HCM Control Delay (s)	8.3	-	-	-	11.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.5	-	-	-	0.7

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	365	161	382	14	10	64
Future Vol, veh/h	365	161	382	14	10	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	406	179	424	16	11	71

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	440	0	-	0	1334	220
Stage 1	-	-	-	-	432	-
Stage 2	-	-	-	-	902	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1116	-	-	-	145	784
Stage 1	-	-	-	-	622	-
Stage 2	-	-	-	-	356	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1116	-	-	-	92	784
Mov Cap-2 Maneuver	-	-	-	-	92	-
Stage 1	-	-	-	-	396	-
Stage 2	-	-	-	-	356	-

Approach	EB	WB	SB
HCM Control Delay, s	7	0	16.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1116	-	-	-	389
HCM Lane V/C Ratio	0.363	-	-	-	0.211
HCM Control Delay (s)	10.1	-	-	-	16.7
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	1.7	-	-	-	0.8

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Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Traffic Vol, veh/h	0	262	257	0	0	2
Future Vol, veh/h	0	262	257	0	0	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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	291	286	0	0	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	143
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	0	879
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	879
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	879
HCM Lane V/C Ratio	-	-	0.003
HCM Control Delay (s)	-	-	9.1
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Traffic Vol, veh/h	0	171	395	0	0	1
Future Vol, veh/h	0	171	395	0	0	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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	190	439	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	220
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	0	784
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	784
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	784
HCM Lane V/C Ratio	-	-	0.001
HCM Control Delay (s)	-	-	9.6
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0

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Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	27	231	8	28	234
Future Vol, veh/h	13	27	231	8	28	234
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	30	257	9	31	260

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	454	133	0	0	266	0
Stage 1	262	-	-	-	-	-
Stage 2	192	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	535	892	-	-	1295	-
Stage 1	758	-	-	-	-	-
Stage 2	822	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	522	892	-	-	1295	-
Mov Cap-2 Maneuver	522	-	-	-	-	-
Stage 1	758	-	-	-	-	-
Stage 2	802	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	0.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	725	1295	-
HCM Lane V/C Ratio	-	-	0.061	0.024	-
HCM Control Delay (s)	-	-	10.3	7.8	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	25	370	9	25	146
Future Vol, veh/h	9	25	370	9	25	146
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	28	411	10	28	162

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	553	211	0	0	421	0
Stage 1	416	-	-	-	-	-
Stage 2	137	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	463	794	-	-	1135	-
Stage 1	634	-	-	-	-	-
Stage 2	875	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	451	794	-	-	1135	-
Mov Cap-2 Maneuver	451	-	-	-	-	-
Stage 1	634	-	-	-	-	-
Stage 2	853	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	1.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	661	1135	-
HCM Lane V/C Ratio	-	-	0.057	0.024	-
HCM Control Delay (s)	-	-	10.8	8.3	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

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Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	186	0	6	1	0	17	4	46	9	69	162	16
Future Vol, veh/h	186	0	6	1	0	17	4	46	9	69	162	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	207	0	7	1	0	19	4	51	10	77	180	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	377	412	99	308	416	31	198	0	0	61	0	0
Stage 1	343	343	-	64	64	-	-	-	-	-	-	-
Stage 2	34	69	-	244	352	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	555	529	937	621	526	1036	1372	-	-	1540	-	-
Stage 1	646	636	-	939	841	-	-	-	-	-	-	-
Stage 2	978	837	-	738	630	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	523	501	937	592	498	1036	1372	-	-	1540	-	-
Mov Cap-2 Maneuver	523	501	-	592	498	-	-	-	-	-	-	-
Stage 1	644	604	-	936	838	-	-	-	-	-	-	-
Stage 2	957	834	-	696	599	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.3	8.7	0.5	2.1
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1372	-	-	530	995	1540	-	-
HCM Lane V/C Ratio	0.003	-	-	0.403	0.02	0.05	-	-
HCM Control Delay (s)	7.6	-	-	16.3	8.7	7.5	-	-
HCM Lane LOS	A	-	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.9	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	86	0	3	6	0	41	9	253	1	5	112	38
Future Vol, veh/h	86	0	3	6	0	41	9	253	1	5	112	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	96	0	3	7	0	46	10	281	1	6	124	42

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	318	459	83	376	480	141	166	0	0	282	0	0
Stage 1	157	157	-	302	302	-	-	-	-	-	-	-
Stage 2	161	302	-	74	178	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	611	497	960	556	484	881	1410	-	-	1277	-	-
Stage 1	829	767	-	682	663	-	-	-	-	-	-	-
Stage 2	825	663	-	927	751	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	574	491	960	549	478	881	1410	-	-	1277	-	-
Mov Cap-2 Maneuver	574	491	-	549	478	-	-	-	-	-	-	-
Stage 1	823	763	-	677	658	-	-	-	-	-	-	-
Stage 2	777	658	-	919	747	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.4	9.7	0.3	0.3
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1410	-	-	582	818	1277	-	-
HCM Lane V/C Ratio	0.007	-	-	0.17	0.064	0.004	-	-
HCM Control Delay (s)	7.6	-	-	12.4	9.7	7.8	-	-
HCM Lane LOS	A	-	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.2	0	-	-

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Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕				↱	↰	↑↑	↱		↑↑	↱
Traffic Vol, veh/h	41	0	45	0	0	11	18	504	1	4	1055	12
Future Vol, veh/h	41	0	45	0	0	11	18	504	1	4	1055	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	235	-	145	-	-	120
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	46	0	50	0	0	12	20	560	1	4	1172	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1500	1781	586	-	-	280	1185	0	0	561	0	0
Stage 1	1180	1180	-	-	-	-	-	-	-	-	-	-
Stage 2	320	601	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	-	-	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	-	-	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	*296	*159	*633	0	0	717	*946	-	-	1006	-	-
Stage 1	*596	*523	-	0	0	-	-	-	-	-	-	-
Stage 2	*666	*488	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1				1	-	-		-	-
Mov Cap-1 Maneuver	*284	*154	*633	-	-	717	*946	-	-	1006	-	-
Mov Cap-2 Maneuver	*284	*154	-	-	-	-	-	-	-	-	-	-
Stage 1	*584	*517	-	-	-	-	-	-	-	-	-	-
Stage 2	*641	*478	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.8	10.1	0.3	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 946	-	-	399	717	1006	-	-
HCM Lane V/C Ratio	0.021	-	-	0.239	0.017	0.004	-	-
HCM Control Delay (s)	8.9	-	-	16.8	10.1	8.6	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.9	0.1	0	-	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕				↱	↰	↑↑	↱		↑↑	↱
Traffic Vol, veh/h	27	0	34	0	0	13	42	1114	1	24	721	61
Future Vol, veh/h	27	0	34	0	0	13	42	1114	1	24	721	61
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	235	-	145	-	-	120
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	0	38	0	0	14	47	1238	1	27	801	68

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1568	2188	401	-	-	619	869	0	0	1239	0	0
Stage 1	855	855	-	-	-	-	-	-	-	-	-	-
Stage 2	713	1333	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	-	-	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	-	-	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	135	51	*789	0	0	432	1109	-	-	558	-	-
Stage 1	692	618	-	0	0	-	-	-	-	-	-	-
Stage 2	389	221	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1				1	-	-		-	-
Mov Cap-1 Maneuver	118	44	*789	-	-	432	1109	-	-	558	-	-
Mov Cap-2 Maneuver	118	44	-	-	-	-	-	-	-	-	-	-
Stage 1	663	559	-	-	-	-	-	-	-	-	-	-
Stage 2	360	212	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.9	13.6	0.3	0.4
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1109	-	-	224	432	558	-	-
HCM Lane V/C Ratio	0.042	-	-	0.303	0.033	0.048	-	-
HCM Control Delay (s)	8.4	-	-	27.9	13.6	11.8	-	-
HCM Lane LOS	A	-	-	D	B	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.2	0.1	0.1	-	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

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21-0551 Axon Crossroad
2025 Total AM

1: Hayden Rd & Mayo Blvd/Axon Way
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	20	64	144	35	513	51	426	78	337	861	123
Future Volume (vph)	167	20	64	144	35	513	51	426	78	337	861	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.89		1.00	0.87	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1649		1770	1538	1504	1770	3539	1583	1770	3539	1583
Flt Permitted	0.34	1.00		0.69	1.00	1.00	0.25	1.00	1.00	0.47	1.00	1.00
Satd. Flow (perm)	627	1649		1293	1538	1504	465	3539	1583	866	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	186	22	71	160	39	570	57	473	87	374	957	137
RTOR Reduction (vph)	0	50	0	0	190	214	0	0	32	0	0	50
Lane Group Flow (vph)	186	43	0	160	117	88	57	473	55	374	957	87
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	34.9	34.9		34.9	34.9	34.9	76.1	76.1	76.1	76.1	76.1	76.1
Effective Green, g (s)	34.9	34.9		34.9	34.9	34.9	76.1	76.1	76.1	76.1	76.1	76.1
Actuated g/C Ratio	0.29	0.29		0.29	0.29	0.29	0.63	0.63	0.63	0.63	0.63	0.63
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	182	479		376	447	437	294	2244	1003	549	2244	1003
v/s Ratio Prot		0.03			0.08			0.13			0.27	
v/s Ratio Perm	c0.30			0.12		0.06	0.12		0.03	c0.43		0.05
v/c Ratio	1.02	0.09		0.43	0.26	0.20	0.19	0.21	0.06	0.68	0.43	0.09
Uniform Delay, d1	42.5	31.0		34.4	32.7	32.0	9.2	9.3	8.3	14.1	11.0	8.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.70	1.64	4.26	1.56	1.66	4.45
Incremental Delay, d2	72.6	0.1		0.8	0.3	0.2	1.5	0.2	0.1	3.5	0.3	0.1
Delay (s)	115.1	31.1		35.2	33.0	32.3	17.0	15.4	35.6	25.6	18.6	37.9
Level of Service	F	C		D	C	C	B	B	D	C	B	D
Approach Delay (s)		87.1			33.2			18.4			22.2	
Approach LOS		F			C			B			C	

Intersection Summary				
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	67.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

21-0551 Axon Crossroads
2025 Total PM

1: Hayden Rd & Mayo Blvd/Axon Way
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	234	28	100	115	22	505	74	960	132	459	591	161
Future Volume (vph)	234	28	100	115	22	505	74	960	132	459	591	161
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.88		1.00	0.86	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1644		1770	1526	1504	1770	3539	1583	1770	3539	1583
Flt Permitted	0.41	1.00		0.63	1.00	1.00	0.36	1.00	1.00	0.20	1.00	1.00
Satd. Flow (perm)	761	1644		1174	1526	1504	669	3539	1583	369	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	260	31	111	128	24	561	82	1067	147	510	657	179
RTOR Reduction (vph)	0	73	0	0	17	17	0	0	61	0	0	75
Lane Group Flow (vph)	260	69	0	128	276	275	82	1067	86	510	657	104
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	41.2	41.2		41.2	41.2	41.2	69.8	69.8	69.8	69.8	69.8	69.8
Effective Green, g (s)	41.2	41.2		41.2	41.2	41.2	69.8	69.8	69.8	69.8	69.8	69.8
Actuated g/C Ratio	0.34	0.34		0.34	0.34	0.34	0.58	0.58	0.58	0.58	0.58	0.58
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	261	564		403	523	516	389	2058	920	214	2058	920
v/s Ratio Prot		0.04			0.18			0.30			0.19	
v/s Ratio Perm	c0.34			0.11		0.18	0.12		0.05	c1.38		0.07
v/c Ratio	1.00	0.12		0.32	0.53	0.53	0.21	0.52	0.09	2.38	0.32	0.11
Uniform Delay, d1	39.3	27.0		29.0	31.6	31.7	12.0	15.0	11.1	25.1	12.9	11.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.89	0.98	1.21	1.68	1.64	4.86
Incremental Delay, d2	54.3	0.1		0.5	1.0	1.1	1.1	0.9	0.2	627.1	0.1	0.1
Delay (s)	93.6	27.1		29.5	32.6	32.7	11.8	15.6	13.6	669.3	21.2	54.7
Level of Service	F	C		C	C	C	B	B	B	F	C	D
Approach Delay (s)		70.1			32.1			15.1			271.3	
Approach LOS		E			C			B			F	

Intersection Summary				
HCM 2000 Control Delay	116.0	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.86			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	91.5%	ICU Level of Service	F	
Analysis Period (min)	15			

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	35	60	186	0	48	34	491	143	134	873	50
Future Volume (vph)	30	35	60	186	0	48	34	491	143	134	873	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	1.00	0.97		1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85	1.00		0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1821	1583	3433		1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.98	1.00	0.95		1.00	0.26	1.00	1.00	0.44	1.00	1.00
Satd. Flow (perm)		1821	1583	3433		1583	488	3539	1583	813	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	33	39	67	207	0	53	38	546	159	149	970	56
RTOR Reduction (vph)	0	0	62	0	0	41	0	0	47	0	0	16
Lane Group Flow (vph)	0	72	5	207	0	12	38	546	112	149	970	40
Turn Type	Split	NA	Perm	Prot		Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4	4		3				2			6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)		9.2	9.2	12.6		26.3	84.7	84.7	84.7	84.7	84.7	84.7
Effective Green, g (s)		9.2	9.2	12.6		26.3	84.7	84.7	84.7	84.7	84.7	84.7
Actuated g/C Ratio		0.08	0.08	0.10		0.22	0.71	0.71	0.71	0.71	0.71	0.71
Clearance Time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		139	121	360		346	344	2497	1117	573	2497	1117
v/s Ratio Prot		c0.04		c0.06				0.15			c0.27	
v/s Ratio Perm			0.00			0.01	0.08		0.07	0.18		0.02
v/c Ratio		0.52	0.04	0.57		0.03	0.11	0.22	0.10	0.26	0.39	0.04
Uniform Delay, d1		53.3	51.3	51.1		36.9	5.6	6.1	5.6	6.4	7.2	5.3
Progression Factor		1.00	1.00	1.35		0.28	1.00	1.00	1.00	0.68	0.65	0.63
Incremental Delay, d2		3.2	0.1	2.2		0.0	0.6	0.2	0.2	1.0	0.4	0.1
Delay (s)		56.5	51.5	71.2		10.3	6.3	6.3	5.8	5.4	5.1	3.4
Level of Service		E	D	E		B	A	A	A	A	A	A
Approach Delay (s)		54.1			58.8			6.2			5.0	
Approach LOS		D			E			A			A	

Intersection Summary				
HCM 2000 Control Delay	14.4	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)	13.5	
Intersection Capacity Utilization	51.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	30	55	297	0	180	82	995	135	54	607	61
Future Volume (vph)	24	30	55	297	0	180	82	995	135	54	607	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	1.00	0.97		1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85	1.00		0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1822	1583	3433		1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.98	1.00	0.95		1.00	0.37	1.00	1.00	0.21	1.00	1.00
Satd. Flow (perm)		1822	1583	3433		1583	690	3539	1583	396	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	27	33	61	330	0	200	91	1106	150	60	674	68
RTOR Reduction (vph)	0	0	57	0	0	33	0	0	49	0	0	22
Lane Group Flow (vph)	0	60	4	330	0	167	91	1106	101	60	674	46
Turn Type	Split	NA	Perm	Prot		Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4	4		3				2			6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)		8.7	8.7	16.8		30.0	81.0	81.0	81.0	81.0	81.0	81.0
Effective Green, g (s)		8.7	8.7	16.8		30.0	81.0	81.0	81.0	81.0	81.0	81.0
Actuated g/C Ratio		0.07	0.07	0.14		0.25	0.68	0.68	0.68	0.68	0.68	0.68
Clearance Time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		132	114	480		395	465	2388	1068	267	2388	1068
v/s Ratio Prot		0.03		c0.10				c0.31			0.19	
v/s Ratio Perm			0.00			c0.11	0.13		0.06	0.15		0.03
v/c Ratio		0.45	0.04	0.69		0.42	0.20	0.46	0.09	0.22	0.28	0.04
Uniform Delay, d1		53.4	51.8	49.1		37.7	7.3	9.2	6.8	7.5	7.8	6.5
Progression Factor		1.00	1.00	1.04		1.29	1.00	1.00	1.00	0.41	0.41	0.33
Incremental Delay, d2		2.5	0.1	4.1		0.7	0.9	0.6	0.2	1.9	0.3	0.1
Delay (s)		55.8	51.9	55.3		49.4	8.2	9.9	6.9	4.9	3.5	2.2
Level of Service		E	D	E		D	A	A	A	A	A	A
Approach Delay (s)		53.9			53.1			9.4			3.5	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	58.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

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5: Hayden Rd & Loop 101 EB Ramp

HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	656	2	757	0	0	0	0	777	314	473	624	0
Future Volume (vph)	656	2	757	0	0	0	0	777	314	473	624	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.90	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1504	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1504	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.90	0.85	0.90	0.90
Adj. Flow (vph)	729	2	841	0	0	0	0	914	349	556	693	0
RTOR Reduction (vph)	0	55	407	0	0	0	0	0	265	0	0	0
Lane Group Flow (vph)	547	465	98	0	0	0	0	914	84	556	693	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	23.3	23.3	23.3					29.0	29.0	24.0	39.0	
Effective Green, g (s)	23.3	23.3	23.3					29.0	29.0	24.0	39.0	
Actuated g/C Ratio	0.19	0.19	0.19					0.24	0.24	0.20	0.32	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	326	292	292					1228	382	686	1150	
v/s Ratio Prot	c0.33	0.31						c0.18		c0.16	0.20	
v/s Ratio Perm			0.07						0.05			
v/c Ratio	1.68	1.59	0.34					0.74	0.22	0.81	0.60	
Uniform Delay, d1	48.4	48.4	41.7					42.1	36.4	45.8	34.0	
Progression Factor	1.00	1.00	1.00					0.79	0.57	0.43	0.33	
Incremental Delay, d2	318.2	282.6	0.7					3.8	1.2	6.1	2.0	
Delay (s)	366.5	330.9	42.4					37.2	22.2	25.7	13.2	
Level of Service	F	F	D					D	C	C	B	
Approach Delay (s)		250.6			0.0			33.0			18.8	
Approach LOS		F			A			C			B	

Intersection Summary				
HCM 2000 Control Delay	112.4	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	74.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

6: Hayden Rd & Loop 101 WB Ramp

HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	277	42	465	874	990	0	0	917	461
Future Volume (vph)	0	0	0	277	42	465	874	990	0	0	917	461
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.91	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2869	1441	1770	3539			6408	1583
Flt Permitted				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1610	2869	1441	1770	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	326	52	517	971	1100	0	0	1079	512
RTOR Reduction (vph)	0	0	0	0	209	208	0	0	0	0	0	397
Lane Group Flow (vph)	0	0	0	222	207	50	971	1100	0	0	1079	115
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				23.3	23.3	23.3	26.0	41.0			27.0	27.0
Effective Green, g (s)				23.3	23.3	23.3	26.0	41.0			27.0	27.0
Actuated g/C Ratio				0.19	0.19	0.19	0.22	0.34			0.22	0.22
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				312	557	279	383	1209			1441	356
v/s Ratio Prot				c0.14	0.07		c0.55	c0.31			c0.17	
v/s Ratio Perm						0.03						0.07
v/c Ratio				0.71	0.37	0.18	2.54	0.91			0.75	0.32
Uniform Delay, d1				45.2	42.0	40.4	47.0	37.7			43.3	38.9
Progression Factor				1.00	1.00	1.00	0.96	0.40			1.07	5.04
Incremental Delay, d2				7.5	0.4	0.3	691.6	1.3			3.5	2.3
Delay (s)				52.7	42.4	40.7	736.7	16.4			49.8	198.4
Level of Service				D	D	D	F	B			D	F
Approach Delay (s)		0.0			44.5			354.1			97.6	
Approach LOS		A			D			F			F	

Intersection Summary				
HCM 2000 Control Delay	203.7	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.10			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	102.3%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

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6: Hayden Rd & Loop 101 WB Ramp

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	202	52	537	547	888	0	0	887	310
Future Volume (vph)	0	0	0	202	52	537	547	888	0	0	887	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.89	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2826	1441	1770	3539			6408	1583
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1610	2826	1441	1770	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	238	65	597	608	987	0	0	1044	344
RTOR Reduction (vph)	0	0	0	0	255	254	0	0	0	0	0	232
Lane Group Flow (vph)	0	0	0	212	135	44	608	987	0	0	1044	112
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				17.7	17.7	17.7	14.0	29.0			39.0	39.0
Effective Green, g (s)				17.7	17.7	17.7	14.0	29.0			39.0	39.0
Actuated g/C Ratio				0.15	0.15	0.15	0.12	0.24			0.32	0.32
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				237	416	212	206	855			2082	514
v/s Ratio Prot				c0.13	0.05		c0.34	c0.28			c0.16	
v/s Ratio Perm						0.03						0.07
v/c Ratio				0.89	0.32	0.21	2.95	1.15			0.50	0.22
Uniform Delay, d1				50.2	45.8	45.0	53.0	45.5			32.7	29.4
Progression Factor				1.00	1.00	1.00	1.01	0.37			1.37	7.07
Incremental Delay, d2				31.8	0.5	0.5	879.3	70.9			0.8	0.9
Delay (s)				82.0	46.3	45.5	933.0	87.5			45.6	208.9
Level of Service				F	D	D	F	F			D	F
Approach Delay (s)		0.0			54.4			409.8			86.0	
Approach LOS		A			D			F			F	

Intersection Summary				
HCM 2000 Control Delay	211.7	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	74.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

7: Hayden Rd & Legacy Blvd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	35	199	8	25	0	155	1252	6	0	941	51
Future Volume (vph)	70	35	199	8	25	0	155	1252	6	0	941	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00		0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539		1770	3539	1583		5085	1583
Flt Permitted	0.74	1.00	1.00	0.73	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1375	3539	1583	1360	3539		1770	3539	1583		5085	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	78	39	221	9	28	0	172	1391	7	0	1046	57
RTOR Reduction (vph)	0	0	167	0	0	0	0	0	2	0	0	25
Lane Group Flow (vph)	78	39	54	9	28	0	172	1391	5	0	1046	32
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8					2	6		6
Actuated Green, G (s)	29.5	29.5	29.5	29.5	29.5		10.5	81.5	81.5		66.5	66.5
Effective Green, g (s)	29.5	29.5	29.5	29.5	29.5		10.5	81.5	81.5		66.5	66.5
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25		0.09	0.68	0.68		0.55	0.55
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	338	870	389	334	870		154	2403	1075		2817	877
v/s Ratio Prot		0.01			0.01		c0.10	c0.39			0.21	
v/s Ratio Perm	c0.06		0.03	0.01					0.00			0.02
v/c Ratio	0.23	0.04	0.14	0.03	0.03		1.12	0.58	0.00		0.37	0.04
Uniform Delay, d1	36.2	34.5	35.3	34.4	34.4		54.8	10.2	6.2		15.0	12.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.05	0.42	0.31		1.00	1.00
Incremental Delay, d2	0.4	0.0	0.2	0.1	0.1		91.7	0.6	0.0		0.4	0.1
Delay (s)	36.5	34.5	35.5	34.5	34.5		149.0	4.9	1.9		15.4	12.2
Level of Service	D	C	D	C	C		F	A	A		B	B
Approach Delay (s)		35.6			34.5			20.6			15.2	
Approach LOS		D			C			C			B	

Intersection Summary				
HCM 2000 Control Delay	20.5	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)	13.5	
Intersection Capacity Utilization	60.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

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7: Hayden Rd & Legacy Blvd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	12	97	10	19	0	107	1008	4	0	1107	36
Future Volume (vph)	25	12	97	10	19	0	107	1008	4	0	1107	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00		0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539		1770	3539	1583		5085	1583
Flt Permitted	0.74	1.00	1.00	0.75	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1384	3539	1583	1394	3539		1770	3539	1583		5085	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	28	13	108	11	21	0	119	1120	4	0	1230	40
RTOR Reduction (vph)	0	0	81	0	0	0	0	0	1	0	0	17
Lane Group Flow (vph)	28	13	27	11	21	0	119	1120	3	0	1230	23
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8					2	6		6
Actuated Green, G (s)	30.5	30.5	30.5	30.5	30.5		7.5	80.5	80.5		68.5	68.5
Effective Green, g (s)	30.5	30.5	30.5	30.5	30.5		7.5	80.5	80.5		68.5	68.5
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25		0.06	0.67	0.67		0.57	0.57
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	351	899	402	354	899		110	2374	1061		2902	903
v/s Ratio Prot		0.00			0.01		c0.07	c0.32			0.24	
v/s Ratio Perm	c0.02		0.02	0.01					0.00			0.01
v/c Ratio	0.08	0.01	0.07	0.03	0.02		1.08	0.47	0.00		0.42	0.03
Uniform Delay, d1	34.1	33.5	34.0	33.6	33.6		56.2	9.5	6.5		14.6	11.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.38	0.04		1.00	1.00
Incremental Delay, d2	0.1	0.0	0.1	0.2	0.0		72.7	0.2	0.0		0.5	0.1
Delay (s)	34.2	33.5	34.0	33.8	33.6		127.1	3.8	0.3		15.0	11.3
Level of Service	C	C	C	C	C		F	A	A		B	B
Approach Delay (s)		34.0			33.7			15.6			14.9	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	16.5	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)	13.5	
Intersection Capacity Utilization	51.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

9: Perimeter Dr & Princess Dr

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	318	31	71	259	101	170	20	290	230	25	100
Future Volume (vph)	74	318	31	71	259	101	170	20	290	230	25	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2	
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	
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)	1770	5018		1770	3539	1583	1770	3539	1583	1770	3115	
Flt Permitted	0.57	1.00		0.51	1.00	1.00	0.66	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1058	5018		953	3539	1583	1237	3539	1583	1383	3115	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	41	353	34	79	288	112	189	22	322	256	28	111
RTOR Reduction (vph)	0	9	0	0	0	61	0	0	172	0	59	0
Lane Group Flow (vph)	41	378	0	79	288	51	189	22	150	256	80	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	54.7	54.7		54.7	54.7	54.7	55.8	55.8	55.8	55.8	55.8	
Effective Green, g (s)	54.7	54.7		54.7	54.7	54.7	55.8	55.8	55.8	55.8	55.8	
Actuated g/C Ratio	0.46	0.46		0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	
Clearance Time (s)	5.3	5.3		5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	482	2287		434	1613	721	575	1645	736	643	1448	
v/s Ratio Prot		0.08			0.08			0.01			0.03	
v/s Ratio Perm	0.04			c0.08		0.03	0.15		0.09	c0.19		
v/c Ratio	0.09	0.17		0.18	0.18	0.07	0.33	0.01	0.20	0.40	0.05	
Uniform Delay, d1	18.5	19.2		19.4	19.3	18.4	20.3	17.3	19.0	21.1	17.6	
Progression Factor	1.03	1.01		0.52	0.49	0.34	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.2		0.9	0.2	0.2	1.5	0.0	0.6	1.8	0.1	
Delay (s)	19.4	19.6		11.0	9.7	6.4	21.8	17.3	19.6	22.9	17.7	
Level of Service	B	B		B	A	A	C	B	B	C	B	
Approach Delay (s)		19.6			9.1			20.3			21.1	
Approach LOS		B			A			C			C	

Intersection Summary				
HCM 2000 Control Delay	17.4	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)	9.5	
Intersection Capacity Utilization	48.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

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9: Perimeter Dr & Princess Dr

HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	203	82	294	341	188	101	36	83	64	12	13
Future Volume (vph)	80	203	82	294	341	188	101	36	83	64	12	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2	
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92	
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)	1770	4866		1770	3539	1583	1770	3539	1583	1770	3264	
Flt Permitted	0.50	1.00		0.55	1.00	1.00	0.74	1.00	1.00	0.73	1.00	
Satd. Flow (perm)	931	4866		1028	3539	1583	1376	3539	1583	1359	3264	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	44	226	91	327	379	209	112	40	92	71	13	14
RTOR Reduction (vph)	0	50	0	0	0	114	0	0	49	0	7	0
Lane Group Flow (vph)	44	267	0	327	379	95	112	40	43	71	20	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	54.7	54.7		54.7	54.7	54.7	55.8	55.8	55.8	55.8	55.8	
Effective Green, g (s)	54.7	54.7		54.7	54.7	54.7	55.8	55.8	55.8	55.8	55.8	
Actuated g/C Ratio	0.46	0.46		0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	
Clearance Time (s)	5.3	5.3		5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	424	2218		468	1613	721	639	1645	736	631	1517	
v/s Ratio Prot		0.05			0.11			0.01			0.01	
v/s Ratio Perm	0.05			c0.32		0.06	c0.08		0.03	0.05		
v/c Ratio	0.10	0.12		0.70	0.23	0.13	0.18	0.02	0.06	0.11	0.01	
Uniform Delay, d1	18.6	18.8		26.1	19.9	18.9	18.7	17.4	17.7	18.1	17.3	
Progression Factor	0.96	0.92		0.80	0.64	1.21	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.1		8.1	0.3	0.4	0.6	0.0	0.2	0.4	0.0	
Delay (s)	18.3	17.4		28.9	13.0	23.2	19.3	17.4	17.8	18.5	17.3	
Level of Service	B	B		C	B	C	B	B	B	B	B	
Approach Delay (s)		17.5			21.0			18.4			18.2	
Approach LOS		B			C			B			B	

Intersection Summary					
HCM 2000 Control Delay	19.7	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)		9.5	
Intersection Capacity Utilization	46.6%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

5: Hayden Rd & Loop 101 EB Ramp

HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	417	5	535	0	0	0	0	1447	256	486	710	0
Future Volume (vph)	417	5	535	0	0	0	0	1447	256	486	710	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.89	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1492	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1492	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.90	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.90	0.90
Adj. Flow (vph)	463	6	594	0	0	0	0	1608	301	572	789	0
RTOR Reduction (vph)	0	74	289	0	0	0	0	0	150	0	0	0
Lane Group Flow (vph)	370	280	50	0	0	0	0	1608	151	572	789	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	17.7	17.7	17.7					41.0	41.0	12.0	27.0	
Effective Green, g (s)	17.7	17.7	17.7					41.0	41.0	12.0	27.0	
Actuated g/C Ratio	0.15	0.15	0.15					0.34	0.34	0.10	0.22	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	247	220	221					1737	540	343	796	
v/s Ratio Prot	c0.22	0.19						c0.32		c0.17	c0.22	
v/s Ratio Perm			0.03						0.10			
v/c Ratio	1.50	1.27	0.23					0.93	0.28	1.67	0.99	
Uniform Delay, d1	51.1	51.1	45.1					38.0	28.7	54.0	46.4	
Progression Factor	1.00	1.00	1.00					0.93	1.08	0.63	0.61	
Incremental Delay, d2	244.2	153.0	0.5					9.1	1.1	309.3	24.6	
Delay (s)	295.4	204.1	45.6					44.3	32.3	343.2	53.0	
Level of Service	F	F	D					D	C	F	D	
Approach Delay (s)		185.3			0.0			42.4			175.0	
Approach LOS		F			A			D			F	

Intersection Summary					
HCM 2000 Control Delay	119.1	HCM 2000 Level of Service		F	
HCM 2000 Volume to Capacity ratio	0.92				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		26.0	
Intersection Capacity Utilization	102.3%	ICU Level of Service		G	
Analysis Period (min)	15				
c Critical Lane Group					

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	207	158	1220	578	0	0	0	0	445	556	198
Future Volume (vph)	0	207	158	1220	578	0	0	0	0	445	556	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3167	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3167	1441
Peak-hour factor, PHF	0.90	0.80	0.85	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	259	186	1356	680	0	0	0	0	494	654	233
RTOR Reduction (vph)	0	0	121	0	0	0	0	0	0	0	2	169
Lane Group Flow (vph)	0	259	65	1356	680	0	0	0	0	380	789	41
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		22.8	22.8	53.8	69.5					23.3	23.3	23.3
Effective Green, g (s)		22.8	22.8	53.8	69.5					23.3	23.3	23.3
Actuated g/C Ratio		0.19	0.19	0.45	0.58					0.19	0.19	0.19
Clearance Time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		966	529	1539	2945					312	614	279
v/s Ratio Prot		c0.05		c0.39	0.13					0.24	c0.25	
v/s Ratio Perm			0.02									0.03
v/c Ratio		0.27	0.12	0.88	0.23					1.22	1.29	0.15
Uniform Delay, d1		41.5	40.3	30.2	12.3					48.4	48.4	40.1
Progression Factor		1.17	1.71	0.70	0.66					1.00	1.00	1.00
Incremental Delay, d2		0.7	0.5	5.5	0.2					123.6	140.6	0.2
Delay (s)		49.4	69.3	26.6	8.2					172.0	189.0	40.3
Level of Service		D	E	C	A					F	F	D
Approach Delay (s)		57.7			20.5			0.0			161.7	
Approach LOS		E			C			A			F	

Intersection Summary				
HCM 2000 Control Delay	75.3	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	77.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	487	414	825	322	0	0	0	0	324	278	90
Future Volume (vph)	0	487	414	825	322	0	0	0	0	324	278	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3148	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3148	1441
Peak-hour factor, PHF	0.90	0.85	0.85	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	573	487	917	379	0	0	0	0	360	327	106
RTOR Reduction (vph)	0	0	290	0	0	0	0	0	0	0	1	63
Lane Group Flow (vph)	0	573	197	917	379	0	0	0	0	227	470	32
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		26.3	26.3	33.8	38.2					39.8	39.8	39.8
Effective Green, g (s)		26.3	26.3	33.8	38.2					39.8	39.8	39.8
Actuated g/C Ratio		0.22	0.22	0.28	0.32					0.33	0.33	0.33
Clearance Time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1114	610	966	1618					533	1044	477
v/s Ratio Prot		c0.11		c0.27	0.07					0.14	c0.15	
v/s Ratio Perm			0.07									0.02
v/c Ratio		0.51	0.32	0.95	0.23					0.43	0.45	0.07
Uniform Delay, d1		41.2	39.4	42.3	30.1					31.2	31.5	27.4
Progression Factor		1.16	1.69	1.66	0.56					1.00	1.00	1.00
Incremental Delay, d2		1.7	1.4	15.7	0.3					0.5	0.3	0.1
Delay (s)		49.4	68.0	85.7	17.3					31.8	31.8	27.5
Level of Service		D	E	F	B					C	C	C
Approach Delay (s)		57.9			65.7			0.0			31.3	
Approach LOS		E			E			A			C	

Intersection Summary				
HCM 2000 Control Delay	54.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	66.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

13-ZN-2020#2
10/24/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	592	0	0	1452	337	345	419	984	0	0	0
Future Volume (vph)	60	592	0	0	1452	337	345	419	984	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3362	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3362	2787			
Peak-hour factor, PHF	0.80	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	75	696	0	0	1613	374	383	493	1093	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	53	0	0	881	0	0	0
Lane Group Flow (vph)	75	696	0	0	1613	321	283	593	212	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	7.8	22.8			69.5	69.5	23.3	23.3	23.3			
Effective Green, g (s)	7.8	22.8			69.5	69.5	23.3	23.3	23.3			
Actuated g/C Ratio	0.06	0.19			0.58	0.58	0.19	0.19	0.19			
Clearance Time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	115	672			3711	916	312	652	541			
v/s Ratio Prot	c0.04	c0.20			c0.25		0.18	c0.18				
v/s Ratio Perm						0.20			0.08			
v/c Ratio	0.65	1.04			0.43	0.35	0.91	0.91	0.39			
Uniform Delay, d1	54.8	48.6			14.2	13.3	47.3	47.3	42.2			
Progression Factor	0.46	1.11			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	5.9	33.1			0.4	1.1	28.2	16.6	0.5			
Delay (s)	31.1	87.3			14.6	14.4	75.5	63.9	42.6			
Level of Service	C	F			B	B	E	E	D			
Approach Delay (s)		81.8			14.5			53.8			0.0	
Approach LOS		F			B			D			A	

Intersection Summary				
HCM 2000 Control Delay	41.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	77.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	576	0	0	1018	298	162	518	995	0	0	0
Future Volume (vph)	230	576	0	0	1018	298	162	518	995	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3385	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3385	2787			
Peak-hour factor, PHF	0.85	0.85	0.90	0.90	0.85	0.85	0.85	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	271	678	0	0	1198	351	191	609	1106	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	108	0	0	659	0	0	0
Lane Group Flow (vph)	271	678	0	0	1198	243	172	628	447	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	22.6	26.3			38.2	38.2	39.8	39.8	39.8			
Effective Green, g (s)	22.6	26.3			38.2	38.2	39.8	39.8	39.8			
Actuated g/C Ratio	0.19	0.22			0.32	0.32	0.33	0.33	0.33			
Clearance Time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	333	775			2039	503	533	1122	924			
v/s Ratio Prot	c0.15	c0.19			c0.19		0.11	c0.19				
v/s Ratio Perm						0.15			0.16			
v/c Ratio	0.81	0.87			0.59	0.48	0.32	0.56	0.48			
Uniform Delay, d1	46.7	45.3			34.3	32.9	30.0	32.9	31.9			
Progression Factor	1.27	0.69			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	12.9	12.1			1.2	3.3	0.4	0.6	0.4			
Delay (s)	72.1	43.1			35.5	36.2	30.4	33.5	32.3			
Level of Service	E	D			D	D	C	C	C			
Approach Delay (s)		51.4			35.7			32.5			0.0	
Approach LOS		D			D			C			A	

Intersection Summary				
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	66.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

13-ZN-2020#2
10/24/2024

21-0551 Axon Crossroad
2025 Total AM Mitigated

1: Hayden Rd & Mayo Blvd/Axon Way
Timings

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	167	20	144	35	513	51	426	78	337	861	123
Future Volume (vph)	167	20	144	35	513	51	426	78	337	861	123
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4		8			2		1	6	
Permitted Phases	4		8		8	2		2			6
Detector Phase	4	4	8	8	8	2	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	30.0	75.0	75.0
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	37.5%	37.5%	37.5%	25.0%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						Lag	Lag	Lag	Lead		
Lead-Lag Optimize?						Yes	Yes	Yes	Yes		
Recall Mode	Min	Min	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 1: Hayden Rd & Mayo Blvd/Axon Way



21-0551 Axon Crossroads
2025 Total PM Mitigated

1: Hayden Rd & Mayo Blvd/Axon Way
Timings

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	234	28	115	22	505	74	960	132	459	591	161
Future Volume (vph)	234	28	115	22	505	74	960	132	459	591	161
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4		8			2		1	6	
Permitted Phases	4		8		8	2		2			6
Detector Phase	4	4	8	8	8	2	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	30.0	75.0	75.0
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	37.5%	37.5%	37.5%	25.0%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						Lag	Lag	Lag	Lead		
Lead-Lag Optimize?						Yes	Yes	Yes	Yes		
Recall Mode	Min	Min	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 1: Hayden Rd & Mayo Blvd/Axon Way



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10/24/2024

1: Hayden Rd & Mayo Blvd/Axon Way

HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	167	20	64	144	35	513	51	426	78	337	861	123
Future Volume (veh/h)	167	20	64	144	35	513	51	426	78	337	861	123
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	186	22	53	160	0	312	57	473	44	374	957	69
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	95	230	269	0	621	368	1991	888	454	2591	1156
Arrive On Green	0.20	0.20	0.20	0.20	0.00	0.20	0.56	0.56	0.56	0.09	0.49	0.49
Sat Flow, veh/h	1067	487	1173	1325	0	3170	550	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	186	0	75	160	0	312	57	473	44	374	957	69
Grp Sat Flow(s),veh/h/ln	1067	0	1659	1325	0	1585	550	1777	1585	1728	1777	1585
Q Serve(g_s), s	20.4	0.0	4.6	13.9	0.0	10.5	6.1	8.1	1.5	12.8	20.2	2.8
Cycle Q Clear(g_c), s	20.4	0.0	4.6	18.5	0.0	10.5	6.1	8.1	1.5	12.8	20.2	2.8
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	269	0	325	269	0	621	368	1991	888	454	2591	1156
V/C Ratio(X)	0.69	0.00	0.23	0.60	0.00	0.50	0.15	0.24	0.05	0.82	0.37	0.06
Avail Cap(c_a), veh/h	420	0	560	457	0	1070	368	1991	888	734	2591	1156
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.0	0.0	40.6	48.4	0.0	43.0	12.9	13.4	11.9	53.3	13.5	9.0
Incr Delay (d2), s/veh	3.2	0.0	0.4	2.1	0.0	0.6	0.9	0.3	0.1	4.0	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.5	0.0	3.4	8.3	0.0	7.5	1.5	5.9	1.0	10.0	13.9	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.2	0.0	41.0	50.5	0.0	43.7	13.8	13.7	12.0	57.4	13.9	9.1
LnGrp LOS	D	A	D	D	A	D	B	B	B	E	B	A
Approach Vol, veh/h		261			472			574			1400	
Approach Delay, s/veh		47.5			46.0			13.6			25.3	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	20.3	71.7		28.0		92.0		28.0				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s	25.5	40.5		40.5		70.5		40.5				
Max Q Clear Time (g_c+I1), s	14.8	10.1		22.4		22.2		20.5				
Green Ext Time (p_c), s	1.0	4.3		1.1		9.1		1.7				

Intersection Summary			
HCM 6th Ctrl Delay			28.5
HCM 6th LOS			C

Notes

User approved volume balancing among the lanes for turning movement.

1: Hayden Rd & Mayo Blvd/Axon Way

HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	234	28	100	115	22	505	74	960	132	459	591	161
Future Volume (veh/h)	234	28	100	115	22	505	74	960	132	459	591	161
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	260	31	83	128	0	297	82	1067	74	510	657	90
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	343	118	315	324	0	829	386	1623	724	586	2358	1052
Arrive On Green	0.26	0.26	0.26	0.26	0.00	0.26	0.46	0.46	0.46	0.17	0.66	0.66
Sat Flow, veh/h	1082	450	1204	1279	0	3170	714	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	260	0	114	128	0	297	82	1067	74	510	657	90
Grp Sat Flow(s),veh/h/ln	1082	0	1654	1279	0	1585	714	1777	1585	1728	1777	1585
Q Serve(g_s), s	28.0	0.0	6.6	10.6	0.0	9.2	8.5	28.0	3.2	17.3	9.2	2.4
Cycle Q Clear(g_c), s	28.0	0.0	6.6	17.2	0.0	9.2	8.5	28.0	3.2	17.3	9.2	2.4
Prop In Lane	1.00		0.73	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	343	0	432	324	0	829	386	1623	724	586	2358	1052
V/C Ratio(X)	0.76	0.00	0.26	0.39	0.00	0.36	0.21	0.66	0.10	0.87	0.28	0.09
Avail Cap(c_a), veh/h	425	0	558	422	0	1070	386	1623	724	734	2358	1052
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.1	0.0	35.2	42.0	0.0	36.1	20.0	25.3	18.6	48.6	8.3	7.2
Incr Delay (d2), s/veh	6.1	0.0	0.3	0.8	0.0	0.3	1.3	2.1	0.3	9.3	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.7	0.0	4.9	6.2	0.0	6.5	2.8	17.8	2.2	12.9	6.2	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.2	0.0	35.5	42.7	0.0	36.4	21.3	27.4	18.9	57.9	8.6	7.4
LnGrp LOS	D	A	D	D	A	D	C	C	B	E	A	A
Approach Vol, veh/h		374			425			1223			1257	
Approach Delay, s/veh		45.0			38.3			26.5			28.5	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	24.8	59.3		35.9		84.1		35.9				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s	25.5	40.5		40.5		70.5		40.5				
Max Q Clear Time (g_c+I1), s	19.3	30.0		30.0		11.2		19.2				
Green Ext Time (p_c), s	1.1	5.9		1.3		5.7		1.6				

Intersection Summary			
HCM 6th Ctrl Delay			30.9
HCM 6th LOS			C

Notes

User approved volume balancing among the lanes for turning movement.

