Banner Scottsdale
Transportation Impact & Mitigation Study
City of Scottsdale

Project No.: 1121151

Date: June 2022

It is not clear as to what you are seeking approval for. The Site Plan you provide is unclear and I don't think it included Parcel B1. If you want Parcel B1 to be included in this TIA why does much of your analysis shown tables of information without Parcel B1?

None of your Appendices are included.

REVIEWED
By Martin Lauber at 3:56 pm, Sep 13, 2022

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Not included. A clear site plan with Phasing shown and Parcel B1.

I. Introduction and Summary

A. Purpose of report & study objectives

The purpose of this traffic study is to determine the traffic impacts of a proposed Banner Health medical campus project within the City of Scottsdale. The proposed Banner Health medical campus is proposed to be developed on an approximately 45 acre parcel of State Trust Land located on the east side of Hayden Road between Loop 101 and the Cavasson Boulevard extension (the "Banner Property"). The Banner Property is located on a portion of a parcel referred to as Planning Unit 9 of the Crossroads East Planned Community District. The remaining portion of Planning Unit 9, also approximately 45 acres, is located north of the Cavasson Boulevard extension and east of Hayden Road and is referred to as Parcel B1 within this traffic study. .

This report also compares the difference between the previously anticipated land use trip generation for the Banner Property and the proposed land use for the Banner medical campus. The report further includes analysis that assumes the development of Parcel B1 and evaluates potential future traffic impacts.

B. Executive summary

1. Site Locations & Study Area

The Banner Property is located within the City of Scottsdale, east of Hayden Road between Loop 101 and Cavasson Boulevard. **Figure 1** shows the Banner Property location. This study includes the analysis of the following intersections:

- Loop 101 EB Ramp & Hayden Road
- Loop 101 WB Ramp & Hayden Road
- Main Entrance & Hayden Road
- Cavasson Boulevard & Hayden Road
- Legacy Boulevard & Hayden Road
- Cavasson Boulevard & Driveway 1
- Cavasson Boulevard & Driveway 2

2. Development Description

The Banner Health medical campus project will be developed in three phases ("Banner Project"). The first phase includes two buildings (Phase 1-A and 1-B). Phase 1-A will be a 340,000 SF hospital building with 108 beds in a 4-story hospital building and a 2-story Diagnostic & Treatment building block to house emergency, surgery, laboratory, Pharmacy and associated support services. Phase 1-B will include a 3-story, 120,000 SF Medical Office Building that will be separate from the hospital. The estimated completion date for Phases 1a and 1b is 2025. Phase 2 of the Banner Project is anticipated to include a 3-story, 90,000 SF Cancer Center along with a 4-level parking structure. For the purposes of this report, Phase 2 is assumed to be completed in 2032. The final Phase 3 is planned to expand on the Phase 1-A hospital building and will add an additional 162 to 192 beds for a total bed capacity of 270-300 beds at full build out of the hospital. For the purposes of this report, Phase 3 is assumed to be completed in 2045.

3. Principal Findings

Through capacity and improvement analysis, it was found that providing right turn lanes at all site driveways into the Banner Property is beneficial. It was also determined that for the two site driveways along Cavasson Boulevard, it is beneficial to provide separate egress left and right turn lanes to reduce vehicle queues within the parking lot.

Through the capacity analysis, it was found that the background traffic growth has impacts to the intersection of Cavasson Boulevard & Hayden Road by 2032 (Phase 2 timeframe) without the addition of Banner traffic or Parcel B1. During the morning peak hour, the delay is 64.6 seconds with a LOS E by 2032. The northbound left begins to fail for the background traffic with the addition of Parcel B1 by 2025 (Phase 1 timeframe). The delay with the addition of Parcel B1 is 83.6 second (LOS F) during the morning peak hour and 77.2 seconds (LOS E) during the afternoon peak hour. The addition of the site traffic also has some impacts to the northbound left turn lane at Cavasson Boulevard & Hayden Road due to the addition of the east leg of the intersection as well as over all increased traffic to the intersection. Without the addition of Parcel B1, the northbound left turn has a delay of 79.3 seconds (LOS E) for the morning peak and 91.9 seconds (LOS F) for the afternoon peak hour by Phase 1 opening day 2025. With the addition of both Banner Phase 1 and Parcel B1, the morning peak hour delay is 67.7 seconds (LOS E) and the afternoon peak hour delay is 82.5 seconds (LOS F). The turning movement delay was found to decrease for the background traffic only scenarios as well as with the addition of the Banner traffic scenarios when the northbound and southbound left turns are made a protected/permissive. The LOS becomes a D with 45.5 second delay in the morning peak hour and C with a 34.5 second delay in the afternoon peak hour for the northbound left background traffic scenario by 2025 with the improvement and remaining an acceptable level of service for by 2032 and 2042. One Parcel B1 is added to the background traffic and the improvement is made to the intersection, the delay is decreased to 18 seconds (LOS B) for the morning peak and 31 seconds (LOS C) for the afternoon peak hour by 2025. Note the signal timing was also optimized in all scenarios. The LOS and delay remain at an acceptable level of service by 2032 and 2042. Once the Banner traffic is added at the protected/permissive improvements are added, the delay is decreased to 19.6 seconds (LOS B) and 30.2 (LOS C) for the morning and afternoon peak hour without Parcel B1 by Phase 1 opening day (2025). The turn remains at an acceptable level of service by Phases 2 & 3 opening days.

The westbound left turns at Cavasson Boulevard and Hayden Road will exceed 300 vehicles per hour during the afternoon peak hour with the Banner Project. Per the City's guidelines, dual left turn lanes should be considered. Through capacity analysis, it was determined that dual left turn lanes would provide the most efficiency for the westbound left turning vehicles and create more space for left turning vehicles to queue.

The northbound left turn lane for the Loop 101 interchange for the westbound ramps is currently at a LOS D with a 41.7 second delay during the afternoon peak hour and a queue that exceeds the capacity of the turn lane. Once background traffic is increased to accommodate more development in the area and Parcel B1 traffic is added, the northboubd left turn increases to a 79.7 second delay (LOS E) by 2025. Pavement already exists at the the Loop 101 and Hayden interchange that could accommodate an additional through lane in the northbound and southbound directions. Reconfiguring pavement markings to incorporate this currently unused pavement to add an additional through lane in the north and south direction would benefit traffic as well as making the northbound left turn a protected/permissive left turn instead of a protected left turn. This would allow for more throughput traffic capacity in the northbound and southbound directions and thus allow for more of the signal cycle length to be dedicated to the northbound left turning movement. Making the left turn a protected/permissive left also allows additional vehicles to make a left when there are gaps in the throughput traffic. It is also important to note that based on the traffic counts collected in the field, the northbound left does already exceeds the 300 vehicles per hour threshold in the afternoon peak hour. Per the City guidelines, the intersection meets the threshold today for investigating a dual northbound left turn lane..

4. Conclusions

The Banner Project includes three phases that are anticipated to be completed over the next 20 years. Phase 1 of the Banner Project is anticipated to generate 7,485 weekday trips, 601 morning peak hour trips and 633 afternoon peak hour trips. Phase 2 of the Banner Project is anticipated to generate 2,867 weekday trips, 241 morning peak hour trips and 256 afternoon peak hour trips. Phase 3 of the Banner Project is anticipated to

generate 3,183 weekday trips, 242 morning peak hour trips and 254 afternoon peak hour trips. The three phases combined are anticipated to generate 13,535 weekday trips, 1,084 morning peak hour trips and 1,143 afternoon peak hour trips total for the Banner Project.

A significant portion of the Banner Project traffic is anticipated to use the intersection of Hayden Road & Cavasson Boulevard. Providing dual left turns for the eastbound and westbound approaches significantly benefits the delay and level of service for all turning movements at the intersection. The eastbound approach already has dual left turn lanes and it is recommended for the dual lefts to remain. The westbound approach is recommended to have dual left turn lanes based on the City's guidelines. The dual westbound lefts also significantly reduce delay and queues for westbound left turning vehicles

The future development of Parcel B1 and the associated north/south connector road between Cavasson Blvd. and Hualapai Drive will help to lower the traffic demand at the intersection of Hayden Road & Cavasson Boulevard by providing alternative routes for site traffic to access Pima Road and the Loop 101.

5. Recommendations

The following list includes the recommendations for site access to the Banner Property:

- Provide northbound right turn lane with a minimum 100-foot storage length at the main entrance along Hayden Road.
- Provide eastbound right turn lane with a minimum 100-foot storage length at the west site driveway along Cavasson Boulevard for Phase 1.
- The east driveway onto the Banner site is not anticipated to have a lot of use until Phases 2 and 3 are constructed. It is therefore recommended to plan for a future eastbound right turn lane with 100-foot storage and further investigate when the right turn lane will be needed with the future phases and as Cavasson Boulevard continues to develop.
- Provide dedicated northbound left turn lanes at two site driveways along Cavasson Boulevard for egress traffic as well as a dedicated northbound right turn lane.