13-ZN-2020#2
10/24/2024

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	656	2	757	777	314	473	624		
Future Volume (vph)	656	2	757	777	314	473	624		
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA		
Protected Phases	7	7		6		5	2	1	3
Permitted Phases			7		6				
Detector Phase	7	7	7	6	6	5	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	16.0	12.0	5.0	7.0
Minimum Split (s)	29.0	29.0	29.0	26.0	26.0	22.0	26.0	11.0	29.0
Total Split (s)	44.0	44.0	44.0	46.0	46.0	30.0	31.0	45.0	44.0
Total Split (%)	36.7%	36.7%	36.7%	38.3%	38.3%	25.0%	25.8%	38%	37%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag				Lag	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	C-Max	C-Max	None	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 5: Hayden Rd & Loop 101 EB Ramp

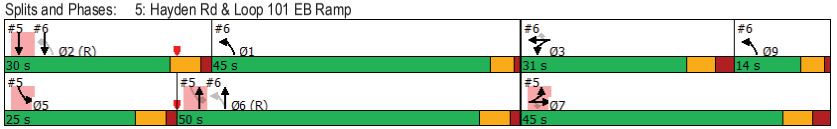


Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3	Ø9
Lane Configurations										
Traffic Volume (vph)	417	5	535	1447	256	486	710			
Future Volume (vph)	417	5	535	1447	256	486	710			
Turn Type	Split	NA	Perm	NA	Perm	D.P+P	NA			
Protected Phases	7	7		6		5	2	1	3	9
Permitted Phases			7		6	6				
Detector Phase	7	7	7	6	6	5	2			
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	16.0	12.0	5.0	7.0	5.0
Minimum Split (s)	29.0	29.0	29.0	26.0	26.0	22.0	26.0	9.5	29.0	9.5
Total Split (s)	45.0	45.0	45.0	50.0	50.0	25.0	30.0	45.0	31.0	14.0
Total Split (%)	37.5%	37.5%	37.5%	41.7%	41.7%	20.8%	25.0%	38%	26%	12%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	3.5	4.3	3.5
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.0	2.7	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0			
Lead/Lag				Lag	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	None	C-Max	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBSB, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated

Splits and Phases: 5: Hayden Rd & Loop 101 EB Ramp



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10/24/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	656	2	757	0	0	0	0	777	314	473	624	0
Future Volume (vph)	656	2	757	0	0	0	0	777	314	473	624	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.90	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1504	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1504	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.90	0.85	0.90	0.90
Adj. Flow (vph)	729	2	841	0	0	0	0	914	349	556	693	0
RTOR Reduction (vph)	0	55	349	0	0	0	0	0	229	0	0	0
Lane Group Flow (vph)	547	465	156	0	0	0	0	914	120	556	693	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	37.0	37.0	37.0					41.3	41.3	22.7	25.0	
Effective Green, g (s)	37.0	37.0	37.0					41.3	41.3	22.7	25.0	
Actuated g/C Ratio	0.31	0.31	0.31					0.34	0.34	0.19	0.21	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	518	463	463					1750	544	649	737	
v/s Ratio Prot	c0.33	0.31						c0.18		0.16	c0.20	
v/s Ratio Perm			0.10						0.08			
v/c Ratio	1.06	1.01	0.34					0.52	0.22	0.86	0.94	
Uniform Delay, d1	41.5	41.5	32.0					31.5	27.9	47.1	46.8	
Progression Factor	1.00	1.00	1.00					0.83	0.90	0.69	0.51	
Incremental Delay, d2	55.1	43.1	0.4					1.0	0.9	7.7	16.4	
Delay (s)	96.6	84.6	32.5					27.3	25.9	40.4	40.3	
Level of Service	F	F	C					C	C	D	D	
Approach Delay (s)		72.0			0.0			26.9			40.4	
Approach LOS		E			A			C			D	

Intersection Summary				
HCM 2000 Control Delay	48.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	74.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	417	5	535	0	0	0	0	1447	256	486	710	0
Future Volume (vph)	417	5	535	0	0	0	0	1447	256	486	710	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.89	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1492	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.99	1.00					1.00	1.00	0.09	1.00	
Satd. Flow (perm)	1681	1492	1504					5085	1583	324	3539	
Peak-hour factor, PHF	0.90	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.90	0.90
Adj. Flow (vph)	463	6	594	0	0	0	0	1608	301	572	789	0
RTOR Reduction (vph)	0	77	232	0	0	0	0	0	149	0	0	0
Lane Group Flow (vph)	370	277	107	0	0	0	0	1608	152	572	789	0
Turn Type	Split	NA	Perm					NA	Perm	D.P+P	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6	6		
Actuated Green, G (s)	38.0	38.0	38.0					44.6	44.6	63.0	24.0	
Effective Green, g (s)	38.0	38.0	38.0					44.6	44.6	63.0	24.0	
Actuated g/C Ratio	0.32	0.32	0.32					0.37	0.37	0.52	0.20	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	532	472	476					1889	588	646	707	
v/s Ratio Prot	c0.22	0.19						0.32		0.14	c0.22	
v/s Ratio Perm			0.07						0.10	c0.33		
v/c Ratio	0.70	0.59	0.23					0.85	0.26	0.89	1.12	
Uniform Delay, d1	35.9	34.4	30.2					34.7	26.2	34.4	48.0	
Progression Factor	1.00	1.00	1.00					0.93	1.46	1.10	0.62	
Incremental Delay, d2	3.9	1.9	0.2					3.5	0.7	8.6	63.8	
Delay (s)	39.9	36.3	30.4					35.8	39.1	46.7	93.8	
Level of Service	D	D	C					D	D	D	F	
Approach Delay (s)		35.7			0.0			36.3			74.0	
Approach LOS		D			A			D			E	

Intersection Summary				
HCM 2000 Control Delay	48.0	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)	23.5	
Intersection Capacity Utilization	101.0%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

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10/24/2024

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	202	52	537	547	888	887	310		
Future Volume (vph)	202	52	537	547	888	887	310		
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm		
Protected Phases	3	3		1	6	2		5	7
Permitted Phases			3				2		
Detector Phase	3	3	3	1	6	2	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	5.0	12.0	12.0	12.0	16.0	7.0
Minimum Split (s)	29.0	29.0	29.0	11.0	26.0	26.0	26.0	22.0	29.0
Total Split (s)	44.0	44.0	44.0	45.0	46.0	31.0	31.0	30.0	44.0
Total Split (%)	36.7%	36.7%	36.7%	37.5%	38.3%	25.8%	25.8%	25%	37%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag				Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 6: Hayden Rd & Loop 101 WB Ramp

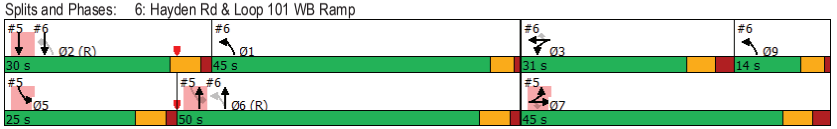


Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR	Ø1	Ø5	Ø7	Ø9
Lane Configurations											
Traffic Volume (vph)	277	42	465	874	990	917	461				
Future Volume (vph)	277	42	465	874	990	917	461				
Turn Type	Split	NA	Perm	custom	NA	NA	Perm				
Protected Phases	3	3		1 9	6	2		1	5	7	9
Permitted Phases			3	2 6			2				
Detector Phase	3	3	3	1 9	6	2	2				
Switch Phase											
Minimum Initial (s)	7.0	7.0	7.0		12.0	12.0	12.0	5.0	16.0	7.0	5.0
Minimum Split (s)	29.0	29.0	29.0		26.0	26.0	26.0	9.5	22.0	29.0	9.5
Total Split (s)	31.0	31.0	31.0		50.0	30.0	30.0	45.0	25.0	45.0	14.0
Total Split (%)	25.8%	25.8%	25.8%		41.7%	25.0%	25.0%	38%	21%	38%	12%
Yellow Time (s)	4.3	4.3	4.3		4.4	4.4	4.4	3.5	4.4	4.3	3.5
All-Red Time (s)	2.7	2.7	2.7		1.6	1.6	1.6	1.0	1.6	2.7	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0				
Total Lost Time (s)	7.0	7.0	7.0		6.0	6.0	6.0				
Lead/Lag	Lead	Lead	Lead		Lag	Lead	Lead	Lag	Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes
Recall Mode	None	None	None		C-Max	C-Max	C-Max	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBSB, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated

Splits and Phases: 6: Hayden Rd & Loop 101 WB Ramp



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10/24/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	202	52	537	547	888	0	0	887	310
Future Volume (vph)	0	0	0	202	52	537	547	888	0	0	887	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.89	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2826	1441	1770	3539			6408	1583
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1610	2826	1441	1770	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	238	65	597	608	987	0	0	1044	344
RTOR Reduction (vph)	0	0	0	0	207	206	0	0	0	0	0	272
Lane Group Flow (vph)	0	0	0	212	183	92	608	987	0	0	1044	72
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				37.0	37.0	37.0	39.0	41.3			25.0	25.0
Effective Green, g (s)				37.0	37.0	37.0	39.0	41.3			25.0	25.0
Actuated g/C Ratio				0.31	0.31	0.31	0.32	0.34			0.21	0.21
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				496	871	444	575	1218			1335	329
v/s Ratio Prot				c0.13	0.06		c0.34	0.28			c0.16	
v/s Ratio Perm						0.06						0.05
v/c Ratio				0.43	0.21	0.21	1.06	0.81			0.78	0.22
Uniform Delay, d1				33.1	30.7	30.7	40.5	35.8			44.9	39.4
Progression Factor				1.00	1.00	1.00	0.84	0.83			0.72	2.55
Incremental Delay, d2				0.6	0.1	0.2	46.3	3.8			4.3	1.4
Delay (s)				33.7	30.8	30.9	80.5	33.5			36.7	101.8
Level of Service				C	C	C	F	C			D	F
Approach Delay (s)		0.0			31.5			51.4			52.9	
Approach LOS		A			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	47.3	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)	19.0	
Intersection Capacity Utilization	74.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	277	42	465	874	990	0	0	917	461
Future Volume (vph)	0	0	0	277	42	465	874	990	0	0	917	461
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	4.5	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.91	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2869	1441	1770	3539			6408	1583
Flt Permitted				0.95	0.99	1.00	0.14	1.00			1.00	1.00
Satd. Flow (perm)				1610	2869	1441	252	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	326	52	517	971	1100	0	0	1079	512
RTOR Reduction (vph)	0	0	0	0	213	212	0	0	0	0	0	246
Lane Group Flow (vph)	0	0	0	222	203	46	971	1100	0	0	1079	266
Turn Type				Split	NA	Perm	custom	NA			NA	Perm
Protected Phases				3	3		1 9	6			2	
Permitted Phases						3	2 6					2
Actuated Green, G (s)				21.5	21.5	21.5	82.1	44.6			24.0	24.0
Effective Green, g (s)				21.5	21.5	21.5	82.1	44.6			24.0	24.0
Actuated g/C Ratio				0.18	0.18	0.18	0.68	0.37			0.20	0.20
Clearance Time (s)				7.0	7.0	7.0		6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)				288	514	258	836	1315			1281	316
v/s Ratio Prot				c0.14	0.07		c0.51	0.31			0.17	
v/s Ratio Perm						0.03	c0.29					0.17
v/c Ratio				0.77	0.40	0.18	1.16	0.84			0.84	0.84
Uniform Delay, d1				46.9	43.5	41.8	28.4	34.4			46.2	46.2
Progression Factor				1.00	1.00	1.00	0.53	0.64			0.80	0.94
Incremental Delay, d2				12.0	0.5	0.3	80.4	3.7			6.7	22.2
Delay (s)				58.9	44.0	42.1	95.5	25.6			43.6	65.5
Level of Service				E	D	D	F	C			D	E
Approach Delay (s)		0.0			47.2			58.4			50.6	
Approach LOS		A			D			E			D	

Intersection Summary				
HCM 2000 Control Delay	53.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.13			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	23.5	
Intersection Capacity Utilization	101.0%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

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APPENDIX I

2030 PEAK HOUR ANALYSIS

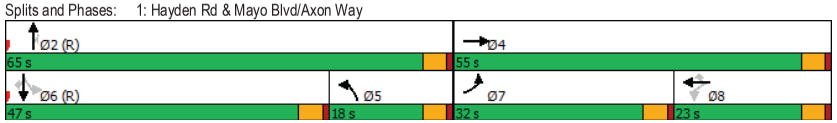
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Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	256	7	4	0	32	88	442	29	174	905	327
Future Volume (vph)	256	7	4	0	32	88	442	29	174	905	327
Turn Type	Prot	NA	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		8		5	2			6	
Permitted Phases			8		8			2	6		6
Detector Phase	7	4	8	8	8	5	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	32.0	55.0	23.0	23.0	23.0	18.0	65.0	65.0	47.0	47.0	47.0
Total Split (%)	26.7%	45.8%	19.2%	19.2%	19.2%	15.0%	54.2%	54.2%	39.2%	39.2%	39.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead		Lag	Lag	Lag	Lag			Lead	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	Min	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 1: Hayden Rd & Mayo Blvd/Axon Way

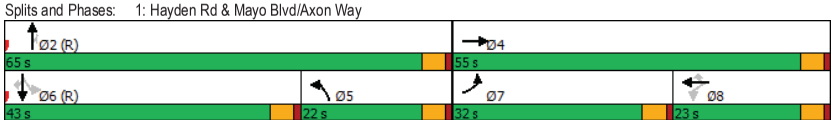


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	528	1	33	4	247	94	1020	11	90	633	261
Future Volume (vph)	528	1	33	4	247	94	1020	11	90	633	261
Turn Type	Prot	NA	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		8		5	2			6	
Permitted Phases			8		8			2	6		6
Detector Phase	7	4	8	8	8	5	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	32.0	55.0	23.0	23.0	23.0	22.0	65.0	65.0	43.0	43.0	43.0
Total Split (%)	26.7%	45.8%	19.2%	19.2%	19.2%	18.3%	54.2%	54.2%	35.8%	35.8%	35.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead		Lag	Lag	Lag	Lag			Lead	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	Min	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 1: Hayden Rd & Mayo Blvd/Axon Way



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	256	7	75	4	0	32	88	442	29	174	905	327
Future Volume (veh/h)	256	7	75	4	0	32	88	442	29	174	905	327
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	284	8	63	4	0	18	98	491	16	193	1006	182
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	360	33	260	113	0	126	1216	2643	1179	344	1259	561
Arrive On Green	0.10	0.18	0.18	0.04	0.00	0.04	0.35	0.74	0.74	0.71	0.71	0.71
Sat Flow, veh/h	3456	182	1431	1329	0	3170	3456	3554	1585	906	3554	1585
Grp Volume(v), veh/h	284	0	71	4	0	18	98	491	16	193	1006	182
Grp Sat Flow(s),veh/h/ln	1728	0	1613	1329	0	1585	1728	1777	1585	906	1777	1585
Q Serve(g_s), s	9.6	0.0	4.5	0.3	0.0	0.7	2.3	4.9	0.3	16.7	22.8	3.8
Cycle Q Clear(g_c), s	9.6	0.0	4.5	0.3	0.0	0.7	2.3	4.9	0.3	21.6	22.8	3.8
Prop In Lane	1.00		0.89	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	360	0	292	113	0	126	1216	2643	1179	344	1259	561
V/C Ratio(X)	0.79	0.00	0.24	0.04	0.00	0.14	0.08	0.19	0.01	0.56	0.80	0.32
Avail Cap(c_a), veh/h	792	0	679	265	0	489	1216	2643	1179	344	1259	561
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.5	0.0	42.1	55.5	0.0	55.6	25.9	4.6	4.0	16.1	14.6	6.3
Incr Delay (d2), s/veh	3.9	0.0	0.4	0.1	0.0	0.5	0.0	0.2	0.0	6.5	5.4	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.8	0.0	3.3	0.2	0.0	0.5	1.7	3.0	0.2	5.2	9.7	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.4	0.0	42.5	55.6	0.0	56.1	26.0	4.7	4.0	22.6	20.0	7.8
LnGrp LOS	E	A	D	E	A	E	C	A	A	C	C	A
Approach Vol, veh/h		355			22			605			1381	
Approach Delay, s/veh		53.6			56.1			8.2			18.8	
Approach LOS		D			E			A			B	

Timer - Assigned Phs		2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s		93.7		26.3	46.7	47.0	17.0	9.3				
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s		60.5		50.5	13.5	42.5	27.5	18.5				
Max Q Clear Time (g_c+I1), s		6.9		6.5	4.3	24.8	11.6	2.7				
Green Ext Time (p_c), s		3.8		0.4	0.2	8.6	0.9	0.0				

Intersection Summary	
HCM 6th Ctrl Delay	21.6
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	528	1	139	33	4	247	94	1020	11	90	633	261
Future Volume (veh/h)	528	1	139	33	4	247	94	1020	11	90	633	261
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	587	1	116	37	0	140	104	1133	6	100	703	146
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	663	4	461	141	0	202	946	2246	1002	134	1140	509
Arrive On Green	0.19	0.29	0.29	0.06	0.00	0.06	0.27	0.63	0.63	0.21	0.21	0.21
Sat Flow, veh/h	3456	14	1574	1275	0	3170	3456	3554	1585	497	3554	1585
Grp Volume(v), veh/h	587	0	117	37	0	140	104	1133	6	100	703	146
Grp Sat Flow(s),veh/h/ln	1728	0	1587	1275	0	1585	1728	1777	1585	497	1777	1585
Q Serve(g_s), s	19.8	0.0	6.8	3.4	0.0	5.2	2.7	20.7	0.2	17.8	21.5	5.6
Cycle Q Clear(g_c), s	19.8	0.0	6.8	3.4	0.0	5.2	2.7	20.7	0.2	38.5	21.5	5.6
Prop In Lane	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	663	0	465	141	0	202	946	2246	1002	134	1140	509
V/C Ratio(X)	0.88	0.00	0.25	0.26	0.00	0.69	0.11	0.50	0.01	0.75	0.62	0.29
Avail Cap(c_a), veh/h	792	0	668	257	0	489	946	2246	1002	134	1140	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.2	0.0	32.4	54.2	0.0	55.0	32.6	11.9	8.2	59.8	40.4	13.1
Incr Delay (d2), s/veh	10.3	0.0	0.3	1.0	0.0	4.3	0.1	0.8	0.0	31.2	2.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	14.5	0.0	4.8	2.0	0.0	3.9	2.1	12.7	0.1	7.7	15.4	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.5	0.0	32.7	55.2	0.0	59.3	32.7	12.7	8.2	91.0	42.9	14.5
LnGrp LOS	E	A	C	E	A	E	C	B	A	F	D	B
Approach Vol, veh/h		704			177			1243			949	
Approach Delay, s/veh		53.4			58.4			14.4			43.6	
Approach LOS		D			E			B			D	

Timer - Assigned Phs		2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s		80.3		39.7	37.3	43.0	27.5	12.1				
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s		60.5		50.5	17.5	38.5	27.5	18.5				
Max Q Clear Time (g_c+I1), s		22.7		8.8	4.7	40.5	21.8	7.2				
Green Ext Time (p_c), s		10.8		0.8	0.2	0.0	1.2	0.4				

Intersection Summary	
HCM 6th Ctrl Delay	34.9
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

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Intersection	
Intersection Delay, s/veh	3.2
Intersection LOS	A

Approach	EB	NB	SB
Entry Lanes	2	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	129	92	6
Demand Flow Rate, veh/h	131	94	6
Vehicles Circulating, veh/h	6	10	42
Vehicles Exiting, veh/h	42	127	62
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.2	3.2	2.8
Approach LOS	A	A	A

Lane	Left	Right	Left	Left
Designated Moves	L	TR	LT	TR
Assumed Moves	L	TR	LT	TR
RT Channelized				
Lane Util	0.076	0.924	1.000	1.000
Follow-Up Headway, s	2.535	2.535	2.609	2.609
Critical Headway, s	4.544	4.544	4.976	4.976
Entry Flow, veh/h	10	121	94	6
Cap Entry Lane, veh/h	1412	1412	1366	1322
Entry HV Adj Factor	1.000	0.983	0.979	0.980
Flow Entry, veh/h	10	119	92	6
Cap Entry, veh/h	1412	1389	1336	1296
V/C Ratio	0.007	0.086	0.069	0.005
Control Delay, s/veh	2.6	3.3	3.2	2.8
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0

Intersection	
Intersection Delay, s/veh	3.9
Intersection LOS	A

Approach	EB	NB	SB
Entry Lanes	2	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	132	241	37
Demand Flow Rate, veh/h	135	246	38
Vehicles Circulating, veh/h	32	0	243
Vehicles Exiting, veh/h	249	167	3
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.4	4.1	3.7
Approach LOS	A	A	A

Lane	Left	Right	Left	Left
Designated Moves	L	TR	LT	TR
Assumed Moves	L	TR	LT	TR
RT Channelized				
Lane Util	0.000	1.000	1.000	1.000
Follow-Up Headway, s	2.535	2.535	2.609	2.609
Critical Headway, s	4.544	4.544	4.976	4.976
Entry Flow, veh/h	0	135	246	38
Cap Entry Lane, veh/h	1379	1379	1380	1077
Entry HV Adj Factor	1.000	0.978	0.979	0.983
Flow Entry, veh/h	0	132	241	37
Cap Entry, veh/h	1379	1349	1351	1059
V/C Ratio	0.000	0.098	0.178	0.035
Control Delay, s/veh	2.6	3.4	4.1	3.7
LOS	A	A	A	A
95th %tile Queue, veh	0	0	1	0

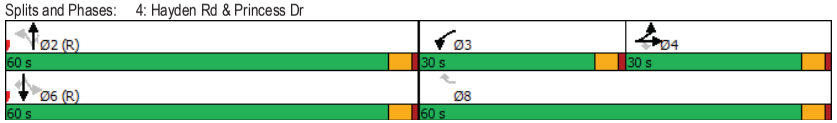
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10/24/2024

Lane Group	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	36	63	190	66	35	477	150	135	779	53
Future Volume (vph)	36	63	190	66	35	477	150	135	779	53
Turn Type	NA	Perm	Prot	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4		3			2			6	
Permitted Phases		4		8	2		2	6		6
Detector Phase	4	4	3	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	36.5	36.5	36.5	36.5	36.5	36.5
Total Split (s)	30.0	30.0	30.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	25.0%	25.0%	25.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes							
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 4: Hayden Rd & Princess Dr

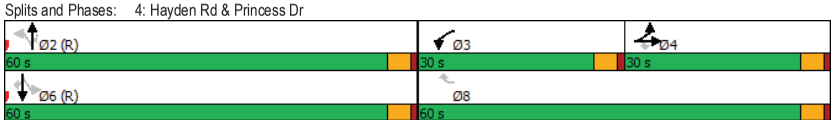


Lane Group	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	31	58	309	195	86	939	142	59	581	64
Future Volume (vph)	31	58	309	195	86	939	142	59	581	64
Turn Type	NA	Perm	Prot	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4		3			2			6	
Permitted Phases		4		8	2		2	6		6
Detector Phase	4	4	3	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	36.5	36.5	36.5	36.5	36.5	36.5
Total Split (s)	30.0	30.0	30.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	25.0%	25.0%	25.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes							
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 4: Hayden Rd & Princess Dr



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	36	63	190	0	66	35	477	150	135	779	53
Future Volume (veh/h)	31	36	63	190	0	66	35	477	150	135	779	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	40	36	211	0	36	39	530	84	150	866	30
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	68	80	129	0	0	0	553	2999	1337	720	2999	1337
Arrive On Green	0.08	0.08	0.08	0.00	0.00	0.00	0.84	0.84	0.84	0.84	0.84	0.84
Sat Flow, veh/h	840	988	1585		0		621	3554	1585	808	3554	1585
Grp Volume(v), veh/h	74	0	36		0.0		39	530	84	150	866	30
Grp Sat Flow(s),veh/h/ln	1828	0	1585				621	1777	1585	808	1777	1585
Q Serve(g_s), s	4.7	0.0	2.6				1.7	3.3	1.0	5.0	6.0	0.4
Cycle Q Clear(g_c), s	4.7	0.0	2.6				7.7	3.3	1.0	8.3	6.0	0.4
Prop In Lane	0.46		1.00				1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	148	0	129				553	2999	1337	720	2999	1337
V/C Ratio(X)	0.50	0.00	0.28				0.07	0.18	0.06	0.21	0.29	0.02
Avail Cap(c_a), veh/h	389	0	337				553	2999	1337	720	2999	1337
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.8	0.0	51.8				2.7	1.7	1.5	2.5	1.9	1.5
Incr Delay (d2), s/veh	2.6	0.0	1.2				0.2	0.1	0.1	0.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.0	0.0	1.9				0.4	1.4	0.4	1.3	2.6	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.4	0.0	53.0				3.0	1.8	1.6	3.1	2.2	1.5
LnGrp LOS	E	A	D				A	A	A	A	A	A
Approach Vol, veh/h		110						653			1046	
Approach Delay, s/veh		54.6						1.9			2.3	
Approach LOS		D						A			A	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	105.8	14.2	105.8
Change Period (Y+Rc), s	4.5	4.5	4.5
Max Green Setting (Gmax), s	55.5	25.5	55.5
Max Q Clear Time (g_c+I1), s	9.7	6.7	10.3
Green Ext Time (p_c), s	4.9	0.4	9.3

Intersection Summary	
HCM 6th Ctrl Delay	5.3
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	31	58	309	0	195	86	939	142	59	581	64
Future Volume (veh/h)	26	31	58	309	0	195	86	939	142	59	581	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	29	34	32	343	0	109	96	1043	79	66	646	35
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	67	79	127	0	0	0	676	3003	1340	452	3003	1340
Arrive On Green	0.08	0.08	0.08	0.00	0.00	0.00	0.85	0.85	0.85	0.85	0.85	0.85
Sat Flow, veh/h	842	987	1585		0		759	3554	1585	502	3554	1585
Grp Volume(v), veh/h	63	0	32		0.0		96	1043	79	66	646	35
Grp Sat Flow(s),veh/h/ln	1828	0	1585				759	1777	1585	502	1777	1585
Q Serve(g_s), s	3.9	0.0	2.3				3.3	7.7	1.0	4.0	4.1	0.4
Cycle Q Clear(g_c), s	3.9	0.0	2.3				7.4	7.7	1.0	11.7	4.1	0.4
Prop In Lane	0.46		1.00				1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	146	0	127				676	3003	1340	452	3003	1340
V/C Ratio(X)	0.43	0.00	0.25				0.14	0.35	0.06	0.15	0.22	0.03
Avail Cap(c_a), veh/h	389	0	337				676	3003	1340	452	3003	1340
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.6	0.0	51.9				2.5	2.0	1.5	3.3	1.8	1.5
Incr Delay (d2), s/veh	2.0	0.0	1.0				0.4	0.3	0.1	0.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.4	0.0	1.7				0.8	3.3	0.4	0.8	1.7	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.6	0.0	52.9				2.9	2.4	1.6	4.0	1.9	1.5
LnGrp LOS	D	A	D				A	A	A	A	A	A
Approach Vol, veh/h		95						1218			747	
Approach Delay, s/veh		54.0						2.3			2.1	
Approach LOS		D						A			A	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	105.9	14.1	105.9
Change Period (Y+Rc), s	4.5	4.5	4.5
Max Green Setting (Gmax), s	55.5	25.5	55.5
Max Q Clear Time (g_c+I1), s	9.7	5.9	13.7
Green Ext Time (p_c), s	11.5	0.3	6.4

Intersection Summary	
HCM 6th Ctrl Delay	4.6
HCM 6th LOS	A

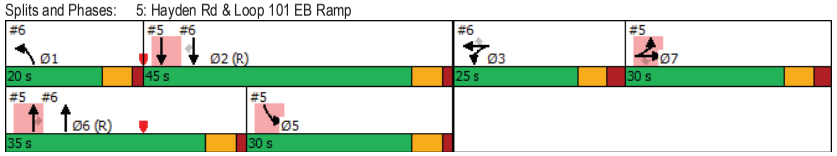
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Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	685	2	802	528	187	495	748		
Future Volume (vph)	685	2	802	528	187	495	748		
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA		
Protected Phases	7	7		6		5	2	1	3
Permitted Phases			7		6				
Detector Phase	7	7	7	6	6	5	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	16.0	12.0	5.0	7.0
Minimum Split (s)	29.0	29.0	29.0	26.0	26.0	22.0	26.0	11.0	24.0
Total Split (s)	30.0	30.0	30.0	35.0	35.0	30.0	45.0	20.0	25.0
Total Split (%)	25.0%	25.0%	25.0%	29.2%	29.2%	25.0%	37.5%	17%	21%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	None	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated

Splits and Phases: 5: Hayden Rd & Loop 101 EB Ramp

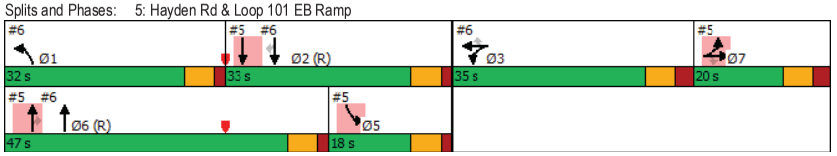


Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	433	5	374	1497	302	506	686		
Future Volume (vph)	433	5	374	1497	302	506	686		
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA		
Protected Phases	7	7		6		5	2	1	3
Permitted Phases			7		6				
Detector Phase	7	7	7	6	6	5	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	12.0	5.0	7.0
Minimum Split (s)	19.0	19.0	19.0	26.0	26.0	18.0	26.0	11.0	34.0
Total Split (s)	20.0	20.0	20.0	47.0	47.0	18.0	33.0	32.0	35.0
Total Split (%)	16.7%	16.7%	16.7%	39.2%	39.2%	15.0%	27.5%	27%	29%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	None	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated

Splits and Phases: 5: Hayden Rd & Loop 101 EB Ramp



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	685	2	802	0	0	0	0	528	187	495	748	0
Future Volume (vph)	685	2	802	0	0	0	0	528	187	495	748	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.90	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1504	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1504	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.90	0.90
Adj. Flow (vph)	761	2	891	0	0	0	0	621	220	582	831	0
RTOR Reduction (vph)	0	56	432	0	0	0	0	0	167	0	0	0
Lane Group Flow (vph)	571	492	103	0	0	0	0	621	53	582	831	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	23.0	23.0	23.0					29.0	29.0	24.0	39.0	
Effective Green, g (s)	23.0	23.0	23.0					29.0	29.0	24.0	39.0	
Actuated g/C Ratio	0.19	0.19	0.19					0.24	0.24	0.20	0.32	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	322	288	288					1228	382	686	1150	
v/s Ratio Prot	c0.34	0.33						c0.12		c0.17	c0.23	
v/s Ratio Perm			0.07						0.03			
v/c Ratio	1.77	1.71	0.36					0.51	0.14	0.85	0.72	
Uniform Delay, d1	48.5	48.5	42.1					39.3	35.7	46.2	35.7	
Progression Factor	1.00	1.00	1.00					0.71	1.12	0.49	0.39	
Incremental Delay, d2	360.4	333.5	0.8					1.5	0.7	7.6	3.1	
Delay (s)	408.9	382.0	42.8					29.5	40.9	30.3	17.2	
Level of Service	F	F	D					C	D	C	B	
Approach Delay (s)		281.6			0.0			32.5			22.6	
Approach LOS		F			A			C			C	

Intersection Summary				
HCM 2000 Control Delay	134.3	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	93.3%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	433	5	374	0	0	0	0	1497	302	506	686	0
Future Volume (vph)	433	5	374	0	0	0	0	1497	302	506	686	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.94	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.97	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1544	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.97	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1544	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.90	0.90
Adj. Flow (vph)	481	6	416	0	0	0	0	1663	336	595	762	0
RTOR Reduction (vph)	0	21	245	0	0	0	0	0	162	0	0	0
Lane Group Flow (vph)	313	282	42	0	0	0	0	1663	174	595	762	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	17.6	17.6	17.6					41.0	41.0	12.0	27.0	
Effective Green, g (s)	17.6	17.6	17.6					41.0	41.0	12.0	27.0	
Actuated g/C Ratio	0.15	0.15	0.15					0.34	0.34	0.10	0.22	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	246	226	220					1737	540	343	796	
v/s Ratio Prot	c0.19	0.18						c0.33		c0.17	c0.22	
v/s Ratio Perm			0.03						0.11			
v/c Ratio	1.27	1.25	0.19					0.96	0.32	1.73	0.96	
Uniform Delay, d1	51.2	51.2	45.0					38.6	29.2	54.0	45.9	
Progression Factor	1.00	1.00	1.00					1.02	1.28	0.62	0.60	
Incremental Delay, d2	150.4	142.2	0.4					11.6	1.3	339.0	18.1	
Delay (s)	201.6	193.4	45.4					51.1	38.7	372.7	45.7	
Level of Service	F	F	D					D	D	F	D	
Approach Delay (s)		149.2			0.0			49.0			189.1	
Approach LOS		F			A			D			F	

Intersection Summary				
HCM 2000 Control Delay	114.9	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	100.0%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

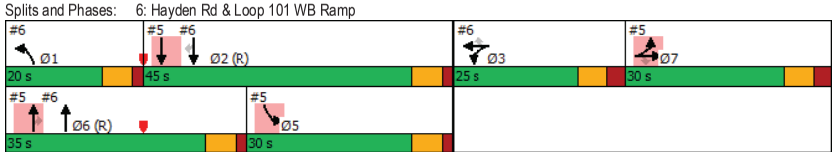
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Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	296	54	562	351	865	936	324		
Future Volume (vph)	296	54	562	351	865	936	324		
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm		
Protected Phases	3	3		1	6	2		5	7
Permitted Phases			3				2		
Detector Phase	3	3	3	1	6	2	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	5.0	12.0	12.0	12.0	16.0	7.0
Minimum Split (s)	24.0	24.0	24.0	11.0	26.0	26.0	26.0	22.0	29.0
Total Split (s)	25.0	25.0	25.0	20.0	35.0	45.0	45.0	30.0	30.0
Total Split (%)	20.8%	20.8%	20.8%	16.7%	29.2%	37.5%	37.5%	25%	25%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated

Splits and Phases: 6: Hayden Rd & Loop 101 WB Ramp

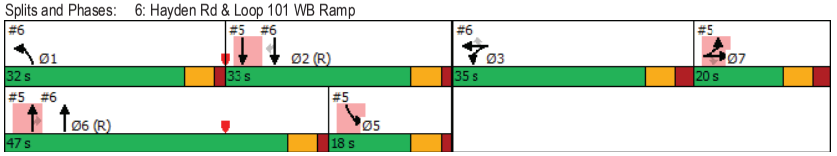


Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	274	42	485	898	1033	916	481		
Future Volume (vph)	274	42	485	898	1033	916	481		
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm		
Protected Phases	3	3		1	6	2		5	7
Permitted Phases			3				2		
Detector Phase	3	3	3	1	6	2	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	5.0	12.0	12.0	12.0	12.0	7.0
Minimum Split (s)	34.0	34.0	34.0	11.0	26.0	26.0	26.0	18.0	19.0
Total Split (s)	35.0	35.0	35.0	32.0	47.0	33.0	33.0	18.0	20.0
Total Split (%)	29.2%	29.2%	29.2%	26.7%	39.2%	27.5%	27.5%	15%	17%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated

Splits and Phases: 6: Hayden Rd & Loop 101 WB Ramp



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	296	54	562	351	865	0	0	936	324
Future Volume (vph)	0	0	0	296	54	562	351	865	0	0	936	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.90	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2859	1441	1770	3539			6408	1583
Flt Permitted				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1610	2859	1441	1770	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	348	68	624	390	961	0	0	1101	360
RTOR Reduction (vph)	0	0	0	0	265	265	0	0	0	0	0	243
Lane Group Flow (vph)	0	0	0	254	209	47	390	961	0	0	1101	117
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				18.0	18.0	18.0	14.0	29.0			39.0	39.0
Effective Green, g (s)				18.0	18.0	18.0	14.0	29.0			39.0	39.0
Actuated g/C Ratio				0.15	0.15	0.15	0.12	0.24			0.32	0.32
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				241	428	216	206	855			2082	514
v/s Ratio Prot				c0.16	0.07		c0.22	c0.27			c0.17	
v/s Ratio Perm						0.03						0.07
v/c Ratio				1.05	0.49	0.22	1.89	1.12			0.53	0.23
Uniform Delay, d1				51.0	46.8	44.8	53.0	45.5			33.0	29.5
Progression Factor				1.00	1.00	1.00	0.80	0.40			1.37	7.17
Incremental Delay, d2				72.9	0.9	0.5	403.6	57.5			0.9	1.0
Delay (s)				123.9	47.7	45.3	446.1	75.9			46.1	212.5
Level of Service				F	D	D	F	E			D	F
Approach Delay (s)		0.0			65.6			182.7			87.1	
Approach LOS		A			E			F			F	

Intersection Summary				
HCM 2000 Control Delay	114.8	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	93.3%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	274	42	485	898	1033	0	0	916	481
Future Volume (vph)	0	0	0	274	42	485	898	1033	0	0	916	481
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.90	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2862	1441	1770	3539			6408	1583
Flt Permitted				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1610	2862	1441	1770	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	322	52	539	998	1148	0	0	1078	534
RTOR Reduction (vph)	0	0	0	0	217	217	0	0	0	0	0	414
Lane Group Flow (vph)	0	0	0	225	203	52	998	1148	0	0	1078	120
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				23.4	23.4	23.4	26.0	41.0			27.0	27.0
Effective Green, g (s)				23.4	23.4	23.4	26.0	41.0			27.0	27.0
Actuated g/C Ratio				0.19	0.19	0.19	0.22	0.34			0.22	0.22
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				313	558	280	383	1209			1441	356
v/s Ratio Prot				c0.14	0.07		c0.56	c0.32			c0.17	
v/s Ratio Perm						0.04						0.08
v/c Ratio				0.72	0.36	0.19	2.61	0.95			0.75	0.34
Uniform Delay, d1				45.2	41.8	40.4	47.0	38.5			43.3	39.0
Progression Factor				1.00	1.00	1.00	0.97	0.44			1.07	5.11
Incremental Delay, d2				7.7	0.4	0.3	723.3	2.3			3.5	2.5
Delay (s)				52.9	42.2	40.7	768.8	19.4			49.9	201.9
Level of Service				D	D	D	F	B			D	F
Approach Delay (s)		0.0			44.4			367.9			100.3	
Approach LOS		A			D			F			F	

Intersection Summary				
HCM 2000 Control Delay	212.3	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.13			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	100.0%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

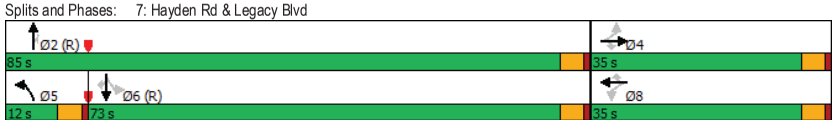
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Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	25	12	98	10	19	107	996	4	1170	36
Future Volume (vph)	25	12	98	10	19	107	996	4	1170	36
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	NA	Perm
Protected Phases		4			8	5	2		6	
Permitted Phases	4		4	8				2		6
Detector Phase	4	4	4	8	8	5	2	2	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	9.5	9.5	9.5	9.5	9.5
Total Split (s)	35.0	35.0	35.0	35.0	35.0	12.0	85.0	85.0	73.0	73.0
Total Split (%)	29.2%	29.2%	29.2%	29.2%	29.2%	10.0%	70.8%	70.8%	60.8%	60.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						Lead			Lag	Lag
Lead-Lag Optimize?						Yes			Yes	Yes
Recall Mode	None	None	None	Max	Max	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Splits and Phases: 7: Hayden Rd & Legacy Blvd

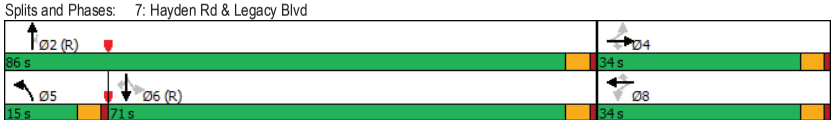


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	70	35	199	8	25	155	1314	6	948	51
Future Volume (vph)	70	35	199	8	25	155	1314	6	948	51
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	NA	Perm
Protected Phases		4			8	5	2		6	
Permitted Phases	4		4	8				2		6
Detector Phase	4	4	4	8	8	5	2	2	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	9.5	9.5	9.5	9.5	9.5
Total Split (s)	34.0	34.0	34.0	34.0	34.0	15.0	86.0	86.0	71.0	71.0
Total Split (%)	28.3%	28.3%	28.3%	28.3%	28.3%	12.5%	71.7%	71.7%	59.2%	59.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						Lead			Lag	Lag
Lead-Lag Optimize?						Yes			Yes	Yes
Recall Mode	None	None	None	Max	Max	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 7: Hayden Rd & Legacy Blvd



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	12	98	10	19	0	107	996	4	0	1170	36
Future Volume (veh/h)	25	12	98	10	19	0	107	996	4	0	1170	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	28	13	55	11	21	0	119	1107	2	0	1300	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	407	903	403	412	903	403	173	2384	1063	60	2979	925
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.00	0.05	0.67	0.67	0.00	0.58	0.58
Sat Flow, veh/h	1391	3554	1585	1401	3554	1585	3456	3554	1585	509	5106	1585
Grp Volume(v), veh/h	28	13	55	11	21	0	119	1107	2	0	1300	20
Grp Sat Flow(s),veh/h/ln	1391	1777	1585	1401	1777	1585	1728	1777	1585	509	1702	1585
Q Serve(g_s), s	1.8	0.3	3.2	0.7	0.5	0.0	4.1	17.9	0.0	0.0	17.1	0.6
Cycle Q Clear(g_c), s	2.4	0.3	3.2	1.0	0.5	0.0	4.1	17.9	0.0	0.0	17.1	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	407	903	403	412	903	403	173	2384	1063	60	2979	925
V/C Ratio(X)	0.07	0.01	0.14	0.03	0.02	0.00	0.69	0.46	0.00	0.00	0.44	0.02
Avail Cap(c_a), veh/h	407	903	403	412	903	403	216	2384	1063	60	2979	925
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	34.5	33.5	34.6	33.9	33.6	0.0	56.1	9.4	6.5	0.0	14.0	10.5
Incr Delay (d2), s/veh	0.1	0.0	0.2	0.1	0.0	0.0	6.6	0.7	0.0	0.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	0.3	2.3	0.5	0.4	0.0	3.5	11.0	0.0	0.0	10.7	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.5	33.5	34.7	34.0	33.6	0.0	62.6	10.1	6.5	0.0	14.4	10.6
LnGrp LOS	C	C	C	C	C	A	E	B	A	A	B	B
Approach Vol, veh/h		96			32			1228			1320	
Approach Delay, s/veh		34.5			33.8			15.2			14.4	
Approach LOS		C			C			B			B	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		85.0		35.0	10.5	74.5		35.0				
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		80.5		30.5	7.5	68.5		30.5				
Max Q Clear Time (g_c+I1), s		19.9		5.2	6.1	19.1		3.0				
Green Ext Time (p_c), s		11.2		0.3	0.0	13.6		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			15.7									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	35	199	8	25	0	155	1314	6	0	948	51
Future Volume (veh/h)	70	35	199	8	25	0	155	1314	6	0	948	51
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	78	39	165	9	28	0	172	1460	4	0	1053	29
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	391	874	390	385	874	390	230	2414	1077	60	2937	912
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.00	0.07	0.68	0.68	0.00	0.58	0.58
Sat Flow, veh/h	1382	3554	1585	1368	3554	1585	3456	3554	1585	364	5106	1585
Grp Volume(v), veh/h	78	39	165	9	28	0	172	1460	4	0	1053	29
Grp Sat Flow(s),veh/h/ln	1382	1777	1585	1368	1777	1585	1728	1777	1585	364	1702	1585
Q Serve(g_s), s	5.5	1.0	10.5	0.6	0.7	0.0	5.9	26.8	0.1	0.0	13.2	0.9
Cycle Q Clear(g_c), s	6.2	1.0	10.5	1.6	0.7	0.0	5.9	26.8	0.1	0.0	13.2	0.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	391	874	390	385	874	390	230	2414	1077	60	2937	912
V/C Ratio(X)	0.20	0.04	0.42	0.02	0.03	0.00	0.75	0.60	0.00	0.00	0.36	0.03
Avail Cap(c_a), veh/h	391	874	390	385	874	390	302	2414	1077	60	2937	912
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	36.7	34.5	38.1	35.1	34.4	0.0	55.0	10.5	6.2	0.0	13.6	11.0
Incr Delay (d2), s/veh	0.2	0.0	0.7	0.1	0.1	0.0	7.1	1.1	0.0	0.0	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.4	0.8	7.5	0.4	0.6	0.0	5.0	15.2	0.1	0.0	8.8	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.0	34.5	38.8	35.2	34.5	0.0	62.2	11.6	6.2	0.0	14.0	11.1
LnGrp LOS	D	C	D	D	C	A	E	B	A	A	B	B
Approach Vol, veh/h		282			37			1636			1082	
Approach Delay, s/veh		37.7			34.7			16.9			13.9	
Approach LOS		D			C			B			B	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		86.0		34.0	12.5	73.5		34.0				
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		81.5		29.5	10.5	66.5		29.5				
Max Q Clear Time (g_c+I1), s		28.8		12.5	7.9	15.2		3.6				
Green Ext Time (p_c), s		17.5		0.9	0.1	10.0		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			18.0									
HCM 6th LOS			B									

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Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	517	14	8	284	35	3	0	10	42	2	36
Future Vol, veh/h	36	517	14	8	284	35	3	0	10	42	2	36
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	85	-	-	105	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	40	574	16	9	316	39	3	0	11	47	2	40

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	355	0	0	590	0	0	839	1035	295	721	1024	178
Stage 1	-	-	-	-	-	-	662	662	-	354	354	-
Stage 2	-	-	-	-	-	-	177	373	-	367	670	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1200	-	-	982	-	-	259	230	701	315	234	834
Stage 1	-	-	-	-	-	-	417	457	-	636	629	-
Stage 2	-	-	-	-	-	-	808	617	-	625	454	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1200	-	-	982	-	-	237	220	701	300	224	834
Mov Cap-2 Maneuver	-	-	-	-	-	-	237	220	-	300	224	-
Stage 1	-	-	-	-	-	-	403	442	-	615	623	-
Stage 2	-	-	-	-	-	-	759	611	-	595	439	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.2	12.6	14.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	237	701	1200	-	-	982	-	-	300	729
HCM Lane V/C Ratio	0.014	0.016	0.033	-	-	0.009	-	-	0.156	0.058
HCM Control Delay (s)	20.4	10.2	8.1	-	-	8.7	-	-	19.2	10.2
HCM Lane LOS	C	B	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0	0	0.1	-	-	0	-	-	0.5	0.2

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	73	292	16	24	632	56	15	1	4	36	3	65
Future Vol, veh/h	73	292	16	24	632	56	15	1	4	36	3	65
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	85	-	-	105	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	81	324	18	27	702	62	17	1	4	40	3	72

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	764	0	0	342	0	0	902	1313	171	1112	1291	382
Stage 1	-	-	-	-	-	-	495	495	-	787	787	-
Stage 2	-	-	-	-	-	-	407	818	-	325	504	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	845	-	-	1214	-	-	233	157	843	163	162	616
Stage 1	-	-	-	-	-	-	525	544	-	351	401	-
Stage 2	-	-	-	-	-	-	592	388	-	661	539	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	845	-	-	1214	-	-	184	139	843	147	143	616
Mov Cap-2 Maneuver	-	-	-	-	-	-	184	139	-	147	143	-
Stage 1	-	-	-	-	-	-	475	492	-	317	392	-
Stage 2	-	-	-	-	-	-	507	379	-	593	487	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.3	23.3	21.7
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	184	419	845	-	-	1214	-	-	147	538
HCM Lane V/C Ratio	0.091	0.013	0.096	-	-	0.022	-	-	0.272	0.14
HCM Control Delay (s)	26.5	13.7	9.7	-	-	8	-	-	38.4	12.8
HCM Lane LOS	D	B	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	0.3	0	0.3	-	-	0.1	-	-	1	0.5

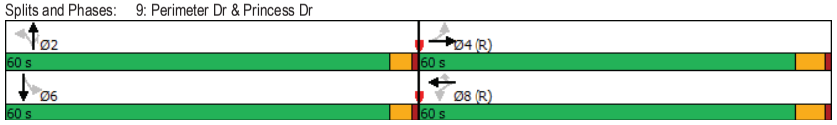
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Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	84	217	309	374	173	106	38	87	23	13
Future Volume (vph)	84	217	309	374	173	106	38	87	23	13
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		4		8			2			6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	2	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	22.5	22.5
Total Split (s)	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.2	3.2	3.2	3.2	3.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 9: Perimeter Dr & Princess Dr

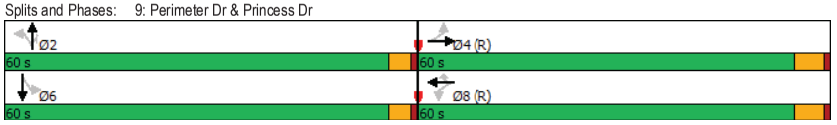


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	78	350	75	278	69	179	21	304	215	27
Future Volume (vph)	78	350	75	278	69	179	21	304	215	27
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		4		8			2			6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	2	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	22.5	22.5
Total Split (s)	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.2	3.2	3.2	3.2	3.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 9: Perimeter Dr & Princess Dr



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	217	86	309	374	173	106	38	87	23	13	14
Future Volume (veh/h)	84	217	86	309	374	173	106	38	87	23	13	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	47	241	73	343	416	96	118	42	49	26	14	13
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	401	1798	513	506	1620	723	697	1652	737	659	869	701
Arrive On Green	0.46	0.46	0.46	0.46	0.46	0.46	0.47	0.47	0.47	0.47	0.47	0.47
Sat Flow, veh/h	888	3945	1126	1066	3554	1585	1383	3554	1585	1306	1868	1508
Grp Volume(v), veh/h	47	206	108	343	416	96	118	42	49	26	13	14
Grp Sat Flow(s),veh/h/ln	888	1702	1668	1066	1777	1585	1383	1777	1585	1306	1777	1599
Q Serve(g_s), s	4.1	4.2	4.5	33.1	8.7	4.2	6.0	0.8	2.0	1.3	0.5	0.6
Cycle Q Clear(g_c), s	12.8	4.2	4.5	37.7	8.7	4.2	6.6	0.8	2.0	2.1	0.5	0.6
Prop In Lane	1.00		0.68	1.00		1.00	1.00		1.00	1.00		0.94
Lane Grp Cap(c), veh/h	401	1552	760	506	1620	723	697	1652	737	659	826	743
V/C Ratio(X)	0.12	0.13	0.14	0.68	0.26	0.13	0.17	0.03	0.07	0.04	0.02	0.02
Avail Cap(c_a), veh/h	401	1552	760	506	1620	723	697	1652	737	659	826	743
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.1	18.9	19.0	30.0	20.1	18.9	19.1	17.4	17.7	17.9	17.3	17.3
Incr Delay (d2), s/veh	0.6	0.2	0.4	7.2	0.4	0.4	0.5	0.0	0.2	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.7	3.1	3.3	14.4	6.6	2.9	3.7	0.6	1.4	0.8	0.4	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	19.1	19.4	37.1	20.5	19.3	19.6	17.4	17.9	18.1	17.3	17.4
LnGrp LOS	C	B	B	D	C	B	B	B	B	B	B	B
Approach Vol, veh/h		361			855			209			53	
Approach Delay, s/veh		19.9			27.0			18.8			17.7	
Approach LOS		B			C			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		60.0		60.0		60.0		60.0				
Change Period (Y+Rc), s		* 4.2		5.3		* 4.2		5.3				
Max Green Setting (Gmax), s		* 56		54.7		* 56		54.7				
Max Q Clear Time (g_c+I1), s		8.6		14.8		4.1		39.7				
Green Ext Time (p_c), s		0.8		2.5		0.2		4.2				
Intersection Summary												
HCM 6th Ctrl Delay			23.8									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	350	32	75	278	69	179	21	304	215	27	105
Future Volume (veh/h)	78	350	32	75	278	69	179	21	304	215	27	105
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	43	389	27	83	309	39	199	23	169	239	30	88
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	477	2224	153	456	1620	723	612	1652	737	610	826	737
Arrive On Green	0.46	0.46	0.46	0.46	0.46	0.46	0.47	0.47	0.47	0.47	0.47	0.47
Sat Flow, veh/h	1033	4879	335	970	3554	1585	1274	3554	1585	1191	1777	1585
Grp Volume(v), veh/h	43	270	146	83	309	39	199	23	169	239	30	88
Grp Sat Flow(s),veh/h/ln	1033	1702	1810	970	1777	1585	1274	1777	1585	1191	1777	1585
Q Serve(g_s), s	3.1	5.6	5.7	6.6	6.2	1.6	12.6	0.4	7.7	16.2	1.1	3.8
Cycle Q Clear(g_c), s	9.3	5.6	5.7	12.4	6.2	1.6	16.4	0.4	7.7	16.6	1.1	3.8
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	477	1552	825	456	1620	723	612	1652	737	610	826	737
V/C Ratio(X)	0.09	0.17	0.18	0.18	0.19	0.05	0.32	0.01	0.23	0.39	0.04	0.12
Avail Cap(c_a), veh/h	477	1552	825	456	1620	723	612	1652	737	610	826	737
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.2	19.3	19.3	23.0	19.5	18.2	22.8	17.3	19.2	21.8	17.5	18.2
Incr Delay (d2), s/veh	0.4	0.2	0.5	0.9	0.3	0.1	1.4	0.0	0.7	1.9	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.5	4.1	4.6	3.0	4.7	1.1	7.2	0.3	5.4	8.4	0.9	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.6	19.5	19.8	23.9	19.7	18.4	24.2	17.3	19.9	23.7	17.6	18.5
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		459			431			391			357	
Approach Delay, s/veh		19.9			20.4			22.0			21.9	
Approach LOS		B			C			C			C	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		60.0		60.0		60.0		60.0				
Change Period (Y+Rc), s		* 4.2		5.3		* 4.2		5.3				
Max Green Setting (Gmax), s		* 56		54.7		* 56		54.7				
Max Q Clear Time (g_c+I1), s		18.4		11.3		18.6		14.4				
Green Ext Time (p_c), s		1.4		3.1		1.7		2.8				
Intersection Summary												
HCM 6th Ctrl Delay			21.0									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

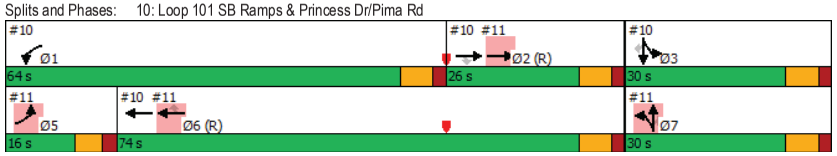
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Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	218	126	1282	599	467	584	208		
Future Volume (vph)	218	126	1282	599	467	584	208		
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm		
Protected Phases	2		1	6	3	3		5	7
Permitted Phases		2					3		
Detector Phase	2	2	1	6	3	3	3		
Switch Phase									
Minimum Initial (s)	1.0	1.0	7.0	1.0	10.0	10.0	10.0	5.0	7.0
Minimum Split (s)	7.7	7.7	13.7	7.7	19.0	19.0	19.0	11.0	13.7
Total Split (s)	26.0	26.0	64.0	74.0	30.0	30.0	30.0	16.0	30.0
Total Split (%)	21.7%	21.7%	53.3%	61.7%	25.0%	25.0%	25.0%	13%	25%
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lag	Lag	Lead	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated

Splits and Phases: 10: Loop 101 SB Ramps & Princess Dr/Pima Rd

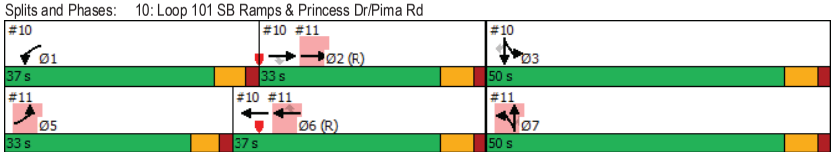


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	511	424	867	307	341	293	94		
Future Volume (vph)	511	424	867	307	341	293	94		
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm		
Protected Phases	2		1	6	3	3		5	7
Permitted Phases		2					3		
Detector Phase	2	2	1	6	3	3	3		
Switch Phase									
Minimum Initial (s)	1.0	1.0	7.0	1.0	10.0	10.0	10.0	5.0	7.0
Minimum Split (s)	7.7	7.7	13.7	7.7	19.0	19.0	19.0	11.0	13.7
Total Split (s)	33.0	33.0	37.0	37.0	50.0	50.0	50.0	33.0	50.0
Total Split (%)	27.5%	27.5%	30.8%	30.8%	41.7%	41.7%	41.7%	28%	42%
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lag	Lag	Lead	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 10: Loop 101 SB Ramps & Princess Dr/Pima Rd



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	218	126	1282	599	0	0	0	0	467	584	208
Future Volume (vph)	0	218	126	1282	599	0	0	0	0	467	584	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3167	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3167	1441
Peak-hour factor, PHF	0.90	0.80	0.80	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	272	158	1424	705	0	0	0	0	519	687	245
RTOR Reduction (vph)	0	0	122	0	0	0	0	0	0	0	2	177
Lane Group Flow (vph)	0	273	36	1424	705	0	0	0	0	400	829	43
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		21.5	21.5	55.1	69.5					23.3	23.3	23.3
Effective Green, g (s)		21.5	21.5	55.1	69.5					23.3	23.3	23.3
Actuated g/C Ratio		0.18	0.18	0.46	0.58					0.19	0.19	0.19
Clearance Time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		911	499	1576	2945					312	614	279
v/s Ratio Prot		c0.05		c0.41	0.14					0.25	c0.26	
v/s Ratio Perm			0.01									0.03
v/c Ratio		0.30	0.07	0.90	0.24					1.28	1.35	0.15
Uniform Delay, d1		42.7	41.0	30.0	12.3					48.4	48.4	40.2
Progression Factor		1.24	2.30	0.69	0.65					1.00	1.00	1.00
Incremental Delay, d2		0.8	0.3	6.7	0.2					149.2	168.4	0.3
Delay (s)		53.6	94.3	27.5	8.1					197.6	216.8	40.4
Level of Service		D	F	C	A					F	F	D
Approach Delay (s)		68.5			21.1			0.0			184.7	
Approach LOS		E			C			A			F	

Intersection Summary				
HCM 2000 Control Delay	85.4	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	79.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	511	424	867	307	0	0	0	0	341	293	94
Future Volume (vph)	0	511	424	867	307	0	0	0	0	341	293	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3149	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3149	1441
Peak-hour factor, PHF	0.90	0.85	0.85	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	601	499	963	361	0	0	0	0	379	345	111
RTOR Reduction (vph)	0	0	269	0	0	0	0	0	0	0	1	66
Lane Group Flow (vph)	0	601	230	963	361	0	0	0	0	239	495	34
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		26.3	26.3	33.0	36.7					40.6	40.6	40.6
Effective Green, g (s)		26.3	26.3	33.0	36.7					40.6	40.6	40.6
Actuated g/C Ratio		0.22	0.22	0.28	0.31					0.34	0.34	0.34
Clearance Time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1114	610	944	1555					544	1065	487
v/s Ratio Prot		c0.12		c0.28	0.07					0.15	c0.16	
v/s Ratio Perm			0.08									0.02
v/c Ratio		0.54	0.38	1.02	0.23					0.44	0.46	0.07
Uniform Delay, d1		41.5	39.9	43.5	31.1					30.9	31.2	26.9
Progression Factor		1.18	1.67	1.68	0.58					1.00	1.00	1.00
Incremental Delay, d2		1.8	1.7	31.4	0.3					0.6	0.3	0.1
Delay (s)		50.9	68.2	104.4	18.5					31.4	31.5	27.0
Level of Service		D	E	F	B					C	C	C
Approach Delay (s)		58.8			81.0			0.0			30.9	
Approach LOS		E			F			A			C	

Intersection Summary				
HCM 2000 Control Delay	60.7	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	69.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

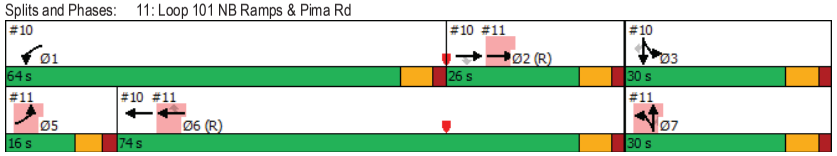
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Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	63	622	1526	354	354	441	1034		
Future Volume (vph)	63	622	1526	354	354	441	1034		
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm		
Protected Phases	5	2	6		7	7		1	3
Permitted Phases				6			7		
Detector Phase	5	2	6	6	7	7	7		
Switch Phase									
Minimum Initial (s)	5.0	1.0	1.0	1.0	7.0	7.0	7.0	7.0	10.0
Minimum Split (s)	11.0	7.7	7.7	7.7	13.7	13.7	13.7	13.7	19.0
Total Split (s)	16.0	26.0	74.0	74.0	30.0	30.0	30.0	64.0	30.0
Total Split (%)	13.3%	21.7%	61.7%	61.7%	25.0%	25.0%	25.0%	53%	25%
Yellow Time (s)	4.0	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lead	Lag	Lag	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated

Splits and Phases: 11: Loop 101 NB Ramps & Pima Rd

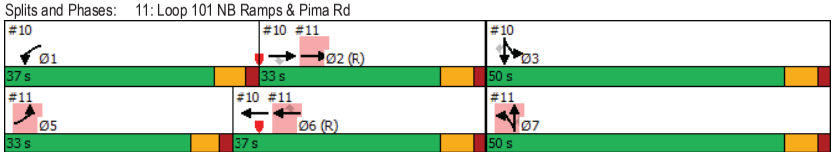


Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	241	606	1070	313	140	545	1045		
Future Volume (vph)	241	606	1070	313	140	545	1045		
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm		
Protected Phases	5	2	6		7	7		1	3
Permitted Phases				6			7		
Detector Phase	5	2	6	6	7	7	7		
Switch Phase									
Minimum Initial (s)	5.0	1.0	1.0	1.0	7.0	7.0	7.0	7.0	10.0
Minimum Split (s)	11.0	7.7	7.7	7.7	13.7	13.7	13.7	13.7	19.0
Total Split (s)	33.0	33.0	37.0	37.0	50.0	50.0	50.0	37.0	50.0
Total Split (%)	27.5%	27.5%	30.8%	30.8%	41.7%	41.7%	41.7%	31%	42%
Yellow Time (s)	4.0	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lead	Lag	Lag	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 11: Loop 101 NB Ramps & Pima Rd



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	622	0	0	1526	354	354	441	1034	0	0	0
Future Volume (vph)	63	622	0	0	1526	354	354	441	1034	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3363	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3363	2787			
Peak-hour factor, PHF	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	79	691	0	0	1696	393	393	519	1149	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	49	0	0	926	0	0	0
Lane Group Flow (vph)	79	691	0	0	1696	344	295	617	223	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	7.8	21.5			69.5	69.5	23.3	23.3	23.3			
Effective Green, g (s)	7.8	21.5			69.5	69.5	23.3	23.3	23.3			
Actuated g/C Ratio	0.06	0.18			0.58	0.58	0.19	0.19	0.19			
Clearance Time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	115	634			3711	916	312	652	541			
v/s Ratio Prot	c0.04	c0.20			c0.26		0.18	c0.18				
v/s Ratio Perm						0.22			0.08			
v/c Ratio	0.69	1.09			0.46	0.38	0.95	0.95	0.41			
Uniform Delay, d1	54.9	49.2			14.5	13.6	47.7	47.7	42.4			
Progression Factor	0.44	1.10			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	5.3	49.4			0.4	1.2	36.4	22.7	0.5			
Delay (s)	29.6	103.7			14.9	14.8	84.1	70.4	42.9			
Level of Service	C	F			B	B	F	E	D			
Approach Delay (s)		96.1			14.8			57.0			0.0	
Approach LOS		F			B			E			A	

Intersection Summary				
HCM 2000 Control Delay	45.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	79.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	241	606	0	0	1070	313	140	545	1045	0	0	0
Future Volume (vph)	241	606	0	0	1070	313	140	545	1045	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3386	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3386	2787			
Peak-hour factor, PHF	0.85	0.90	0.90	0.90	0.85	0.90	0.85	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	284	673	0	0	1259	348	165	641	1161	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	100	0	0	653	0	0	0
Lane Group Flow (vph)	284	673	0	0	1259	248	148	658	508	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	23.3	26.3			36.7	36.7	40.6	40.6	40.6			
Effective Green, g (s)	23.3	26.3			36.7	36.7	40.6	40.6	40.6			
Actuated g/C Ratio	0.19	0.22			0.31	0.31	0.34	0.34	0.34			
Clearance Time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	343	775			1959	484	544	1145	942			
v/s Ratio Prot	c0.16	c0.19			c0.20		0.09	c0.19				
v/s Ratio Perm						0.16			0.18			
v/c Ratio	0.83	0.87			0.64	0.51	0.27	0.57	0.54			
Uniform Delay, d1	46.4	45.2			36.0	34.3	28.9	32.6	32.1			
Progression Factor	1.29	0.69			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	13.5	11.4			1.6	3.8	0.3	0.7	0.6			
Delay (s)	73.3	42.5			37.6	38.1	29.2	33.3	32.7			
Level of Service	E	D			D	D	C	C	C			
Approach Delay (s)		51.6			37.7			32.7			0.0	
Approach LOS		D			D			C			A	

Intersection Summary				
HCM 2000 Control Delay	38.5	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)	20.1	
Intersection Capacity Utilization	69.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

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Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	1	37	0	9	200
Future Vol, veh/h	0	1	37	0	9	200
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1	41	0	10	222

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	172	21	0	0	41	0
Stage 1	41	-	-	-	-	-
Stage 2	131	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	801	1051	-	-	1567	-
Stage 1	976	-	-	-	-	-
Stage 2	881	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	796	1051	-	-	1567	-
Mov Cap-2 Maneuver	796	-	-	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	876	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.4	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 1051	1567	-
HCM Lane V/C Ratio	-	- 0.001	0.006	-
HCM Control Delay (s)	-	- 8.4	7.3	-
HCM Lane LOS	-	- A	A	-
HCM 95th %tile Q(veh)	-	- 0	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	280	0	1	99
Future Vol, veh/h	0	5	280	0	1	99
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	6	311	0	1	110

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	368	156	0	0	311	0
Stage 1	311	-	-	-	-	-
Stage 2	57	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	605	862	-	-	1246	-
Stage 1	716	-	-	-	-	-
Stage 2	959	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	604	862	-	-	1246	-
Mov Cap-2 Maneuver	604	-	-	-	-	-
Stage 1	716	-	-	-	-	-
Stage 2	958	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 862	1246	-
HCM Lane V/C Ratio	-	- 0.006	0.001	-
HCM Control Delay (s)	-	- 9.2	7.9	-
HCM Lane LOS	-	- A	A	-
HCM 95th %tile Q(veh)	-	- 0	0	-

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Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	1	0	18	0	30	9	69	132	0
Future Vol, veh/h	0	0	0	1	0	18	0	30	9	69	132	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	1	0	20	0	33	10	77	147	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	318	344	74	266	339	22	147	0	0	43	0	0
Stage 1	301	301	-	38	38	-	-	-	-	-	-	-
Stage 2	17	43	-	228	301	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	611	577	973	665	581	1050	1432	-	-	1564	-	-
Stage 1	683	664	-	972	863	-	-	-	-	-	-	-
Stage 2	1000	858	-	754	664	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	577	549	973	640	553	1050	1432	-	-	1564	-	-
Mov Cap-2 Maneuver	577	549	-	640	553	-	-	-	-	-	-	-
Stage 1	683	631	-	972	863	-	-	-	-	-	-	-
Stage 2	981	858	-	717	631	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	8.6	0	2.5
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1432	-	-	-	1016	1564	-	-
HCM Lane V/C Ratio	-	-	-	-	0.021	0.049	-	-
HCM Control Delay (s)	0	-	-	0	8.6	7.4	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	6	0	41	0	239	1	5	94	0
Future Vol, veh/h	0	0	0	6	0	41	0	239	1	5	94	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	7	0	46	0	266	1	6	104	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	249	383	52	331	383	134	104	0	0	267	0	0
Stage 1	116	116	-	267	267	-	-	-	-	-	-	-
Stage 2	133	267	-	64	116	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	684	549	1005	599	549	890	1485	-	-	1294	-	-
Stage 1	876	799	-	715	687	-	-	-	-	-	-	-
Stage 2	857	687	-	939	799	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	646	546	1005	597	546	890	1485	-	-	1294	-	-
Mov Cap-2 Maneuver	646	546	-	597	546	-	-	-	-	-	-	-
Stage 1	876	795	-	715	687	-	-	-	-	-	-	-
Stage 2	813	687	-	935	795	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	9.6	0	0.4
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1485	-	-	-	838	1294	-	-
HCM Lane V/C Ratio	-	-	-	-	0.062	0.004	-	-
HCM Control Delay (s)	0	-	-	0	9.6	7.8	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0	-	-

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Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	43	1	47	6	0	11	19	507	1	11	962	13
Future Vol, veh/h	43	1	47	6	0	11	19	507	1	11	962	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	235	-	145	370	-	120
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	48	1	52	7	0	12	21	563	1	12	1069	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1417	1699	535	1164	1712	282	1083	0	0	564	0	0
Stage 1	1093	1093	-	605	605	-	-	-	-	-	-	-
Stage 2	324	606	-	559	1107	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	*289	*165	*685	*554	161	715	*1024	-	-	1004	-	-
Stage 1	*645	*566	-	*451	486	-	-	-	-	-	-	-
Stage 2	*662	*485	-	*645	563	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1		1	-	-		-	-
Mov Cap-1 Maneuver	*277	*160	*685	*496	155	715	*1024	-	-	1004	-	-
Mov Cap-2 Maneuver	*277	*160	-	*496	155	-	-	-	-	-	-	-
Stage 1	*632	*559	-	*442	476	-	-	-	-	-	-	-
Stage 2	*637	*475	-	*588	556	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.2	11	0.3	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 1024	-	-	395	619	1004	-	-
HCM Lane V/C Ratio	0.021	-	-	0.256	0.031	0.012	-	-
HCM Control Delay (s)	8.6	-	-	17.2	11	8.6	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1	0.1	0	-	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	1	35	4	0	13	44	1070	1	14	725	64
Future Vol, veh/h	28	1	35	4	0	13	44	1070	1	14	725	64
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	235	-	145	370	-	120
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	31	1	39	4	0	14	49	1189	1	16	806	71

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1531	2126	403	1723	2196	595	877	0	0	1190	0	0
Stage 1	838	838	-	1287	1287	-	-	-	-	-	-	-
Stage 2	693	1288	-	436	909	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	148	58	*789	*95	50	447	1099	-	-	582	-	-
Stage 1	714	632	-	*174	233	-	-	-	-	-	-	-
Stage 2	400	233	-	*744	574	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1		1	-	-		-	-
Mov Cap-1 Maneuver	135	53	*789	*84	47	447	1099	-	-	582	-	-
Mov Cap-2 Maneuver	135	53	-	*84	47	-	-	-	-	-	-	-
Stage 1	682	615	-	*166	223	-	-	-	-	-	-	-
Stage 2	370	223	-	*686	559	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26.7	22.7	0.3	0.2
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1099	-	-	236	222	582	-	-
HCM Lane V/C Ratio	0.044	-	-	0.301	0.085	0.027	-	-
HCM Control Delay (s)	8.4	-	-	26.7	22.7	11.4	-	-
HCM Lane LOS	A	-	-	D	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.2	0.3	0.1	-	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

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21-0551 Axon Crossroad
2030 Background AM

1: Hayden Rd & Mayo Blvd/Axon Way
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	256	7	75	4	0	32	88	442	29	174	905	327
Future Volume (vph)	256	7	75	4	0	32	88	442	29	174	905	327
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00		1.00	0.95	0.95	0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.86		1.00	0.85	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1608		1770	1504	1504	3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.47	1.00	1.00
Satd. Flow (perm)	3433	1608		1863	1504	1504	3433	3539	1583	868	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	284	8	83	4	0	36	98	491	32	193	1006	363
RTOR Reduction (vph)	0	67	0	0	17	17	0	0	9	0	0	113
Lane Group Flow (vph)	284	24	0	4	1	1	98	491	23	193	1006	250
Turn Type	Prot	NA		Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases				8		8			2	6		6
Actuated Green, G (s)	15.2	23.6		3.9	3.9	3.9	13.5	87.4	87.4	69.4	69.4	69.4
Effective Green, g (s)	15.2	23.6		3.9	3.9	3.9	13.5	87.4	87.4	69.4	69.4	69.4
Actuated g/C Ratio	0.13	0.20		0.03	0.03	0.03	0.11	0.73	0.73	0.58	0.58	0.58
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	434	316		60	48	48	386	2577	1152	501	2046	915
v/s Ratio Prot	c0.08	c0.02			0.00		c0.03	0.14			c0.28	
v/s Ratio Perm				0.00		0.00			0.01	0.22		0.16
v/c Ratio	0.65	0.08		0.07	0.01	0.01	0.25	0.19	0.02	0.39	0.49	0.27
Uniform Delay, d1	49.9	39.3		56.3	56.2	56.2	48.6	5.1	4.5	13.7	14.9	12.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.84	0.89	0.58	1.08	1.06	1.37
Incremental Delay, d2	3.5	0.1		0.5	0.1	0.1	0.3	0.2	0.0	0.9	0.3	0.3
Delay (s)	53.4	39.4		56.8	56.3	56.3	41.0	4.8	2.6	15.7	16.2	17.7
Level of Service	D	D		E	E	E	D	A	A	B	B	B
Approach Delay (s)		50.0			56.3			10.4			16.5	
Approach LOS		D			E			B			B	

Intersection Summary				
HCM 2000 Control Delay	20.5	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)	18.0	
Intersection Capacity Utilization	54.4%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

21-0551 Axon Crossroads
2030 Background PM

1: Hayden Rd & Mayo Blvd/Axon Way
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	528	1	139	33	4	247	94	1020	11	90	633	261
Future Volume (vph)	528	1	139	33	4	247	94	1020	11	90	633	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00		1.00	0.95	0.95	0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.85		1.00	0.85	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1585		1770	1512	1504	3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.66	1.00	1.00	0.95	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)	3433	1585		1227	1512	1504	3433	3539	1583	263	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	587	1	154	37	4	274	104	1133	12	100	703	290
RTOR Reduction (vph)	0	100	0	0	42	85	0	0	5	0	0	176
Lane Group Flow (vph)	587	55	0	37	96	55	104	1133	7	100	703	114
Turn Type	Prot	NA		Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases				8		8			2	6		6
Actuated Green, G (s)	24.7	41.8		12.6	12.6	12.6	17.5	69.2	69.2	47.2	47.2	47.2
Effective Green, g (s)	24.7	41.8		12.6	12.6	12.6	17.5	69.2	69.2	47.2	47.2	47.2
Actuated g/C Ratio	0.21	0.35		0.10	0.10	0.10	0.15	0.58	0.58	0.39	0.39	0.39
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	706	552		128	158	157	500	2040	912	103	1392	622
v/s Ratio Prot	c0.17	0.03			c0.06		0.03	c0.32			0.20	
v/s Ratio Perm				0.03		0.04			0.00	c0.38		0.07
v/c Ratio	0.83	0.10		0.29	0.61	0.35	0.21	0.56	0.01	0.97	0.51	0.18
Uniform Delay, d1	45.7	26.4		49.6	51.3	49.9	45.1	15.8	10.8	35.7	27.6	23.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.03	1.12	1.00	1.02	1.04	1.78
Incremental Delay, d2	8.3	0.1		1.3	6.5	1.4	0.2	1.0	0.0	49.7	0.5	0.3
Delay (s)	53.9	26.5		50.8	57.8	51.2	46.6	18.8	10.8	86.0	29.3	42.7
Level of Service	D	C		D	E	D	D	B	B	F	C	D
Approach Delay (s)		48.2			54.1			21.0			38.0	
Approach LOS		D			D			C			D	

Intersection Summary				
HCM 2000 Control Delay	35.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	68.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

13-ZN-2020#2
10/24/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	36	63	190	0	66	35	477	150	135	779	53
Future Volume (vph)	31	36	63	190	0	66	35	477	150	135	779	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	1.00	0.97		1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85	1.00		0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1821	1583	3433		1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.98	1.00	0.95		1.00	0.29	1.00	1.00	0.44	1.00	1.00
Satd. Flow (perm)		1821	1583	3433		1583	549	3539	1583	824	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	34	40	70	211	0	73	39	530	167	150	866	59
RTOR Reduction (vph)	0	0	63	0	0	56	0	0	52	0	0	18
Lane Group Flow (vph)	0	74	7	211	0	17	39	530	115	150	866	41
Turn Type	Split	NA	Perm	Prot		Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4	4		3				2			6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)		11.2	11.2	12.7		28.4	82.6	82.6	82.6	82.6	82.6	82.6
Effective Green, g (s)		11.2	11.2	12.7		28.4	82.6	82.6	82.6	82.6	82.6	82.6
Actuated g/C Ratio		0.09	0.09	0.11		0.24	0.69	0.69	0.69	0.69	0.69	0.69
Clearance Time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		169	147	363		374	377	2436	1089	567	2436	1089
v/s Ratio Prot		c0.04		c0.06				0.15			c0.24	
v/s Ratio Perm			0.00			0.01	0.07		0.07	0.18		0.03
v/c Ratio		0.44	0.04	0.58		0.05	0.10	0.22	0.11	0.26	0.36	0.04
Uniform Delay, d1		51.4	49.5	51.1		35.3	6.3	6.9	6.3	7.1	7.7	6.0
Progression Factor		1.00	1.00	1.37		0.23	1.00	1.00	1.00	1.77	1.64	3.59
Incremental Delay, d2		1.8	0.1	2.3		0.1	0.6	0.2	0.2	1.0	0.4	0.1
Delay (s)		53.2	49.7	72.4		8.2	6.8	7.1	6.5	13.6	13.0	21.5
Level of Service		D	D	E		A	A	A	A	B	B	C
Approach Delay (s)		51.5			55.9			6.9			13.6	
Approach LOS		D			E			A			B	

Intersection Summary				
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	48.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	31	58	309	0	195	86	939	142	59	581	64
Future Volume (vph)	26	31	58	309	0	195	86	939	142	59	581	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	1.00	0.97		1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85	1.00		0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1821	1583	3433		1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.98	1.00	0.95		1.00	0.38	1.00	1.00	0.23	1.00	1.00
Satd. Flow (perm)		1821	1583	3433		1583	713	3539	1583	430	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	34	64	343	0	217	96	1043	158	66	646	71
RTOR Reduction (vph)	0	0	59	0	0	40	0	0	52	0	0	23
Lane Group Flow (vph)	0	63	5	343	0	177	96	1043	106	66	646	48
Turn Type	Split	NA	Perm	Prot		Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4	4		3				2			6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)		8.8	8.8	17.2		30.5	80.5	80.5	80.5	80.5	80.5	80.5
Effective Green, g (s)		8.8	8.8	17.2		30.5	80.5	80.5	80.5	80.5	80.5	80.5
Actuated g/C Ratio		0.07	0.07	0.14		0.25	0.67	0.67	0.67	0.67	0.67	0.67
Clearance Time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		133	116	492		402	478	2374	1061	288	2374	1061
v/s Ratio Prot		0.03		c0.10				c0.29			0.18	
v/s Ratio Perm			0.00			c0.11	0.13		0.07	0.15		0.03
v/c Ratio		0.47	0.04	0.70		0.44	0.20	0.44	0.10	0.23	0.27	0.04
Uniform Delay, d1		53.4	51.7	48.9		37.6	7.5	9.2	7.0	7.7	8.0	6.7
Progression Factor		1.00	1.00	1.03		1.30	1.00	1.00	1.00	2.21	2.23	4.71
Incremental Delay, d2		2.7	0.1	4.3		0.8	0.9	0.6	0.2	1.7	0.3	0.1
Delay (s)		56.0	51.8	54.7		49.8	8.5	9.8	7.2	18.7	18.0	31.7
Level of Service		E	D	D		D	A	A	A	B	B	C
Approach Delay (s)		53.9			52.8			9.4			19.3	
Approach LOS		D			D			A			B	

Intersection Summary				
HCM 2000 Control Delay	23.0	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)	13.5	
Intersection Capacity Utilization	57.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	685	2	802	0	0	0	0	528	187	495	748	0
Future Volume (vph)	685	2	802	0	0	0	0	528	187	495	748	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.90	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1504	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1504	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.90	0.90
Adj. Flow (vph)	761	2	891	0	0	0	0	621	220	582	831	0
RTOR Reduction (vph)	0	56	432	0	0	0	0	0	167	0	0	0
Lane Group Flow (vph)	571	492	103	0	0	0	0	621	53	582	831	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	23.0	23.0	23.0					29.0	29.0	24.0	39.0	
Effective Green, g (s)	23.0	23.0	23.0					29.0	29.0	24.0	39.0	
Actuated g/C Ratio	0.19	0.19	0.19					0.24	0.24	0.20	0.32	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	322	288	288					1228	382	686	1150	
v/s Ratio Prot	c0.34	0.33						c0.12		c0.17	c0.23	
v/s Ratio Perm			0.07						0.03			
v/c Ratio	1.77	1.71	0.36					0.51	0.14	0.85	0.72	
Uniform Delay, d1	48.5	48.5	42.1					39.3	35.7	46.2	35.7	
Progression Factor	1.00	1.00	1.00					0.71	1.12	0.49	0.39	
Incremental Delay, d2	360.4	333.5	0.8					1.5	0.7	7.6	3.1	
Delay (s)	408.9	382.0	42.8					29.5	40.9	30.3	17.2	
Level of Service	F	F	D					C	D	C	B	
Approach Delay (s)		281.6			0.0			32.5			22.6	
Approach LOS		F			A			C			C	

Intersection Summary				
HCM 2000 Control Delay	134.3	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	93.3%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	433	5	374	0	0	0	0	1497	302	506	686	0
Future Volume (vph)	433	5	374	0	0	0	0	1497	302	506	686	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.94	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.97	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1544	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.97	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1544	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.90	0.90
Adj. Flow (vph)	481	6	416	0	0	0	0	1663	336	595	762	0
RTOR Reduction (vph)	0	21	245	0	0	0	0	0	162	0	0	0
Lane Group Flow (vph)	313	282	42	0	0	0	0	1663	174	595	762	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	17.6	17.6	17.6					41.0	41.0	12.0	27.0	
Effective Green, g (s)	17.6	17.6	17.6					41.0	41.0	12.0	27.0	
Actuated g/C Ratio	0.15	0.15	0.15					0.34	0.34	0.10	0.22	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	246	226	220					1737	540	343	796	
v/s Ratio Prot	c0.19	0.18						c0.33		c0.17	c0.22	
v/s Ratio Perm			0.03						0.11			
v/c Ratio	1.27	1.25	0.19					0.96	0.32	1.73	0.96	
Uniform Delay, d1	51.2	51.2	45.0					38.6	29.2	54.0	45.9	
Progression Factor	1.00	1.00	1.00					1.02	1.28	0.62	0.60	
Incremental Delay, d2	150.4	142.2	0.4					11.6	1.3	339.0	18.1	
Delay (s)	201.6	193.4	45.4					51.1	38.7	372.7	45.7	
Level of Service	F	F	D					D	D	F	D	
Approach Delay (s)		149.2			0.0			49.0			189.1	
Approach LOS		F			A			D			F	

Intersection Summary				
HCM 2000 Control Delay	114.9	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0	
Intersection Capacity Utilization	100.0%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	296	54	562	351	865	0	0	936	324
Future Volume (vph)	0	0	0	296	54	562	351	865	0	0	936	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.90	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2859	1441	1770	3539			6408	1583
Flt Permitted				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1610	2859	1441	1770	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	348	68	624	390	961	0	0	1101	360
RTOR Reduction (vph)	0	0	0	0	265	265	0	0	0	0	0	243
Lane Group Flow (vph)	0	0	0	254	209	47	390	961	0	0	1101	117
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				18.0	18.0	18.0	14.0	29.0			39.0	39.0
Effective Green, g (s)				18.0	18.0	18.0	14.0	29.0			39.0	39.0
Actuated g/C Ratio				0.15	0.15	0.15	0.12	0.24			0.32	0.32
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				241	428	216	206	855			2082	514
v/s Ratio Prot				c0.16	0.07		c0.22	c0.27			c0.17	
v/s Ratio Perm						0.03						0.07
v/c Ratio				1.05	0.49	0.22	1.89	1.12			0.53	0.23
Uniform Delay, d1				51.0	46.8	44.8	53.0	45.5			33.0	29.5
Progression Factor				1.00	1.00	1.00	0.80	0.40			1.37	7.17
Incremental Delay, d2				72.9	0.9	0.5	403.6	57.5			0.9	1.0
Delay (s)				123.9	47.7	45.3	446.1	75.9			46.1	212.5
Level of Service				F	D	D	F	E			D	F
Approach Delay (s)		0.0			65.6			182.7			87.1	
Approach LOS		A			E			F			F	

Intersection Summary					
HCM 2000 Control Delay	114.8	HCM 2000 Level of Service		F	
HCM 2000 Volume to Capacity ratio	0.77				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		26.0	
Intersection Capacity Utilization	93.3%	ICU Level of Service		F	
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	274	42	485	898	1033	0	0	916	481
Future Volume (vph)	0	0	0	274	42	485	898	1033	0	0	916	481
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.90	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2862	1441	1770	3539			6408	1583
Flt Permitted				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1610	2862	1441	1770	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	322	52	539	998	1148	0	0	1078	534
RTOR Reduction (vph)	0	0	0	0	217	217	0	0	0	0	0	414
Lane Group Flow (vph)	0	0	0	225	203	52	998	1148	0	0	1078	120
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				23.4	23.4	23.4	26.0	41.0			27.0	27.0
Effective Green, g (s)				23.4	23.4	23.4	26.0	41.0			27.0	27.0
Actuated g/C Ratio				0.19	0.19	0.19	0.22	0.34			0.22	0.22
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				313	558	280	383	1209			1441	356
v/s Ratio Prot				c0.14	0.07		c0.56	c0.32			c0.17	
v/s Ratio Perm						0.04						0.08
v/c Ratio				0.72	0.36	0.19	2.61	0.95			0.75	0.34
Uniform Delay, d1				45.2	41.8	40.4	47.0	38.5			43.3	39.0
Progression Factor				1.00	1.00	1.00	0.97	0.44			1.07	5.11
Incremental Delay, d2				7.7	0.4	0.3	723.3	2.3			3.5	2.5
Delay (s)				52.9	42.2	40.7	768.8	19.4			49.9	201.9
Level of Service				D	D	D	F	B			D	F
Approach Delay (s)		0.0			44.4			367.9			100.3	
Approach LOS		A			D			F			F	

Intersection Summary					
HCM 2000 Control Delay	212.3	HCM 2000 Level of Service		F	
HCM 2000 Volume to Capacity ratio	1.13				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		26.0	
Intersection Capacity Utilization	100.0%	ICU Level of Service		F	
Analysis Period (min)	15				

c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	12	98	10	19	0	107	996	4	0	1170	36
Future Volume (vph)	25	12	98	10	19	0	107	996	4	0	1170	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95	1.00		0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539		3433	3539	1583		5085	1583
Flt Permitted	0.74	1.00	1.00	0.75	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1384	3539	1583	1394	3539		3433	3539	1583		5085	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	28	13	109	11	21	0	119	1107	4	0	1300	40
RTOR Reduction (vph)	0	0	81	0	0	0	0	0	1	0	0	17
Lane Group Flow (vph)	28	13	28	11	21	0	119	1107	3	0	1300	23
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8		8			2	6		6
Actuated Green, G (s)	30.5	30.5	30.5	30.5	30.5		7.4	80.5	80.5		68.6	68.6
Effective Green, g (s)	30.5	30.5	30.5	30.5	30.5		7.4	80.5	80.5		68.6	68.6
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25		0.06	0.67	0.67		0.57	0.57
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	351	899	402	354	899		211	2374	1061		2906	904
v/s Ratio Prot		0.00			0.01		0.03	c0.31			0.26	
v/s Ratio Perm	c0.02		0.02	0.01					0.00			0.01
v/c Ratio	0.08	0.01	0.07	0.03	0.02		0.56	0.47	0.00		0.45	0.03
Uniform Delay, d1	34.1	33.5	34.0	33.6	33.6		54.7	9.5	6.5		14.8	11.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.95	0.34	0.04		1.00	1.00
Incremental Delay, d2	0.1	0.0	0.1	0.2	0.0		1.2	0.2	0.0		0.5	0.1
Delay (s)	34.2	33.5	34.0	33.8	33.6		53.2	3.5	0.3		15.3	11.2
Level of Service	C	C	C	C	C		D	A	A		B	B
Approach Delay (s)		34.0			33.7			8.3			15.2	
Approach LOS		C			C			A			B	