The following list includes all recommendations of off-site improvements for Base traffic that will also improve traffic once Banner traffic is added:

- Reconfigure pavement markings to make the additional unused pavement a shared through/right southbound lane if not already planned at Hayden Road & the Loop 101 westbound interchange.
- Change the northbound left turn lane at Hayden Road and Cavasson Boulevard to a protected/permissive left turn lane by phase 1 opening day (2025) to reduce delay and queues for the turning movement.

The following list includes all recommendations of off-site improvements to accommodate Banner Project site traffic:

- Cavasson Boulevard along the north boundary of the Banner Property is recommended to be a two-lane roadway section to be widened at the intersection of Hayden Road.
- Provide dual westbound left turn lanes with at least 300-foot storage length at Hayden Road & Cavasson Boulevard and a westbound shared through/right turn lane.
- Reconfigure pavement markings for the 1st eastbound right turn lane to be a through lane at Hayden Road & Cavasson Boulevard while maintaining the eastbound dual left turn lane and outer dedicated right turn lane.
- When updating the signal at Hayden Road & Cavasson to accommodate the new east leg of Cavasson, provide protected/permissive southbound left turn indications. The dual eastbound left

turn lanes will need to be updated to protected left indications. The dual westbound left turn lanes will also require protected left turn indications.

- Provide a southbound left turn lane at the main entrance on Hayden Road with a storage length that fits within the constraints of available space within the existing median.

II. Proposed Development

A. Off-Site Development

The proposed development of the Banner Project will include the design and construction of the currently non-existent east leg of the Hayden Road & Cavasson Boulevard intersection. Cavasson Boulevard, as collector road, will be constructed along the length of Banner Property and terminate with a temporary turn-around at the east end of the Banner Property. The construction of the east leg of Cavasson Boulevard will include the addition of a southbound left turn lane at the intersection as well as restriping the west leg to accommodate a through lane at the intersection. Additionally, the main entrance to the Banner Project will be located along Hayden Road to align with the Hayden Road entrance for the new Nationwide/Cavasson development on the west side of Hayden Road. Due to the proximity of the Loop 101, the main entrance will have limited access to include left-in, right-in and right-out. Left-out will be restricted at this access location.

B. Description of On-Site Development

1. Lane Use & Intensity

The Banner Project will have 3 main access locations. As previously mentioned, one main entrance driveway with ¾ access along Hayden Road as well as two driveways along Cavasson Boulevard will be constructed.

2. Location

The Banner Project site is located within the City of Scottsdale, east of Hayden Road between Loop 101 and Cavasson Boulevard. **Figure 1** shows the project location.

Figure 1 – Site Location

3. Site Plan

The Banner Project site plan is provided in **Figure 2**. A Larger version of the site plan is also included in **Appendix E**. Not attached

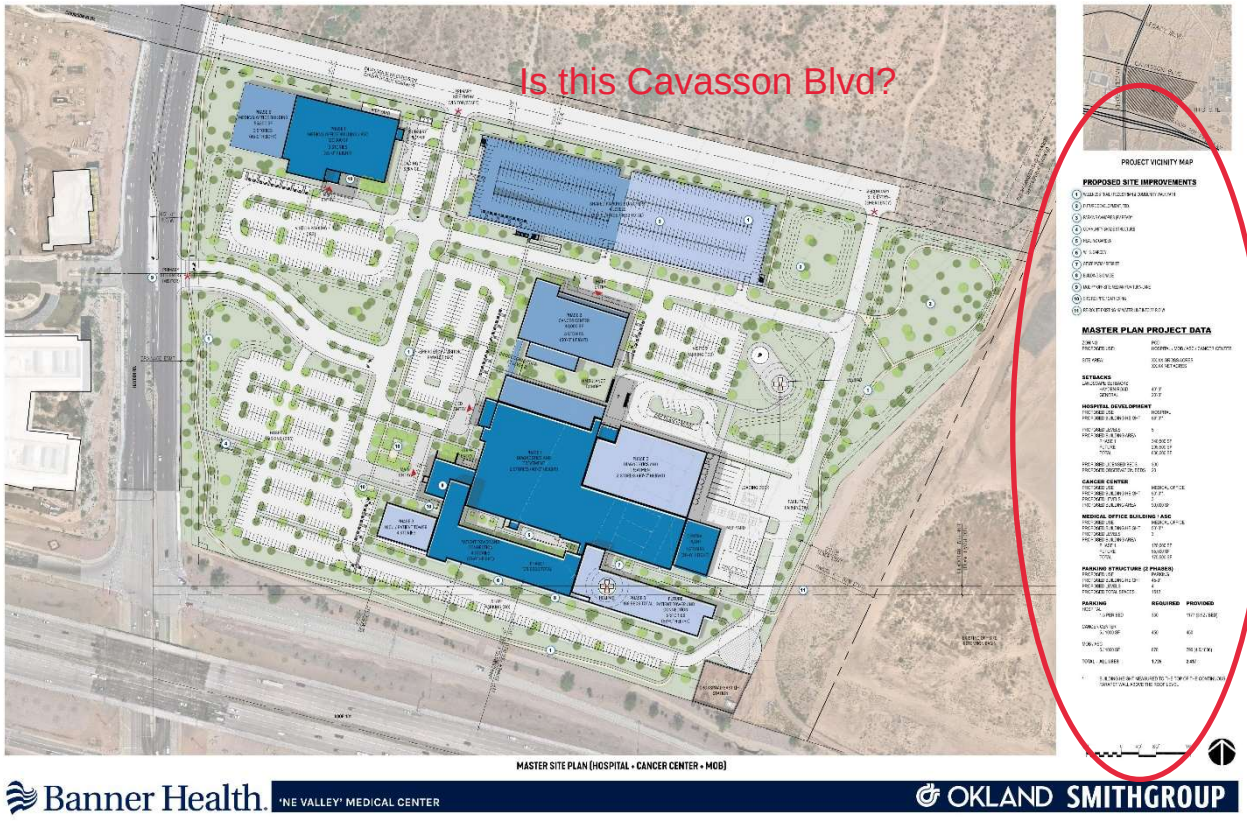

Figure 2 – Site Plan

Where is Parcel B1?

4. Zoning

The Banner Property is zoned Planned Community District as part of the Crossroads East PCD. Prior traffic studies assumed that the Banner Property would be developed as an employment center with a mix of office and light industrial uses. This Banner Project will consist of medical uses that include a hospital and ancillary facilities as well as medical office buildings.

5. Phasing & Timing

As noted, the Banner Project will be developed in three phases. Phase 1 is planned to be completed by 2025. The second phase of the Banner Project is planned for completion 8 to 10 years after Phase 1. The final phase of the Banner Project, Phase 3, does not have a definitive completion date, however completion of the third phase is anticipated to be 5 to 8 years beyond Phase 2. For the purposes of this study, the horizon years of 2025, 2032, and 2042 were used in the analysis of the 3 phases.

III. Area Conditions

A. Study Area

In discussion with the City, it was determined that the following intersections could be impacted by traffic and would be analyzed in this traffic study.

- Loop 101 EB Ramp & Hayden Road

- Loop 101 WB Ramp & Hayden Road
- Main Entrance & Hayden Road
- Cavasson Boulevard & Hayden Road
- Legacy Boulevard/Hualapai Drive & Hayden Road

B. Study Area Land Use

1. Existing Land Uses

The Banner Property is currently zoned for employment issues and anticipated to have a mix of office and light industrial uses. This Banner Project will consist of medical uses that include a hospital and ancillary facilities as well as medical office buildings.

For comparison purposes, the anticipated trip generation for the existing anticipated land uses on the Banner Property was calculated. The land use and density was determined in coordination with the City traffic and planning departments. **Table 1** summarizes the resulting trip generation.

Table 1 – Former Land Use Trip Generation

Land Use	Quant	Units	Weekday			Morning Peak			Afternoon Peak		
			Total	Ingress	Egress	Total	Ingress	Egress	Total	Ingress	Egress
Office	601.62	1000 SF	6522	3261	3261	914	804	110	866	147	719
Light Industrial	300.81	1000 SF	1465	733	732	223	196	27	196	27	169
Total Traffic			**7987**	**3994**	**3993**	**1137**	**1000**	**137**	**1062**	**174**	**888**

C. Site Accessibility

1. Area Roadway System

a. Existing

The following roadways are within the study area and used to access the Banner Property.

Hayden Road is a 6-lane arterial roadway along the frontage of the Banner Property and reduces down to 4-lanes north of the Banner Property as well as to the south. The speed limit is 45 miles per hour. There is a bike lane, curb, gutter and sidewalk along the west side of the road. There are bike lanes, curb, and gutter along the east side of the road.