Intersection Summary				
HCM 2000 Control Delay	13.3	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)	13.5	
Intersection Capacity Utilization	51.3%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	35	199	8	25	0	155	1314	6	0	948	51
Future Volume (vph)	70	35	199	8	25	0	155	1314	6	0	948	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95	1.00		0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539		3433	3539	1583		5085	1583
Flt Permitted	0.74	1.00	1.00	0.73	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1375	3539	1583	1360	3539		3433	3539	1583		5085	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	78	39	221	9	28	0	172	1460	7	0	1053	57
RTOR Reduction (vph)	0	0	167	0	0	0	0	0	2	0	0	25
Lane Group Flow (vph)	78	39	54	9	28	0	172	1460	5	0	1053	32
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8		8			2	6		6
Actuated Green, G (s)	29.5	29.5	29.5	29.5	29.5		9.9	81.5	81.5		67.1	67.1
Effective Green, g (s)	29.5	29.5	29.5	29.5	29.5		9.9	81.5	81.5		67.1	67.1
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25		0.08	0.68	0.68		0.56	0.56
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	338	870	389	334	870		283	2403	1075		2843	885
v/s Ratio Prot		0.01			0.01		0.05	c0.41			0.21	
v/s Ratio Perm	c0.06		0.03	0.01					0.00			0.02
v/c Ratio	0.23	0.04	0.14	0.03	0.03		0.61	0.61	0.00		0.37	0.04
Uniform Delay, d1	36.2	34.5	35.3	34.4	34.4		53.2	10.5	6.2		14.7	11.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.04	0.45	0.29		1.00	1.00
Incremental Delay, d2	0.4	0.0	0.2	0.1	0.1		2.1	0.7	0.0		0.4	0.1
Delay (s)	36.5	34.5	35.5	34.5	34.5		57.3	5.4	1.8		15.1	12.0
Level of Service	D	C	D	C	C		E	A	A		B	B
Approach Delay (s)		35.6			34.5			10.8			14.9	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	62.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	217	86	309	374	173	106	38	87	23	13	14
Future Volume (vph)	84	217	86	309	374	173	106	38	87	23	13	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2	
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92	
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)	1770	4868		1770	3539	1583	1770	3539	1583	1770	3256	
Flt Permitted	0.47	1.00		0.54	1.00	1.00	0.74	1.00	1.00	0.73	1.00	
Satd. Flow (perm)	882	4868		1008	3539	1583	1372	3539	1583	1356	3256	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	47	241	96	343	416	192	118	42	97	26	14	16
RTOR Reduction (vph)	0	52	0	0	0	104	0	0	52	0	9	0
Lane Group Flow (vph)	47	285	0	343	416	88	118	42	45	26	21	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	54.7	54.7		54.7	54.7	54.7	55.8	55.8	55.8	55.8	55.8	
Effective Green, g (s)	54.7	54.7		54.7	54.7	54.7	55.8	55.8	55.8	55.8	55.8	
Actuated g/C Ratio	0.46	0.46		0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	
Clearance Time (s)	5.3	5.3		5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	402	2218		459	1613	721	637	1645	736	630	1514	
v/s Ratio Prot		0.06			0.12			0.01			0.01	
v/s Ratio Perm	0.05			c0.34		0.06	c0.09		0.03	0.02		
v/c Ratio	0.12	0.13		0.75	0.26	0.12	0.19	0.03	0.06	0.04	0.01	
Uniform Delay, d1	18.8	18.9		26.9	20.1	18.8	18.8	17.4	17.7	17.5	17.3	
Progression Factor	1.04	0.99		0.80	0.64	1.09	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	0.1		10.2	0.4	0.3	0.6	0.0	0.2	0.1	0.0	
Delay (s)	20.1	18.8		31.7	13.2	20.7	19.4	17.4	17.8	17.6	17.3	
Level of Service	C	B		C	B	C	B	B	B	B	B	
Approach Delay (s)		18.9			21.4			18.5			17.5	
Approach LOS		B			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	20.2	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)	9.5	
Intersection Capacity Utilization	48.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	350	32	75	278	69	179	21	304	215	27	105
Future Volume (vph)	78	350	32	75	278	69	179	21	304	215	27	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2	
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	
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)	1770	5021		1770	3539	1583	1770	3539	1583	1770	3117	
Flt Permitted	0.55	1.00		0.49	1.00	1.00	0.66	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1028	5021		907	3539	1583	1227	3539	1583	1381	3117	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	43	389	36	83	309	77	199	23	338	239	30	117
RTOR Reduction (vph)	0	9	0	0	0	42	0	0	181	0	63	0
Lane Group Flow (vph)	43	416	0	83	309	35	199	23	157	239	84	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	54.7	54.7		54.7	54.7	54.7	55.8	55.8	55.8	55.8	55.8	
Effective Green, g (s)	54.7	54.7		54.7	54.7	54.7	55.8	55.8	55.8	55.8	55.8	
Actuated g/C Ratio	0.46	0.46		0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	
Clearance Time (s)	5.3	5.3		5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	468	2288		413	1613	721	570	1645	736	642	1449	
v/s Ratio Prot		0.08			0.09			0.01			0.03	
v/s Ratio Perm	0.04			c0.09		0.02	0.16		0.10	c0.17		
v/c Ratio	0.09	0.18		0.20	0.19	0.05	0.35	0.01	0.21	0.37	0.06	
Uniform Delay, d1	18.5	19.4		19.6	19.5	18.2	20.5	17.3	19.1	20.8	17.7	
Progression Factor	1.12	1.05		0.56	0.53	0.38	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.2		1.1	0.3	0.1	1.7	0.0	0.7	1.7	0.1	
Delay (s)	21.1	20.5		12.1	10.6	7.0	22.2	17.3	19.7	22.4	17.7	
Level of Service	C	C		B	B	A	C	B	B	C	B	
Approach Delay (s)		20.6			10.2			20.5			20.6	
Approach LOS		C			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	18.0	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)	9.5	
Intersection Capacity Utilization	49.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	218	126	1282	599	0	0	0	0	467	584	208
Future Volume (vph)	0	218	126	1282	599	0	0	0	0	467	584	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3167	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3167	1441
Peak-hour factor, PHF	0.90	0.80	0.80	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	272	158	1424	705	0	0	0	0	519	687	245
RTOR Reduction (vph)	0	0	122	0	0	0	0	0	0	0	2	177
Lane Group Flow (vph)	0	273	36	1424	705	0	0	0	0	400	829	43
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		21.5	21.5	55.1	69.5					23.3	23.3	23.3
Effective Green, g (s)		21.5	21.5	55.1	69.5					23.3	23.3	23.3
Actuated g/C Ratio		0.18	0.18	0.46	0.58					0.19	0.19	0.19
Clearance Time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		911	499	1576	2945					312	614	279
v/s Ratio Prot		c0.05		c0.41	0.14					0.25	c0.26	
v/s Ratio Perm			0.01									0.03
v/c Ratio		0.30	0.07	0.90	0.24					1.28	1.35	0.15
Uniform Delay, d1		42.7	41.0	30.0	12.3					48.4	48.4	40.2
Progression Factor		1.24	2.30	0.69	0.65					1.00	1.00	1.00
Incremental Delay, d2		0.8	0.3	6.7	0.2					149.2	168.4	0.3
Delay (s)		53.6	94.3	27.5	8.1					197.6	216.8	40.4
Level of Service		D	F	C	A					F	F	D
Approach Delay (s)		68.5			21.1			0.0			184.7	
Approach LOS		E			C			A			F	

Intersection Summary				
HCM 2000 Control Delay	85.4	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	79.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	511	424	867	307	0	0	0	0	341	293	94
Future Volume (vph)	0	511	424	867	307	0	0	0	0	341	293	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3149	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3149	1441
Peak-hour factor, PHF	0.90	0.85	0.85	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	601	499	963	361	0	0	0	0	379	345	111
RTOR Reduction (vph)	0	0	269	0	0	0	0	0	0	0	1	66
Lane Group Flow (vph)	0	601	230	963	361	0	0	0	0	239	495	34
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		26.3	26.3	33.0	36.7					40.6	40.6	40.6
Effective Green, g (s)		26.3	26.3	33.0	36.7					40.6	40.6	40.6
Actuated g/C Ratio		0.22	0.22	0.28	0.31					0.34	0.34	0.34
Clearance Time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1114	610	944	1555					544	1065	487
v/s Ratio Prot		c0.12		c0.28	0.07					0.15	c0.16	
v/s Ratio Perm			0.08									0.02
v/c Ratio		0.54	0.38	1.02	0.23					0.44	0.46	0.07
Uniform Delay, d1		41.5	39.9	43.5	31.1					30.9	31.2	26.9
Progression Factor		1.18	1.67	1.68	0.58					1.00	1.00	1.00
Incremental Delay, d2		1.8	1.7	31.4	0.3					0.6	0.3	0.1
Delay (s)		50.9	68.2	104.4	18.5					31.4	31.5	27.0
Level of Service		D	E	F	B					C	C	C
Approach Delay (s)		58.8			81.0			0.0			30.9	
Approach LOS		E			F			A			C	

Intersection Summary				
HCM 2000 Control Delay	60.7	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	69.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	622	0	0	1526	354	354	441	1034	0	0	0
Future Volume (vph)	63	622	0	0	1526	354	354	441	1034	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3363	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3363	2787			
Peak-hour factor, PHF	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	79	691	0	0	1696	393	393	519	1149	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	49	0	0	926	0	0	0
Lane Group Flow (vph)	79	691	0	0	1696	344	295	617	223	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	7.8	21.5			69.5	69.5	23.3	23.3	23.3			
Effective Green, g (s)	7.8	21.5			69.5	69.5	23.3	23.3	23.3			
Actuated g/C Ratio	0.06	0.18			0.58	0.58	0.19	0.19	0.19			
Clearance Time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	115	634			3711	916	312	652	541			
v/s Ratio Prot	c0.04	c0.20			c0.26		0.18	c0.18				
v/s Ratio Perm						0.22			0.08			
v/c Ratio	0.69	1.09			0.46	0.38	0.95	0.95	0.41			
Uniform Delay, d1	54.9	49.2			14.5	13.6	47.7	47.7	42.4			
Progression Factor	0.44	1.10			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	5.3	49.4			0.4	1.2	36.4	22.7	0.5			
Delay (s)	29.6	103.7			14.9	14.8	84.1	70.4	42.9			
Level of Service	C	F			B	B	F	E	D			
Approach Delay (s)		96.1			14.8			57.0			0.0	
Approach LOS		F			B			E			A	

Intersection Summary				
HCM 2000 Control Delay	45.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	79.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	241	606	0	0	1070	313	140	545	1045	0	0	0
Future Volume (vph)	241	606	0	0	1070	313	140	545	1045	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3386	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3386	2787			
Peak-hour factor, PHF	0.85	0.90	0.90	0.90	0.85	0.90	0.85	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	284	673	0	0	1259	348	165	641	1161	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	100	0	0	653	0	0	0
Lane Group Flow (vph)	284	673	0	0	1259	248	148	658	508	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	23.3	26.3			36.7	36.7	40.6	40.6	40.6			
Effective Green, g (s)	23.3	26.3			36.7	36.7	40.6	40.6	40.6			
Actuated g/C Ratio	0.19	0.22			0.31	0.31	0.34	0.34	0.34			
Clearance Time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	343	775			1959	484	544	1145	942			
v/s Ratio Prot	c0.16	c0.19			c0.20		0.09	c0.19				
v/s Ratio Perm						0.16			0.18			
v/c Ratio	0.83	0.87			0.64	0.51	0.27	0.57	0.54			
Uniform Delay, d1	46.4	45.2			36.0	34.3	28.9	32.6	32.1			
Progression Factor	1.29	0.69			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	13.5	11.4			1.6	3.8	0.3	0.7	0.6			
Delay (s)	73.3	42.5			37.6	38.1	29.2	33.3	32.7			
Level of Service	E	D			D	D	C	C	C			
Approach Delay (s)		51.6			37.7			32.7			0.0	
Approach LOS		D			D			C			A	

Intersection Summary				
HCM 2000 Control Delay	38.5	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)	20.1	
Intersection Capacity Utilization	69.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

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21-0551 Axon Crossroad
2030 Total AM

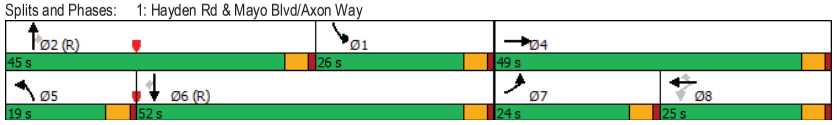
1: Hayden Rd & Mayo Blvd/Axon Way
Timings

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	256	20	144	35	515	89	442	79	342	905	327
Future Volume (vph)	256	20	144	35	515	89	442	79	342	905	327
Turn Type	Prot	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		8		5	2		1	6	
Permitted Phases			8		8			2			6
Detector Phase	7	4	8	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	24.0	49.0	25.0	25.0	25.0	19.0	45.0	45.0	26.0	52.0	52.0
Total Split (%)	20.0%	40.8%	20.8%	20.8%	20.8%	15.8%	37.5%	37.5%	21.7%	43.3%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead		Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 1: Hayden Rd & Mayo Blvd/Axon Way



21-0551 Axon Crossroads
2030 Total PM

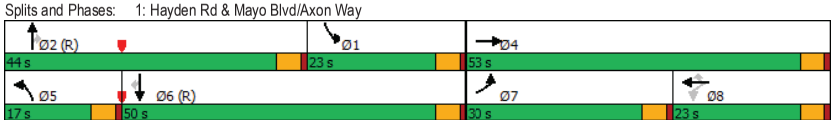
1: Hayden Rd & Mayo Blvd/Axon Way
Timings

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	528	28	117	22	515	95	1004	133	463	623	261
Future Volume (vph)	528	28	117	22	515	95	1004	133	463	623	261
Turn Type	Prot	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		8		5	2		1	6	
Permitted Phases			8		8			2			6
Detector Phase	7	4	8	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	30.0	53.0	23.0	23.0	23.0	17.0	44.0	44.0	23.0	50.0	50.0
Total Split (%)	25.0%	44.2%	19.2%	19.2%	19.2%	14.2%	36.7%	36.7%	19.2%	41.7%	41.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead		Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	None	None	None	Max	C-Max	C-Max	None	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 104.1 (87%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 1: Hayden Rd & Mayo Blvd/Axon Way



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	256	20	75	144	35	515	89	442	79	342	905	327
Future Volume (veh/h)	256	20	75	144	35	515	89	442	79	342	905	327
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	284	22	63	160	0	312	99	491	45	380	1006	182
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	353	120	345	247	0	450	154	1199	535	927	1995	890
Arrive On Green	0.10	0.28	0.28	0.14	0.00	0.14	0.04	0.34	0.34	0.54	1.00	1.00
Sat Flow, veh/h	3456	427	1223	1313	0	3170	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	284	0	85	160	0	312	99	491	45	380	1006	182
Grp Sat Flow(s),veh/h/ln	1728	0	1650	1313	0	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	9.6	0.0	4.7	14.3	0.0	6.7	3.4	12.7	2.3	7.8	0.0	0.0
Cycle Q Clear(g_c), s	9.6	0.0	4.7	14.3	0.0	6.7	3.4	12.7	2.3	7.8	0.0	0.0
Prop In Lane	1.00		0.74	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	353	0	465	247	0	450	154	1199	535	927	1995	890
V/C Ratio(X)	0.81	0.00	0.18	0.65	0.00	0.69	0.64	0.41	0.08	0.41	0.50	0.20
Avail Cap(c_a), veh/h	562	0	612	284	0	542	418	1199	535	927	1995	890
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.7	0.0	32.6	50.3	0.0	17.6	56.4	30.6	27.1	22.2	0.0	0.0
Incr Delay (d2), s/veh	4.5	0.0	0.2	4.1	0.0	3.0	4.5	1.0	0.3	0.3	0.9	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.8	0.0	3.4	8.6	0.0	4.8	2.8	9.5	1.7	5.1	0.5	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.2	0.0	32.8	54.4	0.0	20.6	60.9	31.6	27.4	22.4	0.9	0.5
LnGrp LOS	E	A	C	D	A	C	E	C	C	C	A	A
Approach Vol, veh/h		369			472			635			1568	
Approach Delay, s/veh		51.6			32.1			35.9			6.1	
Approach LOS		D			C			D			A	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	36.7	45.0		38.3	9.8	71.9	16.8	21.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	21.5	40.5		44.5	14.5	47.5	19.5	20.5				
Max Q Clear Time (g_c+I1), s	9.8	14.7		6.7	5.4	2.0	11.6	16.3				
Green Ext Time (p_c), s	1.1	3.6		0.5	0.2	10.3	0.6	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			21.8									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	528	28	139	117	22	515	95	1004	133	463	623	261
Future Volume (veh/h)	528	28	139	117	22	515	95	1004	133	463	623	261
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	587	31	116	130	0	302	106	1116	75	514	692	146
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	655	122	455	215	0	396	360	1170	522	713	1533	684
Arrive On Green	0.19	0.35	0.35	0.12	0.00	0.12	0.10	0.33	0.33	0.34	0.72	0.72
Sat Flow, veh/h	3456	345	1292	1241	0	3170	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	587	0	147	130	0	302	106	1116	75	514	692	146
Grp Sat Flow(s),veh/h/ln	1728	0	1638	1241	0	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	19.9	0.0	7.7	12.3	0.0	7.5	3.4	36.9	4.0	15.6	9.7	3.7
Cycle Q Clear(g_c), s	19.9	0.0	7.7	12.3	0.0	7.5	3.4	36.9	4.0	15.6	9.7	3.7
Prop In Lane	1.00		0.79	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	655	0	577	215	0	396	360	1170	522	713	1533	684
V/C Ratio(X)	0.90	0.00	0.25	0.60	0.00	0.76	0.29	0.95	0.14	0.72	0.45	0.21
Avail Cap(c_a), veh/h	734	0	662	251	0	489	360	1170	522	713	1533	684
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.5	0.0	27.7	51.3	0.0	23.4	49.7	39.4	28.3	36.3	10.9	10.1
Incr Delay (d2), s/veh	12.7	0.0	0.2	3.1	0.0	5.6	2.1	17.4	0.6	3.6	1.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	14.8	0.0	5.5	7.2	0.0	5.6	2.8	25.7	2.9	10.3	5.8	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.2	0.0	27.9	54.4	0.0	29.0	51.7	56.7	28.9	39.9	11.9	10.8
LnGrp LOS	E	A	C	D	A	C	D	E	C	D	B	B
Approach Vol, veh/h		734			432			1297			1352	
Approach Delay, s/veh		53.7			36.6			54.7			22.4	
Approach LOS		D			D			D			C	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	29.3	44.0		46.7	17.0	56.3	27.3	19.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	18.5	39.5		48.5	12.5	45.5	25.5	18.5				
Max Q Clear Time (g_c+I1), s	17.6	38.9		9.7	5.4	11.7	21.9	14.3				
Green Ext Time (p_c), s	0.2	0.5		1.0	0.1	6.0	0.9	0.7				
Intersection Summary												
HCM 6th Ctrl Delay			41.0									
HCM 6th LOS			D									

Notes

User approved volume balancing among the lanes for turning movement.

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Intersection	
Intersection Delay, s/veh	3.4
Intersection LOS	A

Approach	EB	NB	SB
Entry Lanes	2	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	176	115	6
Demand Flow Rate, veh/h	179	117	6
Vehicles Circulating, veh/h	6	10	65
Vehicles Exiting, veh/h	65	175	62
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.5	3.4	2.9
Approach LOS	A	A	A

Lane	Left	Right	Left	Left
Designated Moves	L	TR	LT	TR
Assumed Moves	L	TR	LT	TR
RT Channelized				
Lane Util	0.056	0.944	1.000	1.000
Follow-Up Headway, s	2.535	2.535	2.609	2.609
Critical Headway, s	4.544	4.544	4.976	4.976
Entry Flow, veh/h	10	169	117	6
Cap Entry Lane, veh/h	1412	1412	1366	1291
Entry HV Adj Factor	1.000	0.982	0.983	0.980
Flow Entry, veh/h	10	166	115	6
Cap Entry, veh/h	1412	1387	1342	1266
V/C Ratio	0.007	0.120	0.086	0.005
Control Delay, s/veh	2.6	3.5	3.4	2.9
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0

Intersection	
Intersection Delay, s/veh	4.1
Intersection LOS	A

Approach	EB	NB	SB
Entry Lanes	2	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	159	280	37
Demand Flow Rate, veh/h	162	286	38
Vehicles Circulating, veh/h	32	0	283
Vehicles Exiting, veh/h	289	194	3
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.6	4.4	3.9
Approach LOS	A	A	A

Lane	Left	Right	Left	Left
Designated Moves	L	TR	LT	TR
Assumed Moves	L	TR	LT	TR
RT Channelized				
Lane Util	0.000	1.000	1.000	1.000
Follow-Up Headway, s	2.535	2.535	2.609	2.609
Critical Headway, s	4.544	4.544	4.976	4.976
Entry Flow, veh/h	0	162	286	38
Cap Entry Lane, veh/h	1379	1379	1380	1034
Entry HV Adj Factor	1.000	0.981	0.979	0.983
Flow Entry, veh/h	0	159	280	37
Cap Entry, veh/h	1379	1354	1351	1017
V/C Ratio	0.000	0.117	0.207	0.037
Control Delay, s/veh	2.6	3.6	4.4	3.9
LOS	A	A	A	A
95th %tile Queue, veh	0	0	1	0

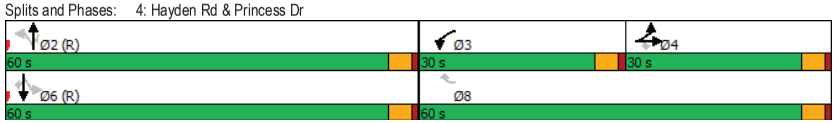
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Lane Group	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	36	63	195	66	35	527	150	146	914	53
Future Volume (vph)	36	63	195	66	35	527	150	146	914	53
Turn Type	NA	Perm	Prot	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4		3			2			6	
Permitted Phases		4		8	2		2	6		6
Detector Phase	4	4	3	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	36.5	36.5	36.5	36.5	36.5	36.5
Total Split (s)	30.0	30.0	30.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	25.0%	25.0%	25.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes							
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 4: Hayden Rd & Princess Dr

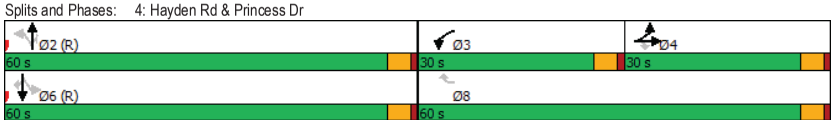


Lane Group	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	31	58	312	195	86	1045	142	73	652	64
Future Volume (vph)	31	58	312	195	86	1045	142	73	652	64
Turn Type	NA	Perm	Prot	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4		3			2			6	
Permitted Phases		4		8	2		2	6		6
Detector Phase	4	4	3	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	36.5	36.5	36.5	36.5	36.5	36.5
Total Split (s)	30.0	30.0	30.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	25.0%	25.0%	25.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes							
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 4: Hayden Rd & Princess Dr



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	36	63	195	0	66	35	527	150	146	914	53
Future Volume (veh/h)	31	36	63	195	0	66	35	527	150	146	914	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	40	36	217	0	36	39	586	84	162	1016	30
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	68	80	129	0	0	0	481	2999	1337	684	2999	1337
Arrive On Green	0.08	0.08	0.08	0.00	0.00	0.00	0.84	0.84	0.84	0.84	0.84	0.84
Sat Flow, veh/h	840	988	1585		0		539	3554	1585	767	3554	1585
Grp Volume(v), veh/h	74	0	36		0.0		39	586	84	162	1016	30
Grp Sat Flow(s),veh/h/ln	1828	0	1585				539	1777	1585	767	1777	1585
Q Serve(g_s), s	4.7	0.0	2.6				2.0	3.7	1.0	6.0	7.5	0.4
Cycle Q Clear(g_c), s	4.7	0.0	2.6				9.6	3.7	1.0	9.7	7.5	0.4
Prop In Lane	0.46		1.00				1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	148	0	129				481	2999	1337	684	2999	1337
V/C Ratio(X)	0.50	0.00	0.28				0.08	0.20	0.06	0.24	0.34	0.02
Avail Cap(c_a), veh/h	389	0	337				481	2999	1337	684	2999	1337
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.8	0.0	51.8				3.1	1.8	1.5	2.7	2.1	1.5
Incr Delay (d2), s/veh	2.6	0.0	1.2				0.3	0.1	0.1	0.8	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.0	0.0	1.9				0.4	1.6	0.4	1.5	3.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.4	0.0	53.0				3.4	1.9	1.6	3.5	2.4	1.5
LnGrp LOS	E	A	D				A	A	A	A	A	A
Approach Vol, veh/h		110						709			1208	
Approach Delay, s/veh		54.6						2.0			2.5	
Approach LOS		D						A			A	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		105.8		14.2		105.8						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		55.5		25.5		55.5						
Max Q Clear Time (g_c+I1), s		11.6		6.7		11.7						
Green Ext Time (p_c), s		5.5		0.4		11.6						

Intersection Summary												
HCM 6th Ctrl Delay			5.1									
HCM 6th LOS			A									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	31	58	312	0	195	86	1045	142	73	652	64
Future Volume (veh/h)	26	31	58	312	0	195	86	1045	142	73	652	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	29	34	32	347	0	109	96	1161	79	81	724	35
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	67	79	127	0	0	0	629	3003	1340	406	3003	1340
Arrive On Green	0.08	0.08	0.08	0.00	0.00	0.00	0.85	0.85	0.85	0.85	0.85	0.85
Sat Flow, veh/h	842	987	1585		0		706	3554	1585	449	3554	1585
Grp Volume(v), veh/h	63	0	32		0.0		96	1161	79	81	724	35
Grp Sat Flow(s),veh/h/ln	1828	0	1585				706	1777	1585	449	1777	1585
Q Serve(g_s), s	3.9	0.0	2.3				3.7	9.0	1.0	6.1	4.8	0.4
Cycle Q Clear(g_c), s	3.9	0.0	2.3				8.4	9.0	1.0	15.1	4.8	0.4
Prop In Lane	0.46		1.00				1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	146	0	127				629	3003	1340	406	3003	1340
V/C Ratio(X)	0.43	0.00	0.25				0.15	0.39	0.06	0.20	0.24	0.03
Avail Cap(c_a), veh/h	389	0	337				629	3003	1340	406	3003	1340
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.6	0.0	51.9				2.6	2.1	1.5	3.9	1.8	1.5
Incr Delay (d2), s/veh	2.0	0.0	1.0				0.5	0.4	0.1	1.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.4	0.0	1.7				0.9	3.8	0.4	1.1	2.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.6	0.0	52.9				3.1	2.5	1.6	5.0	2.0	1.5
LnGrp LOS	D	A	D				A	A	A	A	A	A
Approach Vol, veh/h		95						1336			840	
Approach Delay, s/veh		54.0						2.5			2.3	
Approach LOS		D						A			A	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		105.9		14.1		105.9						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		55.5		25.5		55.5						
Max Q Clear Time (g_c+I1), s		11.0		5.9		17.1						
Green Ext Time (p_c), s		13.4		0.3		7.7						

Intersection Summary												
HCM 6th Ctrl Delay			4.6									
HCM 6th LOS			A									

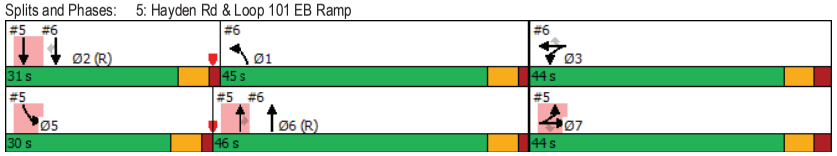
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Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	685	2	913	843	355	495	805		
Future Volume (vph)	685	2	913	843	355	495	805		
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA		
Protected Phases	7	7		6		5	2	1	3
Permitted Phases			7		6				
Detector Phase	7	7	7	6	6	5	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	16.0	12.0	5.0	7.0
Minimum Split (s)	44.0	44.0	44.0	26.0	26.0	22.0	26.0	11.0	44.0
Total Split (s)	44.0	44.0	44.0	46.0	46.0	30.0	31.0	45.0	44.0
Total Split (%)	36.7%	36.7%	36.7%	38.3%	38.3%	25.0%	25.8%	38%	37%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag				Lag	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	C-Max	C-Max	None	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 106 (88%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated

Splits and Phases: 5: Hayden Rd & Loop 101 EB Ramp

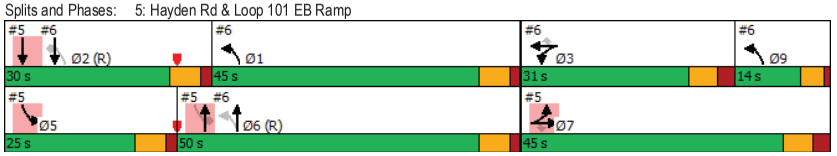


Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3	Ø9
Lane Configurations										
Traffic Volume (vph)	433	5	609	1663	388	506	815			
Future Volume (vph)	433	5	609	1663	388	506	815			
Turn Type	Split	NA	Perm	NA	Perm	D.P+P	NA			
Protected Phases	7	7		6		5	2	1	3	9
Permitted Phases			7		6	6				
Detector Phase	7	7	7	6	6	5	2			
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	16.0	12.0	15.0	7.0	6.0
Minimum Split (s)	31.0	31.0	31.0	26.0	26.0	22.0	26.0	21.0	30.8	13.5
Total Split (s)	45.0	45.0	45.0	50.0	50.0	25.0	30.0	45.0	31.0	14.0
Total Split (%)	37.5%	37.5%	37.5%	41.7%	41.7%	20.8%	25.0%	38%	26%	12%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3	3.5
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0			
Lead/Lag				Lag	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	None	C-Max	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 94.3 (79%), Referenced to phase 2:SBT and 6:NBSB, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated

Splits and Phases: 5: Hayden Rd & Loop 101 EB Ramp



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	685	2	913	0	0	0	0	843	355	495	805	0
Future Volume (vph)	685	2	913	0	0	0	0	843	355	495	805	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.89	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1486	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1486	1504					5085	1583	3433	3539	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.90	0.85	0.90	0.90
Adj. Flow (vph)	761	2	1014	0	0	0	0	992	394	582	894	0
RTOR Reduction (vph)	0	91	393	0	0	0	0	0	260	0	0	0
Lane Group Flow (vph)	616	502	175	0	0	0	0	992	134	582	894	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	37.0	37.0	37.0					40.9	40.9	23.1	25.0	
Effective Green, g (s)	37.0	37.0	37.0					40.9	40.9	23.1	25.0	
Actuated g/C Ratio	0.31	0.31	0.31					0.34	0.34	0.19	0.21	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	518	458	463					1733	539	660	737	
v/s Ratio Prot	c0.37	0.34						c0.20		0.17	c0.25	
v/s Ratio Perm			0.12						0.08			
v/c Ratio	1.19	1.10	0.38					0.57	0.25	0.88	1.21	
Uniform Delay, d1	41.5	41.5	32.5					32.4	28.5	47.1	47.5	
Progression Factor	1.00	1.00	1.00					0.60	1.18	0.74	0.60	
Incremental Delay, d2	103.2	70.4	0.5					1.2	1.0	8.8	103.9	
Delay (s)	144.7	111.9	33.0					20.8	34.6	43.9	132.3	
Level of Service	F	F	C					C	C	D	F	
Approach Delay (s)		98.1			0.0			24.7			97.5	
Approach LOS		F			A			C			F	

Intersection Summary				
HCM 2000 Control Delay	76.0	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.97			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	108.3%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	433	5	609	0	0	0	0	1663	388	506	815	0
Future Volume (vph)	433	5	609	0	0	0	0	1663	388	506	815	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.95	
Frt	1.00	0.88	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1481	1504					5085	1583	3433	3539	
Flt Permitted	0.95	0.99	1.00					1.00	1.00	0.09	1.00	
Satd. Flow (perm)	1681	1481	1504					5085	1583	326	3539	
Peak-hour factor, PHF	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.90	0.90
Adj. Flow (vph)	481	6	677	0	0	0	0	1848	431	595	906	0
RTOR Reduction (vph)	0	110	254	0	0	0	0	0	186	0	0	0
Lane Group Flow (vph)	404	278	118	0	0	0	0	1848	245	595	906	0
Turn Type	Split	NA	Perm					NA	Perm	D.P+P	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6	6		
Actuated Green, G (s)	38.0	38.0	38.0					44.4	44.4	63.0	24.0	
Effective Green, g (s)	38.0	38.0	38.0					44.4	44.4	63.0	24.0	
Actuated g/C Ratio	0.32	0.32	0.32					0.37	0.37	0.52	0.20	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	532	468	476					1881	585	652	707	
v/s Ratio Prot	c0.24	0.19						c0.36		0.14	c0.26	
v/s Ratio Perm			0.08						0.15	0.34		
v/c Ratio	0.76	0.59	0.25					0.98	0.42	0.91	1.28	
Uniform Delay, d1	36.9	34.5	30.4					37.4	28.2	36.0	48.0	
Progression Factor	1.00	1.00	1.00					0.74	0.70	1.11	0.68	
Incremental Delay, d2	6.2	2.0	0.3					12.1	1.3	10.0	132.3	
Delay (s)	43.1	36.5	30.7					39.8	21.1	49.9	165.2	
Level of Service	D	D	C					D	C	D	F	
Approach Delay (s)		36.9			0.0			36.2			119.5	
Approach LOS		D			A			D			F	

Intersection Summary				
HCM 2000 Control Delay	61.7	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	23.3	
Intersection Capacity Utilization	112.2%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

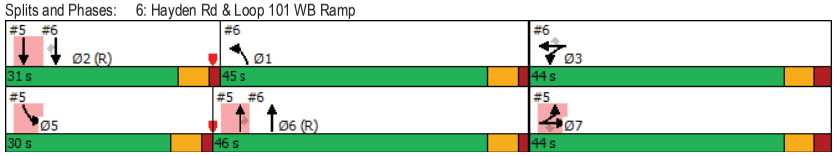
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Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	328	54	562	596	935	961	324		
Future Volume (vph)	328	54	562	596	935	961	324		
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm		
Protected Phases	3	3		1	6	2		5	7
Permitted Phases			3				2		
Detector Phase	3	3	3	1	6	2	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	5.0	12.0	12.0	12.0	16.0	7.0
Minimum Split (s)	44.0	44.0	44.0	11.0	26.0	26.0	26.0	22.0	44.0
Total Split (s)	44.0	44.0	44.0	45.0	46.0	31.0	31.0	30.0	44.0
Total Split (%)	36.7%	36.7%	36.7%	37.5%	38.3%	25.8%	25.8%	25%	37%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag				Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 106 (88%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated

Splits and Phases: 6: Hayden Rd & Loop 101 WB Ramp

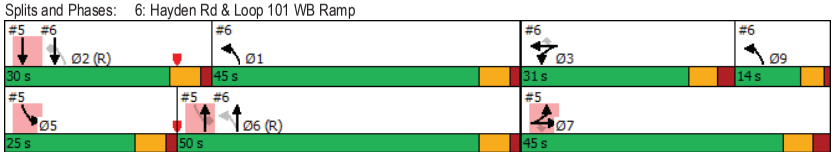


Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR	Ø1	Ø5	Ø7	Ø9
Lane Configurations											
Traffic Volume (vph)	350	42	485	1027	1070	969	481				
Future Volume (vph)	350	42	485	1027	1070	969	481				
Turn Type	Split	NA	Perm	custom	NA	NA	Perm				
Protected Phases	3	3		1 9	6	2		1	5	7	9
Permitted Phases			3	2 6			2				
Detector Phase	3	3	3	1 9	6	2	2				
Switch Phase											
Minimum Initial (s)	7.0	7.0	7.0		12.0	12.0	12.0	15.0	16.0	7.0	6.0
Minimum Split (s)	30.8	30.8	30.8		26.0	26.0	26.0	21.0	22.0	31.0	13.5
Total Split (s)	31.0	31.0	31.0		50.0	30.0	30.0	45.0	25.0	45.0	14.0
Total Split (%)	25.8%	25.8%	25.8%		41.7%	25.0%	25.0%	38%	21%	38%	12%
Yellow Time (s)	4.3	4.3	4.3		4.4	4.4	4.4	4.4	4.4	4.3	3.5
All-Red Time (s)	2.5	2.5	2.5		1.6	1.6	1.6	1.6	1.6	2.7	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0				
Total Lost Time (s)	6.8	6.8	6.8		6.0	6.0	6.0				
Lead/Lag	Lead	Lead	Lead		Lag	Lead	Lead	Lag	Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes
Recall Mode	None	None	None		C-Max	C-Max	C-Max	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 94.3 (79%), Referenced to phase 2:SBT and 6:NBSB, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated

Splits and Phases: 6: Hayden Rd & Loop 101 WB Ramp



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6: Hayden Rd & Loop 101 WB Ramp

HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	328	54	562	596	935	0	0	961	324
Future Volume (vph)	0	0	0	328	54	562	596	935	0	0	961	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.90	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2864	1441	1770	3539			6408	1583
Flt Permitted				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1610	2864	1441	1770	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	364	68	624	662	1039	0	0	1131	360
RTOR Reduction (vph)	0	0	0	0	216	216	0	0	0	0	0	285
Lane Group Flow (vph)	0	0	0	258	270	96	662	1039	0	0	1131	75
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				37.0	37.0	37.0	39.0	40.9			25.0	25.0
Effective Green, g (s)				37.0	37.0	37.0	39.0	40.9			25.0	25.0
Actuated g/C Ratio				0.31	0.31	0.31	0.32	0.34			0.21	0.21
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				496	883	444	575	1206			1335	329
v/s Ratio Prot				c0.16	0.09		c0.37	0.29			c0.18	
v/s Ratio Perm						0.07						0.05
v/c Ratio				0.52	0.31	0.22	1.15	0.86			0.85	0.23
Uniform Delay, d1				34.2	31.7	30.8	40.5	36.9			45.7	39.5
Progression Factor				1.00	1.00	1.00	0.82	0.81			0.71	1.37
Incremental Delay, d2				1.0	0.2	0.2	78.9	4.6			6.3	1.5
Delay (s)				35.2	31.9	31.0	112.3	34.5			38.9	55.8
Level of Service				D	C	C	F	C			D	E
Approach Delay (s)		0.0			32.4			64.8			43.0	
Approach LOS		A			C			E			D	

Intersection Summary				
HCM 2000 Control Delay	49.1	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)	19.0	
Intersection Capacity Utilization	108.3%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

6: Hayden Rd & Loop 101 WB Ramp

HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	350	42	485	1027	1070	0	0	969	481
Future Volume (vph)	0	0	0	350	42	485	1027	1070	0	0	969	481
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.8	6.8	6.8	6.0	6.0			6.0	6.0
Lane Util. Factor				0.91	0.86	0.91	1.00	0.95			0.86	1.00
Frt				1.00	0.91	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	2880	1441	1770	3539			6408	1583
Flt Permitted				0.95	0.99	1.00	0.14	1.00			1.00	1.00
Satd. Flow (perm)				1610	2880	1441	253	3539			6408	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	389	52	539	1141	1189	0	0	1140	534
RTOR Reduction (vph)	0	0	0	0	216	218	0	0	0	0	0	230
Lane Group Flow (vph)	0	0	0	249	247	51	1141	1189	0	0	1140	304
Turn Type				Split	NA	Perm	custom	NA			NA	Perm
Protected Phases				3	3		1 9	6			2	
Permitted Phases						3	2 6					2
Actuated Green, G (s)				22.7	22.7	22.7	79.4	44.4			24.0	24.0
Effective Green, g (s)				22.7	22.7	22.7	79.4	44.4			24.0	24.0
Actuated g/C Ratio				0.19	0.19	0.19	0.66	0.37			0.20	0.20
Clearance Time (s)				6.8	6.8	6.8		6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)				304	544	272	799	1309			1281	316
v/s Ratio Prot				c0.15	0.09		c0.59	0.34			0.18	
v/s Ratio Perm						0.04	c0.35					0.19
v/c Ratio				0.82	0.45	0.19	1.43	0.91			0.89	0.96
Uniform Delay, d1				46.7	43.1	40.9	29.4	35.9			46.7	47.5
Progression Factor				1.00	1.00	1.00	0.60	0.64			0.79	0.54
Incremental Delay, d2				15.6	0.6	0.3	195.3	4.4			9.2	40.7
Delay (s)				62.3	43.7	41.2	212.7	27.3			46.2	66.5
Level of Service				E	D	D	F	C			D	E
Approach Delay (s)		0.0			47.8			118.1			52.7	
Approach LOS		A			D			F			D	

Intersection Summary				
HCM 2000 Control Delay	82.3	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.33			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	23.3	
Intersection Capacity Utilization	112.2%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

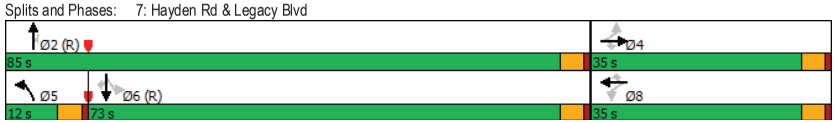
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Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	25	12	98	10	19	107	1066	4	1195	36
Future Volume (vph)	25	12	98	10	19	107	1066	4	1195	36
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	NA	Perm
Protected Phases		4			8	5	2		6	
Permitted Phases	4		4	8				2		6
Detector Phase	4	4	4	8	8	5	2	2	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	9.5	9.5	9.5	9.5	9.5
Total Split (s)	35.0	35.0	35.0	35.0	35.0	12.0	85.0	85.0	73.0	73.0
Total Split (%)	29.2%	29.2%	29.2%	29.2%	29.2%	10.0%	70.8%	70.8%	60.8%	60.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						Lead			Lag	Lag
Lead-Lag Optimize?						Yes			Yes	Yes
Recall Mode	None	None	None	Max	Max	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Splits and Phases: 7: Hayden Rd & Legacy Blvd

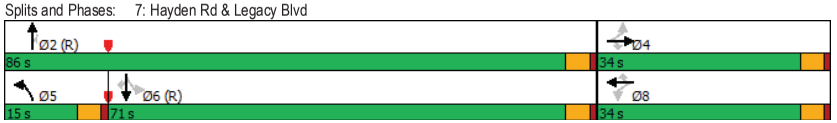


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	70	35	199	8	25	155	1351	6	1001	51
Future Volume (vph)	70	35	199	8	25	155	1351	6	1001	51
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	NA	Perm
Protected Phases		4			8	5	2		6	
Permitted Phases	4		4	8				2		6
Detector Phase	4	4	4	8	8	5	2	2	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	9.5	9.5	9.5	9.5	9.5
Total Split (s)	34.0	34.0	34.0	34.0	34.0	15.0	86.0	86.0	71.0	71.0
Total Split (%)	28.3%	28.3%	28.3%	28.3%	28.3%	12.5%	71.7%	71.7%	59.2%	59.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						Lead			Lag	Lag
Lead-Lag Optimize?						Yes			Yes	Yes
Recall Mode	None	None	None	Max	Max	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 7: Hayden Rd & Legacy Blvd



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	12	98	10	19	0	107	1066	4	0	1195	36
Future Volume (veh/h)	25	12	98	10	19	0	107	1066	4	0	1195	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	28	13	55	11	21	0	119	1184	2	0	1328	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	407	903	403	412	903	403	173	2384	1063	60	2979	925
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.00	0.05	0.67	0.67	0.00	0.58	0.58
Sat Flow, veh/h	1391	3554	1585	1401	3554	1585	3456	3554	1585	473	5106	1585
Grp Volume(v), veh/h	28	13	55	11	21	0	119	1184	2	0	1328	20
Grp Sat Flow(s),veh/h/ln	1391	1777	1585	1401	1777	1585	1728	1777	1585	473	1702	1585
Q Serve(g_s), s	1.8	0.3	3.2	0.7	0.5	0.0	4.1	19.7	0.0	0.0	17.6	0.6
Cycle Q Clear(g_c), s	2.4	0.3	3.2	1.0	0.5	0.0	4.1	19.7	0.0	0.0	17.6	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	407	903	403	412	903	403	173	2384	1063	60	2979	925
V/C Ratio(X)	0.07	0.01	0.14	0.03	0.02	0.00	0.69	0.50	0.00	0.00	0.45	0.02
Avail Cap(c_a), veh/h	407	903	403	412	903	403	216	2384	1063	60	2979	925
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	34.5	33.5	34.6	33.9	33.6	0.0	56.1	9.7	6.5	0.0	14.1	10.5
Incr Delay (d2), s/veh	0.1	0.0	0.2	0.1	0.0	0.0	6.6	0.7	0.0	0.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	0.3	2.3	0.5	0.4	0.0	3.5	11.9	0.0	0.0	11.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.5	33.5	34.7	34.0	33.6	0.0	62.6	10.5	6.5	0.0	14.6	10.6
LnGrp LOS	C	C	C	C	C	A	E	B	A	A	B	B
Approach Vol, veh/h		96			32			1305			1348	
Approach Delay, s/veh		34.5			33.8			15.2			14.5	
Approach LOS		C			C			B			B	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		85.0		35.0	10.5	74.5		35.0				
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		80.5		30.5	7.5	68.5		30.5				
Max Q Clear Time (g_c+I1), s		21.7		5.2	6.1	19.6		3.0				
Green Ext Time (p_c), s		12.5		0.3	0.0	14.0		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			15.8									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	35	199	8	25	0	155	1351	6	0	1001	51
Future Volume (veh/h)	70	35	199	8	25	0	155	1351	6	0	1001	51
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	78	39	167	9	28	0	172	1501	4	0	1112	29
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	391	874	390	385	874	390	230	2414	1077	60	2937	912
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.00	0.07	0.68	0.68	0.00	0.58	0.58
Sat Flow, veh/h	1382	3554	1585	1368	3554	1585	3456	3554	1585	350	5106	1585
Grp Volume(v), veh/h	78	39	167	9	28	0	172	1501	4	0	1112	29
Grp Sat Flow(s),veh/h/ln	1382	1777	1585	1368	1777	1585	1728	1777	1585	350	1702	1585
Q Serve(g_s), s	5.5	1.0	10.7	0.6	0.7	0.0	5.9	28.2	0.1	0.0	14.2	0.9
Cycle Q Clear(g_c), s	6.2	1.0	10.7	1.6	0.7	0.0	5.9	28.2	0.1	0.0	14.2	0.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	391	874	390	385	874	390	230	2414	1077	60	2937	912
V/C Ratio(X)	0.20	0.04	0.43	0.02	0.03	0.00	0.75	0.62	0.00	0.00	0.38	0.03
Avail Cap(c_a), veh/h	391	874	390	385	874	390	302	2414	1077	60	2937	912
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	36.7	34.5	38.1	35.1	34.4	0.0	55.0	10.7	6.2	0.0	13.8	11.0
Incr Delay (d2), s/veh	0.2	0.0	0.7	0.1	0.1	0.0	7.1	1.2	0.0	0.0	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.4	0.8	7.6	0.4	0.6	0.0	5.0	15.9	0.1	0.0	9.3	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.0	34.5	38.9	35.2	34.5	0.0	62.2	11.9	6.2	0.0	14.2	11.1
LnGrp LOS	D	C	D	D	C	A	E	B	A	A	B	B
Approach Vol, veh/h		284			37			1677			1141	
Approach Delay, s/veh		37.8			34.7			17.1			14.1	
Approach LOS		D			C			B			B	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		86.0		34.0	12.5	73.5		34.0				
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		81.5		29.5	10.5	66.5		29.5				
Max Q Clear Time (g_c+I1), s		30.2		12.7	7.9	16.2		3.6				
Green Ext Time (p_c), s		18.3		0.9	0.1	10.8		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			18.1									
HCM 6th LOS			B									

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Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	517	14	8	284	35	3	0	10	42	2	41
Future Vol, veh/h	45	517	14	8	284	35	3	0	10	42	2	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	85	-	-	105	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	50	574	16	9	316	39	3	0	11	47	2	46

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	355	0	0	590	0	0	859	1055	295	741	1044	178
Stage 1	-	-	-	-	-	-	682	682	-	354	354	-
Stage 2	-	-	-	-	-	-	177	373	-	387	690	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1200	-	-	982	-	-	250	224	701	305	228	834
Stage 1	-	-	-	-	-	-	406	448	-	636	629	-
Stage 2	-	-	-	-	-	-	808	617	-	608	444	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1200	-	-	982	-	-	226	213	701	289	216	834
Mov Cap-2 Maneuver	-	-	-	-	-	-	226	213	-	289	216	-
Stage 1	-	-	-	-	-	-	389	429	-	609	623	-
Stage 2	-	-	-	-	-	-	754	611	-	573	425	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0.2	12.7	14.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	226	701	1200	-	-	982	-	-	289	736
HCM Lane V/C Ratio	0.015	0.016	0.042	-	-	0.009	-	-	0.161	0.065
HCM Control Delay (s)	21.2	10.2	8.1	-	-	8.7	-	-	19.8	10.2
HCM Lane LOS	C	B	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0	0	0.1	-	-	0	-	-	0.6	0.2

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	292	16	24	632	56	15	1	4	36	3	68
Future Vol, veh/h	85	292	16	24	632	56	15	1	4	36	3	68
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	85	-	-	105	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	94	324	18	27	702	62	17	1	4	40	3	76

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	764	0	0	342	0	0	928	1339	171	1138	1317	382
Stage 1	-	-	-	-	-	-	521	521	-	787	787	-
Stage 2	-	-	-	-	-	-	407	818	-	351	530	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	845	-	-	1214	-	-	223	152	843	156	156	616
Stage 1	-	-	-	-	-	-	507	530	-	351	401	-
Stage 2	-	-	-	-	-	-	592	388	-	639	525	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	845	-	-	1214	-	-	173	132	843	139	136	616
Mov Cap-2 Maneuver	-	-	-	-	-	-	173	132	-	139	136	-
Stage 1	-	-	-	-	-	-	451	471	-	312	392	-
Stage 2	-	-	-	-	-	-	504	379	-	564	467	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.1	0.3	24.5	22.4
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	173	406	845	-	-	1214	-	-	139	536
HCM Lane V/C Ratio	0.096	0.014	0.112	-	-	0.022	-	-	0.288	0.147
HCM Control Delay (s)	28	14	9.8	-	-	8	-	-	41	12.9
HCM Lane LOS	D	B	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	0.3	0	0.4	-	-	0.1	-	-	1.1	0.5

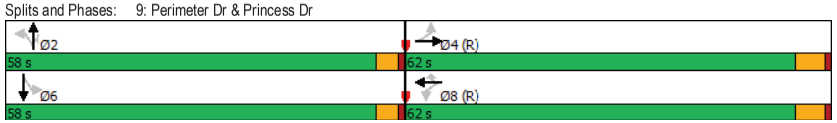
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Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	84	217	309	374	194	106	38	87	65	13
Future Volume (vph)	84	217	309	374	194	106	38	87	65	13
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		4		8			2			6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	2	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	22.5	22.5
Total Split (s)	62.0	62.0	62.0	62.0	62.0	58.0	58.0	58.0	58.0	58.0
Total Split (%)	51.7%	51.7%	51.7%	51.7%	51.7%	48.3%	48.3%	48.3%	48.3%	48.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.2	3.2	3.2	3.2	3.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 9: Perimeter Dr & Princess Dr

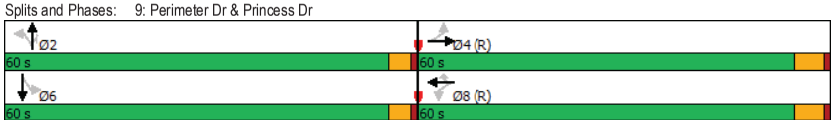


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	78	350	75	278	104	179	21	304	239	27
Future Volume (vph)	78	350	75	278	104	179	21	304	239	27
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		4		8			2			6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	2	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	22.5	22.5
Total Split (s)	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.2	3.2	3.2	3.2	3.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 9: Perimeter Dr & Princess Dr



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	217	86	309	374	194	106	38	87	65	13	14
Future Volume (veh/h)	84	217	86	309	374	194	106	38	87	65	13	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	47	241	73	343	416	108	118	42	49	72	14	13
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	414	1864	532	525	1679	749	674	1593	711	637	837	676
Arrive On Green	0.47	0.47	0.47	0.47	0.47	0.47	0.45	0.45	0.45	0.45	0.45	0.45
Sat Flow, veh/h	878	3945	1126	1066	3554	1585	1383	3554	1585	1306	1868	1508
Grp Volume(v), veh/h	47	206	108	343	416	108	118	42	49	72	13	14
Grp Sat Flow(s),veh/h/ln	878	1702	1668	1066	1777	1585	1383	1777	1585	1306	1777	1599
Q Serve(g_s), s	4.1	4.1	4.4	32.1	8.4	4.6	6.2	0.8	2.1	3.9	0.5	0.6
Cycle Q Clear(g_c), s	12.4	4.1	4.4	36.5	8.4	4.6	6.8	0.8	2.1	4.7	0.5	0.6
Prop In Lane	1.00		0.68	1.00		1.00	1.00		1.00	1.00		0.94
Lane Grp Cap(c), veh/h	414	1608	788	525	1679	749	674	1593	711	637	797	717
V/C Ratio(X)	0.11	0.13	0.14	0.65	0.25	0.14	0.18	0.03	0.07	0.11	0.02	0.02
Avail Cap(c_a), veh/h	414	1608	788	525	1679	749	674	1593	711	637	797	717
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.6	17.8	17.9	28.2	18.9	17.9	20.3	18.5	18.8	19.8	18.4	18.4
Incr Delay (d2), s/veh	0.6	0.2	0.4	6.2	0.4	0.4	0.6	0.0	0.2	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.6	3.0	3.2	13.9	6.4	3.2	3.8	0.6	1.5	2.3	0.4	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.2	17.9	18.2	34.4	19.3	18.3	20.9	18.5	19.0	20.2	18.4	18.5
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		361			867			209			99	
Approach Delay, s/veh		18.7			25.1			20.0			19.7	
Approach LOS		B			C			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		58.0		62.0		58.0		62.0				
Change Period (Y+Rc), s		* 4.2		5.3		* 4.2		5.3				
Max Green Setting (Gmax), s		* 54		56.7		* 54		56.7				
Max Q Clear Time (g_c+I1), s		8.8		14.4		6.7		38.5				
Green Ext Time (p_c), s		0.8		2.5		0.4		4.6				
Intersection Summary												
HCM 6th Ctrl Delay			22.6									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	350	32	75	278	104	179	21	304	239	27	105
Future Volume (veh/h)	78	350	32	75	278	104	179	21	304	239	27	105
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	43	389	27	83	309	58	199	23	169	266	30	88
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	470	2224	153	456	1620	723	612	1652	737	610	826	737
Arrive On Green	0.46	0.46	0.46	0.46	0.46	0.46	0.47	0.47	0.47	0.47	0.47	0.47
Sat Flow, veh/h	1015	4879	335	970	3554	1585	1274	3554	1585	1191	1777	1585
Grp Volume(v), veh/h	43	270	146	83	309	58	199	23	169	266	30	88
Grp Sat Flow(s),veh/h/ln	1015	1702	1810	970	1777	1585	1274	1777	1585	1191	1777	1585
Q Serve(g_s), s	3.2	5.6	5.7	6.6	6.2	2.5	12.6	0.4	7.7	18.6	1.1	3.8
Cycle Q Clear(g_c), s	9.4	5.6	5.7	12.4	6.2	2.5	16.4	0.4	7.7	19.0	1.1	3.8
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	470	1552	825	456	1620	723	612	1652	737	610	826	737
V/C Ratio(X)	0.09	0.17	0.18	0.18	0.19	0.08	0.32	0.01	0.23	0.44	0.04	0.12
Avail Cap(c_a), veh/h	470	1552	825	456	1620	723	612	1652	737	610	826	737
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.3	19.3	19.3	23.0	19.5	18.4	22.8	17.3	19.2	22.4	17.5	18.2
Incr Delay (d2), s/veh	0.4	0.2	0.5	0.9	0.3	0.2	1.4	0.0	0.7	2.3	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.5	4.1	4.6	3.0	4.7	1.7	7.2	0.3	5.4	9.4	0.9	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.6	19.5	19.8	23.9	19.7	18.7	24.2	17.3	19.9	24.7	17.6	18.5
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		459			450			391			384	
Approach Delay, s/veh		19.9			20.3			22.0			22.7	
Approach LOS		B			C			C			C	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		60.0		60.0		60.0		60.0				
Change Period (Y+Rc), s		* 4.2		5.3		* 4.2		5.3				
Max Green Setting (Gmax), s		* 56		54.7		* 56		54.7				
Max Q Clear Time (g_c+I1), s		18.4		11.4		21.0		14.4				
Green Ext Time (p_c), s		1.4		3.1		1.8		2.9				
Intersection Summary												
HCM 6th Ctrl Delay			21.1									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

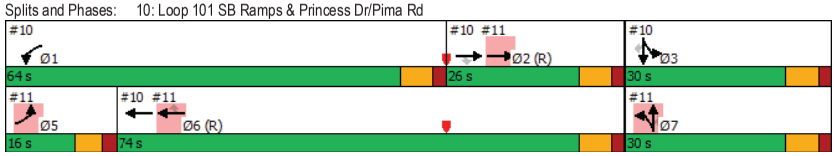
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Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	218	168	1282	620	467	584	208		
Future Volume (vph)	218	168	1282	620	467	584	208		
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm		
Protected Phases	2		1	6	3	3		5	7
Permitted Phases		2					3		
Detector Phase	2	2	1	6	3	3	3		
Switch Phase									
Minimum Initial (s)	1.0	1.0	7.0	1.0	10.0	10.0	10.0	5.0	7.0
Minimum Split (s)	7.7	7.7	13.7	7.7	19.0	19.0	19.0	11.0	13.7
Total Split (s)	26.0	26.0	64.0	74.0	30.0	30.0	30.0	16.0	30.0
Total Split (%)	21.7%	21.7%	53.3%	61.7%	25.0%	25.0%	25.0%	13%	25%
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lag	Lag	Lead	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 95 (79%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated

Splits and Phases: 10: Loop 101 SB Ramps & Princess Dr/Pima Rd

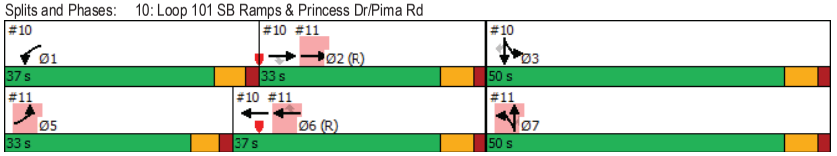


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	511	448	867	342	341	293	94		
Future Volume (vph)	511	448	867	342	341	293	94		
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm		
Protected Phases	2		1	6	3	3		5	7
Permitted Phases		2					3		
Detector Phase	2	2	1	6	3	3	3		
Switch Phase									
Minimum Initial (s)	1.0	1.0	7.0	1.0	10.0	10.0	10.0	5.0	7.0
Minimum Split (s)	7.7	7.7	13.7	7.7	19.0	19.0	19.0	11.0	13.7
Total Split (s)	33.0	33.0	37.0	37.0	50.0	50.0	50.0	33.0	50.0
Total Split (%)	27.5%	27.5%	30.8%	30.8%	41.7%	41.7%	41.7%	28%	42%
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lag	Lag	Lead	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 10: Loop 101 SB Ramps & Princess Dr/Pima Rd



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	218	168	1282	620	0	0	0	0	467	584	208
Future Volume (vph)	0	218	168	1282	620	0	0	0	0	467	584	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3167	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3167	1441
Peak-hour factor, PHF	0.90	0.80	0.85	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	272	198	1424	729	0	0	0	0	519	687	245
RTOR Reduction (vph)	0	0	122	0	0	0	0	0	0	0	2	177
Lane Group Flow (vph)	0	273	76	1424	729	0	0	0	0	400	829	43
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		21.5	21.5	55.1	69.5					23.3	23.3	23.3
Effective Green, g (s)		21.5	21.5	55.1	69.5					23.3	23.3	23.3
Actuated g/C Ratio		0.18	0.18	0.46	0.58					0.19	0.19	0.19
Clearance Time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		911	499	1576	2945					312	614	279
v/s Ratio Prot		c0.05		c0.41	0.14					0.25	c0.26	
v/s Ratio Perm			0.03									0.03
v/c Ratio		0.30	0.15	0.90	0.25					1.28	1.35	0.15
Uniform Delay, d1		42.7	41.6	30.0	12.4					48.4	48.4	40.2
Progression Factor		0.94	0.98	0.69	0.66					1.00	1.00	1.00
Incremental Delay, d2		0.8	0.6	6.6	0.2					149.2	168.4	0.3
Delay (s)		41.1	41.4	27.3	8.3					197.6	216.8	40.4
Level of Service		D	D	C	A					F	F	D
Approach Delay (s)		41.2			20.9			0.0			184.7	
Approach LOS		D			C			A			F	

Intersection Summary				
HCM 2000 Control Delay	81.6	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	80.5%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	511	448	867	342	0	0	0	0	341	293	94
Future Volume (vph)	0	511	448	867	342	0	0	0	0	341	293	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3149	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3149	1441
Peak-hour factor, PHF	0.90	0.85	0.85	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	601	527	963	402	0	0	0	0	379	345	111
RTOR Reduction (vph)	0	0	269	0	0	0	0	0	0	0	1	66
Lane Group Flow (vph)	0	601	258	963	402	0	0	0	0	239	495	34
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		26.3	26.3	32.6	36.3					41.0	41.0	41.0
Effective Green, g (s)		26.3	26.3	32.6	36.3					41.0	41.0	41.0
Actuated g/C Ratio		0.22	0.22	0.27	0.30					0.34	0.34	0.34
Clearance Time (s)		6.7	6.7	6.7	6.7					6.7	6.7	6.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1114	610	932	1538					550	1075	492
v/s Ratio Prot		c0.12		c0.28	0.08					0.15	c0.16	
v/s Ratio Perm			0.09									0.02
v/c Ratio		0.54	0.42	1.03	0.26					0.43	0.46	0.07
Uniform Delay, d1		41.5	40.3	43.7	31.7					30.5	30.9	26.6
Progression Factor		1.17	1.54	1.66	0.61					1.00	1.00	1.00
Incremental Delay, d2		1.8	2.1	35.3	0.3					0.6	0.3	0.1
Delay (s)		50.3	64.4	107.7	19.6					31.1	31.2	26.7
Level of Service		D	E	F	B					C	C	C
Approach Delay (s)		56.9			81.7			0.0			30.6	
Approach LOS		E			F			A			C	

Intersection Summary				
HCM 2000 Control Delay	60.5	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	69.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

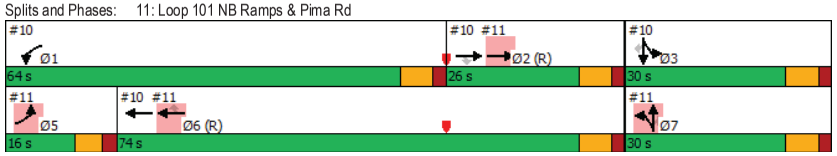
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Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	63	622	1526	354	375	441	1034		
Future Volume (vph)	63	622	1526	354	375	441	1034		
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm		
Protected Phases	5	2	6		7	7		1	3
Permitted Phases				6			7		
Detector Phase	5	2	6	6	7	7	7		
Switch Phase									
Minimum Initial (s)	5.0	1.0	1.0	1.0	7.0	7.0	7.0	7.0	10.0
Minimum Split (s)	11.0	7.7	7.7	7.7	13.7	13.7	13.7	13.7	19.0
Total Split (s)	16.0	26.0	74.0	74.0	30.0	30.0	30.0	64.0	30.0
Total Split (%)	13.3%	21.7%	61.7%	61.7%	25.0%	25.0%	25.0%	53%	25%
Yellow Time (s)	4.0	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lead	Lag	Lag	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 95 (79%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated

Splits and Phases: 11: Loop 101 NB Ramps & Pima Rd

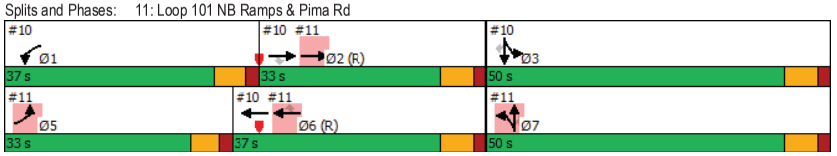


Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	241	606	1070	313	175	545	1045		
Future Volume (vph)	241	606	1070	313	175	545	1045		
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm		
Protected Phases	5	2	6		7	7		1	3
Permitted Phases				6			7		
Detector Phase	5	2	6	6	7	7	7		
Switch Phase									
Minimum Initial (s)	5.0	1.0	1.0	1.0	7.0	7.0	7.0	7.0	10.0
Minimum Split (s)	11.0	7.7	7.7	7.7	13.7	13.7	13.7	13.7	19.0
Total Split (s)	33.0	33.0	37.0	37.0	50.0	50.0	50.0	37.0	50.0
Total Split (%)	27.5%	27.5%	30.8%	30.8%	41.7%	41.7%	41.7%	31%	42%
Yellow Time (s)	4.0	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.7	6.7	6.7	6.7	6.7	6.7		
Lead/Lag	Lead	Lag	Lag	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes	
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 11: Loop 101 NB Ramps & Pima Rd



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	622	0	0	1526	354	375	441	1034	0	0	0
Future Volume (vph)	63	622	0	0	1526	354	375	441	1034	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3360	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3360	2787			
Peak-hour factor, PHF	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	79	691	0	0	1696	393	417	519	1149	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	49	0	0	926	0	0	0
Lane Group Flow (vph)	79	691	0	0	1696	344	304	632	223	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	7.8	21.5			69.5	69.5	23.3	23.3	23.3			
Effective Green, g (s)	7.8	21.5			69.5	69.5	23.3	23.3	23.3			
Actuated g/C Ratio	0.06	0.18			0.58	0.58	0.19	0.19	0.19			
Clearance Time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	115	634			3711	916	312	652	541			
v/s Ratio Prot	c0.04	c0.20			c0.26		c0.19	0.19				
v/s Ratio Perm						0.22			0.08			
v/c Ratio	0.69	1.09			0.46	0.38	0.97	0.97	0.41			
Uniform Delay, d1	54.9	49.2			14.5	13.6	48.1	48.0	42.4			
Progression Factor	0.44	1.10			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	5.3	49.4			0.4	1.2	43.6	27.4	0.5			
Delay (s)	29.6	103.8			14.9	14.8	91.7	75.4	42.9			
Level of Service	C	F			B	B	F	E	D			
Approach Delay (s)		96.2			14.8			59.8			0.0	
Approach LOS		F			B			E			A	

Intersection Summary				
HCM 2000 Control Delay	46.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	80.5%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	241	606	0	0	1070	313	175	545	1045	0	0	0
Future Volume (vph)	241	606	0	0	1070	313	175	545	1045	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3385	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3385	2787			
Peak-hour factor, PHF	0.85	0.90	0.90	0.90	0.85	0.90	0.85	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	284	673	0	0	1259	348	206	641	1161	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	100	0	0	650	0	0	0
Lane Group Flow (vph)	284	673	0	0	1259	248	185	662	511	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	23.3	26.3			36.3	36.3	41.0	41.0	41.0			
Effective Green, g (s)	23.3	26.3			36.3	36.3	41.0	41.0	41.0			
Actuated g/C Ratio	0.19	0.22			0.30	0.30	0.34	0.34	0.34			
Clearance Time (s)	6.0	6.7			6.7	6.7	6.7	6.7	6.7			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	343	775			1938	478	550	1156	952			
v/s Ratio Prot	c0.16	c0.19			c0.20		0.11	c0.20				
v/s Ratio Perm						0.16			0.18			
v/c Ratio	0.83	0.87			0.65	0.52	0.34	0.57	0.54			
Uniform Delay, d1	46.4	45.2			36.3	34.6	29.4	32.3	31.8			
Progression Factor	1.29	0.69			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	13.5	11.4			1.7	4.0	0.4	0.7	0.6			
Delay (s)	73.6	42.5			38.0	38.6	29.7	33.0	32.4			
Level of Service	E	D			D	D	C	C	C			
Approach Delay (s)		51.7			38.2			32.4			0.0	
Approach LOS		D			D			C			A	

Intersection Summary				
HCM 2000 Control Delay	38.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	69.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

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Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↱			↱
Traffic Vol, veh/h	0	440	341	1	0	355
Future Vol, veh/h	0	440	341	1	0	355
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	489	379	1	0	394

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	190
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	820
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	820
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.4
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	820
HCM Lane V/C Ratio	-	-	-	0.481
HCM Control Delay (s)	-	-	-	13.4
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	2.6

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↱			↱
Traffic Vol, veh/h	0	622	456	2	0	200
Future Vol, veh/h	0	622	456	2	0	200
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	691	507	2	0	222

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	255
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	744
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	744
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	744
HCM Lane V/C Ratio	-	-	-	0.299
HCM Control Delay (s)	-	-	-	11.9
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	1.3

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Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	400	40	0	342	0	6
Future Vol, veh/h	400	40	0	342	0	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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	444	44	0	380	0	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	244
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	757
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	757
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	757	-	-	-
HCM Lane V/C Ratio	0.009	-	-	-
HCM Control Delay (s)	9.8	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	527	95	0	458	0	3
Future Vol, veh/h	527	95	0	458	0	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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	586	106	0	509	0	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	346
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	650
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	650
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	650	-	-	-
HCM Lane V/C Ratio	0.005	-	-	-
HCM Control Delay (s)	10.6	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

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Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	156	250	252	8	18	90
Future Vol, veh/h	156	250	252	8	18	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	173	278	280	9	20	100

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	289	0	-	0	770	145
Stage 1	-	-	-	-	285	-
Stage 2	-	-	-	-	485	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1270	-	-	-	337	876
Stage 1	-	-	-	-	738	-
Stage 2	-	-	-	-	585	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1270	-	-	-	291	876
Mov Cap-2 Maneuver	-	-	-	-	291	-
Stage 1	-	-	-	-	638	-
Stage 2	-	-	-	-	585	-

Approach	EB	WB	SB
HCM Control Delay, s	3.2	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1270	-	-	-	656
HCM Lane V/C Ratio	0.136	-	-	-	0.183
HCM Control Delay (s)	8.3	-	-	-	11.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.5	-	-	-	0.7

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	365	165	394	14	10	64
Future Vol, veh/h	365	165	394	14	10	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	406	183	438	16	11	71

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	454	0	-	0	1350	227
Stage 1	-	-	-	-	446	-
Stage 2	-	-	-	-	904	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1103	-	-	-	142	776
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	355	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1103	-	-	-	90	776
Mov Cap-2 Maneuver	-	-	-	-	90	-
Stage 1	-	-	-	-	387	-
Stage 2	-	-	-	-	355	-

Approach	EB	WB	SB
HCM Control Delay, s	7	0	17
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1103	-	-	-	382
HCM Lane V/C Ratio	0.368	-	-	-	0.215
HCM Control Delay (s)	10.1	-	-	-	17
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	1.7	-	-	-	0.8

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Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Traffic Vol, veh/h	0	268	258	0	0	2
Future Vol, veh/h	0	268	258	0	0	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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	298	287	0	0	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	144
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	0	877
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	877
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	877
HCM Lane V/C Ratio	-	-	0.003
HCM Control Delay (s)	-	-	9.1
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Traffic Vol, veh/h	0	175	407	0	0	1
Future Vol, veh/h	0	175	407	0	0	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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	194	452	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	226
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	0	777
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	777
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	777
HCM Lane V/C Ratio	-	-	0.001
HCM Control Delay (s)	-	-	9.6
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0

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Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	27	232	8	28	240
Future Vol, veh/h	13	27	232	8	28	240
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	30	258	9	31	267

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	459	134	0	0	267	0
Stage 1	263	-	-	-	-	-
Stage 2	196	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	531	890	-	-	1294	-
Stage 1	757	-	-	-	-	-
Stage 2	818	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	518	890	-	-	1294	-
Mov Cap-2 Maneuver	518	-	-	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	798	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	0.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	722	1294	-
HCM Lane V/C Ratio	-	-	0.062	0.024	-
HCM Control Delay (s)	-	-	10.3	7.9	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	25	382	9	25	150
Future Vol, veh/h	9	25	382	9	25	150
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	28	424	10	28	167

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	569	217	0	0	434	0
Stage 1	429	-	-	-	-	-
Stage 2	140	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	452	787	-	-	1122	-
Stage 1	624	-	-	-	-	-
Stage 2	872	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	441	787	-	-	1122	-
Mov Cap-2 Maneuver	441	-	-	-	-	-
Stage 1	624	-	-	-	-	-
Stage 2	850	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	1.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	652	1122	-
HCM Lane V/C Ratio	-	-	0.058	0.025	-
HCM Control Delay (s)	-	-	10.9	8.3	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

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Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	186	0	6	1	0	18	4	47	9	69	168	16
Future Vol, veh/h	186	0	6	1	0	18	4	47	9	69	168	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	207	0	7	1	0	20	4	52	10	77	187	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	384	420	103	313	424	31	205	0	0	62	0	0
Stage 1	350	350	-	65	65	-	-	-	-	-	-	-
Stage 2	34	70	-	248	359	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	549	523	932	616	520	1036	1364	-	-	1539	-	-
Stage 1	639	631	-	938	840	-	-	-	-	-	-	-
Stage 2	978	836	-	734	626	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	517	495	932	587	492	1036	1364	-	-	1539	-	-
Mov Cap-2 Maneuver	517	495	-	587	492	-	-	-	-	-	-	-
Stage 1	637	599	-	935	837	-	-	-	-	-	-	-
Stage 2	956	833	-	692	595	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.5	8.7	0.5	2
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1364	-	-	524	996	1539	-	-
HCM Lane V/C Ratio	0.003	-	-	0.407	0.021	0.05	-	-
HCM Control Delay (s)	7.6	-	-	16.5	8.7	7.5	-	-
HCM Lane LOS	A	-	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	2	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	86	0	3	6	0	41	9	265	1	5	116	38
Future Vol, veh/h	86	0	3	6	0	41	9	265	1	5	116	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	96	0	3	7	0	46	10	294	1	6	129	42

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	329	477	86	392	498	148	171	0	0	295	0	0
Stage 1	162	162	-	315	315	-	-	-	-	-	-	-
Stage 2	167	315	-	77	183	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	600	486	956	542	472	872	1404	-	-	1263	-	-
Stage 1	824	763	-	671	654	-	-	-	-	-	-	-
Stage 2	818	654	-	923	747	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	563	480	956	535	466	872	1404	-	-	1263	-	-
Mov Cap-2 Maneuver	563	480	-	535	466	-	-	-	-	-	-	-
Stage 1	818	759	-	666	649	-	-	-	-	-	-	-
Stage 2	770	649	-	915	743	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.6	9.8	0.2	0.2
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1404	-	-	571	807	1263	-	-
HCM Lane V/C Ratio	0.007	-	-	0.173	0.065	0.004	-	-
HCM Control Delay (s)	7.6	-	-	12.6	9.8	7.9	-	-
HCM Lane LOS	A	-	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.2	0	-	-

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Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	43	0	47	0	0	12	19	557	1	4	1110	13
Future Vol, veh/h	43	0	47	0	0	12	19	557	1	4	1110	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	235	-	145	370	-	120
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	48	0	52	0	0	13	21	619	1	4	1233	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1593	1903	617	-	-	310	1247	0	0	620	0	0
Stage 1	1241	1241	-	-	-	-	-	-	-	-	-	-
Stage 2	352	662	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	-	-	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	-	-	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	*259	*128	*607	0	0	686	*907	-	-	956	-	-
Stage 1	*572	*501	-	0	0	-	-	-	-	-	-	-
Stage 2	*638	*457	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1				1	-	-		-	-
Mov Cap-1 Maneuver	*249	*124	*607	-	-	686	*907	-	-	956	-	-
Mov Cap-2 Maneuver	*249	*124	-	-	-	-	-	-	-	-	-	-
Stage 1	*559	*499	-	-	-	-	-	-	-	-	-	-
Stage 2	*611	*446	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.8	10.4	0.3	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 907	-	-	360	686	956	-	-
HCM Lane V/C Ratio	0.023	-	-	0.278	0.019	0.005	-	-
HCM Control Delay (s)	9.1	-	-	18.8	10.4	8.8	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1	0.1	0	-	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	0	35	0	0	14	44	1176	1	24	790	64
Future Vol, veh/h	28	0	35	0	0	14	44	1176	1	24	790	64
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	235	-	145	370	-	120
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	31	0	39	0	0	16	49	1307	1	27	878	71

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1684	2338	439	-	-	654	949	0	0	1308	0	0
Stage 1	932	932	-	-	-	-	-	-	-	-	-	-
Stage 2	752	1406	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	-	-	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	-	-	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	111	38	*763	0	0	409	1060	-	-	525	-	-
Stage 1	661	592	-	0	0	-	-	-	-	-	-	-
Stage 2	368	204	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1				1	-	-		-	-
Mov Cap-1 Maneuver	99	34	*763	-	-	409	1060	-	-	525	-	-
Mov Cap-2 Maneuver	99	34	-	-	-	-	-	-	-	-	-	-
Stage 1	631	562	-	-	-	-	-	-	-	-	-	-
Stage 2	338	195	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	34.1	14.2	0.3	0.3
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1060	-	-	192	409	525	-	-
HCM Lane V/C Ratio	0.046	-	-	0.365	0.038	0.051	-	-
HCM Control Delay (s)	8.6	-	-	34.1	14.2	12.2	-	-
HCM Lane LOS	A	-	-	D	B	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.6	0.1	0.2	-	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

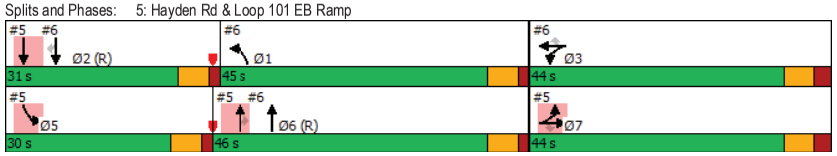
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Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	685	2	913	843	355	495	806		
Future Volume (vph)	685	2	913	843	355	495	806		
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA		
Protected Phases	7	7		6		5	2	1	3
Permitted Phases			7		6				
Detector Phase	7	7	7	6	6	5	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	16.0	12.0	5.0	7.0
Minimum Split (s)	44.0	44.0	44.0	26.0	26.0	22.0	26.0	11.0	44.0
Total Split (s)	44.0	44.0	44.0	46.0	46.0	30.0	31.0	45.0	44.0
Total Split (%)	36.7%	36.7%	36.7%	38.3%	38.3%	25.0%	25.8%	38%	37%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag				Lag	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	C-Max	C-Max	None	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Splits and Phases: 5: Hayden Rd & Loop 101 EB Ramp



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3
Lane Configurations									
Traffic Volume (vph)	433	5	609	1663	388	506	817		
Future Volume (vph)	433	5	609	1663	388	506	817		
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA		
Protected Phases		7		6		5	2	1	3
Permitted Phases	7		7		6				
Detector Phase	7	7	7	6	6	5	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	16.0	12.0	15.0	7.0
Minimum Split (s)	26.8	26.8	26.8	27.0	27.0	22.5	25.9	25.9	26.8
Total Split (s)	27.0	27.0	27.0	67.0	67.0	26.0	30.0	63.0	27.0
Total Split (%)	22.5%	22.5%	22.5%	55.8%	55.8%	21.7%	25.0%	53%	23%
Yellow Time (s)	4.0	4.0	4.0	5.5	5.5	4.4	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	1.5	1.5	1.5	1.5	1.5	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.0	6.0	7.0	7.0	5.9	5.5		
Lead/Lag				Lag	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	C-Max	C-Max	None	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 94 (78%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated

Splits and Phases: 5: Hayden Rd & Loop 101 EB Ramp



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	685	2	913	0	0	0	0	843	355	495	806	0
Future Volume (vph)	685	2	913	0	0	0	0	843	355	495	806	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.95	0.88					0.81	0.81	0.97	0.91	
Frt	1.00	1.00	0.85					0.98	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1686	2787					5919	1282	3433	5085	
Flt Permitted	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1686	2787					5919	1282	3433	5085	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.90	0.85	0.90	0.90
Adj. Flow (vph)	761	2	1014	0	0	0	0	992	394	582	896	0
RTOR Reduction (vph)	0	0	714	0	0	0	0	21	160	0	0	0
Lane Group Flow (vph)	380	383	300	0	0	0	0	1117	88	582	896	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	7						6		5	2	
Permitted Phases			7						6			
Actuated Green, G (s)	35.5	35.5	35.5					42.4	42.4	23.1	26.5	
Effective Green, g (s)	35.5	35.5	35.5					42.4	42.4	23.1	26.5	
Actuated g/C Ratio	0.30	0.30	0.30					0.35	0.35	0.19	0.22	
Clearance Time (s)	7.0	7.0	7.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	497	498	824					2091	452	660	1122	
v/s Ratio Prot	0.23	c0.23						c0.19		0.17	c0.18	
v/s Ratio Perm			0.11						0.07			
v/c Ratio	0.76	0.77	0.36					0.53	0.19	0.88	0.80	
Uniform Delay, d1	38.4	38.5	33.3					30.9	26.9	47.1	44.2	
Progression Factor	1.00	1.00	1.00					0.91	1.51	0.76	0.64	
Incremental Delay, d2	6.9	7.0	0.3					0.9	0.9	9.6	4.2	
Delay (s)	45.3	45.5	33.6					29.0	41.6	45.6	32.6	
Level of Service	D	D	C					C	D	D	C	
Approach Delay (s)		38.7			0.0			31.2			37.7	
Approach LOS		D			A			C			D	

Intersection Summary				
HCM 2000 Control Delay	36.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	76.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	433	5	609	0	0	0	0	1663	388	506	817	0
Future Volume (vph)	433	5	609	0	0	0	0	1663	388	506	817	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					7.0	7.0	5.9	5.5	
Lane Util. Factor	0.95	0.95	0.88					0.81	0.81	0.97	0.91	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1687	2787					6015	1282	3433	5085	
Flt Permitted	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1687	2787					6015	1282	3433	5085	
Peak-hour factor, PHF	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.90
Adj. Flow (vph)	481	6	677	0	0	0	0	1848	431	595	961	0
RTOR Reduction (vph)	0	0	562	0	0	0	0	3	194	0	0	0
Lane Group Flow (vph)	245	242	115	0	0	0	0	1889	194	595	961	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		7						6		5	2	
Permitted Phases	7		7						6			
Actuated Green, G (s)	20.4	20.4	20.4					60.0	60.0	20.7	25.1	
Effective Green, g (s)	20.4	20.4	20.4					60.0	60.0	20.7	25.1	
Actuated g/C Ratio	0.17	0.17	0.17					0.50	0.50	0.17	0.21	
Clearance Time (s)	6.0	6.0	6.0					7.0	7.0	5.9	5.5	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	285	286	473					3007	641	592	1063	
v/s Ratio Prot								c0.31		0.17	c0.19	
v/s Ratio Perm	c0.15	0.14	0.04						0.15			
v/c Ratio	0.86	0.85	0.24					0.63	0.30	1.01	0.90	
Uniform Delay, d1	48.4	48.3	43.1					21.9	17.7	49.6	46.3	
Progression Factor	1.00	1.00	1.00					1.72	8.94	0.88	0.62	
Incremental Delay, d2	21.8	20.0	0.3					0.5	0.6	25.9	6.2	
Delay (s)	70.3	68.3	43.4					38.1	158.7	69.5	34.8	
Level of Service	E	E	D					D	F	E	C	
Approach Delay (s)		54.2			0.0			58.7			48.1	
Approach LOS		D			A			E			D	

Intersection Summary				
HCM 2000 Control Delay	54.3	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)	18.9	
Intersection Capacity Utilization	91.5%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

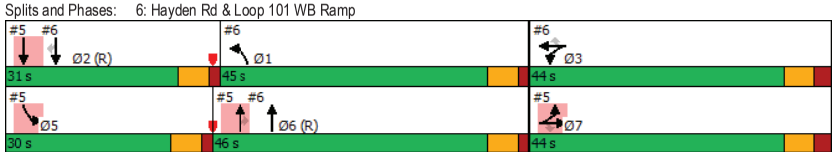
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Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	329	54	562	596	935	961	324		
Future Volume (vph)	329	54	562	596	935	961	324		
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm		
Protected Phases	3	3		1	6	2		5	7
Permitted Phases			3				2		
Detector Phase	3	3	3	1	6	2	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	5.0	12.0	12.0	12.0	16.0	7.0
Minimum Split (s)	44.0	44.0	44.0	11.0	26.0	26.0	26.0	22.0	44.0
Total Split (s)	44.0	44.0	44.0	45.0	46.0	31.0	31.0	30.0	44.0
Total Split (%)	36.7%	36.7%	36.7%	37.5%	38.3%	25.8%	25.8%	25%	37%
Yellow Time (s)	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.3
All-Red Time (s)	2.7	2.7	2.7	1.6	1.6	1.6	1.6	1.6	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	6.0	6.0	6.0	6.0		
Lead/Lag				Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Splits and Phases: 6: Hayden Rd & Loop 101 WB Ramp

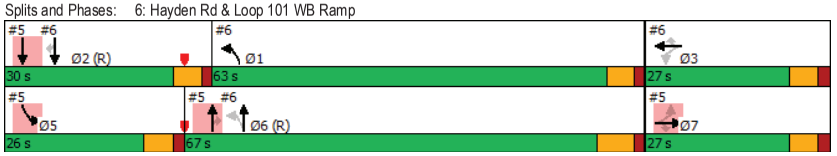


Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	352	42	485	1027	1070	969	481		
Future Volume (vph)	352	42	485	1027	1070	969	481		
Turn Type	Perm	NA	Perm	pm+pt	NA	NA	Perm		
Protected Phases		3		1	6	2		5	7
Permitted Phases	3		3	6			2		
Detector Phase	3	3	3	1	6	2	2		
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	15.0	12.0	12.0	12.0	16.0	7.0
Minimum Split (s)	26.8	26.8	26.8	25.9	27.0	25.9	25.9	22.5	26.8
Total Split (s)	27.0	27.0	27.0	63.0	67.0	30.0	30.0	26.0	27.0
Total Split (%)	22.5%	22.5%	22.5%	52.5%	55.8%	25.0%	25.0%	22%	23%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.5	4.0	4.0	4.4	4.0
All-Red Time (s)	2.0	2.0	2.0	1.5	1.5	1.5	1.5	1.5	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.0	6.0	5.5	7.0	5.5	5.5		
Lead/Lag				Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 94 (78%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated

Splits and Phases: 6: Hayden Rd & Loop 101 WB Ramp



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6: Hayden Rd & Loop 101 WB Ramp

HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	329	54	562	596	935	0	0	961	324
Future Volume (vph)	0	0	0	329	54	562	596	935	0	0	961	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.97	0.95	0.95	1.00	0.91			0.76	0.76
Frt				1.00	0.88	0.85	1.00	1.00			0.98	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433	1556	1504	1770	5085			6950	1203
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				3433	1556	1504	1770	5085			6950	1203
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.80	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	0	0	366	68	624	662	1039	0	0	1131	381
RTOR Reduction (vph)	0	0	0	0	126	242	0	0	0	0	20	175
Lane Group Flow (vph)	0	0	0	366	223	101	662	1039	0	0	1267	50
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				3	3		1	6			2	
Permitted Phases						3						2
Actuated Green, G (s)				35.5	35.5	35.5	39.0	42.4			26.5	26.5
Effective Green, g (s)				35.5	35.5	35.5	39.0	42.4			26.5	26.5
Actuated g/C Ratio				0.30	0.30	0.30	0.32	0.35			0.22	0.22
Clearance Time (s)				7.0	7.0	7.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				1015	460	444	575	1796			1534	265
v/s Ratio Prot				0.11	c0.14		c0.37	c0.20			c0.18	
v/s Ratio Perm						0.07						0.04
v/c Ratio				0.36	0.48	0.23	1.15	0.58			0.83	0.19
Uniform Delay, d1				33.3	34.7	31.9	40.5	31.5			44.6	38.0
Progression Factor				1.00	1.00	1.00	0.91	0.89			0.71	1.90
Incremental Delay, d2				0.2	0.8	0.3	83.3	1.1			4.8	1.4
Delay (s)				33.5	35.5	32.2	120.0	29.1			36.4	73.7
Level of Service				C	D	C	F	C			D	E
Approach Delay (s)		0.0			33.7			64.5			42.0	
Approach LOS		A			C			E			D	

Intersection Summary				
HCM 2000 Control Delay	48.9	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)	19.0	
Intersection Capacity Utilization	76.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

6: Hayden Rd & Loop 101 WB Ramp

HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	352	42	485	1027	1070	0	0	969	481
Future Volume (vph)	0	0	0	352	42	485	1027	1070	0	0	969	481
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	6.0	5.5	7.0			5.5	5.5
Lane Util. Factor				0.97	0.95	0.95	1.00	0.91			0.76	0.76
Frt				1.00	0.87	0.85	1.00	1.00			0.97	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433	1548	1504	1770	5085			6877	1203
Flt Permitted				0.95	1.00	1.00	1.00	1.00			1.00	1.00
Satd. Flow (perm)				3433	1548	1504	1863	5085			6877	1203
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.90
Adj. Flow (vph)	0	0	0	414	49	539	1141	1189	0	0	1140	534
RTOR Reduction (vph)	0	0	0	0	153	242	0	0	0	0	35	196
Lane Group Flow (vph)	0	0	0	414	144	49	1141	1189	0	0	1372	71
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					3		1	6			2	
Permitted Phases				3		3	6					2
Actuated Green, G (s)				20.4	20.4	20.4	61.5	60.0			25.1	25.1
Effective Green, g (s)				20.4	20.4	20.4	61.5	60.0			25.1	25.1
Actuated g/C Ratio				0.17	0.17	0.17	0.51	0.50			0.21	0.21
Clearance Time (s)				6.0	6.0	6.0	5.5	7.0			5.5	5.5
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				583	263	255	953	2542			1438	251
v/s Ratio Prot					0.09		0.57	0.23			c0.20	
v/s Ratio Perm				c0.12		0.03	c0.07					0.06
v/c Ratio				0.71	0.55	0.19	1.20	0.47			0.95	0.28
Uniform Delay, d1				47.0	45.6	42.7	29.8	19.6			46.9	39.9
Progression Factor				1.00	1.00	1.00	0.66	0.59			0.78	0.37
Incremental Delay, d2				4.1	2.3	0.4	96.5	0.5			14.7	2.7
Delay (s)				51.1	47.9	43.1	116.3	11.9			51.3	17.6
Level of Service				D	D	D	F	B			D	B
Approach Delay (s)		0.0			47.8			63.0			45.9	
Approach LOS		A			D			E			D	