Cavasson Boulevard is a 3-lane collector roadway to the west of Hayden Road. There is one westbound and one eastbound through lane along with a two-way left turn lane.

Hayden Road & Eastbound Loop 101 Off-Ramp is a 4-leg intersection. There is a dedicated eastbound left turn lane, a shared all-way lane and a dedicated right turn lane on the west leg. There are three northbound through lanes and a dedicated right turn lane. There are also dual southbound left turn lanes and two through lanes. There is a hatched striped out pavement area that vehicles cannot currently drive on. The southbound left turn lanes are protected left turn.

Hayden Road & Westbound Loop 101 Off-Ramp is a 4-leg intersection. There are dedicated westbound dual left turn lanes, a shared through/right turn lane and a dedicated right turn lane on the east leg. There are four southbound through lanes and a dedicated right turn lane. There is also a single

northbound left turn lane and two through lanes. There is a hatched striped out pavement area that vehicles cannot currently drive on for the northbound traffic. The northbound left turn lane is a protected left turn.

Hayden Road & Cavasson Boulevard is currently a 3-leg intersection. There are dedicated eastbound dual left turn lanes and two dedicated right turn lanes. There is currently not an east leg. There are three northbound through lanes and one left turn lane. There are three southbound through lanes and a dedicated right turn lane. The northbound left turn lane is a permissive left turn.

Hayden Road & Legacy Boulevard/Hualapai Drive is currently a 3-leg intersection. There is a dedicated eastbound left turn lane and a dedicated right turn lane. There is currently not an east leg. The east leg is currently in the design phase and will connect to existing Hualapi Drive. There are two northbound through lanes and one left turn lane. There are two southbound through lanes and a dedicated right turn lane. The northbound left turn lane is a permissive left turn.

2. Traffic Volumes & Conditions

Existing traffic counts were collected by Field Data Services of Arizona (FDS). for the following intersections that was previously mentioned.

- Loop 101 EB Ramp & Hayden Road
- Loop 101 WB Ramp & Hayden Road
- Cavasson Boulevard & Hayden Road
- Legacy Boulevard & Hayden Road

The traffic count data from FDS can be found in **Appendix A.** A summary of the turning movement counts for the morning and afternoon peak hours are summarized in Table 2.

Table 2 – Existing Traffic Counts

Intersection	Peak Hour	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Hayden Rd & Loop 101 EB	AM	449	1	466	-	-	-	-	243	25	347	367	-
	PM	284	0	202	-	-	-	-	1025	51	344	340	-
Hayden Rd & Loop 101 WB	AM	-	-	-	49	4	362	110	599	-	-	663	246
	PM	-	-	-	68	3	465	527	782	-	-	616	361
Hayden Rd & Main Entrance	AM	-	-	0	-	-	0	0	1054	0	0	928	0
	PM	-	-	0	-	-	0	0	1774	0	0	965	0
Hayden Rd & Cavasson Blvd	AM	3	0	10	0	0	0	21	960	0	0	918	3
	PM	3	0	25	0	0	0	2	1286	0	0	940	1
Hayden Rd & Legacy Blvd/ Hualapai Dr	AM	7	0	30	0	0	2	8	988	1	1	881	9
	PM	10	0	12	0	0	1	35	1288	0	0	902	18

3. Transit Service

Transit services do not currently exist adjacent to the project site. In discussion with the City, there are not currently plans for providing transit services to this area.

IV. Projected Traffic

A. Site Traffic

1. Trip Generation

The trip generation for each phase of the Banner Project were calculated using the ITE Trip Generation Manual, 11th Edition. The calculations are summarized in **Table 3**.

Table 3 – Trip Generation

Phase	Land Use	Land Use Code	Quant	Units	Weekday			Morning Peak			Afternoon Peak		
					Total	Ingress	Egress	Total	Ingress	Egress	Total	Ingress	Egress
1	Hospital	610	340	1000 SF	3662	1831	1831	279	187	92	292	102	190
	Medical Dental Office	720	120	1000 SF	3823	1912	1911	322	261	61	341	85	256
	Phase 1 Total				**7485**	**3743**	**3742**	**601**	**448**	**153**	**633**	**187**	**446**
2	Medical Dental Office	720	90	1000 SF	2867	1434	1433	241	195	46	256	64	192
	Phase 2 Total				**2867**	**1434**	**1433**	**241**	**195**	**46**	**256**	**64**	**192**
3	Hospital	610	295.5	1000 SF	3183	1592	1591	242	162	80	254	89	165
	Phase 3 Total				**3183**	**1592**	**1591**	**242**	**162**	**80**	**254**	**89**	**165**
Total for All Phases					**13535**	**6769**	**6766**	**1084**	**805**	**279**	**1143**	**340**	**803**

2. Trip Distribution

The trip distribution was determined based on anticipated patient origins as well as employees. Most traffic is anticipated to arrive from the east and west on the Loop 101. Some traffic is anticipated to arrive from the north of the Banner Property along Scottsdale Road, Hayden Road and Pima Road. Some traffic is also anticipated to arrive from the south from Scottsdale Road and Hayden Road.

Figure 3 – Trip Distribution

3. Modal Split

Transit is not currently planned within this area, therefore trips were not reduced for the purposes of this study to account for the use of transit.

4. Trip Assignment

Two trip assignment calculations were completed for the purposes of this study, this is due to the planned north/south connector road between Cavasson Boulevard and Legacy Boulevard/Hualapai Drive. The connector road will provide access from Cavasson Boulevard to Legacy Boulevard/Hualapai Drive and thus Pima Road, which will alleviate some of the traffic demand at the Cavasson Boulevard & Hayden Road intersection as well as the Legacy Blvd. & Hayden Road intersection. The connector road will not be built with the Banner Project, but instead will be constructed with Parcel B1 to the north of Cavasson Boulevard. The timeframe for the north/south connector road is not known at this point. Analysis with and without the development of Parcel B1 was therefore conducted for the purposes of this study. The analysis was first conducted without the development of Parcel B1 and thus without the construction of the connector road. Then the analysis was conducted with the development of Parcel B1 and thus with the construction of the connector road. The resulting trip assignments are summarized in the following exhibits. **Figure 4** through **Figure 6**, depict the anticipated trip assignment for the traffic generated for each individual phase without the development of Parcel B1 and thus without the addition of the connector road. **Figure 7** depicts the combined total of all 3 phases without the development of Parcel B1. **Figure 8** through **Figure 10**, depict the anticipated trip assignment for the traffic generated for each individual phase with the development of Parcel B1 and thus with the construction of the connector road. **Figure 11** depicts the combined total of all 3 phases with the development of Parcel B1.

Please provide an exhibit that shows each phase and Parcel B1.