Intersection Summary				
HCM 2000 Control Delay	54.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.10			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9	
Intersection Capacity Utilization	91.5%	ICU Level of Service	F	
Analysis Period (min)	15			

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1: Hayden Rd & Mayo Blvd/Axon Way
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	245	0	54	144	0	576	76	423	78	363	843	322
Future Volume (vph)	245	0	54	144	0	576	76	423	78	363	843	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00		1.00	0.95	0.95	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.85		1.00	0.85	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1583		1770	1504	1504	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.72	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1583		1337	1504	1504	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	272	0	60	160	0	640	84	470	87	403	937	358
RTOR Reduction (vph)	0	41	0	0	268	268	0	0	54	0	0	150
Lane Group Flow (vph)	272	19	0	160	52	52	84	470	33	403	937	208
Turn Type	Prot	NA		Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8			2			6
Actuated Green, G (s)	14.8	38.9		19.6	19.6	19.6	7.1	45.2	45.2	22.4	60.5	60.5
Effective Green, g (s)	14.8	38.9		19.6	19.6	19.6	7.1	45.2	45.2	22.4	60.5	60.5
Actuated g/C Ratio	0.12	0.32		0.16	0.16	0.16	0.06	0.38	0.38	0.19	0.50	0.50
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	423	513		218	245	245	203	1333	596	640	1784	798
v/s Ratio Prot	c0.08	0.01			0.03		0.02	c0.13		c0.12	c0.26	
v/s Ratio Perm				c0.12		0.03			0.02			0.13
v/c Ratio	0.64	0.04		0.73	0.21	0.21	0.41	0.35	0.05	0.63	0.53	0.26
Uniform Delay, d1	50.1	27.7		47.7	43.5	43.5	54.4	26.9	23.8	45.0	20.1	17.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.94	1.32	2.76	1.10	1.11	1.48
Incremental Delay, d2	3.3	0.0		12.0	0.4	0.4	1.4	0.7	0.2	0.6	0.3	0.2
Delay (s)	53.4	27.8		59.8	44.0	44.0	52.4	36.3	65.8	50.3	22.6	25.3
Level of Service	D	C		E	D	D	D	D	E	D	C	C
Approach Delay (s)		48.8			47.1			42.4			29.8	
Approach LOS		D			D			D			C	

Intersection Summary				
HCM 2000 Control Delay	37.9	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)	18.0	
Intersection Capacity Utilization	61.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

1: Hayden Rd & Mayo Blvd/Axon Way
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	519	0	87	99	0	551	71	878	125	512	553	250
Future Volume (vph)	519	0	87	99	0	551	71	878	125	512	553	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00		1.00	0.95	0.95	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.85		1.00	0.85	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1583		1770	1504	1504	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.69	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1583		1293	1504	1504	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	577	0	97	110	0	612	79	976	139	569	614	278
RTOR Reduction (vph)	0	61	0	0	217	217	0	0	87	0	0	147
Lane Group Flow (vph)	577	36	0	110	89	89	79	976	52	569	614	131
Turn Type	Prot	NA		Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8			2			6
Actuated Green, G (s)	24.5	44.4		15.4	15.4	15.4	5.7	44.6	44.6	17.5	56.4	56.4
Effective Green, g (s)	24.5	44.4		15.4	15.4	15.4	5.7	44.6	44.6	17.5	56.4	56.4
Actuated g/C Ratio	0.20	0.37		0.13	0.13	0.13	0.05	0.37	0.37	0.15	0.47	0.47
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	700	585		165	193	193	163	1315	588	500	1663	744
v/s Ratio Prot	c0.17	0.02			0.06		0.02	c0.28		c0.17	0.17	
v/s Ratio Perm				c0.09		0.06			0.03			0.08
v/c Ratio	0.82	0.06		0.67	0.46	0.46	0.48	0.74	0.09	1.14	0.37	0.18
Uniform Delay, d1	45.7	24.4		49.9	48.5	48.5	55.7	32.7	24.5	51.2	20.4	18.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.89	1.03	2.04	0.94	0.76	1.22
Incremental Delay, d2	7.8	0.0		9.8	1.7	1.7	2.1	3.6	0.3	69.9	0.2	0.2
Delay (s)	53.5	24.4		59.6	50.2	50.2	51.8	37.4	50.2	118.1	15.7	22.5
Level of Service	D	C		E	D	D	D	D	D	F	B	C
Approach Delay (s)		49.3			51.6			39.8			56.9	
Approach LOS		D			D			D			E	

Intersection Summary				
HCM 2000 Control Delay	49.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	80.1%	ICU Level of Service	D	
Analysis Period (min)	15			

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	34	60	181	0	63	34	509	140	136	833	49
Future Volume (vph)	29	34	60	181	0	63	34	509	140	136	833	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	1.00	0.97		1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85	1.00		0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1821	1583	3433		1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.98	1.00	0.95		1.00	0.28	1.00	1.00	0.43	1.00	1.00
Satd. Flow (perm)		1821	1583	3433		1583	517	3539	1583	795	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	32	38	67	201	0	70	38	566	156	151	926	54
RTOR Reduction (vph)	0	0	62	0	0	55	0	0	46	0	0	16
Lane Group Flow (vph)	0	70	5	201	0	15	38	566	111	151	926	38
Turn Type	Split	NA	Perm	Prot		Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4	4		3				2			6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)		9.1	9.1	12.4		26.0	85.0	85.0	85.0	85.0	85.0	85.0
Effective Green, g (s)		9.1	9.1	12.4		26.0	85.0	85.0	85.0	85.0	85.0	85.0
Actuated g/C Ratio		0.08	0.08	0.10		0.22	0.71	0.71	0.71	0.71	0.71	0.71
Clearance Time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		138	120	354		342	366	2506	1121	563	2506	1121
v/s Ratio Prot		c0.04		c0.06				0.16			c0.26	
v/s Ratio Perm			0.00			0.01	0.07		0.07	0.19		0.02
v/c Ratio		0.51	0.04	0.57		0.04	0.10	0.23	0.10	0.27	0.37	0.03
Uniform Delay, d1		53.3	51.4	51.2		37.2	5.5	6.1	5.5	6.3	6.9	5.2
Progression Factor		1.00	1.00	1.25		0.26	1.00	1.00	1.00	2.56	2.68	4.95
Incremental Delay, d2		2.9	0.1	2.1		0.1	0.6	0.2	0.2	1.0	0.4	0.1
Delay (s)		56.2	51.6	65.9		9.8	6.1	6.3	5.7	17.2	18.9	25.9
Level of Service		E	D	E		A	A	A	A	B	B	C
Approach Delay (s)		53.9			51.4			6.1			19.0	
Approach LOS		D			D			A			B	

Intersection Summary				
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	49.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	29	55	295	0	182	79	918	132	62	550	60
Future Volume (vph)	24	29	55	295	0	182	79	918	132	62	550	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	1.00	0.97		1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85	1.00		0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1821	1583	3433		1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.98	1.00	0.95		1.00	0.40	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)		1821	1583	3433		1583	745	3539	1583	446	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	27	32	61	328	0	202	88	1020	147	69	611	67
RTOR Reduction (vph)	0	0	57	0	0	43	0	0	48	0	0	22
Lane Group Flow (vph)	0	59	4	328	0	159	88	1020	99	69	611	45
Turn Type	Split	NA	Perm	Prot		Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4	4		3				2			6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)		8.7	8.7	16.7		29.9	81.1	81.1	81.1	81.1	81.1	81.1
Effective Green, g (s)		8.7	8.7	16.7		29.9	81.1	81.1	81.1	81.1	81.1	81.1
Actuated g/C Ratio		0.07	0.07	0.14		0.25	0.68	0.68	0.68	0.68	0.68	0.68
Clearance Time (s)		4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		132	114	477		394	503	2391	1069	301	2391	1069
v/s Ratio Prot		0.03		c0.10				c0.29			0.17	
v/s Ratio Perm			0.00			c0.10	0.12		0.06	0.15		0.03
v/c Ratio		0.45	0.04	0.69		0.40	0.17	0.43	0.09	0.23	0.26	0.04
Uniform Delay, d1		53.3	51.8	49.2		37.6	7.2	8.9	6.7	7.5	7.6	6.5
Progression Factor		1.00	1.00	1.00		1.14	1.00	1.00	1.00	2.38	2.27	6.04
Incremental Delay, d2		2.4	0.1	4.0		0.7	0.8	0.6	0.2	1.7	0.2	0.1
Delay (s)		55.7	51.9	53.2		43.4	7.9	9.4	6.9	19.4	17.5	39.3
Level of Service		E	D	D		D	A	A	A	B	B	D
Approach Delay (s)		53.8			49.5			9.0			19.7	
Approach LOS		D			D			A			B	

Intersection Summary				
HCM 2000 Control Delay	22.1	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)	13.5	
Intersection Capacity Utilization	56.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	13	45	26	15	0	47	995	6	0	1142	29
Future Volume (vph)	39	13	45	26	15	0	47	995	6	0	1142	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95	1.00		0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539		3433	3539	1583		5085	1583
Flt Permitted	0.75	1.00	1.00	0.75	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1389	3539	1583	1393	3539		3433	3539	1583		5085	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	43	14	50	29	17	0	52	1106	7	0	1269	32
RTOR Reduction (vph)	0	0	37	0	0	0	0	0	2	0	0	13
Lane Group Flow (vph)	43	14	13	29	17	0	52	1106	5	0	1269	19
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8		8			2	6		6
Actuated Green, G (s)	30.5	30.5	30.5	30.5	30.5		5.7	80.5	80.5		70.3	70.3
Effective Green, g (s)	30.5	30.5	30.5	30.5	30.5		5.7	80.5	80.5		70.3	70.3
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25		0.05	0.67	0.67		0.59	0.59
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	353	899	402	354	899		163	2374	1061		2978	927
v/s Ratio Prot		0.00			0.00		0.02	c0.31			0.25	
v/s Ratio Perm	c0.03		0.01	0.02					0.00			0.01
v/c Ratio	0.12	0.02	0.03	0.08	0.02		0.32	0.47	0.00		0.43	0.02
Uniform Delay, d1	34.4	33.5	33.6	34.1	33.5		55.3	9.5	6.5		13.7	10.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.84	1.21	3.14		1.00	1.00
Incremental Delay, d2	0.2	0.0	0.0	0.5	0.0		0.8	0.5	0.0		0.4	0.0
Delay (s)	34.6	33.5	33.7	34.5	33.6		47.5	11.9	20.4		14.2	10.5
Level of Service	C	C	C	C	C		D	B	C		B	B
Approach Delay (s)		34.0			34.2			13.6			14.1	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	50.0%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	28	50	14	15	0	56	1268	9	0	938	49
Future Volume (vph)	51	28	50	14	15	0	56	1268	9	0	938	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95	1.00		0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539		3433	3539	1583		5085	1583
Flt Permitted	0.75	1.00	1.00	0.74	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1389	3539	1583	1371	3539		3433	3539	1583		5085	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	57	31	56	16	17	0	62	1409	10	0	1042	54
RTOR Reduction (vph)	0	0	42	0	0	0	0	0	3	0	0	22
Lane Group Flow (vph)	57	31	14	16	17	0	62	1409	7	0	1042	32
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8		8			2	6		6
Actuated Green, G (s)	29.5	29.5	29.5	29.5	29.5		6.4	81.5	81.5		70.6	70.6
Effective Green, g (s)	29.5	29.5	29.5	29.5	29.5		6.4	81.5	81.5		70.6	70.6
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25		0.05	0.68	0.68		0.59	0.59
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	341	870	389	337	870		183	2403	1075		2991	931
v/s Ratio Prot		0.01			0.00		0.02	c0.40			0.20	
v/s Ratio Perm	c0.04		0.01	0.01					0.00			0.02
v/c Ratio	0.17	0.04	0.04	0.05	0.02		0.34	0.59	0.01		0.35	0.03
Uniform Delay, d1	35.6	34.4	34.4	34.5	34.3		54.8	10.3	6.2		12.8	10.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.91	1.01	1.90		1.00	1.00
Incremental Delay, d2	0.2	0.0	0.0	0.3	0.0		0.7	0.7	0.0		0.3	0.1
Delay (s)	35.8	34.4	34.5	34.8	34.3		50.7	11.1	11.8		13.1	10.4
Level of Service	D	C	C	C	C		D	B	B		B	B
Approach Delay (s)		35.0			34.6			12.7			13.0	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	52.0%	ICU Level of Service	A	
Analysis Period (min)	15			

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	217	86	309	374	185	106	38	87	40	13	14
Future Volume (vph)	84	217	86	309	374	185	106	38	87	40	13	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2	
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92	
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)	1770	4868		1770	3539	1583	1770	3539	1583	1770	3256	
Flt Permitted	0.51	1.00		0.54	1.00	1.00	0.74	1.00	1.00	0.73	1.00	
Satd. Flow (perm)	947	4868		1008	3539	1583	1372	3539	1583	1356	3256	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	47	241	96	343	416	206	118	42	97	44	14	16
RTOR Reduction (vph)	0	28	0	0	0	61	0	0	76	0	13	0
Lane Group Flow (vph)	47	309	0	343	416	145	118	42	21	44	17	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	84.7	84.7		84.7	84.7	84.7	25.8	25.8	25.8	25.8	25.8	
Effective Green, g (s)	84.7	84.7		84.7	84.7	84.7	25.8	25.8	25.8	25.8	25.8	
Actuated g/C Ratio	0.71	0.71		0.71	0.71	0.71	0.22	0.22	0.22	0.22	0.22	
Clearance Time (s)	5.3	5.3		5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	668	3435		711	2497	1117	294	760	340	291	700	
v/s Ratio Prot		0.06			0.12			0.01			0.01	
v/s Ratio Perm	0.05			c0.34		0.09	c0.09		0.01	0.03		
v/c Ratio	0.07	0.09		0.48	0.17	0.13	0.40	0.06	0.06	0.15	0.02	
Uniform Delay, d1	5.5	5.5		7.9	5.9	5.7	40.5	37.4	37.5	38.2	37.2	
Progression Factor	0.85	0.83		1.76	1.06	3.60	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.1		2.2	0.1	0.2	4.0	0.1	0.3	1.1	0.1	
Delay (s)	4.9	4.7		16.1	6.4	20.8	44.5	37.6	37.8	39.3	37.2	
Level of Service	A	A		B	A	C	D	D	D	D	D	
Approach Delay (s)		4.7			12.9			40.8			38.5	
Approach LOS		A			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.5	
Intersection Capacity Utilization	48.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	350	32	75	278	83	179	21	304	227	26	105
Future Volume (vph)	78	350	32	75	278	83	179	21	304	227	26	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2	
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	
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)	1770	5021		1770	3539	1583	1770	3539	1583	1770	3114	
Flt Permitted	0.56	1.00		0.49	1.00	1.00	0.66	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1050	5021		922	3539	1583	1228	3539	1583	1381	3114	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	43	389	36	83	309	92	199	23	338	252	29	117
RTOR Reduction (vph)	0	9	0	0	0	29	0	0	257	0	89	0
Lane Group Flow (vph)	43	416	0	83	309	63	199	23	81	252	57	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	81.7	81.7		81.7	81.7	81.7	28.8	28.8	28.8	28.8	28.8	
Effective Green, g (s)	81.7	81.7		81.7	81.7	81.7	28.8	28.8	28.8	28.8	28.8	
Actuated g/C Ratio	0.68	0.68		0.68	0.68	0.68	0.24	0.24	0.24	0.24	0.24	
Clearance Time (s)	5.3	5.3		5.3	5.3	5.3	4.2	4.2	4.2	4.2	4.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	714	3418		627	2409	1077	294	849	379	331	747	
v/s Ratio Prot		0.08			0.09			0.01			0.02	
v/s Ratio Perm	0.04			c0.09		0.04	0.16		0.05	c0.18		
v/c Ratio	0.06	0.12		0.13	0.13	0.06	0.68	0.03	0.21	0.76	0.08	
Uniform Delay, d1	6.4	6.7		6.7	6.7	6.4	41.4	34.9	36.5	42.4	35.3	
Progression Factor	0.92	0.92		0.21	0.21	0.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.1		0.4	0.1	0.1	11.9	0.1	1.3	15.2	0.2	
Delay (s)	6.0	6.2		1.8	1.5	0.1	53.2	34.9	37.8	57.6	35.5	
Level of Service	A	A		A	A	A	D	C	D	E	D	
Approach Delay (s)		6.2			1.3			43.2			49.5	
Approach LOS		A			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.30			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.5	
Intersection Capacity Utilization	50.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

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10: Loop 101 SB Ramps & Princess Dr/Pima Rd
HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	218	143	1282	611	0	0	0	0	467	585	208
Future Volume (vph)	0	218	143	1282	611	0	0	0	0	467	585	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0					5.9	5.9	5.9
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3167	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3167	1441
Peak-hour factor, PHF	0.90	0.80	0.80	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	272	179	1424	719	0	0	0	0	519	688	245
RTOR Reduction (vph)	0	0	110	0	0	0	0	0	0	0	1	148
Lane Group Flow (vph)	0	273	69	1424	719	0	0	0	0	400	831	72
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		22.0	22.0	40.6	49.8					39.5	39.5	39.5
Effective Green, g (s)		22.0	22.0	40.6	49.8					39.5	39.5	39.5
Actuated g/C Ratio		0.18	0.18	0.34	0.41					0.33	0.33	0.33
Clearance Time (s)		6.0	6.0	6.0	6.0					5.9	5.9	5.9
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		932	510	1161	2110					529	1042	474
v/s Ratio Prot		0.05		c0.41	c0.14					0.25	c0.26	
v/s Ratio Perm			0.02									0.05
v/c Ratio		0.29	0.13	1.23	0.34					0.76	0.80	0.15
Uniform Delay, d1		42.3	41.0	39.7	23.9					35.9	36.6	28.4
Progression Factor		1.06	1.26	1.36	0.53					1.00	1.00	1.00
Incremental Delay, d2		0.8	0.5	108.3	0.4					6.1	4.3	0.2
Delay (s)		45.4	52.1	162.4	13.0					42.0	40.9	28.6
Level of Service		D	D	F	B					D	D	C
Approach Delay (s)		48.1			112.3			0.0			39.4	
Approach LOS		D			F			A			D	

Intersection Summary				
HCM 2000 Control Delay	79.0	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.9	
Intersection Capacity Utilization	82.8%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

10: Loop 101 SB Ramps & Princess Dr/Pima Rd
HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	511	436	867	321	0	0	0	0	341	295	94
Future Volume (vph)	0	511	436	867	321	0	0	0	0	341	295	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0					5.9	5.9	5.9
Lane Util. Factor		0.91	0.88	0.97	0.91					0.91	0.86	0.91
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	2787	3433	5085					1610	3149	1441
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		5085	2787	3433	5085					1610	3149	1441
Peak-hour factor, PHF	0.90	0.85	0.85	0.90	0.85	0.90	0.90	0.90	0.90	0.90	0.85	0.85
Adj. Flow (vph)	0	601	513	963	378	0	0	0	0	379	347	111
RTOR Reduction (vph)	0	0	226	0	0	0	0	0	0	0	1	68
Lane Group Flow (vph)	0	601	287	963	378	0	0	0	0	239	497	32
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					3	3	
Permitted Phases			2									3
Actuated Green, G (s)		27.9	27.9	35.6	41.3					38.6	38.6	38.6
Effective Green, g (s)		27.9	27.9	35.6	41.3					38.6	38.6	38.6
Actuated g/C Ratio		0.23	0.23	0.30	0.34					0.32	0.32	0.32
Clearance Time (s)		6.0	6.0	6.0	6.0					5.9	5.9	5.9
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1182	647	1018	1750					517	1012	463
v/s Ratio Prot		c0.12		c0.28	0.07					0.15	c0.16	
v/s Ratio Perm			0.10									0.02
v/c Ratio		0.51	0.44	0.95	0.22					0.46	0.49	0.07
Uniform Delay, d1		40.1	39.4	41.3	27.9					32.4	32.8	28.2
Progression Factor		0.94	0.88	1.92	0.43					1.00	1.00	1.00
Incremental Delay, d2		1.5	2.1	14.8	0.2					0.7	0.4	0.1
Delay (s)		39.1	36.8	94.0	12.2					33.1	33.2	28.3
Level of Service		D	D	F	B					C	C	C
Approach Delay (s)		38.0			71.0			0.0			32.6	
Approach LOS		D			E			A			C	

Intersection Summary				
HCM 2000 Control Delay	50.1	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)	17.9	
Intersection Capacity Utilization	67.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	622	0	0	1526	354	366	443	1034	0	0	0
Future Volume (vph)	63	622	0	0	1526	354	366	443	1034	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	5.9	5.9	5.9			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3362	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3362	2787			
Peak-hour factor, PHF	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	79	691	0	0	1696	393	407	521	1149	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	152	0	0	771	0	0	0
Lane Group Flow (vph)	79	691	0	0	1696	241	301	627	378	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	12.8	22.0			49.8	49.8	39.5	39.5	39.5			
Effective Green, g (s)	12.8	22.0			49.8	49.8	39.5	39.5	39.5			
Actuated g/C Ratio	0.11	0.18			0.41	0.41	0.33	0.33	0.33			
Clearance Time (s)	6.0	6.0			6.0	6.0	5.9	5.9	5.9			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	188	648			2659	656	529	1106	917			
v/s Ratio Prot	c0.04	c0.20			c0.26		c0.19	0.19				
v/s Ratio Perm						0.15			0.14			
v/c Ratio	0.42	1.07			0.64	0.37	0.57	0.57	0.41			
Uniform Delay, d1	50.1	49.0			27.9	24.2	33.2	33.2	31.2			
Progression Factor	0.78	1.06			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	1.2	51.1			1.2	1.6	1.4	0.7	0.3			
Delay (s)	40.1	103.3			29.1	25.8	34.6	33.9	31.5			
Level of Service	D	F			C	C	C	C	C			
Approach Delay (s)		96.8			28.5			32.7			0.0	
Approach LOS		F			C			C			A	

Intersection Summary				
HCM 2000 Control Delay	40.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.9	
Intersection Capacity Utilization	82.8%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	241	606	0	0	1070	313	154	546	1045	0	0	0
Future Volume (vph)	241	606	0	0	1070	313	154	546	1045	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	5.9	5.9	5.9			
Lane Util. Factor	1.00	0.95			0.86	1.00	0.91	0.91	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3539			6408	1583	1610	3386	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3539			6408	1583	1610	3386	2787			
Peak-hour factor, PHF	0.85	0.90	0.90	0.90	0.85	0.90	0.85	0.85	0.90	0.90	0.90	0.90
Adj. Flow (vph)	284	673	0	0	1259	348	181	642	1161	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	76	0	0	706	0	0	0
Lane Group Flow (vph)	284	673	0	0	1259	272	163	660	455	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		7	7				
Permitted Phases						6			7			
Actuated Green, G (s)	22.2	27.9			41.3	41.3	38.6	38.6	38.6			
Effective Green, g (s)	22.2	27.9			41.3	41.3	38.6	38.6	38.6			
Actuated g/C Ratio	0.18	0.23			0.34	0.34	0.32	0.32	0.32			
Clearance Time (s)	6.0	6.0			6.0	6.0	5.9	5.9	5.9			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	327	822			2205	544	517	1089	896			
v/s Ratio Prot	c0.16	c0.19			c0.20		0.10	c0.19				
v/s Ratio Perm						0.17			0.16			
v/c Ratio	0.87	0.82			0.57	0.50	0.32	0.61	0.51			
Uniform Delay, d1	47.5	43.7			32.1	31.2	30.7	34.3	33.0			
Progression Factor	1.18	0.74			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	19.0	8.0			1.1	3.3	0.4	1.0	0.5			
Delay (s)	75.1	40.2			33.2	34.4	31.1	35.3	33.5			
Level of Service	E	D			C	C	C	D	C			
Approach Delay (s)		50.6			33.5			33.9			0.0	
Approach LOS		D			C			C			A	

Intersection Summary				
HCM 2000 Control Delay	37.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.9	
Intersection Capacity Utilization	67.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

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APPENDIX J

QUEUE STORAGE ANALYSIS

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Signalized Intersections
2030

Average Vehicle Length, VL (Per Table 9-23, AASHTO "Green Book" 2018, p 9-99)

Intersection Cycle Length (sec): 120

Cycles per Hour: 30 Queuing Cycles: 2

Truck % = 2% *VL* (ft) = 25 Average Vehicle Length

Table 9-23	
Truck%	VL (ft)
0%	25
2%	25
10%	32
15%	35
20%	38
25%	41

Equation Used Storage Length, SL, = 2 x (vehicles/hour)/(cycles/hour) x Average Vehicle Length

Intersection	Cycle Length	Move-ment	AM Peak (veh/hr)	Midday Peak (veh/hr)	PM Peak (veh/hr)	Max vehs per 2 cycles	AASHTO Storage Length (ft)	Synchro 95th %-ile Q
Hayden Rd & Mayo Blvd/Axon Wy	120	NB Left	89	0	95	7	175'	70'
	120	SB Left	342	0	463	31	775'	260'
	120	EB Left	256	0	528	36	900'	370'
	120	WB Left	144	0	117	10	250'	215'
	120	NB Right	79	0	133	9	225'	75'
	120	SB Right	327	0	261	22	550'	60'
	120	WB Right	515	0	515	35	875'	140'
Hayden Rd & Princess Dr	120	NB Left	35	0	86	6	150'	25'
	120	SB Left	146	0	73	10	250'	40'
	120	WB Left	195	0	312	21	525'	0'
	120	NB Right	150	0	142	10	250'	25'
	120	SB Right	53	0	64	5	125'	25'
	120	EB Right	63	0	58	5	125'	50'
Hayden Rd & Loop 101 EB Ramps	120	SB Left	495	0	506	34	850'	275'
	120	EB Left	685	0	433	46	1,150'	405'
	120	NB Right	355	0	388	26	650'	220'
	120	EB Right	913	0	609	61	1,525'	55'
Hayden Rd & Loop 101 WB Ramps	120	NB Left	596	0	1,027	69	1,725'	1375'
	120	WB Left	328	0	350	24	600'	200'
	120	SB Right	324	0	481	33	825'	175'
	120	WB Right	562	0	485	38	950'	85'
Hayden Rd & Legacy Blvd	120	NB Left	107	0	155	11	275'	125'
	120	SB Left	0	0	0	0	'	0'
	120	EB Left	25	0	70	5	125'	85'
	120	WB Left	10	0	8	1	25'	25'
	120	NB Right	4	0	6	1	25'	25'
	120	SB Right	36	0	51	4	100'	25'
	120	EB Right	98	0	199	14	350'	190'
	120	WB Right	0	0	0	0	'	0'
Perimeter Dr & Princess Dr	120	NB Left	106	0	179	12	300'	180'
	120	SB Left	65	0	239	16	400'	235'
	120	EB Left	84	0	78	6	150'	40'
	120	WB Left	309	0	75	21	525'	350'
	120	NB Right	87	0	304	21	525'	135'
Loop 101 SB Ramps @ Princess Dr/Pima Rd	120	SB Left	467	0	341	32	800'	650'
	120	WB Left	1,282	0	867	86	2,150'	590'
	120	SB Right	208	0	94	14	350'	60'
	120	EB Right	168	0	448	30	750'	140'
Loop 101 NB Ramps @ Princess Dr/Pima Rd	120	NB Left	375	0	175	25	625'	460'
	120	EB Left	63	0	241	17	425'	310'
	120	NB Right	1,034	0	1,045	70	1,750'	135'
	120	WB Right	354	0	313	24	600'	255'

*Note: Truck/Passenger Vehicle split is projected based on percentage and not reflective of acctual vehicle classification counts.

"Yield" for turns indicates that, while movement may or may not be subject to a Yield sign, vehicles must yield to oncoming traffic and may experience delays.

Unsignalized Intersections

2030

Truck % = 2% *VL* (ft) = *25'* Average Vehicle Length

Table 9-23	
Truck%	**VL (ft)**
0%	25
2%	25
5%	28
10%	32
20%	38
25%	41

Left Turns (Per AASHTO "Green Book" 2018, pp 9-96 to 9-99)

Equation 9-3	*Equation 9-4*
U.S. Customary	**U.S. Customary**
$c = \frac{V_o e^{-V_o t_c/3600}}{1 - e^{-V_o t_f/3600}}$	$SL = \left\{ \frac{\ln[P(n>N)]}{\ln\left[\frac{v}{c}\right]} - 1 \right\} \times VL$
where:	where:
c = left-turn capacity, veh/h	SL = storage length, ft
V_o = major-road volume conflicting with the minor movement, assumed to be equal to one-half of the two-way major-road volume, veh/h	$P(n>N)$ = probability of turn-lane overflow
t_c = critical gap, s	v = left-turn vehicle volume, veh/h
t_f = follow-up gap, s	c = left-turn capacity, veh/h
	VL = average length per vehicle, ft

Per Section 9.7.2.2 Storage Length

c (veh/hr) =	*calculated*	Left-Turn Capacity
V_O (veh/hr) =	Opposing	Major Road Volume
t_c (sec) =	6.25	85th %-ile Critical Gap
t_f (sec) =	2.50	Follow-Up Gap
SL (ft) =	*calculated*	Storage Length
$P(n>N)$ =	0.005	(a probability, no units)
v (veh/hr) =	*enter below*	Left-Turn Vehicle Volume

Left Turns if above is unsuitable: storage length = 2 x (vehicles/hour)/(60 minutes/hour) x average vehicle length

Right Turns: storage length = 2 x (vehicles/hour)/(60 minutes/hour) x average vehicle length

Intersection	Move-ment	AM Peak (veh/hr)	Midday Peak (veh/hr)	PM Peak (veh/hr)	Veh per 2 minutes	Opposing V_O (veh/hr)	AASHTO Storage Length (ft)	Synchro 95th %-ile Q
82nd St & Princess Dr	NB Left	3	0	15	1	No Calculation	25'	25'
	SB Left	42	0	36	2	No Calculation	50'	30'
	EB Left	45	0	85	3	No Calculation	75'	25'
	WB Left	8	0	24	1	No Calculation	25'	25'
Access C & Axon Wy	EB Left	156	0	365	13	No Calculation	325'	45'
Axon Wy & Access E	SB Left	28	0	25	1	No Calculation	25'	25'
Axon Wy & Access F	NB Left	4	0	9	1	No Calculation	25'	0'
	SB Left	69	0	5	3	No Calculation	75'	25'
Hayden Rd & Union Hills Dr/Mayo Blvd	NB Left	19	0	44	2	No Calculation	50'	25'
	SB Left	4	0	24	1	No Calculation	25'	0'
	NB Right	1	0	1	1	No Calculation	25'	0'
	SB Right	13	0	64	3	No Calculation	75'	0'

*Note: Truck/Passenger Vehicle split is projected based on percentage and not reflective of acctual vehicle classification counts.

"Yield" for turns indicates that, while movement may or may not be subject to a Yield sign, vehicles must yield to oncoming traffic and may experience delays.

Signalized Intersections
Total Traffic: ADOT Queue Storage Calculations
2030

Average Vehicle Length (ft): 25 Cycle Length (sec): 120 Cycles per Hour: 30

Queue Storage Equations:

Queue Length = 1.5 x (vehicles/hour) ÷ (30 cycles/hour) x average vehicle length*

Storage Length = Braking Distance + Queue Length

Turn Lane Length = Storage Length – [Gap – 2/3 Gap]

*** ADOT TGP 430 allows for queues to be calculated for 1.5 to 2.0 cycles.**

Gap					Minimum			Desired	
Design Speed (mph)	Gap (ft)	2/3 Gap (ft)	Calculated Gap (ft)	Design Speed (mph)	Entering Speed (mph)	Braking Speed (mph)	Braking Distance (ft)	Braking Speed (mph)	Braking Distance (ft)
< 40mph	60	40	20	30	20	20	20	29	80
40-50mph	90	60	30	35	25	25	40	34	115
> 50mph	140	95	45	40	30	29	50	38	150
				45	35	34	85	43	200
				50	40	38	120	47	245
				55	45	42	145	52	300
				60	50	47	200	56	360
				65	55	52	265	60	415
				70	60	56	315	64	490
				75	65	61	400	70	585

* ADOT Queue length: minimum queue length is 2 vehicles (2 cars or 1 car+1 truck), which can be reduced by 20 feet for a free right turn movement.
Synchro Queue length: is the 95th percentile queue calculated by Synchro sofeware with HCM 6th edition methodology.

Intersection	Movement	Cycle Length	[M]in. or [D]esired	Posted Approach Speed	Gap Length (ft)	Flow of Turn	AM Peak (veh/hr)	Midday Peak (veh/hr)	PM Peak (veh/hr)	Trucks> 10% (Y if Yes)	Max vehs per 1.5 cycles	ADOT Queue Length (ft)*	Desired Braking Distance (ft)	Turn Lane Length (ft)
Hayden Rd & Loop 101 EB Ramps	SB Left		D	45	**140**		495		506	N	26	650	300	**903**
	EB Left		D	40	**90**		685		433	N	35	875	200	**1045**
	NB Right		D	40	**90**		355		388	N	20	500	200	**670**
	EB Right		D	40	**90**		913		609	N	46	1150	200	**1320**
Hayden Rd & Loop 101 WB Ramps	NB Left	120	D	40	**90**		596		1,027	N	52	1300	200	**1470**
	WB Left		D	40	**90**		328		350	N	18	450	200	**620**
	SB Right		D	45	**140**		324		481	N	25	625	300	**878**
	WB Right		D	40	**90**		562		485	N	29	725	200	**895**
Loop 101 SB Ramps @ Princess Dr/Pima Rd	SB Left		D	40	**90**		467		341	N	24	600	200	**770**
	WB Left		D	45	**140**		1,282		867	N	65	1625	300	**1878**
	SB Right		D	40	**90**		208		94	N	11	275	200	**445**
	EB Right		D	35	**90**		168		448	N	23	575	150	**695**
Loop 101 NB Ramps @ Princess Dr/Pima Rd	NB Left	120	D	40	**90**		375		175	N	19	475	200	**645**
	EB Left		D	35	**90**		63		241	N	13	325	150	**445**
	NB Right		D	40	**90**		1,034		1,045	N	53	1325	200	**1495**
	WB Right		D	45	**140**		354		313	N	18	450	300	**703**

"Yield" for turns indicates that, while movement may or may not be subject to a Yield sign, vehicles must yield to oncoming traffic and may experience delays.

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	380	383	1014	1138	248	582	896
v/c Ratio	0.76	0.77	0.66	0.54	0.40	0.88	0.80
Control Delay	49.4	49.7	4.2	28.9	7.4	47.7	33.3
Queue Delay	0.2	0.2	0.0	0.1	0.0	0.0	0.0
Total Delay	49.6	49.9	4.2	29.0	7.4	47.7	33.3
Queue Length 50th (ft)	276	278	0	159	22	128	131
Queue Length 95th (ft)	401	403	50	189	76	168	174
Internal Link Dist (ft)		626		363			349
Turn Bay Length (ft)	430		430		220		
Base Capacity (vph)	518	519	1560	2110	613	686	1122
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	8	8	0	177	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.75	0.65	0.59	0.40	0.85	0.80

Intersection Summary

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	245	242	677	1891	388	595	961
v/c Ratio	0.86	0.84	0.65	0.63	0.46	1.01	0.90
Control Delay	75.5	73.7	6.6	38.3	16.4	70.5	35.8
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	75.5	73.7	6.6	38.4	16.4	70.5	35.8
Queue Length 50th (ft)	194	191	0	415	143	~186	164
Queue Length 95th (ft)	#338	#301	55	m481	m219	m#272	m177
Internal Link Dist (ft)		626		363			349
Turn Bay Length (ft)	430		430		220		
Base Capacity (vph)	294	295	1046	3011	835	591	1063
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	152	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.82	0.65	0.66	0.46	1.01	0.90

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.
m Volume for 95th percentile queue is metered by upstream signal.

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Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	366	349	343	662	1039	1287	225
v/c Ratio	0.36	0.60	0.50	1.15	0.58	0.83	0.51
Control Delay	34.1	21.2	6.0	118.1	29.8	36.4	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	34.1	21.2	6.0	118.1	30.1	36.4	14.2
Queue Length 50th (ft)	112	113	0	~621	147	251	98
Queue Length 95th (ft)	155	169	72	#837	199	272	172
Internal Link Dist (ft)		715			349	868	
Turn Bay Length (ft)	495		495				235
Base Capacity (vph)	1058	603	700	575	1794	1553	440
Starvation Cap Reductn	0	0	0	0	208	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	0.35	0.58	0.49	1.15	0.66	0.83	0.51

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.



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	414	297	291	1141	1189	1407	267
v/c Ratio	0.71	0.72	0.59	1.20	0.47	0.96	0.60
Control Delay	54.3	28.1	10.1	117.9	12.0	51.0	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	54.3	28.1	10.1	117.9	12.2	51.0	8.2
Queue Length 50th (ft)	156	85	0	~1100	102	233	6
Queue Length 95th (ft)	197	170	85	#1371	90	#260	43
Internal Link Dist (ft)		715			349	868	
Turn Bay Length (ft)	495		495				235
Base Capacity (vph)	600	422	503	954	2542	1472	447
Starvation Cap Reductn	0	0	0	0	552	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	0.69	0.70	0.58	1.20	0.60	0.96	0.60

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.

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Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	273	198	1424	729	400	831	220
v/c Ratio	0.30	0.32	0.90	0.24	1.28	1.35	0.48
Control Delay	42.0	14.2	28.6	8.4	189.0	205.6	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	14.2	28.6	8.4	189.0	205.6	9.2
Queue Length 50th (ft)	67	14	272	59	~431	~492	0
Queue Length 95th (ft)	84	42	m297	m66	#647	#584	59
Internal Link Dist (ft)	573			358		915	
Turn Bay Length (ft)		245	240		355		355
Base Capacity (vph)	910	621	1639	2995	312	616	457
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	0.30	0.32	0.87	0.24	1.28	1.35	0.48

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.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	601	527	963	402	239	496	100
v/c Ratio	0.54	0.60	1.03	0.26	0.44	0.46	0.18
Control Delay	50.5	24.7	102.4	20.6	32.8	31.9	5.8
Queue Delay	0.0	0.0	10.2	0.0	0.0	0.0	0.0
Total Delay	50.5	24.7	112.6	20.6	32.8	31.9	5.8
Queue Length 50th (ft)	163	90	~455	26	151	167	0
Queue Length 95th (ft)	193	137	#589	57	232	206	35
Internal Link Dist (ft)	573			358		915	
Turn Bay Length (ft)		245	240		355		355
Base Capacity (vph)	1114	880	932	1539	580	1137	583
Starvation Cap Reductn	0	0	25	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	0.54	0.60	1.06	0.26	0.41	0.44	0.17

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.

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Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	79	691	1696	393	304	632	1149
v/c Ratio	0.59	1.09	0.45	0.40	0.97	0.97	0.78
Control Delay	29.7	99.6	14.8	11.1	93.4	76.7	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	99.6	14.8	11.1	93.4	76.7	6.8
Queue Length 50th (ft)	57	~347	217	113	259	269	0
Queue Length 95th (ft)	m62	m#276	247	185	#458	#357	60
Internal Link Dist (ft)		358	1200			645	
Turn Bay Length (ft)	265			285	275		280
Base Capacity (vph)	147	634	3775	980	312	652	1467
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	6	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	1.09	0.45	0.40	0.97	0.97	0.78

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.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	284	673	1259	348	185	662	1161
v/c Ratio	0.83	0.87	0.65	0.60	0.34	0.57	0.72
Control Delay	77.9	43.2	39.5	27.0	30.7	34.2	7.7
Queue Delay	0.0	0.0	0.1	0.0	1.2	4.9	0.0
Total Delay	77.9	43.2	39.5	27.0	31.9	39.1	7.7
Queue Length 50th (ft)	237	124	256	139	113	221	51
Queue Length 95th (ft)	310	#179	286	255	169	264	132
Internal Link Dist (ft)		358	1200			645	
Turn Bay Length (ft)	265			285	275		280
Base Capacity (vph)	398	775	1940	579	580	1220	1636
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	49	0	227	478	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.87	0.67	0.60	0.52	0.89	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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APPENDIX K

SIGHT DISTANCE ANALYSIS

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CITY OF SCOTTSDALE

DESIGN STANDARDS & POLICIES MANUAL

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B. **Superelevation Rate Greater than 0.02 ft/ft**
A superelevation rate greater than 0.02 ft/ft may not be used except when approved by the Transportation Department. In no case shall a superelevation exceed 0.06 ft/ft

C. **Transition for Superelevation**
The length of superelevation transition is based on the superelevation rate and the width of rotation. The axis of rotation is generally the pavement centerline. The transition lengths for a superelevation rate of 0.02 ft/ft are provided in Appendix 5-3A. For other superelevation rates, refer to the AASHTO's Policy on Geometric Design.
In designing the beginning or ending of a horizontal curve, 1/3 of the transition is on the curve and 2/3 of the transition is on the tangent pavement section.

D. **Drainage on Superelevated Curves**
Whenever superelevation is allowed on a divided street, a storm drainage system must be provided to collect the runoff along the median curb. Nuisance water from the higher traveled area is not allowed to cross the lower traveled area.

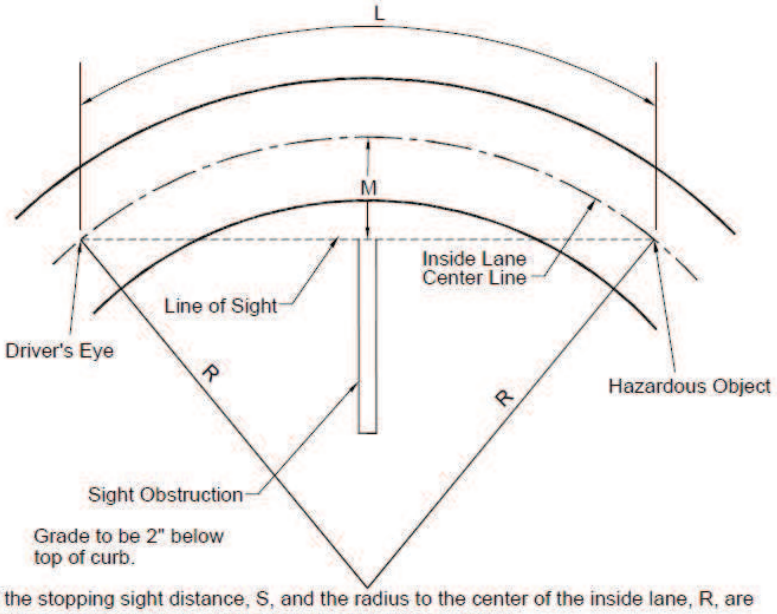
HORIZONTAL CURVES 5-3.120

Horizontal alignments need to provide safe and continuous operation of motor vehicles at a uniform design speed for substantial lengths of street. At a minimum, a horizontal curve is typically required when the angle of change in horizontal alignment is equal to or greater than two degrees. The nature of the surrounding development and topography, and the street classification will establish the factors that determine the radius of a curve.

A. **Minimum Radii of Curvature**
The minimum radius of curvature is determined by the design speed or by the stopping sight distance.

1. Minimum Radii Based on Design Speed
Appendix 5-3A contains the minimum radius of curvature depending on design speed with and without a superelevation rate of 0.02 ft/ft. Wherever possible, the radii used in design needs to be larger. If stopping sight distance conditions require a larger radius than that shown in these appendices, then that larger radius becomes the minimum radius for the curve.
2. Consideration of Stopping Sight Distance
When walls, buildings, bridge piers, cut slopes, vegetation, or other obstructions are near the roadway on the inside of a curve, they can block a driver's view of the road ahead. If they are too near, the driver will not have sufficient distance along the curved roadway to stop when a hazardous condition comes into view. For design, the driver's eye is 3.5 feet above the center of the inside lane (the driving lane nearest to the inside of the curve) and a hazardous condition is an object 2.0 feet high in the center of the inside lane, or per currently accepted AASHTO standards. The clear distance, "M" is measured from the center of the inside lane to the view obstruction. Figure 5-3.27 depicts these relationships.
Refer to AASHTO "A Policy on Geometric Design of Highways and Streets" Section 3-3.12 for Stopping Sight Distance calculations.

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If the stopping sight distance, S, and the radius to the center of the inside lane, R, are known, the distance, M, is found by the following equation:

$$M = R[1-COS(28.65\ S/R)]$$

If the radius, R, and the distance, M, are tentatively selected, then the length, L, of the arc in the middle of the inside lane may be found by the following equation:

$$L = (R/28.65)ARRCCOS[(R-M)/R]$$

If the length, L, is less than the stopping sight distance for the desired speed, either the radius, R, or the distance, M, must be increased.

FIGURE 5-3.24 VIEW OBSTRUCTIONS AND HORIZONTAL CURVES

B. **Reduced Design Speeds on Curves**
The reduction of a street design speed on a curve should be avoided; however, where physical restrictions prohibit increasing the radius of the curve or the clear distance, "M" and/or provide superelevation; the design speed for the curved section may be reduced. In such circumstances, appropriate signage in accordance with the MUTCD is required. The difference between the design speed for the roadway approaching the curve and the design speed for the curve cannot be greater than 10 miles per hour. The design speed for a curved roadway section must not be reduced if the reduction occurs at the end of a long tangent or at any location where high approach speeds may be expected.

C. **Compound Curves**
Compound curves should be avoided; however, if site conditions make the use of compound curves unavoidable, the shorter radius needs to be at least 2/3 the length of the longer radius. Compound curves are not permitted when design speeds require the shorter radius to be greater than 1,000 feet.

D. **Tangent Sections Between Curves in the Same Direction**
On two-lane roads, tangent sections are needed between two curves in the same direction. If the pavement cross-sections throughout the curves do not have

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superelevation then the minimum lengths for tangent sections are listed in Appendix 5-3A.
If superelevation is provided in the curved portions of the roadway, then the superelevation transition lengths indicated will determine the tangent lengths.

E. **Tangent Sections Between Reverse Curves**
Generally, a tangent section must be provided between two curves that curve in the opposite direction. Minimum lengths for tangent sections between reverse curves without superelevation are provided in Appendix 5-3A. If the curve radii are at least 50 percent greater than the radii required by the design speed, a tangent section may not be required depending on grades, topography and vegetation. If superelevation is provided for the curves, then the superelevation transition lengths indicated will determine the minimum length of tangent sections between reverse curves.

F. **Tangent Sections Approaching Intersections**
A tangent section must be provided between a street intersection and a curve unless otherwise approved by the Transportation Department. The minimum tangent length is shown in Appendix 5-3A and shall be measured from the end of the curve to the edge of the intersecting roadway.

VERTICAL ALIGNMENT 5-3.121

A vertical curve is required when grade changes are equal to or greater than 1.5 percent. All sections of a street's vertical alignment must meet passing and stopping sight distance requirements for the design speed established for the street. For specific details, refer to the AASHTO's Policy on Geometric Design.

A. **Longitudinal Street Grades**
For arterial streets, the maximum longitudinal grade is 6 percent. For non-ESL/Rural collector and local streets, the maximum grade is 9 percent. The minimum longitudinal street grade for all streets is 0.4 percent. Wherever possible, longitudinal street grades greater than the minimum grade are to be provided. Where necessary, grades less than 0.4 percent may be used with approval from the Public Works Department and/or Transportation Department. Grades that exceed the maximum longitudinal grades allowed may be used with approval from the Transportation, Public Works, and Fire Departments.

B. **Vertical Curves**
Properly designed vertical curves should provide adequate sight distance, safety and effective drainage.

1. Refer to AASHTO's Policy on Geometric Design of Highways and Streets for the equations that are to be used to determine the necessary parabolic vertical curve criteria.
2. Sight Distance Requirements
Sight distance is the continuous length of street ahead that is visible to the driver. For vertical alignment design, two sight distances are considered: passing sight distance and stopping sight distance. Stopping sight distance is the minimum sight distance to be provided at all points on multi-lane streets and on 2-lane streets when passing sight distance is not economically obtainable as approved by city staff. Stopping sight distance needs to be

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provided near intersections. Appendix 5-3Alists the minimum stopping sight distances for the various design speeds.

a. Stopping Sight Distance
The minimum stopping sight distance is the distance required by the driver of a vehicle, traveling at a given speed, to bring the vehicle to a stop after an object on the road becomes visible. Stopping sight distance is measured from the driver's eyes, 3.5 feet above the pavement surface, to object 2.0 feet tall on the roadway, or per currently accepted AASHTO standards.

b. Passing Sight Distance
Passing sight is the minimum sight distance that must be available to enable the driver of one vehicle to pass another vehicle safely, without interfering with the speed of an oncoming vehicle. The sight distance available for passing at any one place is the distance at which a driver, whose eyes are 3.5 feet above the roadway surface, can see the top 0.8 feet of an object 4.35 feet tall on the road (corresponding to an object height of 3.5 feet tall), or per currently accepted AASHTO standards.

3. Minimum Vertical Curve Lengths
Minimum vertical curve lengths are determined by sight distance requirements for a given design speed.

a. Crest Vertical Curve Lengths
Minimum crest curve lengths are determined by either the stopping sight distance or the passing sight distance, whichever provides the greatest curve length. Refer to AASHTO's Policy on Geometric Design of Highways and Streets for the equations that are to be used to determine the minimum crest vertical curve lengths based upon stopping distance and passing sight distance requirements.

b. Sag Vertical Curve Lengths
Minimum sag vertical curve lengths are determined by either the stopping sight distance or comfort factors. The longer of the two possible minimum curve lengths will be used. Refer to AASHTO's Policy on Geometric Design of Highways and Streets for the equations that are to be used to determine the minimum sag vertical curve lengths based upon stopping distance and comfort factors requirements.

COMBINED CURVES 5-3.122

When horizontal and vertical curves are combined, the horizontal curve needs to lead and follow the vertical curve, and not be introduced near the top or bottom of a crest vertical curve or bottom of a sag vertical curve. For additional information on this topic, refer to the AASHTO's Policy on Geometric Design.

INTERSECTIONS 5-3.123

Although all intersections share certain common elements, they are not subject to generalized treatment. To minimize conflicts and provide for anticipated traffic movements, each intersection must be evaluated based on individual characteristics and designed based on the following factors:

A. Traffic factors such as capacities, turning movements, vehicle size and operating characteristics, vehicle speed, pedestrian and bicycle movements, transit operations and collision history.
B. Physical factors such as topography, existing conditions, channelization requirements and available sight distance.
C. Human factors such as driving habits, reaction to surprises, decision and reaction time, and natural paths of movement.

Unless otherwise noted, intersection and street design for major collectors and arterial streets shall assume a WB-62 design vehicle as defined in AASHTO's A Policy on Geometric Design of Highways and Streets. There may be locations within or adjacent to heavy commercial or industrial areas where a WB-67 design vehicle may be required by Transportation staff.

For this section, the term "intersection" shall refer to the location where a public street meets or overlaps another public street, a private street, or a private driveway unless specifically noted otherwise.

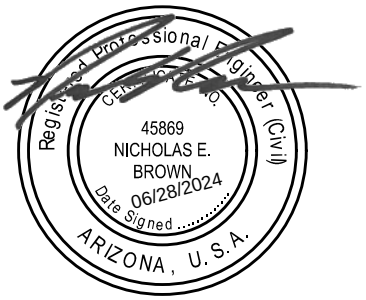
A. **Public and Private Street Intersection Spacing**
Street intersections along major streets should be kept to a minimum. Along arterial streets, the minimum intersection spacing should be 1/4 mile (1320 feet). Along collector streets (major collectors and minor collectors), the minimum spacing should be 1/8 mile (660 feet). Along local streets (local residential and local collectors), the minimum spacing should be 250 feet. New intersections on major streets should be located to align with planned median openings. New intersections on minor streets should be located to avoid creating conflicting turning movements with existing intersections or driveways.

B. **Angle of Intersection**
A right-angle intersection provides the shortest crossing distance for intersecting traffic streams. It also provides the most favorable condition for drivers to judge the relative position and speed of oncoming vehicles. Where special conditions exist, intersection angles may diverge from a right-angle by a maximum of 2 degrees (up to 4 degrees with approval of the Transportation Department) on arterial streets and major collector streets; and by a maximum of 4 degrees (up to 15 degrees with approval of the Transportation Department) on minor and local collector streets, couplets and local streets.

C. **Alignment and Profile**
Intersections occurring on horizontal or crest vertical curves are undesirable. When there is latitude in the selection of intersection locations, vertical or horizontal curvature should be avoided. A line or grade change is frequently warranted when major intersections are involved. If a curve is unavoidable, it should be as flat as site conditions permit. Where the grade of the through roadway is steep, flattening through the intersection is desirable as a safety measure.
The maximum profile grade through an intersection is 6 percent for arterials and collector streets and 8 percent for local streets. The profiles and cross slopes of the intersecting streets need to be coordinated with one another to ensure a safe and comfortable driving surface. Typically, this may mean extending grades through

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CONCEPTUAL WATER DISTRIBUTION SYSTEM
BASIS OF DESIGN REPORT
FOR
AXON WAY & HAYDEN ROAD
June 28, 2024
WP# 205133.04



EXPIRES 03-31-25

13-ZN-2020#2
10/24/2024

WOOD PATEL

June 28, 2024

Mr. Levi Dillon, PE
Sr. Water Resource Engineer
City of Scottsdale
9379 East San Salvador Drive
Scottsdale, Arizona 85258

480.312.5319
ldillon@scottsdaleaz.gov

Re: **Axon Way & Hayden Road**
Conceptual Water Distribution System Basis of Design Report
WP# 205133.04

Dear Mr. Dillon:

The proposed Axon Way & Hayden Road Project is a 74.44-acre site located in the northwest quarter of Section 36, Township 4 North, Range 4 East of the Gila and Salt River Meridian. Specifically, the site is situated at the northeast corner of Hayden Road and Mayo Boulevard. Refer to the Vicinity Map at the end of this report for the project location. Refer to Plate 1 - *Vicinity Map* for the project location.

Phase 1 of this project includes one (1) proposed mixed-use structure, along with associated parking, landscape, hardscape, and utilities, as well as the realignment of Mayo Boulevard to be renamed Axon Way. This report focuses on the improvements planned for Phase 2, which includes five (5) proposed mixed-use structures with associated parking, landscape, hardscape, and utilities. The proposed structures range from three (3) to five (5) stories tall, each with two levels of underground garage parking. Building D will house a four-story hotel, while buildings A, B, C, and E will contain residential units. Buildings C and D will also include commercial space on the ground floor. Building A consists of approximately 486,625 square-feet containing 723 residential units. Building B consists of approximately 265,161 square-feet containing 392 residential unit. Building C consists of approximately 161,436 square-feet containing 233 residential units with 40,957 square-feet of commercial space. Building D consists of approximately 222,730 square-feet containing 425 hotel rooms with 8,529 square-feet of commercial space. Building E consists of approximately 417,927 square-feet containing 627 residential units.

Existing water infrastructure adjacent to the Site includes a public 16-inch waterline within Hayden Road and a public 12-inch waterline within the existing Mayo Boulevard.

The design criteria used to estimate potable water demands and evaluate system hydraulics are based on Wood, Patel & Associates, Inc.'s (WOODPATEL) understanding of the published *City of Scottsdale Design Standards and Policies Manual*, 2018, *City of Phoenix Design Standards Manual for Water and Wastewater Systems*, 2017 and *International Fire Code,* 2015. The following is a summary of the primary design criteria utilized:

Civil Engineering
Water Resources
Land Survey
Construction Management

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EMERITUS
Darrel E. Wood, PE, RLS
Ashok C. Patel, PE, RLS

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- Average Day Water Demand, Office: ..... 8.34×10^{-4} gpm/ sq. ft*
- Average Day Water Demand, Industrial (Phoenix): ..... 9.03×10^{-2} gpm/ 1,000 sq. ft
- Maximum Day Demand: ..... 2.0 x ADD
- Peak Hour Demand: ..... 3.5 x ADD
- Fire Flow Demand ..... 3,625 gpm (7,250 gpm * 50% reduction)
- Minimum Residual Pressure, Peak Hour: ..... 50 psi
- Minimum Residual Pressure, Maximum Day + Fire Flow: ..... 30 psi
- Maximum System Pressure ..... 120 psi
- Maximum Pipe Head Loss, Maximum day Demand ..... 8 ft / 1000 ft
- Maximum Pipe Head Loss, Peak Hour Demand ..... 10 ft / 1000 ft
- Minimum Pipe Diameter, Public Water Line ..... 8 inches

Abbreviations: gpd = gallons per day; sf = square feet; ADD = average day demand; psi = pounds per square inch
*Includes both inside and outside use per Figure 6-1.2, COS Design Standards & Policies Manual

Proposed water infrastructure includes two (2) 12-inch waterline loops. The first proposed loop will be located near the proposed buildings A, B, C, and D and connects to another 16-inch waterline that is a part of the improvements in Phase 1 of this project. The second proposed loop is located near building E. This loop will connect to the existing waterline in Hayden Road and will also connect into waterlines included in the Phase 1 improvements. Fire protection for the project will be provided by a combination of a fire service for building fire sprinklers and proposed fire hydrants that have been located to meet City of Scottsdale coverage requirements. Refer to Plate 2 - Proposed Water System Map for a depiction of the proposed water infrastructure surrounding the Site.

To meet zoning stipulations approximately thirty-one hundred feet of 30-inch waterline is proposed on the north side of the projects parcel along the frontage of Arizona Department of Transportation (ADOT) State Route 101. In addition, approximately seven hundred fifty feet of 30-inch waterline is also proposed on the east side of Hayden Road underneath ADOT's overpass. The 30-inch waterline was not evaluated as part of this report.

The average day water demand for the Site is projected to be approximately 855 gallons per minute (gpm). Maximum day demands and peak hour demands are projected to be 1,713 gpm and 2,997 gpm, respectively (refer to the Calculations and Hydraulic Modeling Results).

WaterCAD V10i, by Haestad Methods, was utilized to analyze the existing water distribution system and proposed improvements. Results from a fire hydrant flow test, conducted on March 12, 2020, by Arizona Flow Testing LLC, were utilized to simulate the City of Scottsdale water supply for the project (refer to Fire Hydrant Flow Test).

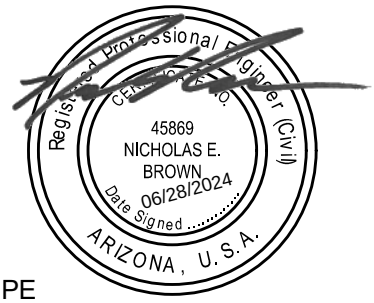
The hydraulic modeling results indicate the proposed system is capable of delivering peak hour demands, totaling 1,713 gpm, to the proposed Site, with pressures ranging from 49 to 67 pounds per square inch (psi).

The *Fire Flow + Max Day* results from the model indicate that while using the reduced flow test results, per City of Scottsdale requirements, the proposed fire flow system can deliver the modeled flow of 2,000 gpm while maintaining minimums pressures of 30 psi throughout the site.

Thank you for your review of the Conceptual Water Distribution System Basis of Design Report provided for the Axon Way & Hayden Road Project. Feel free to contact me if you have any questions.

Sincerely,

Wood, Patel & Associates, Inc.



Nicholas Brown, PE
Vice President

EXPIRES 03-31-25

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TABLE 1 – WATER SYSTEM DESIGN CRITERIA

WOOD PATEL

TABLE 1
WATER DISTRIBUTION SYSTEM DESIGN CRITERIA

Project	Axon Way & Hayden Road
Location	Scottsdale Arizona
Project Number	205133.04
Project Engineer	Nicholas Brown, P.E.
References	City of Scottsdale Design Standards & Policies Manual (2018)

RESIDENTIAL WATER DEMANDS			
LAND USE	**AVERAGE DAILY DEMAND (ADD)**		**NOTES**
	VALUE	**UNITS**	
< 2 DU/ac	0.69	gpm/unit	Note 1
2-2.9 DU/ac	0.66	gpm/unit	Note 1
3-7.9 DU/ac	0.36	gpm/unit	Note 1
8-11.9 DU/ac	0.33	gpm/unit	Note 1
12-22 DU/ac	0.33	gpm/unit	Note 1
High Density Condominium	0.27	gpm/unit	Note 1
Resort Hotel (includes site amenities)	0.63	gpm/unit	Note 1

NON-RESIDENTIAL WATER DEMANDS			
LAND USE	**AVERAGE DAILY DEMAND (ADD)**		**NOTES**
	VALUE	**UNITS**	
Restaurant	0.00181	gpm/sf	Note 1
Commercial/Retail	0.00111	gpm/sf	Note 1
Commercial High Rise	0.000834	gpm/sf	Note 1
Office	0.000834	gpm/sf	Note 1
Institutional	1.88	gpm/acre	Note 1
Industrial	1.44	gpm/acre	Note 1
Research and Development	1.79	gpm/acre	Note 1

LANDSCAPE WATER DEMANDS			
LAND USE	**AVERAGE DAILY DEMAND (ADD)**		**NOTES**
	VALUE	**UNITS**	
Natural Area Open Space	0.00	gpm/acre	Note 1
Developed Open Space - Parks	2.49	gpm/acre	Note 1
Developed Open Space - Golf Course	5.96	gpm/acre	Note 1

HYDRAULIC MODELING CRITERIA				
	DESCRIPTION	**VALUE**	**UNITS**	**NOTES**
MAX DAY FLOW				
	Max Day Flow = Peaking Factor (PF) x ADD	2 x ADD	gpm	Note 1
PEAK HOUR FLOW				
	Peak Hour Flow = Peaking Factor (PF) x ADD	3.5 x ADD	gpm	Note 1
MODELED FIRE HYDRANT FLOW (MINIMUM)				
☐	Residential, 0 - 3,600 sf fire-flow calculation area	1,000	gpm	Note 3
☐	Residential, 3,601 - 4,800 sf fire-flow calculation area	1,750	gpm	Note 4
☐	Residential, 4,801 - 6,200 sf fire-flow calculation area	2,000	gpm	Note 4
☐	Residential, 6,201 - 7,700 sf fire-flow calculation area	2,250	gpm	Note 4
☐	Residential, 7,701 - 9,400 sf fire-flow calculation area	2,500	gpm	Note 4
☐	Residential, 9,401 - 11,300 sf fire-flow calculation area	2,750	gpm	Note 4
☐	Multi-Family Residential	Varies	gpm	Note 2
☐	Commercial	Varies	gpm	Note 2
HYDRAULICS				
	Residual Pressure Range, Peak Hour	50-150	psi	Note 1
	Minimum Residual Pressure, Max Day + Fire Flow (Hydrant)	30	psi	Note 1
	Minimum Residual Pressure, Max Day + Fire Flow (Domestic Service)	15	psi	Note 1
	Minimum Pipe Diameter, Looped System	6	in	Note 1
	Hazen-Williams C-value	130	-	Note 1

Notes:

1. Per City of Scottsdale Design Standards & Policies Manual (2018)
2. Per 2015 International Fire Code as adopted by the City of Scottsdale with 50% reduction applied.
3. Residential limited to one- and two-family dwellings, assumes Type V-B construction, and has a 1-hour fire duration
4. Residential limited to one- and two-family dwellings, assumes Type V-B construction, and has a 2-hour fire duration

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TABLE 2 – WATER DEMAND DESIGN FLOWS

WOOD PATEL

TABLE 2
WATER DEMAND DESIGN FLOWS

Project Axon Way & Hayden Road
Location Scottsdale Arizona
Project Number 205133.04
Project Engineer Nicholas Brown, P.E.
References City of Scottsdale Design Standards & Policies Manual (2018)

BUILDING ID	CONSTRUCTION TYPE	BUILDING AREA	LAND USE	APPLICABLE UNIT	NUMBER OF UNITS	GPM/APPLICABLE UNIT[1]	AVERAGE DAILY DEMAND		MAX DAY DEMAND		PEAK HOUR DEMAND		Fire Flow[2]
							(gpm)	Total (gpm)	(gpm)	Total (gpm)	(gpm)	Total (gpm)	(gpm)
A	IA & IIIA	486,625	High Density Condominium	gpm/unit	723	0.27	195.2	**195**	390.4	**390**	683.2	**683**	**2,000**
B	IA & IIIA	265,161	High Density Condominium	gpm/unit	392	0.27	105.8	**106**	211.6	**212**	370.3	**370**	**2,000**
C	IA & IIIA	161,436	High Density Condominium	gpm/unit	233	0.27	62.9	**108**	125.8	**217**	220.2	**380**	**2,000**
			Commercial/Retail	gpm/sf	40,957	0.00111	45.5		91.0		159.3		
D	IA & IIIA	222,730	Resort Hotel (includes site amenities)	gpm/unit	425	0.63	267.8	**277**	535.6	**555**	937.3	**971**	**2,000**
			Commercial/Retail	gpm/sf	8,529	0.00111	9.5		19.0		33.3		
E	IA & IIIA	417,927	High Density Condominium	gpm/unit	627	0.27	169.3	**169**	338.6	**339**	592.6	**593**	**2,000**
							Total	**855**		**1,713**		**2,997**	

Notes
1. GPM values are based on a 12-hour active water used period per 24-hour day per the City of Scottsdale Design Standards and Policy Manual.
2. Fire Flows determined from IFC Section B105, applying a 50% reduction due to fire sprinkler systems.

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APPENDIX A – FIRE HYDRANT FLOW TEST RESULTS

Arizona Flow Testing LLC

HYDRANT FLOW TEST REPORT

Project Name:	Hayden/ Union Hills
Project Address:	Union Hills & 82nd Street, Scottsdale, Arizona, 85255
Client Project No.:	Not Provided
Arizona Flow Testing Project No.:	21181
Flow Test Permit No.:	C64955
Date and time flow test conducted:	April 14, 2021 at 6:50 AM
Data is current and reliable until:	October 14, 2021
Conducted by:	F. Vaughan & S. Ballard – Az. Flow Testing, LLC (480-250-8154)
Coordinated by:	Jared Berry – City of Scottsdale-Inspector (602-541-4942)

Raw Test Data

Static Pressure: **75.0 PSI**
(Measured in pounds per square inch)

Residual Pressure: **48.0 PSI**
(Measured in pounds per square inch)

Pitot Pressure: **17.0 PSI Hyd A**
25.0 PSI Hyd B
(Measured in pounds per square inch)

Diffuser Orifice Diameter: One 4-inch Hose Monster (B)
(Measured in inches) One 4 inch Pollard Diffuser (A)

Coefficient of Diffuser: 0.7875/(B) and 0.9/(A)

Flowing GPM: **3,698 GPM**
(Measured in gallons per minute)
1,550 GPM + 2,148 GPM = 3,698 GPM

GPM @ 20 PSI: **5,431 GPM**

Data with 10% Safety Factor

Static Pressure: **67.5 PSI**
(Measured in pounds per square inch)

Residual Pressure: **40.5 PSI**
(Measured in pounds per square inch)

Distance between hydrants: See Below

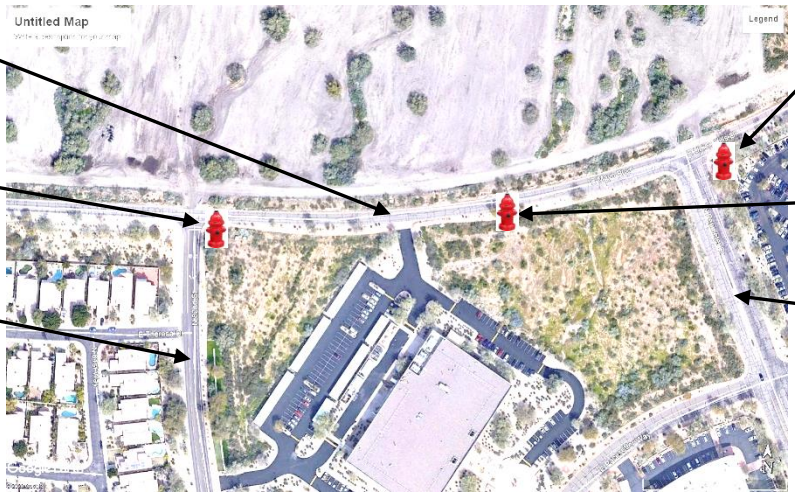
Main size: Not Provided

Flowing GPM: **3,698 GPM**

GPM @ 20 PSI**:** **5,018 GPM**

Flow Test Location

North



East Mayo Blvd.

Flow Fire Hydrant A (630 Feet from Pressure Hydrant)

North 82nd Street

Flow Fire Hydrant B (450 Feet from Pressure Hydrant)

Pressure Fire Hydrant

North Perimeter Drive

Project Site
Union Hills & 82nd Street

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APPENDIX B – HYDRAULIC MODELING RESULTS

CALIBRATION – STATIC

Axon Way & Hayden Road
FlexTable: Junction Table
Active Scenario: Calibration Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Is Active?
FH-FLOW A (EX)	1,586.00	0	1,764.75	77	True
FH-FLOW B (EX)	1,595.87	0	1,764.75	73	True
FH-TEST (EX)	1,590.98	0	1,764.75	75	True
J-1 (PUB)	1,591.24	0	1,764.75	75	True
J-3 (EX)	1,599.01	0	1,764.75	72	True
J-15 (PH 1)	1,595.00	0	1,764.75	73	True
J-16 (PH 1)	1,584.45	0	1,764.75	78	True
J-17 (EX)	1,584.83	0	1,764.75	78	True

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CALIBRATION – RESIDUAL

Axon Way & Hayden Road
FlexTable: Junction Table
Active Scenario: Calibration Residual

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Is Active?
FH-FLOW A (EX)	1,586.00	1,550	1,698.90	49	True
FH-FLOW B (EX)	1,595.87	2,148	1,697.45	44	True
FH-TEST (EX)	1,590.98	0	1,702.38	48	True
J-1 (PUB)	1,591.24	0	1,698.90	47	True
J-3 (EX)	1,599.01	0	1,698.90	43	True
J-15 (PH 1)	1,595.00	0	1,698.78	45	True
J-16 (PH 1)	1,584.45	0	1,698.90	50	True
J-17 (EX)	1,584.83	0	1,698.90	49	True

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CALIBRATION – MAX

Axon Way & Hayden Road
FlexTable: Junction Table
Active Scenario: Calibration Max

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Is Active?
FH-FLOW A (EX)	1,586.00	2,276	1,630.66	19	True
FH-FLOW B (EX)	1,595.87	3,154	1,627.69	14	True
FH-TEST (EX)	1,590.98	0	1,637.74	20	True
J-1 (PUB)	1,591.24	0	1,630.66	17	True
J-3 (EX)	1,599.01	0	1,630.66	14	True
J-15 (PH 1)	1,595.00	0	1,630.41	15	True
J-16 (PH 1)	1,584.45	0	1,630.66	20	True
J-17 (EX)	1,584.83	0	1,630.66	20	True

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AVERAGE DAY FLOW DEMAND

Axon Way & Hayden Road
FlexTable: Junction Table
Active Scenario: Average Day Demand

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Is Active?
BLDG A DOM	1,598.35	195	1,760.18	70	True
BLDG B DOM	1,598.53	106	1,760.18	70	True
BLDG C DOM	1,602.48	108	1,760.19	68	True
BLDG D DOM	1,595.11	277	1,760.18	71	True
BLDG E DOM	1,595.38	169	1,760.20	71	True
FH-1 (PH 2)	1,593.00	0	1,760.18	72	True
FH-1 (PUB)	1,589.10	0	1,760.21	74	True
FH-2 (PH 2)	1,606.00	0	1,760.18	67	True
FH-2 (PUB)	1,575.28	0	1,760.20	80	True
FH-3 (PH 2)	1,600.00	0	1,760.18	69	True
FH-3 (PUB)	1,591.32	0	1,760.28	73	True
FH-4 (PH 2)	1,603.82	0	1,760.18	68	True
FH-4 (PUB)	1,589.00	0	1,760.34	74	True
FH-5 (PH 2)	1,603.90	0	1,760.19	68	True
FH-6 (PH 2)	1,599.07	0	1,760.18	70	True
FH-7 (PH 2)	1,597.14	0	1,760.18	71	True
FH-8 (PH 2)	1,587.87	0	1,760.28	75	True
FH-9 (PH 2)	1,597.14	0	1,760.28	71	True
FH-18 (PH 1)	1,599.85	0	1,760.25	69	True
FH-19 (PH 1)	1,594.07	0	1,760.25	72	True
FH-FLOW A (EX)	1,586.00	0	1,760.34	75	True
FH-FLOW B (EX)	1,595.87	0	1,760.39	71	True
FH-TEST (EX)	1,590.98	0	1,760.60	73	True
J-1 (PH 2)	1,604.43	0	1,760.18	67	True
J-1 (PUB)	1,591.24	0	1,760.21	73	True
J-2 (PH 1)	1,605.24	0	1,760.24	67	True
J-2 (PH 2)	1,602.56	0	1,760.19	68	True
J-2 (PUB)	1,591.60	0	1,760.20	73	True
J-3 (EX)	1,599.01	0	1,760.21	70	True
J-3 (PH 2)	1,600.00	0	1,760.18	69	True
J-3 (PUB)	1,564.55	0	1,760.20	85	True
J-4 (PUB)	1,595.20	0	1,760.25	71	True
J-5 (PUB)	1,590.25	0	1,760.29	74	True
J-6 (PH 1)	1,603.62	0	1,760.24	68	True
J-6 (PUB)	1,588.85	0	1,760.32	74	True
J-7 (PH 1)	1,600.67	0	1,760.25	69	True
J-7 (PUB)	1,595.38	0	1,760.37	71	True
J-8 (PH 1)	1,599.26	0	1,760.25	70	True
J-8 (PUB)	1,602.22	0	1,760.37	68	True
J-9 (PH 1)	1,593.63	0	1,760.28	72	True
J-12 (PH 1)	1,594.93	0	1,760.25	72	True
J-13 (PH 1)	1,593.22	0	1,760.28	72	True
J-14 (PH 1)	1,599.38	0	1,760.30	70	True
J-15 (PH 1)	1,595.00	0	1,760.39	72	True
J-16 (PH 1)	1,584.45	0	1,760.28	76	True
J-17 (EX)	1,584.83	0	1,760.22	76	True

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Axon Way & Hayden Road
FlexTable: Pipe Table
Active Scenario: Average Day Demand

Label	Start Node	Stop Node	Length (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)
P-1 (PH 2)	J-2 (PUB)	BLDG C DOM	92	12.0	130.0	210	0.60	0.140
P-1 (PUB)	J-1 (PUB)	FH-1 (PUB)	102	16.0	130.0	166	0.26	0.023
P-2 (PH 2)	BLDG C DOM	FH-1 (PH 2)	173	12.0	130.0	102	0.29	0.037
P-2 (PUB)	FH-1 (PUB)	J-2 (PUB)	365	16.0	130.0	166	0.26	0.022
P-3 (PH 2)	FH-1 (PH 2)	BLDG A DOM	178	12.0	130.0	102	0.29	0.036
P-3 (PUB)	FH-2 (PUB)	J-2 (PUB)	279	16.0	130.0	44	0.07	0.002
P-4 (PH 2)	BLDG A DOM	FH-2 (PH 2)	142	12.0	130.0	-36	0.10	0.005
P-4 (PUB)	J-3 (PUB)	FH-2 (PUB)	183	16.0	130.0	44	0.07	0.001
P-5 (PH 2)	J-1 (PH 2)	FH-2 (PH 2)	191	12.0	130.0	36	0.10	0.005
P-5 (PUB)	BLDG E DOM	J-3 (PUB)	9	16.0	130.0	307	0.49	0.081
P-6 (PH 2)	FH-3 (PH 2)	J-1 (PH 2)	246	12.0	130.0	0	0.00	0.000
P-6 (PUB)	J-4 (PUB)	BLDG E DOM	285	16.0	130.0	476	0.76	0.158
P-7 (PH 2)	FH-4 (PH 2)	J-1 (PH 2)	302	12.0	130.0	36	0.10	0.006
P-7 (PUB)	FH-3 (PUB)	J-4 (PUB)	198	16.0	130.0	460	0.73	0.148
P-8 (PH 2)	FH-4 (PH 2)	BLDG B DOM	322	12.0	130.0	-36	0.10	0.005
P-8 (PUB)	J-5 (PUB)	FH-3 (PUB)	54	16.0	130.0	460	0.73	0.148
P-9 (PH 2)	BLDG B DOM	FH-5 (PH 2)	57	12.0	130.0	-142	0.40	0.068
P-9 (PUB)	J-5 (PUB)	J-6 (PUB)	231	16.0	130.0	-485	0.77	0.164
P-10 (PH 2)	FH-5 (PH 2)	J-2 (PH 2)	16	12.0	130.0	-142	0.40	0.069
P-10 (PUB)	J-6 (PUB)	FH-4 (PUB)	366	16.0	130.0	-241	0.38	0.044
P-11 (PH 2)	J-2 (PH 2)	J-2 (PH 1)	340	12.0	130.0	-213	0.61	0.145
P-11 (PUB)	FH-4 (PUB)	J-7 (PUB)	595	16.0	130.0	-241	0.38	0.045
P-12 (PH 2)	J-2 (PH 2)	J-3 (PH 2)	187	12.0	130.0	71	0.20	0.019
P-12 (PUB)	J-7 (PUB)	J-8 (PUB)	750	16.0	130.0	0	0.00	0.000
P-13 (PH 2)	J-3 (PH 2)	FH-6 (PH 2)	88	12.0	130.0	57	0.16	0.013
P-13 (PUB)	J-6 (PUB)	FH-FLOW A (EX)	92	12.0	130.0	-245	0.69	0.187
P-14 (PH 2)	J-3 (PH 2)	FH-7 (PH 2)	189	12.0	130.0	14	0.04	0.001
P-14 (PUB)	J-15 (PH 1)	J-7 (PUB)	35	12.0	130.0	470	1.33	0.623
P-15 (PH 2)	FH-7 (PH 2)	BLDG D DOM	184	12.0	130.0	14	0.04	0.001

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Axon Way & Hayden Road
FlexTable: Pipe Table
Active Scenario: Average Day Demand

Label	Start Node	Stop Node	Length (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)
P-16 (PH 2)	BLDG D DOM	J-3 (PUB)	96	12.0	130.0	-263	0.75	0.213
P-17 (PH 2)	J-16 (PH 1)	FH-8 (PH 2)	341	12.0	130.0	-25	0.07	0.003
P-18 (PH 2)	FH-8 (PH 2)	FH-9 (PH 2)	310	12.0	130.0	-25	0.07	0.003
P-19 (PH 2)	FH-9 (PH 2)	J-5 (PUB)	372	12.0	130.0	-25	0.07	0.003
P-29 (PH 1)	J-12 (PH 1)	J-8 (PH 1)	284	12.0	130.0	-16	0.05	0.001
P-30 (PH 1)	J-8 (PH 1)	FH-18 (PH 1)	38	12.0	130.0	98	0.28	0.032
P-31 (PH 1)	FH-18 (PH 1)	J-7 (PH 1)	72	12.0	130.0	98	0.28	0.034
P-32 (PH 1)	J-2 (PH 1)	J-6 (PH 1)	82	12.0	130.0	-98	0.28	0.033
P-33 (PH 1)	J-14 (PH 1)	J-2 (PH 1)	1,467	12.0	130.0	116	0.33	0.047
P-34 (PH 1)	J-14 (PH 1)	J-9 (PH 1)	618	12.0	130.0	114	0.32	0.045
P-35 (PH 1)	J-9 (PH 1)	J-13 (PH 1)	44	12.0	130.0	0	0.00	0.000
P-36 (PH 1)	FH-19 (PH 1)	J-12 (PH 1)	77	12.0	130.0	0	0.00	0.000
P-38 (EX)	J-15 (PH 1)	FH-FLOW B (EX)	127	12.0	130.0	0	0.00	0.000
P-38 (PH 1)	J-7 (PUB)	J-14 (PH 1)	377	12.0	130.0	229	0.65	0.166
P-39 (EX)	J-15 (PH 1)	FH-TEST (EX)	345	12.0	130.0	-470	1.33	0.626
P-40 (EX)	FH-FLOW A (EX)	FH-TEST (EX)	609	12.0	130.0	-385	1.09	0.433
P-41 (EX)	J-17 (EX)	J-16 (PH 1)	642	12.0	130.0	-166	0.47	0.091
P-41 (EX)	FH-FLOW A (EX)	J-16 (PH 1)	866	12.0	130.0	140	0.40	0.067
P-42 (EX)	J-1 (PUB)	J-17 (EX)	544	16.0	130.0	-166	0.26	0.022
P-43 (EX)	J-1 (PUB)	J-3 (EX)	531	16.0	130.0	0	0.00	0.000
P-49 (PH 1)	J-7 (PH 1)	J-6 (PH 1)	201	12.0	130.0	98	0.28	0.035
P-135	J-4 (PUB)	J-12 (PH 1)	163	12.0	130.0	-16	0.05	0.002
P-159	J-8 (PH 1)	J-9 (PH 1)	601	12.0	130.0	-114	0.32	0.045
P-166	BLDG A DOM	FH-6 (PH 2)	438	12.0	130.0	-57	0.16	0.013
P-PUMP	PUMP	FH-TEST (EX)	1	48.0	130.0	855	0.15	0.000
P-RESERVOIR	RESERVOIR	PUMP	1	48.0	130.0	855	0.15	0.000

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PEAK HOUR FLOW DEMAND

Axon Way & Hayden Road
FlexTable: Junction Table
Active Scenario: Peak Hour Demand

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Is Active?
BLDG A DOM	1,598.35	683	1,718.24	52	True
BLDG B DOM	1,598.53	371	1,718.29	52	True
BLDG C DOM	1,602.48	378	1,718.37	50	True
BLDG D DOM	1,595.11	969	1,718.31	53	True
BLDG E DOM	1,595.38	592	1,718.52	53	True
FH-1 (PH 2)	1,593.00	0	1,718.31	54	True
FH-1 (PUB)	1,589.10	0	1,718.59	56	True
FH-2 (PH 2)	1,606.00	0	1,718.25	49	True
FH-2 (PUB)	1,575.28	0	1,718.51	62	True
FH-3 (PH 2)	1,600.00	0	1,718.26	51	True
FH-3 (PUB)	1,591.32	0	1,719.28	55	True
FH-4 (PH 2)	1,603.82	0	1,718.28	50	True
FH-4 (PUB)	1,589.00	0	1,719.91	57	True
FH-5 (PH 2)	1,603.90	0	1,718.33	50	True
FH-6 (PH 2)	1,599.07	0	1,718.30	52	True
FH-7 (PH 2)	1,597.14	0	1,718.31	52	True
FH-8 (PH 2)	1,587.87	0	1,719.34	57	True
FH-9 (PH 2)	1,597.14	0	1,719.35	53	True
FH-18 (PH 1)	1,599.85	0	1,718.97	52	True
FH-19 (PH 1)	1,594.07	0	1,718.98	54	True
FH-FLOW A (EX)	1,586.00	0	1,719.92	58	True
FH-FLOW B (EX)	1,595.87	0	1,720.40	54	True
FH-TEST (EX)	1,590.98	0	1,722.60	57	True
J-1 (PH 2)	1,604.43	0	1,718.26	49	True
J-1 (PUB)	1,591.24	0	1,718.61	55	True
J-2 (PH 1)	1,605.24	0	1,718.85	49	True
J-2 (PH 2)	1,602.56	0	1,718.35	50	True
J-2 (PUB)	1,591.60	0	1,718.50	55	True
J-3 (EX)	1,599.01	0	1,718.61	52	True
J-3 (PH 2)	1,600.00	0	1,718.31	51	True
J-3 (PUB)	1,564.55	0	1,718.51	67	True
J-4 (PUB)	1,595.20	0	1,718.98	54	True
J-5 (PUB)	1,590.25	0	1,719.36	56	True
J-6 (PH 1)	1,603.62	0	1,718.88	50	True
J-6 (PUB)	1,588.85	0	1,719.74	57	True
J-7 (PH 1)	1,600.67	0	1,718.95	51	True
J-7 (PUB)	1,595.38	0	1,720.18	54	True
J-8 (PH 1)	1,599.26	0	1,718.98	52	True
J-8 (PUB)	1,602.22	0	1,720.18	51	True
J-9 (PH 1)	1,593.63	0	1,719.26	54	True
J-12 (PH 1)	1,594.93	0	1,718.98	54	True
J-13 (PH 1)	1,593.22	0	1,719.26	55	True
J-14 (PH 1)	1,599.38	0	1,719.54	52	True
J-15 (PH 1)	1,595.00	0	1,720.40	54	True
J-16 (PH 1)	1,584.45	0	1,719.33	58	True
J-17 (EX)	1,584.83	0	1,718.74	58	True

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Axon Way & Hayden Road
FlexTable: Pipe Table
Active Scenario: Peak Hour Demand

Label	Start Node	Stop Node	Length (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)
P-1 (PH 2)	J-2 (PUB)	BLDG C DOM	92	12.0	130.0	734	2.08	1.431
P-1 (PUB)	J-1 (PUB)	FH-1 (PUB)	102	16.0	130.0	580	0.93	0.227
P-2 (PH 2)	BLDG C DOM	FH-1 (PH 2)	173	12.0	130.0	356	1.01	0.375
P-2 (PUB)	FH-1 (PUB)	J-2 (PUB)	365	16.0	130.0	580	0.93	0.228
P-3 (PH 2)	FH-1 (PH 2)	BLDG A DOM	178	12.0	130.0	356	1.01	0.375
P-3 (PUB)	FH-2 (PUB)	J-2 (PUB)	279	16.0	130.0	154	0.25	0.019
P-4 (PH 2)	BLDG A DOM	FH-2 (PH 2)	142	12.0	130.0	-126	0.36	0.055
P-4 (PUB)	J-3 (PUB)	FH-2 (PUB)	183	16.0	130.0	154	0.25	0.020
P-5 (PH 2)	J-1 (PH 2)	FH-2 (PH 2)	191	12.0	130.0	126	0.36	0.055
P-5 (PUB)	BLDG E DOM	J-3 (PUB)	9	16.0	130.0	1,074	1.71	0.703
P-6 (PH 2)	FH-3 (PH 2)	J-1 (PH 2)	246	12.0	130.0	0	0.00	0.000
P-6 (PUB)	J-4 (PUB)	BLDG E DOM	285	16.0	130.0	1,665	2.66	1.606
P-7 (PH 2)	FH-4 (PH 2)	J-1 (PH 2)	302	12.0	130.0	126	0.36	0.055
P-7 (PUB)	FH-3 (PUB)	J-4 (PUB)	198	16.0	130.0	1,610	2.57	1.508
P-8 (PH 2)	FH-4 (PH 2)	BLDG B DOM	322	12.0	130.0	-126	0.36	0.055
P-8 (PUB)	J-5 (PUB)	FH-3 (PUB)	54	16.0	130.0	1,610	2.57	1.507
P-9 (PH 2)	BLDG B DOM	FH-5 (PH 2)	57	12.0	130.0	-497	1.41	0.696
P-9 (PUB)	J-5 (PUB)	J-6 (PUB)	231	16.0	130.0	-1,699	2.71	1.665
P-10 (PH 2)	FH-5 (PH 2)	J-2 (PH 2)	16	12.0	130.0	-497	1.41	0.693
P-10 (PUB)	J-6 (PUB)	FH-4 (PUB)	366	16.0	130.0	-842	1.34	0.454
P-11 (PH 2)	J-2 (PH 2)	J-2 (PH 1)	340	12.0	130.0	-747	2.12	1.476
P-11 (PUB)	FH-4 (PUB)	J-7 (PUB)	595	16.0	130.0	-842	1.34	0.454
P-12 (PH 2)	J-2 (PH 2)	J-3 (PH 2)	187	12.0	130.0	249	0.71	0.193
P-12 (PUB)	J-7 (PUB)	J-8 (PUB)	750	16.0	130.0	0	0.00	0.000
P-13 (PH 2)	J-3 (PH 2)	FH-6 (PH 2)	88	12.0	130.0	200	0.57	0.128
P-13 (PUB)	J-6 (PUB)	FH-FLOW A (EX)	92	12.0	130.0	-857	2.43	1.903
P-14 (PH 2)	J-3 (PH 2)	FH-7 (PH 2)	189	12.0	130.0	50	0.14	0.010
P-14 (PUB)	J-15 (PH 1)	J-7 (PUB)	35	12.0	130.0	1,644	4.67	6.369
P-15 (PH 2)	FH-7 (PH 2)	BLDG D DOM	184	12.0	130.0	50	0.14	0.009

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Axon Way & Hayden Road
FlexTable: Pipe Table
Active Scenario: Peak Hour Demand