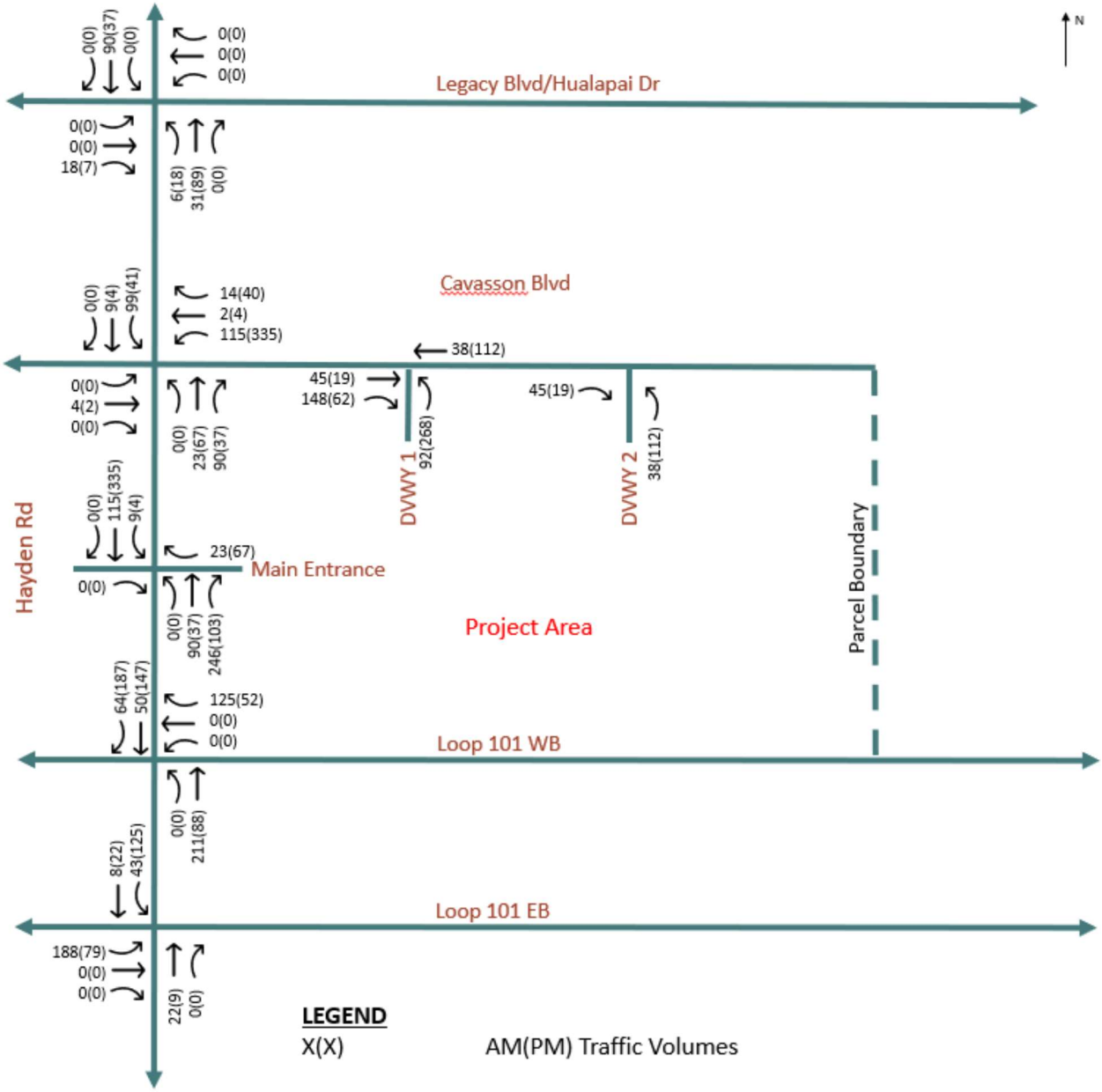

Figure 4 – Trip Assignment Phase 1 Only w/o Parcel B1

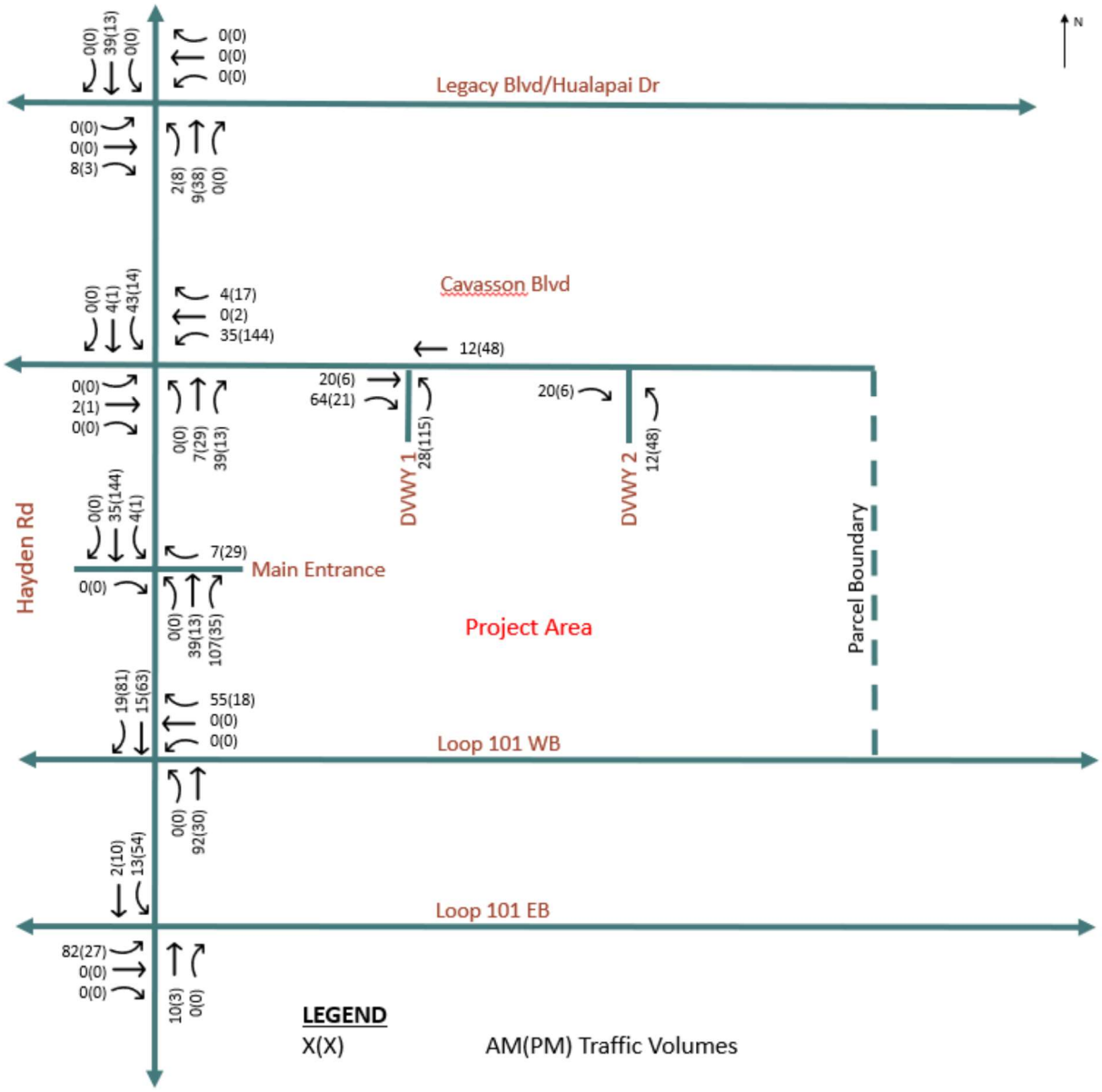

Figure 5 – Trip Assignment Phase 2 Only w/o Parcel B1

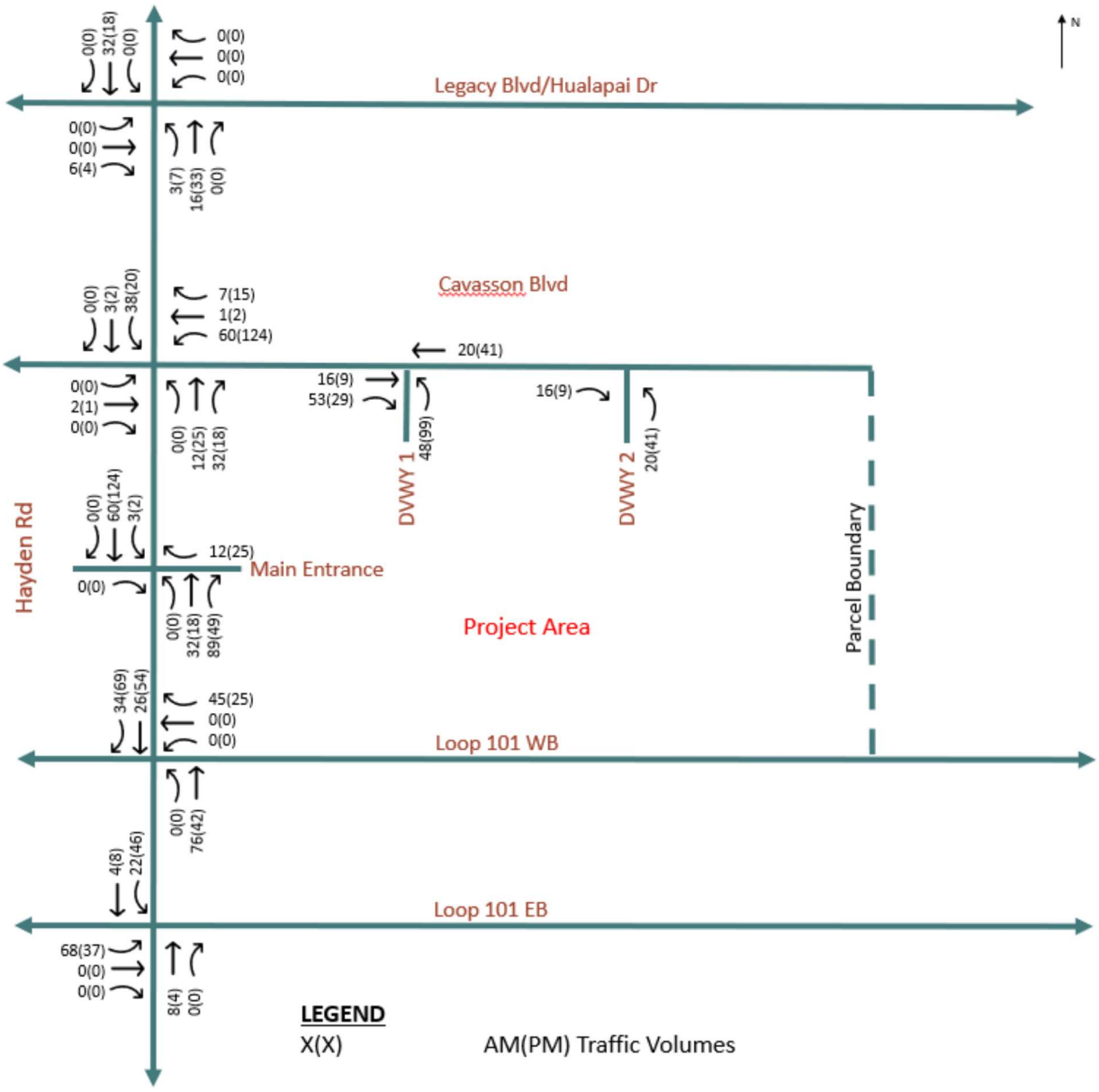

Figure 6 – Trip Assignment Phase 3 Only w/o Parcel B1

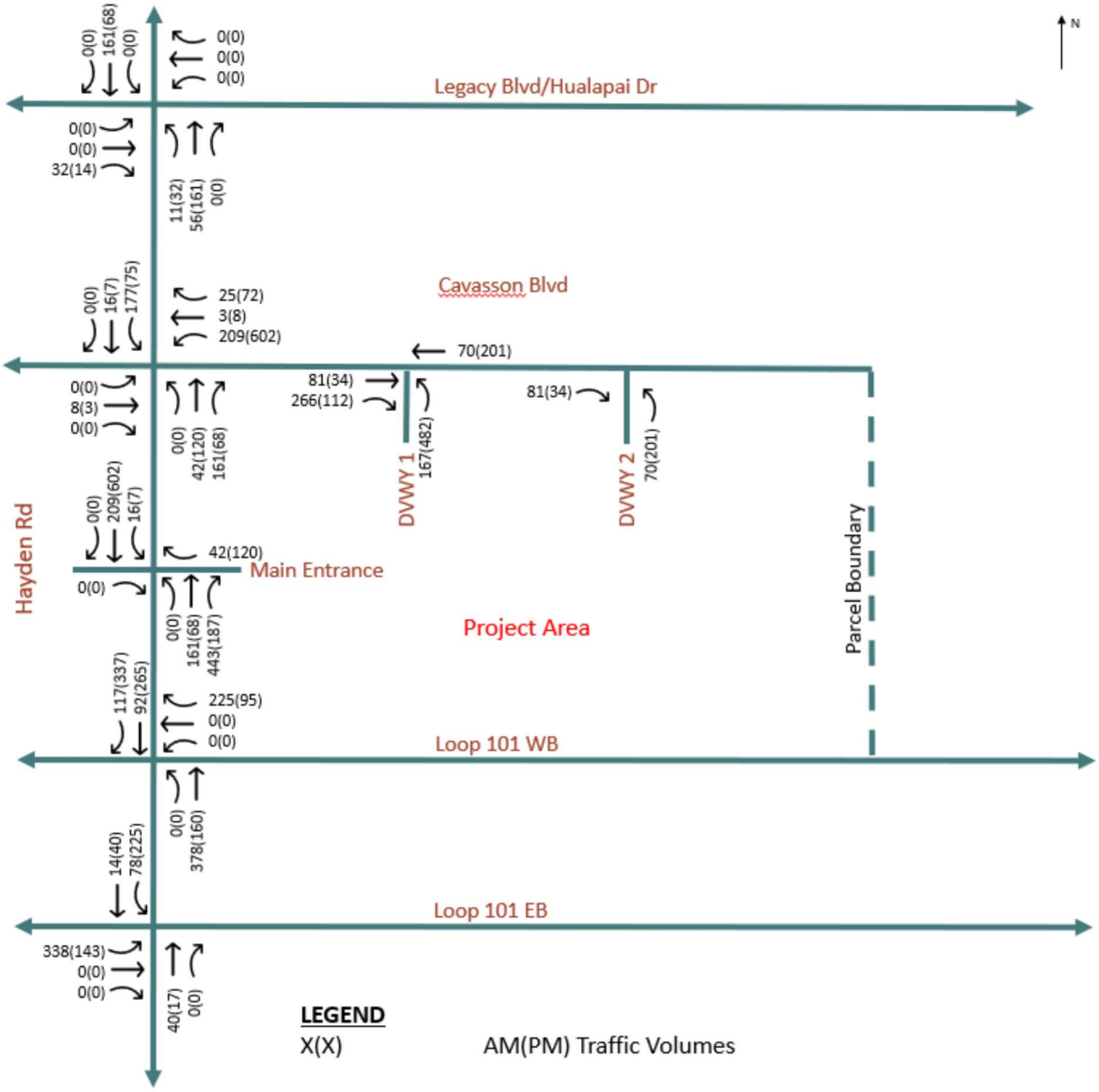

Figure 7 – Trip Assignment All Phases Combined w/o Parcel B1

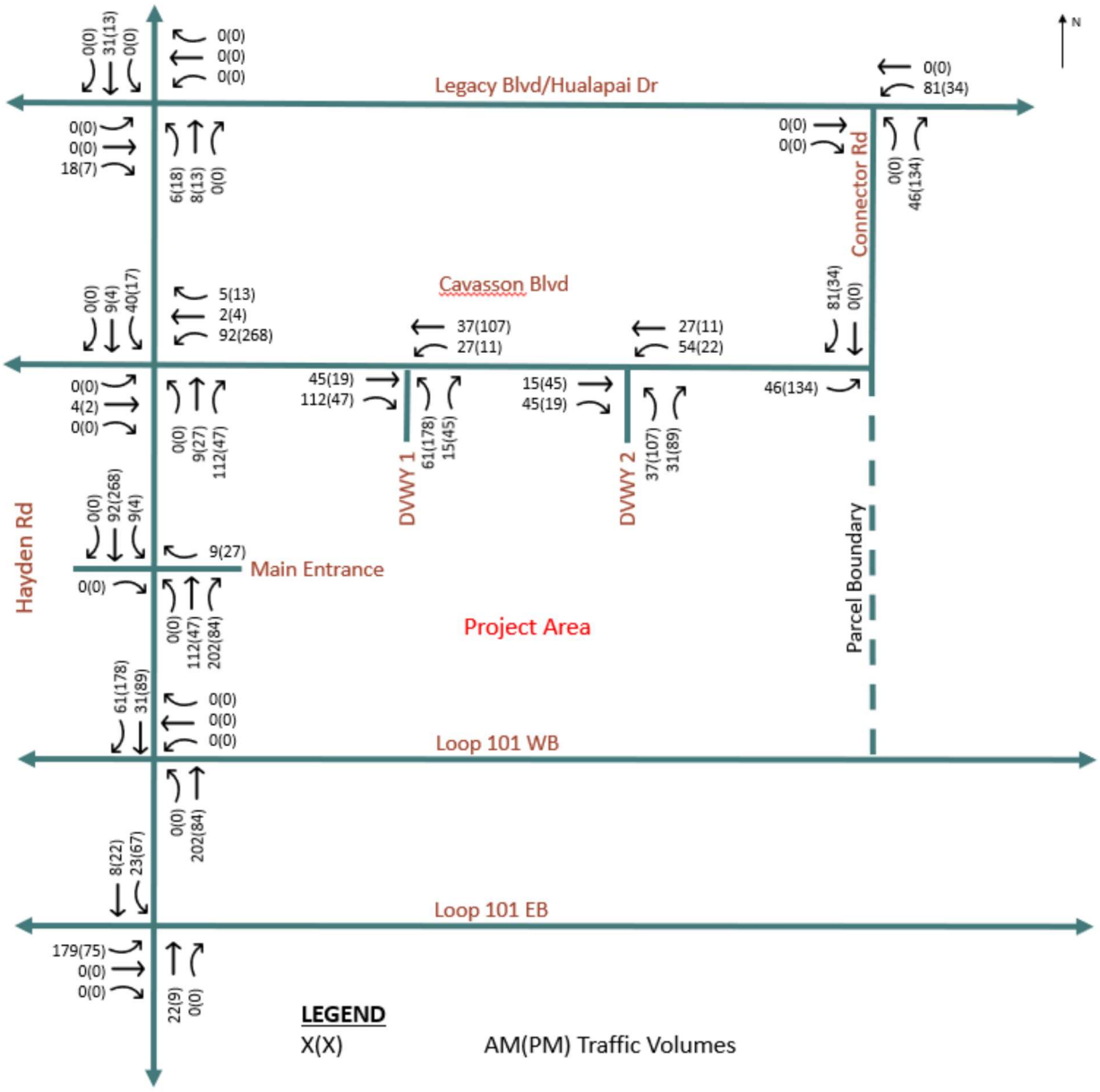

Figure 8 – Trip Assignment Phase 1 Only w/Parcel B1

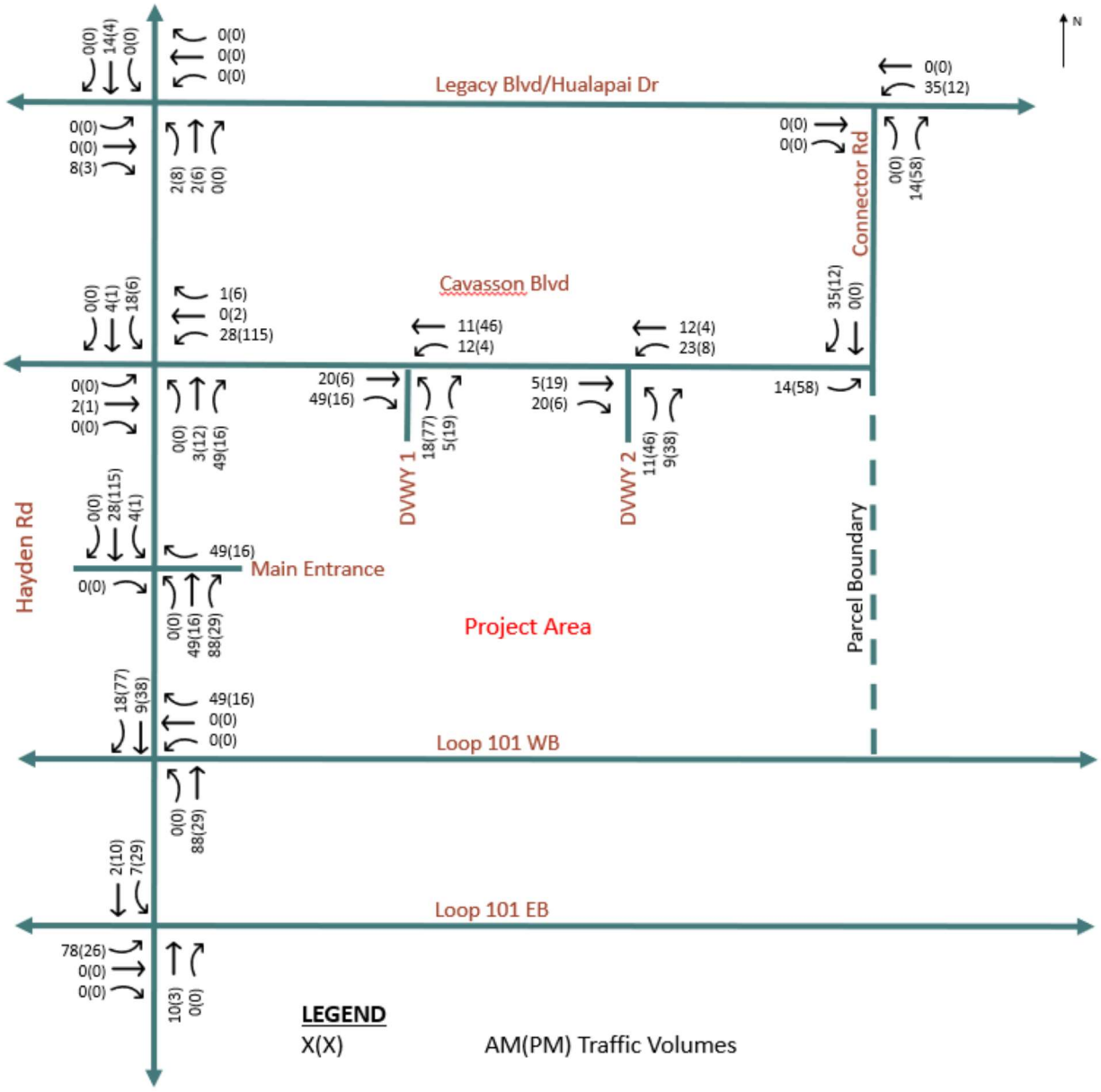

Figure 9 – Trip Assignment Phase 2 Only w/Parcel B1

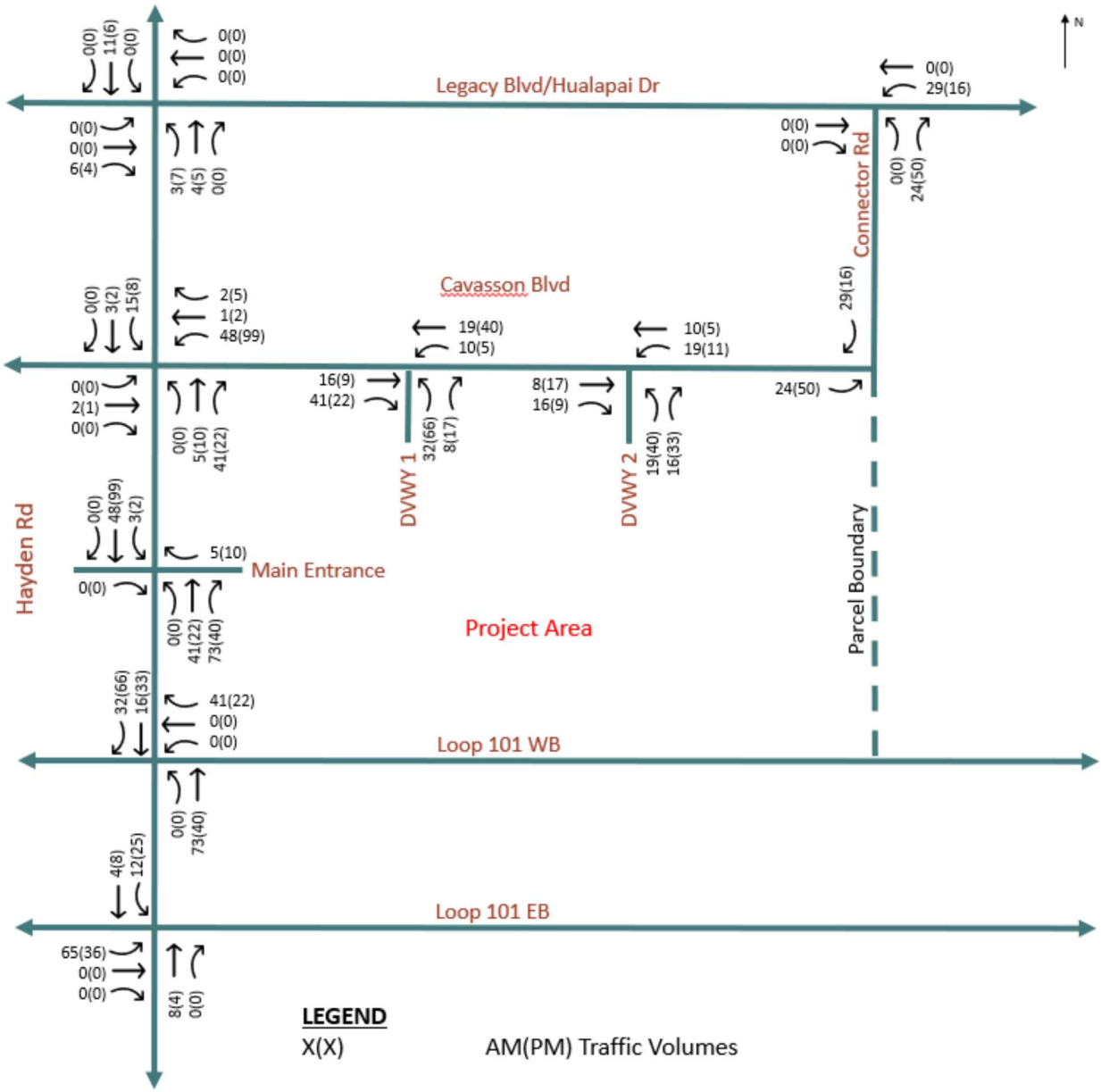

Figure 10 – Trip Assignment Phase 3 Only w/Parcel B1

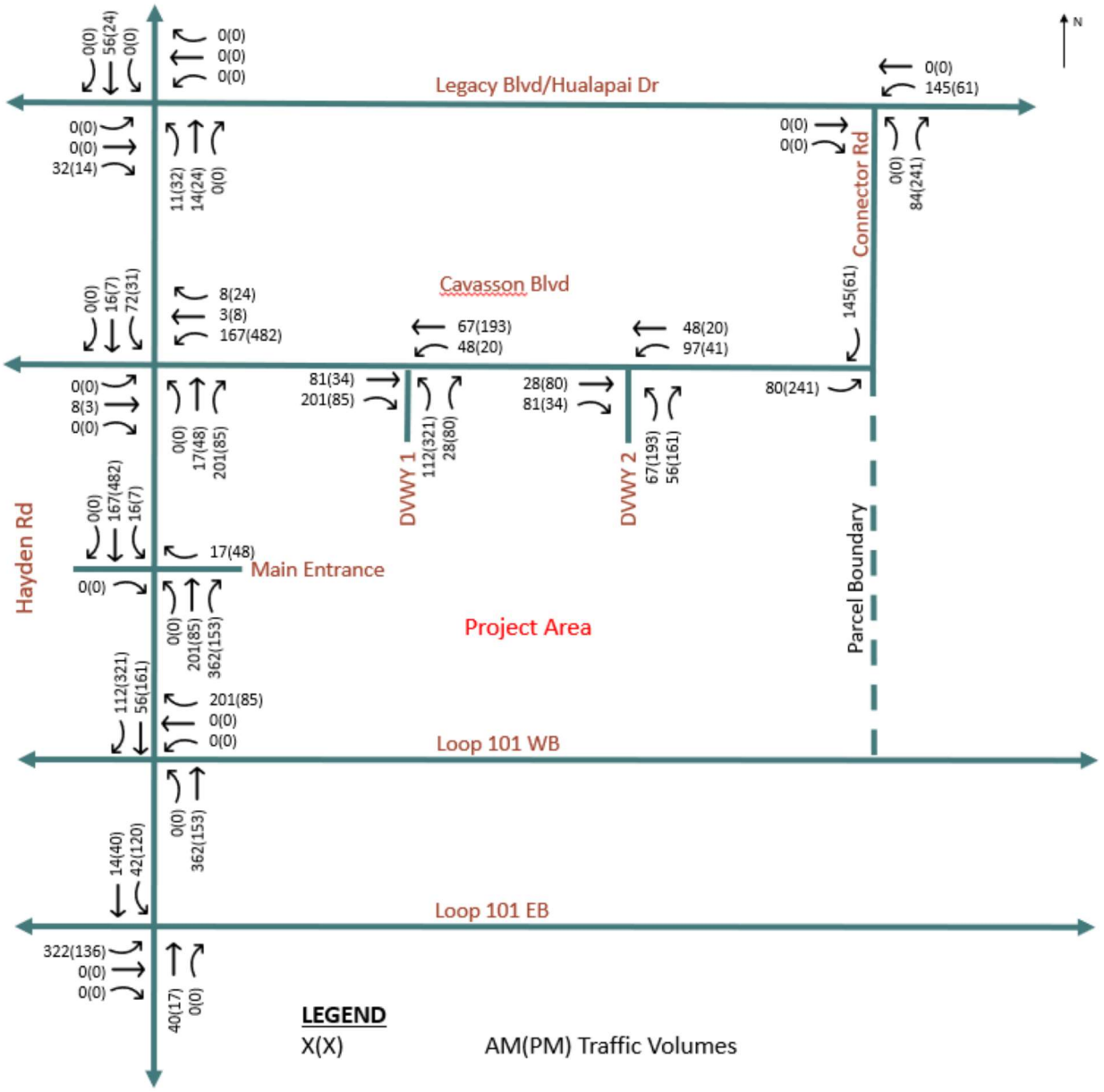

Figure 11 – Trip Assignment All Phases Combined w/Parcel B1

B. Through Traffic

1. Method of Projection

The background traffic for this study was determined using a few different resources. The first source of data came from traffic data that was collected by Field Data Services (FDS) of Arizona as previously mentioned.

The existing traffic was increased by a growth rate of 1% per year for each horizon year. This growth rate was determined based on the remaining empty land within the vicinity of the project. The increased traffic for each horizon year are summarized in the following tables.

Table 4 – Increased Existing Traffic Counts 2025

Intersection	Peak	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Hayden Rd & Loop 101 EB	AM	463	1	480	-	-	-	-	250	26	358	378	-
	PM	293	0	208	-	-	-	-	1056	53	354	350	-
Hayden Rd & Loop 101 WB	AM	-	-	-	50	4	373	113	617	-	-	683	253
	PM	-	-	-	70	3	479	543	806	-	-	635	372
Hayden Rd & Main Entrance	AM	-	-	0	-	-	0	0	1086	0	0	956	0
	PM	-	-	0	-	-	0	0	1828	0	0	994	0
Hayden Rd & Cavasson Blvd	AM	3	0	10	0	0	0	22	989	0	0	946	3
	PM	3	0	26	0	0	0	2	1325	0	0	968	1
Hayden Rd & Legacy Blvd/ Hualapai Dr	AM	7	0	31	0	0	2	8	1018	1	1	908	9
	PM	10	0	12	0	0	1	36	1327	0	0	929	19

Table 5 – Increased Existing Traffic Counts 2032

Intersection	Peak	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Hayden Rd & Loop 101 EB	AM	496	1	515	-	-	-	-	268	28	383	405	-
	PM	314	0	223	-	-	-	-	1132	56	380	376	-
Hayden Rd & Loop 101 WB	AM	-	-	-	54	4	400	122	662	-	-	732	272
	PM	-	-	-	75	3	514	582	864	-	-	680	399
Hayden Rd & Main Entrance	AM	-	-	0	-	-	0	0	1164	0	0	1025	0
	PM	-	-	0	-	-	0	0	1960	0	0	1066	0
Hayden Rd & Cavasson Blvd	AM	3	0	11	0	0	0	23	1060	0	0	1014	3
	PM	3	0	28	0	0	0	2	1421	0	0	1038	1
Hayden Rd & Legacy Blvd/ Hualapai Dr	AM	8	0	33	0	0	2	9	1091	1	1	973	10
	PM	11	0	13	0	0	1	39	1423	0	0	996	20

Table 6 – Increased Existing Traffic Counts 2042