Label	Start Node	Stop Node	Length (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/1000ft)
P-16 (PH 2)	BLDG D DOM	J-3 (PUB)	96	12.0	130.0	-920	2.61	2.172
P-17 (PH 2)	J-16 (PH 1)	FH-8 (PH 2)	341	12.0	130.0	-89	0.25	0.029
P-18 (PH 2)	FH-8 (PH 2)	FH-9 (PH 2)	310	12.0	130.0	-89	0.25	0.029
P-19 (PH 2)	FH-9 (PH 2)	J-5 (PUB)	372	12.0	130.0	-89	0.25	0.029
P-29 (PH 1)	J-12 (PH 1)	J-8 (PH 1)	284	12.0	130.0	-56	0.16	0.012
P-30 (PH 1)	J-8 (PH 1)	FH-18 (PH 1)	38	12.0	130.0	342	0.97	0.346
P-31 (PH 1)	FH-18 (PH 1)	J-7 (PH 1)	72	12.0	130.0	342	0.97	0.348
P-32 (PH 1)	J-2 (PH 1)	J-6 (PH 1)	82	12.0	130.0	-342	0.97	0.347
P-33 (PH 1)	J-14 (PH 1)	J-2 (PH 1)	1,467	12.0	130.0	405	1.15	0.475
P-34 (PH 1)	J-14 (PH 1)	J-9 (PH 1)	618	12.0	130.0	398	1.13	0.460
P-35 (PH 1)	J-9 (PH 1)	J-13 (PH 1)	44	12.0	130.0	0	0.00	0.000
P-36 (PH 1)	FH-19 (PH 1)	J-12 (PH 1)	77	12.0	130.0	0	0.00	0.000
P-38 (EX)	J-15 (PH 1)	FH-FLOW B (EX)	127	12.0	130.0	0	0.00	0.000
P-38 (PH 1)	J-7 (PUB)	J-14 (PH 1)	377	12.0	130.0	802	2.28	1.686
P-39 (EX)	J-15 (PH 1)	FH-TEST (EX)	345	12.0	130.0	-1,644	4.67	6.368
P-40 (EX)	FH-FLOW A (EX)	FH-TEST (EX)	609	12.0	130.0	-1,348	3.82	4.407
P-41 (EX)	J-17 (EX)	J-16 (PH 1)	642	12.0	130.0	-580	1.65	0.925
P-41 (EX)	FH-FLOW A (EX)	J-16 (PH 1)	866	12.0	130.0	491	1.39	0.680
P-42 (EX)	J-1 (PUB)	J-17 (EX)	544	16.0	130.0	-580	0.93	0.228
P-43 (EX)	J-1 (PUB)	J-3 (EX)	531	16.0	130.0	0	0.00	0.000
P-49 (PH 1)	J-7 (PH 1)	J-6 (PH 1)	201	12.0	130.0	342	0.97	0.347
P-135	J-4 (PUB)	J-12 (PH 1)	163	12.0	130.0	-56	0.16	0.012
P-159	J-8 (PH 1)	J-9 (PH 1)	601	12.0	130.0	-398	1.13	0.460
P-166	BLDG A DOM	FH-6 (PH 2)	438	12.0	130.0	-200	0.57	0.128
P-PUMP	PUMP	FH-TEST (EX)	1	48.0	130.0	2,993	0.53	0.000
P-RESERVOIR	RESERVOIR	PUMP	1	48.0	130.0	2,993	0.53	0.000

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MAX DAY DEMAND – PLUS FIRE FLOW

Axon Way & Hayden Road

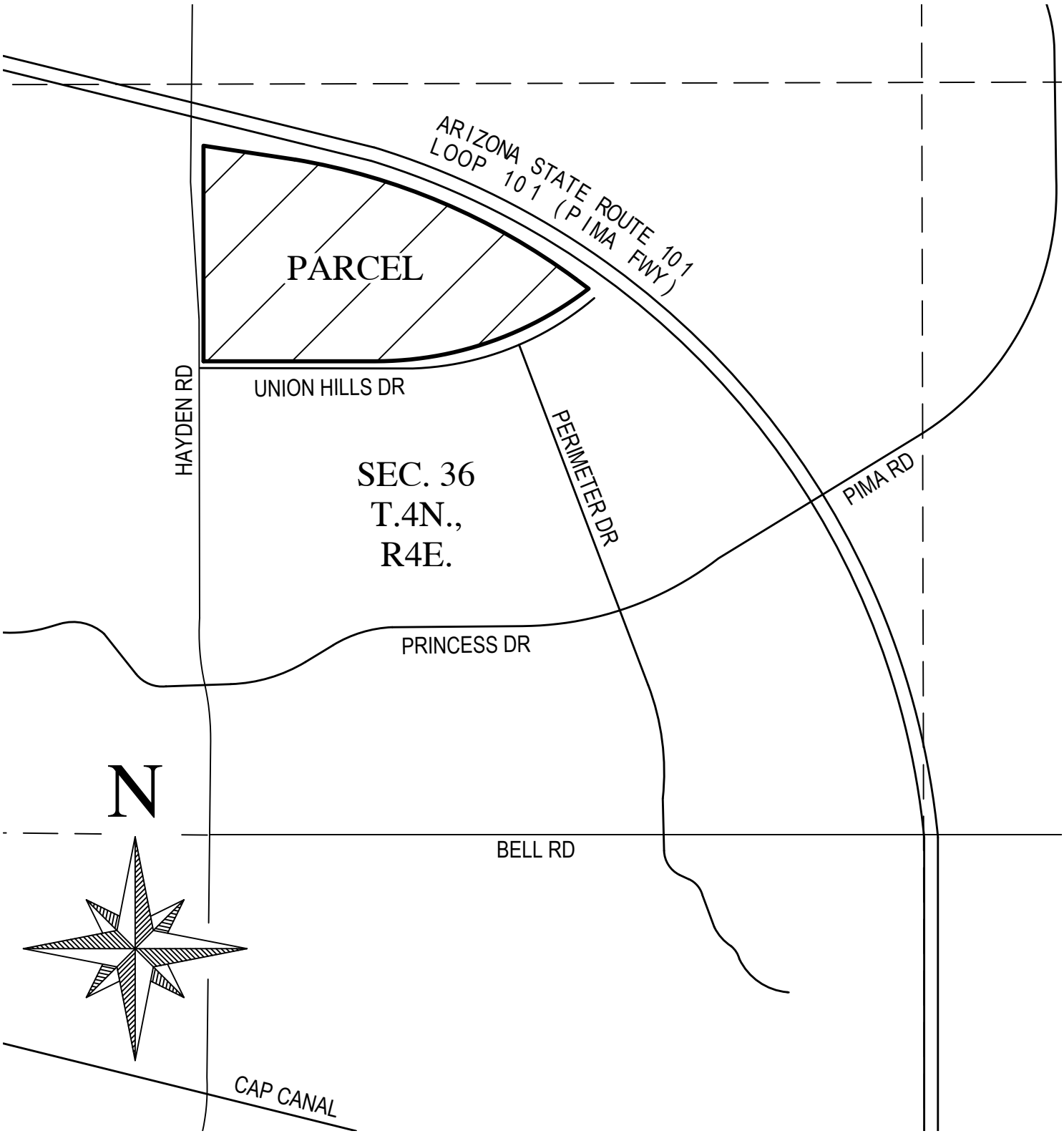
Fire Flow Node FlexTable: Fire Flow Results Table

Active Scenario: Max Day + Fire Flow (Fire Flow Analysis)

Label	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual) (psi)	Pressure (Calculated System Lower Limit) (psi)	Pressure (Calculated Zone Lower Limit @ Total Flow Needed) (psi)	Fire Flow Status
BLDG A DOM	2,000	2,097	2,585	30	33	30	32	Passed
BLDG B DOM	2,000	2,111	2,376	30	33	30	32	Passed
BLDG C DOM	2,000	2,118	2,388	30	31	30	32	Passed
BLDG D DOM	2,000	2,126	2,819	30	34	30	32	Passed
BLDG E DOM	2,000	2,133	2,556	30	35	30	32	Passed
FH-1 (PH 2)	2,000	2,107	2,107	30	35	30	32	Passed
FH-1 (PUB)	2,000	2,129	2,129	30	37	30	32	Passed
FH-2 (PH 2)	2,000	2,083	2,083	30	30	31	32	Passed
FH-2 (PUB)	2,000	2,130	2,130	30	43	30	32	Passed
FH-3 (PH 2)	2,000	2,091	2,091	30	31	30	32	Passed
FH-3 (PUB)	2,000	2,158	2,158	30	37	30	33	Passed
FH-4 (PH 2)	2,000	2,101	2,101	30	31	30	32	Passed
FH-4 (PUB)	2,000	2,180	2,180	30	38	30	33	Passed
FH-5 (PH 2)	2,000	2,113	2,113	30	31	30	32	Passed
FH-6 (PH 2)	2,000	2,112	2,112	30	33	30	32	Passed
FH-7 (PH 2)	2,000	2,121	2,121	30	34	30	32	Passed
FH-8 (PH 2)	2,000	2,156	2,156	30	37	30	33	Passed
FH-9 (PH 2)	2,000	2,159	2,159	30	33	30	33	Passed
FH-18 (PH 1)	2,000	2,143	2,143	30	33	30	32	Passed
FH-19 (PH 1)	2,000	2,147	2,147	30	35	30	32	Passed
FH-FLOW A (EX)	2,000	2,180	2,180	30	39	30	33	Passed
FH-FLOW B (EX)	2,000	2,196	2,196	30	34	30	33	Passed
FH-TEST (EX)	2,000	2,290	2,290	30	38	30	34	Passed
J-1 (PH 2)	2,000	2,091	2,091	30	30	30	32	Passed
J-1 (PUB)	2,000	2,130	2,130	30	36	30	32	Passed
J-2 (PH 1)	2,000	2,133	2,133	30	30	30	32	Passed
J-2 (PH 2)	2,000	2,114	2,114	30	31	30	32	Passed
J-2 (PUB)	2,000	2,126	2,126	30	36	30	32	Passed
J-3 (EX)	2,000	2,130	2,130	30	32	30	32	Passed
J-3 (PH 2)	2,000	2,115	2,115	30	32	30	32	Passed
J-3 (PUB)	2,000	2,133	2,133	30	48	30	32	Passed
J-4 (PUB)	2,000	2,148	2,148	30	35	30	32	Passed
J-5 (PUB)	2,000	2,161	2,161	30	37	30	33	Passed
J-6 (PH 1)	2,000	2,135	2,135	30	31	30	32	Passed
J-6 (PUB)	2,000	2,175	2,175	30	38	30	33	Passed
J-7 (PH 1)	2,000	2,141	2,141	30	32	30	32	Passed
J-7 (PUB)	2,000	2,189	2,189	30	35	30	33	Passed
J-8 (PH 1)	2,000	2,145	2,145	30	33	30	32	Passed
J-8 (PUB)	2,000	2,189	2,189	30	31	30	33	Passed
J-9 (PH 1)	2,000	2,153	2,153	30	35	30	33	Passed
J-12 (PH 1)	2,000	2,147	2,147	30	35	30	32	Passed
J-13 (PH 1)	2,000	2,153	2,153	30	35	30	33	Passed
J-14 (PH 1)	2,000	2,158	2,158	30	33	30	33	Passed
J-15 (PH 1)	2,000	2,196	2,196	30	35	30	33	Passed
J-16 (PH 1)	2,000	2,153	2,153	30	39	30	33	Passed
J-17 (EX)	2,000	2,133	2,133	30	39	30	32	Passed

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PLATE 1 – VICINITY MAP



WOOD PATEL

AXON WAY & HAYDEN ROAD

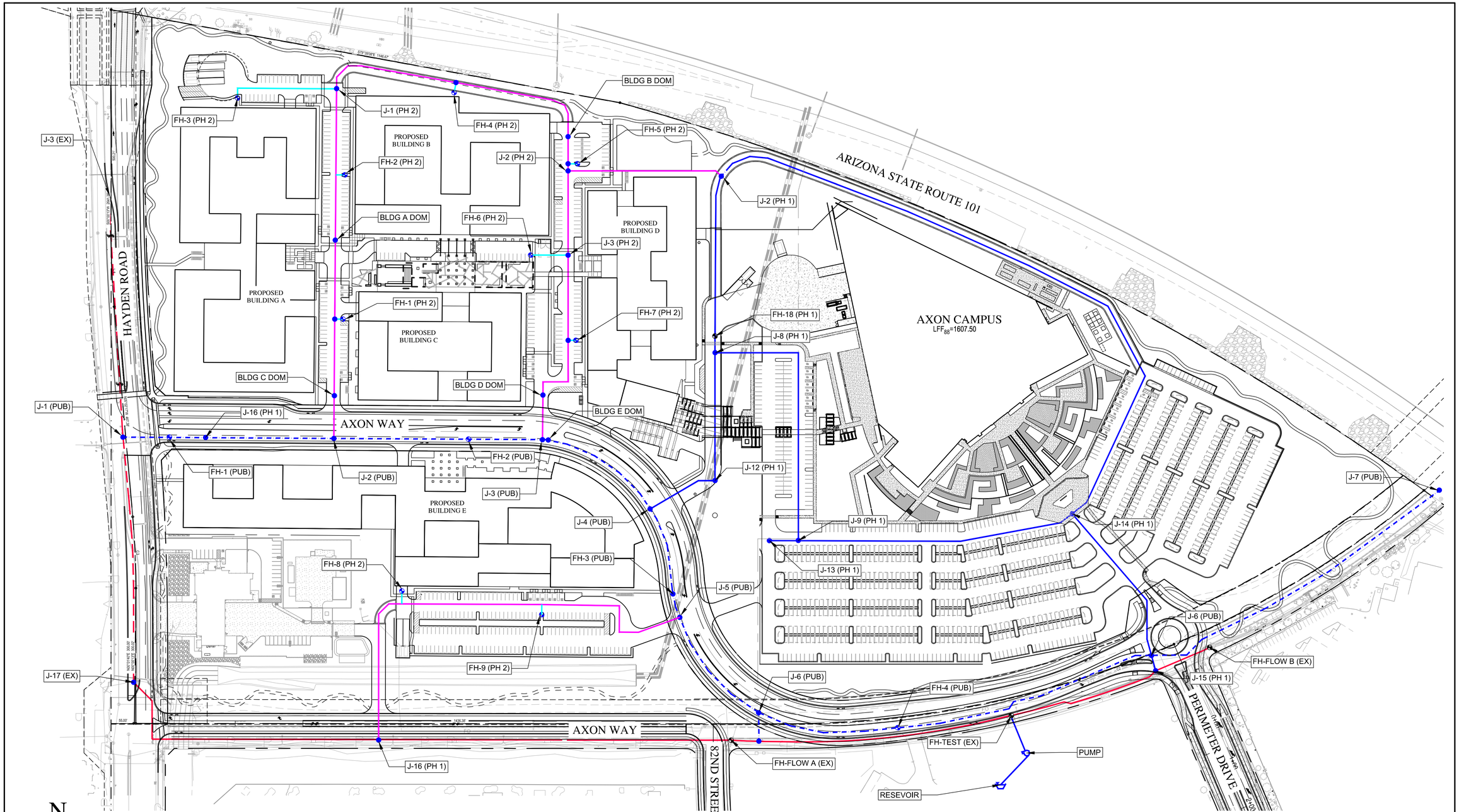
VICINITY MAP

DATE 06-28-24	SCALE	SHEET	1 OF 1
JOB NO. 205133.04	DESIGN BLJ	CHECK	NEB
	DRAWN BLJ		

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PLATE 2 – PROPOSED WATER SYSTEM MAP



NOT FOR CONSTRUCTION OR RECORDING

WOOD PATEL

AXON WAY & HAYDEN ROAD

WATER SYSTEM MAP

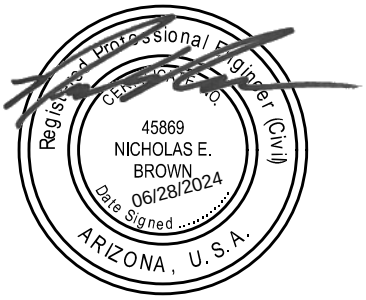
DATE	06-28-2024	SCALE	1" = 100'	SHEET	1 OF 1
JOB NO.	205133.04	DESIGN	AF	DRAWN	BP

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CONCEPTUAL WASTEWATER COLLECTION SYSTEM
BASIS OF DESIGN REPORT
FOR
AXON WAY & HAYDEN ROAD

June 28, 2024
WP# 205133.04



EXPIRES 03-31-25

13-ZN-2020#2
10/24/2024

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June 28, 2024

Mr. Levi Dillon, PE
Sr. Water Resource Engineer
City of Scottsdale
9379 East San Salvador Drive
Scottsdale, Arizona 85258

480.312.5319
ldillon@scottsdaleaz.gov

Re: **Axon Way & Hayden Road**
Conceptual Wastewater Collection System Basis of Design Report
WP# 205133.04

Dear Mr. Dillon:

The proposed Axon Way & Hayden Road Project is a 74.44-acre site located in the northwest quarter of Section 36, Township 4 North, Range 4 East of the Gila and Salt River Meridian. Specifically, the site is situated at the northeast corner of Hayden Road and Mayo Boulevard. Refer to Exhibit 1 - *Vicinity Map* at the end of this report for the project location.

Phase 1 of this project includes one (1) proposed mixed-use structure, along with associated parking, landscape, hardscape, and utilities, as well as the realignment of Mayo Boulevard to be renamed Axon Way. This report focuses on the improvements planned for Phase 2, which includes five (5) proposed mixed-use structures with associated parking, landscape, hardscape, and utilities. The proposed structures range from three (3) to five (5) stories tall, each with two levels of underground garage parking. Building D will house a four-story hotel, while buildings A, B, C, and E will contain residential units. Buildings C and D will also include commercial space on the ground floor. Building A consists of approximately 486,625 square-feet containing 723 residential units. Building B consists of approximately 265,161 square-feet containing 392 residential unit. Building C consists of approximately 161,436 square-feet containing 233 residential units with 40,957 square-feet of commercial space. Building D consists of approximately 222,730 square-feet containing 425 hotel rooms with 8,529 square-feet of commercial space. Building E consists of approximately 417,927 square-feet containing 627 residential units.

Wastewater from the proposed buildings will discharge into three proposed onsite sewer lines. The east and west collections systems will connect into public sewer lines as part of Phase 1 improvements. The west collection system services buildings A, B, and C. This starts as a 10-inch line, increasing to a 12-inch line before connecting to the 15-inch public sewer line in Axon Way as part of improvements with phase 1. The east collection system services buildings B, C, and D. This sewer starts as an 8-inch line, increasing to a 12-inch line before also connecting to the same public 15-inch sewer in Axon Way. Wastewater from Building E will connect into a 12-inch sewer stub located in Mayo Boulevard.

The offsite/public sewer line will be constructed in the realigned Mayo Boulevard to serve wastewater flows from buildings A, B, C, and D. Wastewater will flow from the 15-inch public sewer line and run parallel to the 12-inch sewer in Hayden Road before connecting into this system at a manhole further downstream. Refer to Exhibit 2 - *Proposed Wastewater System Map*

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The design criteria used to estimate wastewater flows and evaluate system hydraulics are based on Wood, Patel & Associates, Inc.'s (WOODPATEL) understanding of the published *City of Scottsdale Design Standards and Policies Manual*, 2018 and City of *Phoenix Design Standards Manual for Water and Wastewater Systems*, 2017. The following is a summary of the primary design criteria utilized:

- Average Day Wastewater Demand, Office: ..... 0.4 gpd / sq. ft
- Average Day Wastewater Demand, Industrial (Phoenix): ..... 50 gpd / 1,000 sq. ft
- Peak Factor, Office: 3
- Peak Factor, Industrial: ..... $1+14/(4+P^{1/2})$
- Minimum Mean Full Flow Velocity: ..... 2.50 fps
- Minimum Peak Full Flow Velocity: ..... 10.0 fps
- Minimum Peak Flow d/D Ratio (12" dia. or less sewers): ..... d/D = 0.65
- Minimum Peak Flow d/D Ratio (sewers more than 12" dia.): ..... d/D = 0.70

Abbreviations: gpd = gallons per day; fps = feet per second; P=population/1,000

Based on the above design criteria, the projected average day flow for the proposed Site is calculated to be 709,651 gallons per day (gpd), or 493 gallons per minute (gpm). The peak flow is projected to be 2,821,459 gpd, or 1,959 gpm. The proposed sewer slopes, projected flow velocities, and pipe flow capacities are summarized on the attached spreadsheets. It is assumed the infiltration and inflow from wet weather has been accounted for in the published design flow rates for the development and the maximum d/D. Therefore, those flows have not been added into the calculations. Refer to Table 2 – *Wastewater Model* and Table 3 - *Calculated Pipe Capacities.*

Thank you for your review of the Conceptual Wastewater Collection System Basis of Design Report provided for the Axon Way & Hayden Road Project. Feel free to contact me if you have any questions.

Sincerely,

Wood, Patel & Associates, Inc.



Nicholas Brown, PE
Vice President EXPIRES 03-31-25

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TABLE 1 – WASTEWATER DESIGN CRITERIA

WOOD PATEL

TABLE 1
WASTEWATER DESIGN CRITERIA

Project	Axon Way & Hayden Road
Location	Scottsdale AZ
Project Number	205133
Project Engineer	Nicholas Brown, PE
References	City of Scottsdale Design Standards and Policy Manual (2018)
	Arizona Administrative Code, Title 18, Chapter 9
	City of Phoenix Design Standards Manual for Water and Wastewater Systems (2017)

RESIDENTIAL WASTEWATER DEMANDS

LAND USE	AVERAGE DAILY DEMAND (ADD)		POPULATION[1]	Peaking Factor (PF)
	VALUE	UNITS		
Single Family Residential	250	gpd/DU	2.5 Persons per DU	4
Multi-Family Residential	220	gpd/DU	2.2 Persons per DU	4

NON-RESIDENTIAL WASTEWATER DEMANDS

LAND USE	AVERAGE DAILY DEMAND (ADD)		POPULATION[1]	Peaking Factor (PF)
	VALUE	UNITS		
Commercial/Retail	0.5	gpd/sf	0.005 Persons per sf	3
Office	0.4	gpd/sf	0.004 Persons per sf	3
Restaurant	1.2	gpd/sf	0.012 Persons per sf	6
High Density Condominium	140	gpd/unit	1.4 Persons per unit	4.5
Resort Hotel	380	gpd/room	3.8 Persons per room	4.5
School: without cafeteria	30	gpd/student	0.3 Persons per Student	6
School: with cafeteria	50	gpd/student	0.5 Persons per Student	6
Cultural	0.1	gpd/sf	0.001 Persons per sf	3
Clubhouse for Subdivision Golf Course	200	gpd/DU	2 Persons per patron x2 patrons per du per day	4.5
Fitness Center/ Spa/ Health Club	0.8	gpd/sf	0	3.5
Industrial	50	gpd/1,000 sf	0.5 Persons per 1,000 sf	See Below

HYDRAULIC MODELING CRITERIA

DESCRIPTION		VALUE
INDUSTRIAL PEAK FLOW[3]		
	Peak Flow = Peaking Factor (PF) x ADD	$[1+14/(4+P^{1/2})]$ x ADD
	(PF is based on upstream population, P = Population/1,000)	
HYDRAULICS		
	Minimum Pipe Diameter (in)	8
	Manning's "n" value	0.013
	Maximum d/D ratio at peak flow (D ≤ 12")	0.65
	Maximum d/D ratio at peak flow (D > 12")	0.70

PIPE SIZE	MEAN VELOCITY[2]		DESIGN SLOPE	
(in)	Minimum (ft/sec)	Maximum (ft/sec)	Minimum (%)	Maximum (%)
6	2.1	10.0	0.520	6.980
8	2.1	10.0	0.520	6.980
10	2.2	10.0	0.390	5.121
12	2.3	10.0	0.310	3.919
15	2.4	10.0	0.205	2.880
18	2.4	10.0	0.140	2.390
21	2.5	10.0	0.146	1.890
24	2.6	10.0	0.127	1.520
27	2.6	10.0	0.115	1.378
30	2.7	10.0	0.102	1.113
36	2.7	10.0	0.085	0.945
42	2.8	10.0	0.073	0.754
48	2.9	10.0	0.064	0.616
54	3.0	10.0	0.058	0.522
60	3.0	10.0	0.051	0.430
66	3.1	10.0	0.047	0.396
72	3.1	10.0	0.043	0.362
78	3.2	10.0	0.040	0.316
84	3.2	10.0	0.037	0.293
96	3.3	10.0	0.032	0.238
108	3.3	10.0	0.028	0.208
120	3.4	10.0	0.026	0.182

Notes
1. Based on Arizona Administrative Code, Title 18, Chapter 9 value of 100 gallons per capita per day.
2. Per City of Scottsdale Design Standards and Policy Manual (2018)
3. Per City of Phoenix Design Standards Manual for Water and Wastewater Systems (2017)

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TABLE 2 – WASTEWATER MODEL

TABLE 2
WASTEWATER MODEL

Project	Axon Way & Hayden Road
Location	Scottsdale AZ
Project Number	205133
Project Engineer	Nicholas Brown, PE
References	City of Scottsdale Design Standards and Policy Manual (2018)
	Arizona Administrative Code, Title 18, Chapter 9
	City of Phoenix Design Standards Manual for Water and Wastewater Systems (2017)

		LAND USE											
FROM NODE	**TO NODE**	**Multi-Family Residential (DU)**	**Commercial/Retail (sf)**	**Office (sf)**	**Restaurant (sf)**	**Resort Hotel (room)**	**Industrial (1,000 sf)**	**SEWER NODE ADD (gpd)**	**TOTAL ADD (gpd)**	**TOTAL ADD (gpm)**	**WEIGHTED PEAKING FACTOR[1]**	**PEAK FLOW (gpd)**	**PEAK FLOW (gpm)**
Outfall 1 M.H. #1 TO M.H. #4													
BLDG CONNECTION A-1	MH #1	314	-	-	-	-	-	69,080	69,080	48	4.0	276,319	192
BLDG CONNECTION B-1	MH #1	332	-	-	-	-	-	73,103	73,103	51	4.0	292,414	203
MH #1	MH #2	-	-	-	-	-	-	0	142,183	99	4.0	568,732	395
BLDG CONNECTION A-2	MH #2	52	-	-	-	-	-	11,491	11,491	8	4.0	45,962	32
BLDG CONNECTION B-2	MH #2	60	-	-	-	-	-	13,137	13,137	9	4.0	52,546	36
BLDG CONNECTION A-3	MH #2	76	-	-		-	-	16,794	16,794	12	4.0	67,176	47
MH #2	MH #3	-	-	-	-	-	-	0	183,604	128	4.0	734,417	510
BLDG CONNECTION A-4	MH #3	280	-	-	-	-	-	61,696	61,696	43	4.0	246,783	171
BLDG CONNECTION C-1	MH #3	135	23,715	-	-		-	41,538	41,538	29	4.0	166,154	115
MH #3	MH #4	-	-	-	-	-	-	0	286,838	199	4.0	1,147,354	797
Total Outfall 1		**1,250**	**23,715**	**0**	**0**	**0**	**0.00**	**286,838**	**286,838**	**199**	4.0	**1,135,496**	**789**

Note:
1. Weighted peaking factor based upon City of Scottsdale Design Standards and Policy Manual (2018) & City of Phoenix Design Standards Manual for Water and Wastewater Systems (2017) peaking factors for various land uses. The peaking factors are weighted in relation to total Average Day Demand for each use.

Outfall 2 M.H. #5 TO M.H. #9													
BLDG CONNECTION D-1	MH #5	-	5,075	-	-	253	-	98,630	98,630	68	4.0	394,521	274
MH #5	MH #6	-	-	-	-	-	-	0	98,630	68	4.0	394,521	274
MH #6	MH #7	-	-	-	-	-	-	0	98,630	68	4.0	394,521	274
MH #7	MH #8	-	-	-	-	-	-	0	98,630	68	4.0	394,521	274
BLDG CONNECTION C-2	MH #8	98	17,242	-	-	-	-	30,200	30,200	21	4.0	120,800	84
BLDG CONNECTION D-2	MH #8	-	1,727	-	-	86	-	33,567	33,567	23	4.0	134,269	93
BLDG CONNECTION D-3	MH #8		1,727			86		33,567	33,567	23	5.0	167,836	117
MH #8	MH #9	-	-	-	-	-	-	0	195,965	136	4.0	783,858	544
Total Outfall 2		**98**	**25,771**	**0**	**0**	**425**	**0**	**195,965**	**195,965**	**136**	4.0	**783,858**	**544**

TABLE 2
WASTEWATER MODEL

Project	Axon Way & Hayden Road
Location	Scottsdale AZ
Project Number	205133
Project Engineer	Nicholas Brown, PE
References	City of Scottsdale Design Standards and Policy Manual (2018)
	Arizona Administrative Code, Title 18, Chapter 9
	City of Phoenix Design Standards Manual for Water and Wastewater Systems (2017)

		LAND USE											
FROM NODE	**TO NODE**	**Multi-Family Residential (DU)**	**Commercial/Retail (sf)**	**Office (sf)**	**Restaurant (sf)**	**Resort Hotel (room)**	**Industrial (1,000 sf)**	**SEWER NODE ADD (gpd)**	**TOTAL ADD (gpd)**	**TOTAL ADD (gpm)**	**WEIGHTED PEAKING FACTOR[1]**	**PEAK FLOW (gpd)**	**PEAK FLOW (gpm)**
Outfall 3 M.H. #10 TO M.H. #16													
MH #7 (PH1)	MH# 10	-		182,380	7,130	-	148.00	88,908	88,908	62	3.2	285,813	198
MH #10	MH# 11	-	-	-	-	-	-	0	88,908	62	3.2	285,813	198
MH #11	MH #12	-	-	-	-	-	-	0	88,908	62	3.2	285,813	198
MH #12	MH #9	-	-	-	-	-	-	0	88,908	62	3.2	285,813	198
Outfall 2	MH #9	98	25,771	-	-	425	-	195,965	195,965	136	4.3	851,723	591
MH #9	MH #4	-	-	-	-	-	-	0	284,873	198	4.3	1,238,145	860
Outfall 1	MH #4	1,250	23,715	-	-	-	-	286,838	286,838	199	4.0	1,135,496	789
MH #4	MH #13	-	-	-	-	-	-	0	571,711	397	4.0	2,263,210	1,572
MH #14	MH #15	-	-	-	-		-	0	571,711	397	4.0	2,263,210	1,572
MH# 15	MH #16	-	-	-	-	-	-	0	571,711	397	4.0	2,263,210	1,572
MH #16	EX. MH #5	-	-	-	-	-	-	0	571,711	397	4.0	2,263,210	1,572
Total Outfall 3		**1,348**	**49,486**	**182,380**	**7,130**	**425**	**148**	**571,711**	**571,711**	**397**	4.0	**2,273,032**	**1,578**
Outfall 4 M.H. #17 TO M.H. #19													
BLDG CONNECTION E-1	MH #17	314	-	-	-	-	-	68,970	68,970	48	4.0	275,880	192
BLDG CONNECTION E-2	MH #17	314						68,970	68,970	48	4.0	275,880	192
MH #17	MH #18	-	-	-	-	-	-	0	137,940	96	4.0	551,760	383
MH #18	MH #19	-	-	-	-	-	-	0	137,940	96	4.0	551,760	383
Total Outfall 4		**627**	**-**	**-**	**-**	**-**	**-**	**137,940**	**137,940**	**96**	4.0	**551,760**	**383**
Total Proposed Flow		**1975**	**73201**	**182,380**	**7130**	**425**	**148.00**	**709,651**	**709,651**	**493**	4.0	**2,821,459**	**1,959**

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TABLE 3 – CALCULATED PIPE CAPACITIES

WOOD PATEL

TABLE 3
CALCULATED PIPE CAPACITIES

Project	Axon Way & Hayden Road
Location	Scottsdale AZ
Project Number	205133
Project Engineer	Nicholas Brown, PE
References	City of Scottsdale Design Standards and Policy Manual (2018)
	ADEQ Bulletin No. 11
	City of Phoenix Design Standards Manual for Water and Wastewater Systems (2017)

						PEAK FLOW RESULTS					
FROM NODE	**TO NODE**	**PIPE SIZE**	**MODELED PIPE SLOPE**	**PIPE CAPACITY (0.65 FULL)**		**PEAK FLOW**		**d/D**	**Peak Flow Velocity**	**SURPLUS CAPACITY**	**PERCENT OF CAPACITY**
		(in)	**(ft/ft)**	**(gpd)**	**(gpm)**	**(gpd)**	**(gpm)**		**(ft/sec)**	**(gpd)**	**(%)**
Outfall 1 M.H. #1 TO M.H. #4											
BLDG CONNECTION A-1	MH #1	8	0.0065	528,642	367	276,319	192	0.46	2.70	252,323	52.3%
BLDG CONNECTION B-1	MH #1	8	0.0065	528,642	367	292,414	203	0.48	2.74	236,228	55.3%
MH #1	MH #2	10	0.0065	958,492	666	568,732	395	0.50	3.24	389,759	59.3%
BLDG CONNECTION A-2	MH #2	6	0.0065	245,466	170	45,962	32	0.27	1.68	199,504	18.7%
BLDG CONNECTION B-2	MH #2	6	0.0065	245,466	170	52,546	36	0.29	1.75	192,920	21.4%
BLDG CONNECTION A-3	MH #2	6	0.0065	958,492	666	734,417	510	0.58	1.87	224,075	76.6%
MH #2	MH #3	10	0.0065	958,492	666	734,417	510	0.58	3.45	224,075	76.6%
BLDG CONNECTION A-4	MH #3	8	0.0065	528,642	367	246,783	171	0.43	2.63	281,859	46.7%
BLDG CONNECTION C-1	MH #3	6	0.0065	245,466	170	166,154	115	0.54	2.38	79,312	67.7%
MH #3	MH #4	12	0.0065	1,558,613	1082	1,147,354	797	0.57	3.86	411,259	73.6%
Outfall 2 M.H. #5 TO M.H. #9											
BLDG CONNECTION D-1	MH #5	8	0.0065	631,412	438	394,521	274	0.57	2.95	236,891	62.5%
MH #5	MH #6	8	0.0065	631,412	438	394,521	274	0.57	2.95	236,891	62.5%
MH #6	MH #7	8	0.0065	631,412	438	394,521	274	0.57	2.95	236,891	62.5%
MH #7	MH #8	8	0.0065	631,412	438	394,521	274	0.57	2.95	236,891	62.5%
BLDG CONNECTION C-2	MH #8	6	0.0065	293,186	204	120,800	84	0.45	2.20	172,385	41.2%
BLDG CONNECTION D-2	MH #8	6	0.0065	293,186	204	134,269	93	0.47	2.26	158,917	45.8%
BLDG CONNECTION D-3	MH #8	6	0.0065	293,186	204	134,269	93	0.47	2.26	158,917	45.8%
MH #8	MH #9	10	0.0065	1,144,826	795	783,858	544	0.61	3.50	360,968	68.5%

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WOOD PATEL

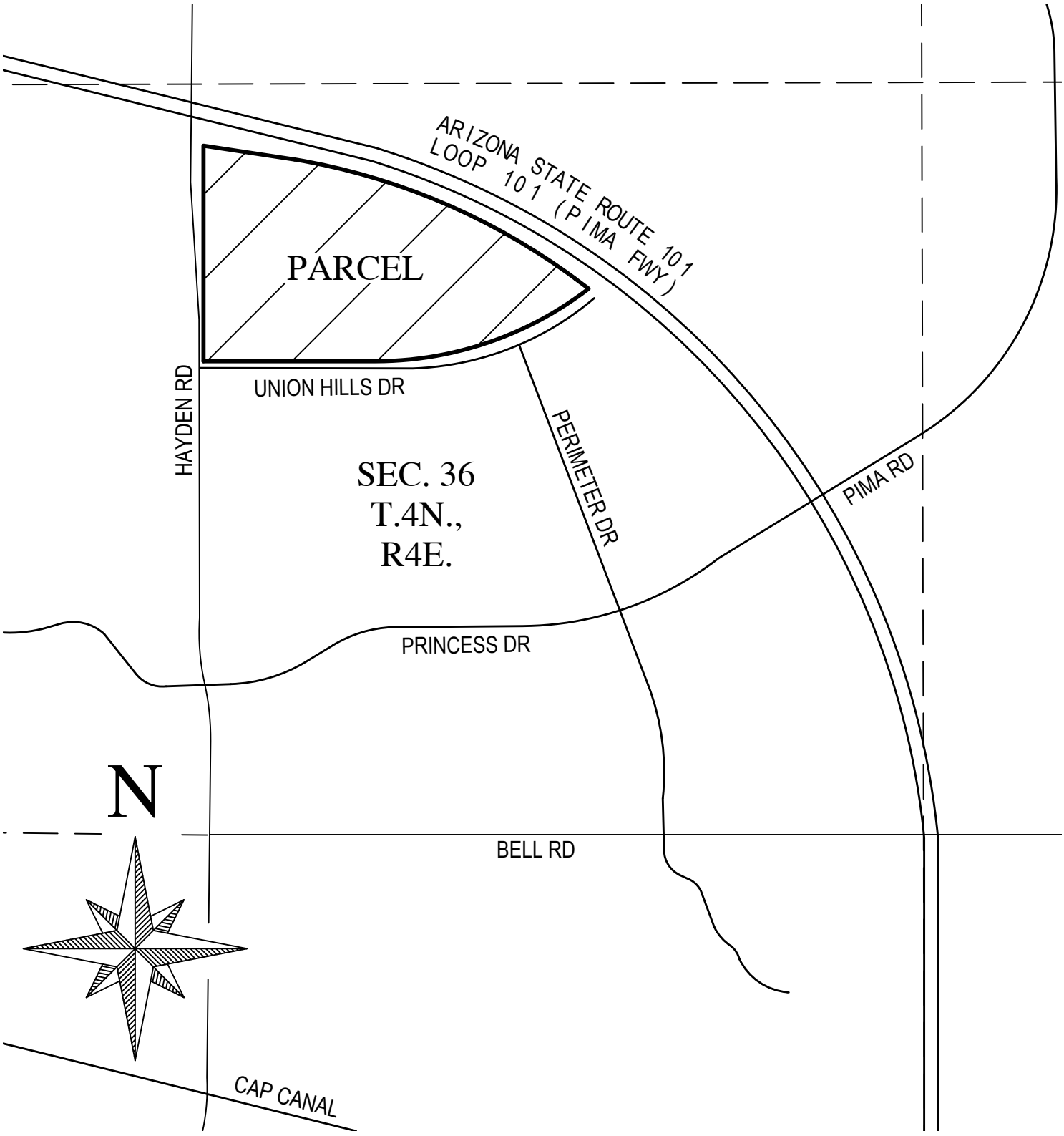
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Project	Axon Way & Hayden Road
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	ADEQ Bulletin No. 11
	City of Phoenix Design Standards Manual for Water and Wastewater Systems (2017)

						PEAK FLOW RESULTS					
FROM NODE	**TO NODE**	**PIPE SIZE**	**MODELED PIPE SLOPE**	**PIPE CAPACITY (0.65 FULL)**		**PEAK FLOW**		**d/D**	**Peak Flow Velocity**	**SURPLUS CAPACITY**	**PERCENT OF CAPACITY**
		(in)	**(ft/ft)**	**(gpd)**	**(gpm)**	**(gpd)**	**(gpm)**		**(ft/sec)**	**(gpd)**	**(%)**
Outfall 3 M.H. #10 TO M.H. #16											
MH #7 (PH1)	MH# 10	8	0.0052	564,752	392	285,813	198	0.50	2.51	278,939	50.6%
MH #10	MH# 11	15	0.0052	3,018,987	2097	285,813	198	0.21	2.40	2,733,174	9.5%
MH #11	MH #12	15	0.0052	3,018,987	2097	285,813	198	0.21	2.40	2,733,174	9.5%
MH #12	MH #9	15	0.0052	3,018,987	2097	285,813	198	0.21	2.40	2,733,174	9.5%
Outfall 2	MH #9	15	0.0052	3,018,987	2097	851,723	591	0.36	3.27	2,167,264	28.2%
MH #9	MH #4	12	0.0052	1,665,078	1156	1,238,145	860	0.64	3.59	426,933	74.4%
Outfall 1	MH #4	15	0.0052	3,018,987	2097	1,135,496	789	0.42	3.54	1,883,491	37.6%
MH #4	MH #13	15	0.0052	3,018,987	2097	2,263,210	1,572	0.65	4.18	755,777	75.0%
MH #14	MH #15	15	0.0052	3,018,987	2097	2,263,210	1,572	0.65	4.18	755,777	75.0%
MH# 15	MH #16	15	0.0052	3,018,987	2097	2,263,210	1,572	0.65	4.18	755,777	75.0%
MH #16	EX. MH #5	15	0.0052	3,018,987	2097	2,263,210	1,572	0.65	4.18	755,777	75.0%
Outfall 4 M.H. #17 TO M.H. #19											
BLDG CONNECTION E-1	MH #17	8	0.0052	564,752	392	275,880	192	0.49	2.49	288,872	48.8%
BLDG CONNECTION E-2	MH #17	8	0.0052	564,752	392	275,880	192	0.49	2.49	288,872	48.8%
MH #17	MH #18	10	0.0052	1,023,964	711	551,760	383	0.52	2.96	472,204	53.9%
MH #18	MH #19	12	0.0052	1,665,078	1156	551,760	383	0.40	2.95	1,113,318	33.1%

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EXHIBIT 1 – VICINITY MAP



WOOD PATEL

AXON WAY & HAYDEN ROAD

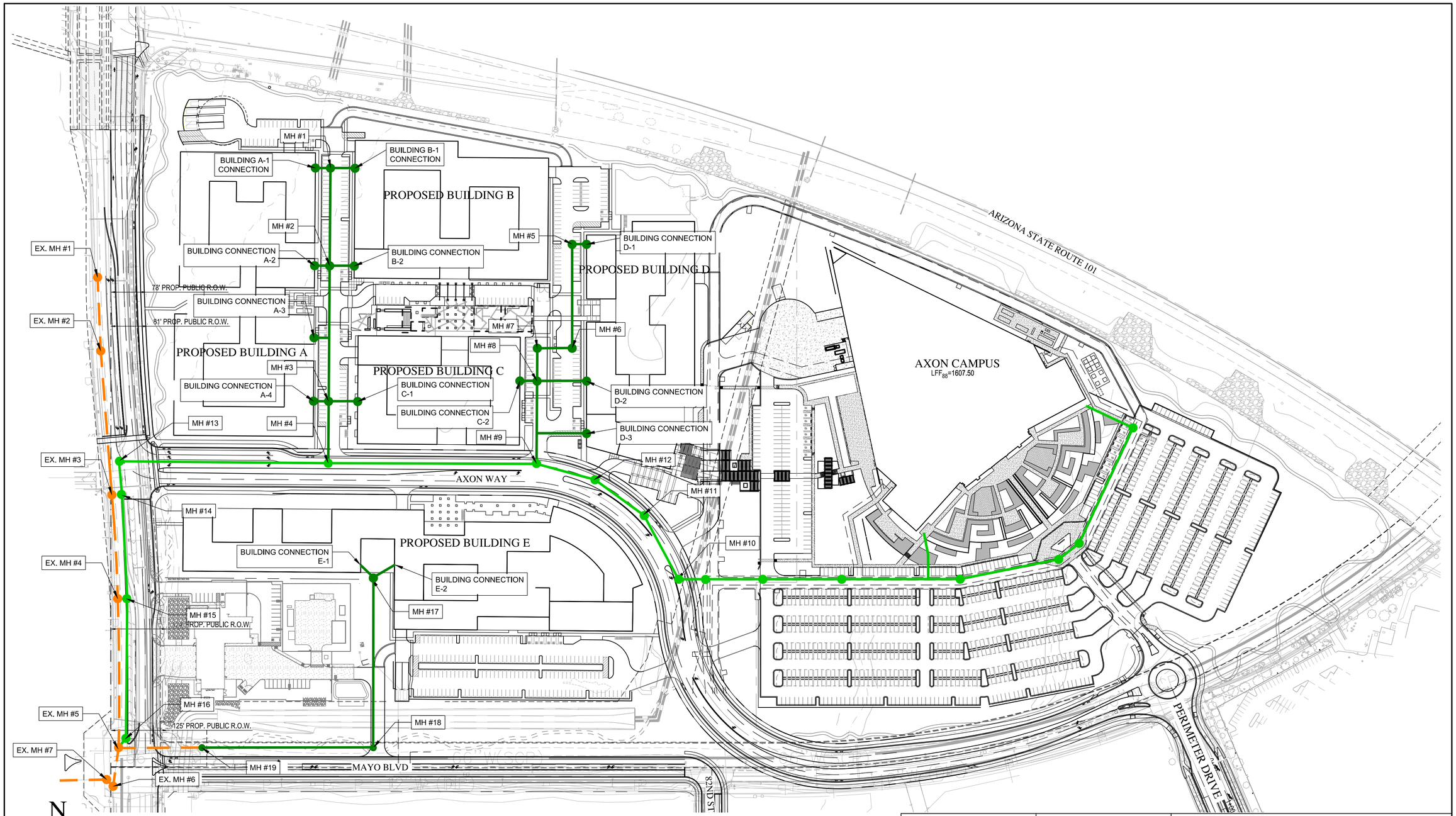
VICINITY MAP

DATE 06-28-24	SCALE	SHEET	1 OF 1
JOB NO. 205133.04	DESIGN BLJ	CHECK	NEB
	DRAWN BLJ		

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EXHIBIT 2 – PROPOSED WASTEWATER SYSTEM MAP



NOT FOR CONSTRUCTION OR RECORDING

WOOD PATEL

AXON WAY & HAYDEN ROAD

WASTEWATER SYSTEM MAP

DATE	06-28-2024	SCALE	1" = 100'	SHEET	1 OF 1
JOB NO.	205133.04	DESIGN	AF	DRAWN	BP

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