Intersection	Peak	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Hayden Rd & Loop 101 EB	AM	521	1	541	-	-	-	-	282	29	403	426	-
	PM	330	0	235	-	-	-	-	1190	59	399	395	-
Hayden Rd & Loop 101 WB	AM	-	-	-	57	5	420	128	695	-	-	770	286
	PM	-	-	-	79	3	540	612	908	-	-	715	419
Hayden Rd & Main Entrance	AM	-	-	0	-	-	0	0	1224	0	0	1077	0
	PM	-	-	0	-	-	0	0	2060	0	0	1120	0
Hayden Rd & Cavasson Blvd	AM	3	0	12	0	0	0	24	1115	0	0	1066	3
	PM	3	0	29	0	0	0	2	1493	0	0	1091	1
Hayden Rd & Legacy Blvd/ Hualapai Dr	AM	8	0	35	0	0	2	9	1147	1	1	1023	10
	PM	12	0	14	0	0	1	41	1495	0	0	1047	21

The second source for the background traffic was the Civtech report for the Cavasson/Nationwide development on the west side of Hayden Road. The proposed generated traffic for that site was also included in the background traffic. An excerpt of the report with the traffic data used can be found in **Appendix B**.

The last source of background traffic was from the generated trips for Parcel B1 (north of Cavasson), which were also calculated and included in the background traffic. Land uses as well as land use densities were determined with input from the City of Scottsdale Traffic and Planning departments. Parcel B1 was assumed to have a mix of employment land uses. In discussion with the City, it was assumed that Parcel B1 would be an even mix of office and light industrial. The office space was assumed to have a floor area ratio (FAR) of one (1) while the light industrial was assumed to have a FAR of 0.5. The resulting trip generation calculations are summarized in **Table 7**.

Table 7 – Parcel B1 Trip Generation

Land Use	LUC	Quant	Units	Weekday			Morning Peak			Afternoon Peak		
				Total	Ingress	Egress	Total	Ingress	Egress	Total	Ingress	Egress
Office	710	601.62	1000 SF	6522	3261	3261	914	804	110	866	147	719
Light Industrial	110	300.81	1000 SF	1465	733	732	223	196	27	196	27	169
			Total	7987	3994	3993	1137	1000	137	1062	174	888

Parcel B1 is anticipated to have the same overall trip distribution as assumed for the Banner Property and shown in Figure 3**.**

a. Trip Assignment

The trip assignment will be different from that of the Banner Property since Parcel B1 site access will be different. It is assumed that Parcel B1 will have access from Cavasson Boulevard, Hayden Road and Legacy Boulevard/Hualapai Drive. With the development of Parcel B1, a north/south connector road on the east side of the parcel is planned to connect Legacy Boulevard/Hualapai Drive and Cavasson Boulevard. This will provide access from Cavasson Boulevard to Pima Road. One additional access point along the connector road for Parcel B1 is anticipated. The resulting trip assignment for the Banner Property and Parcel B1 is summarized in **Table 8**.

Table 8 – Parcel B1 Trip Assignment

Intersection	Peak	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Hayden Rd & Loop 101 EB	AM	420	0	0	-	-	-	-	50	0	21	7	-
	PM	73	0	0	-	-	-	-	9	0	133	44	-
Hayden Rd & Loop 101 WB	AM	-	-	-	0	0	200	0	470	-	-	27	58
	PM	-	-	-	0	0	35	0	82	-	-	178	373
Hayden Rd & Main Entrance	AM	-	-	0	-	-	0	0	670	0	0	85	0
	PM	-	-	0	-	-	0	0	117	0	0	551	0
Hayden Rd & Cavasson Blvd	AM	0	10	0	34	1	1	0	300	370	0	0	0
	PM	0	2	0	222	9	9	0	52	64	0	0	0
Hayden Rd & Legacy Blvd/ Hualapai Dr	AM	0	40	0	51	5	5	0	7	100	110	0	0
	PM	0	7	0	329	36	36	0	44	17	19	0	0
Cavasson Blvd & Driveway 1	AM	170	200	0	0	37	0	0	0	0	0	0	0
	PM	30	35	0	0	240	0	0	0	0	0	0	0
Cavasson Blvd & Driveway 2	AM	200	0	0	0	0	0	0	0	0	0	0	15
	PM	35	0	0	0	0	0	0	0	0	0	0	98
Cavasson Blvd & Legacy Blvd	AM	-	22	0	90	90	-	0	-	12	-	-	-
	PM	-	142	0	16	16	-	0	-	80	-	-	-

Combining all three sources of background traffic, the resulting background traffic for each horizon year is summarized in the following figures.

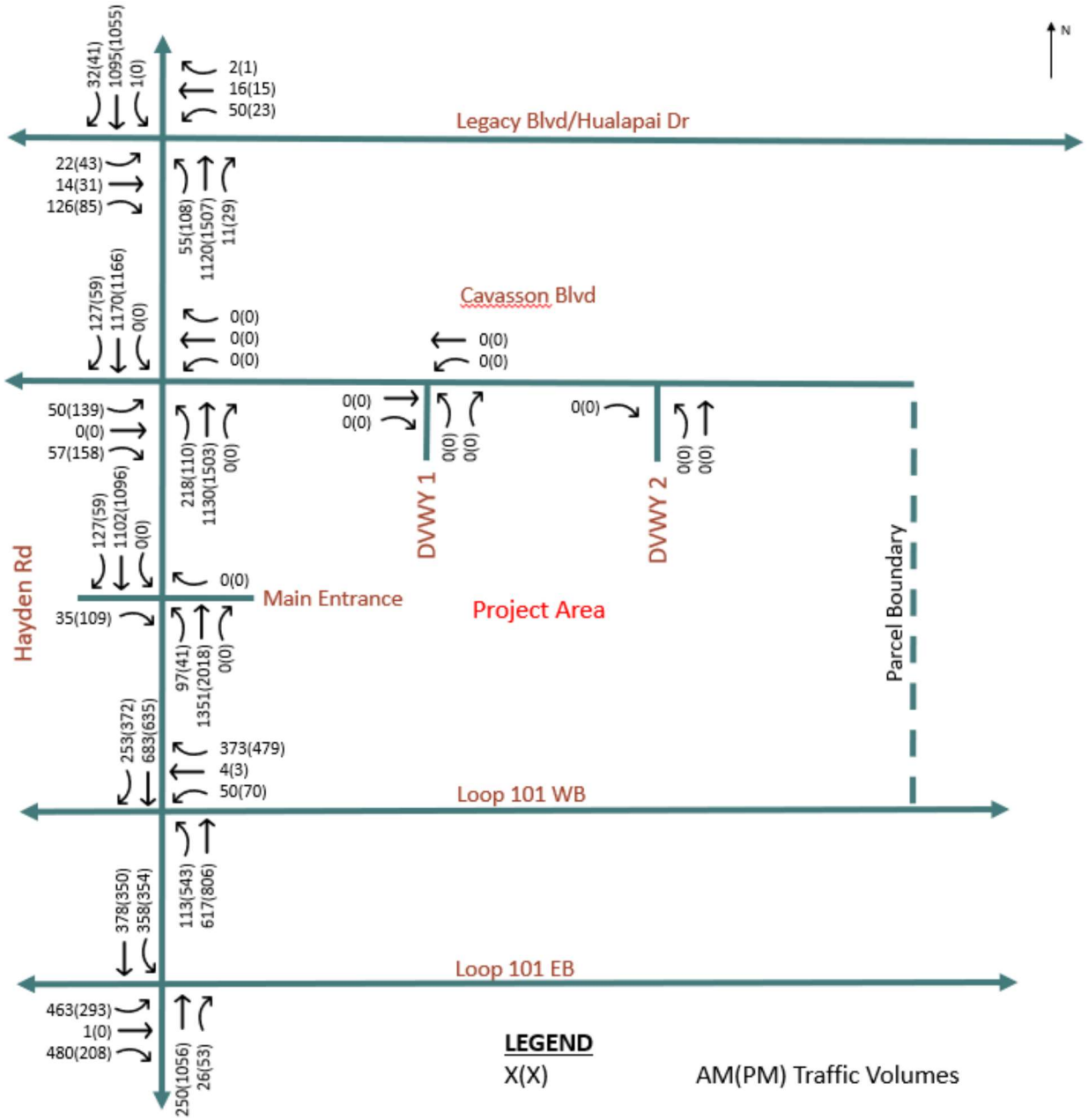

Figure 12 – Background Traffic w/o Parcel B1 Horizon Year (2025)

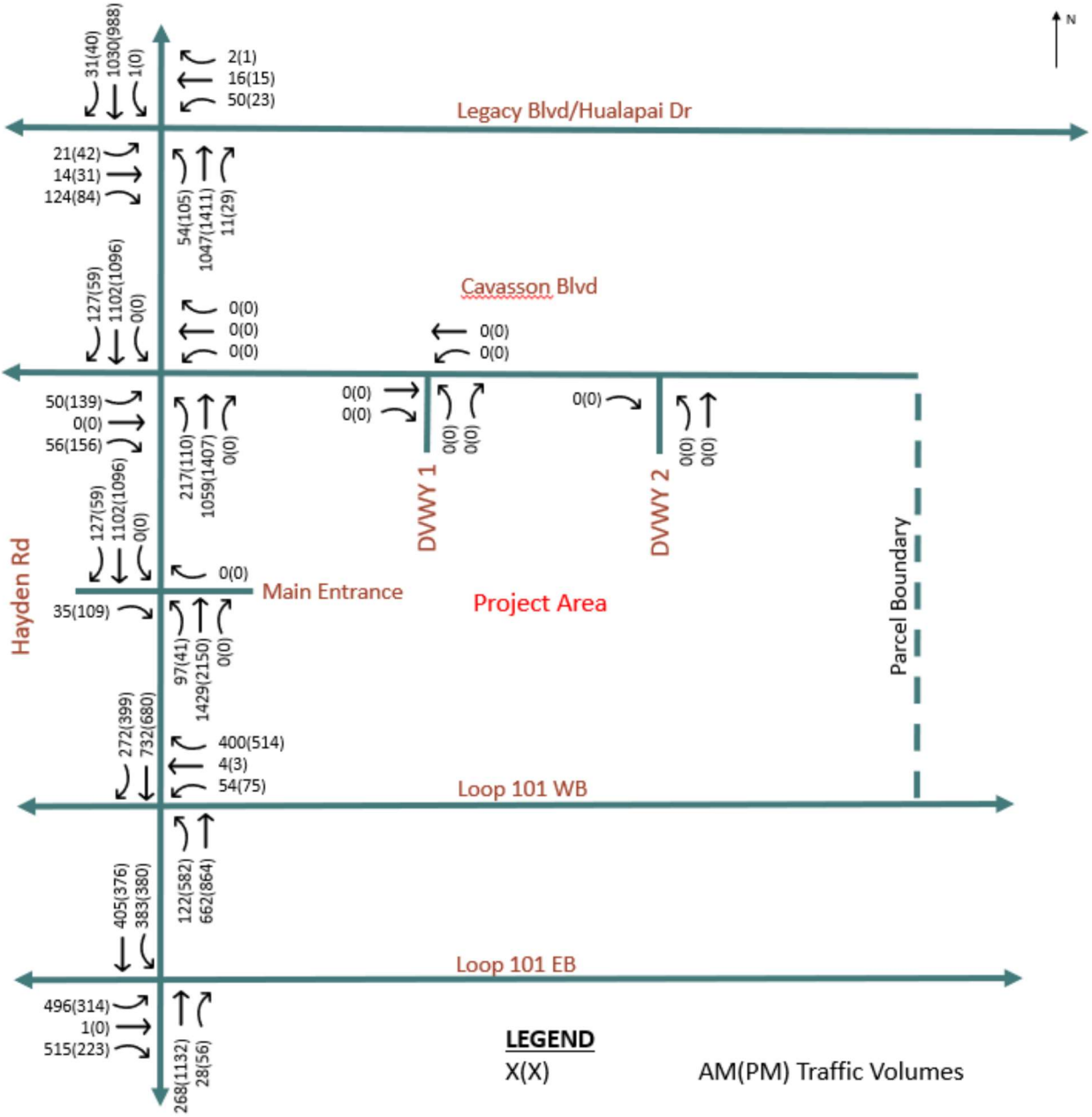

Figure 13 – Background Traffic w/o Parcel B1 Horizon Year (2032)

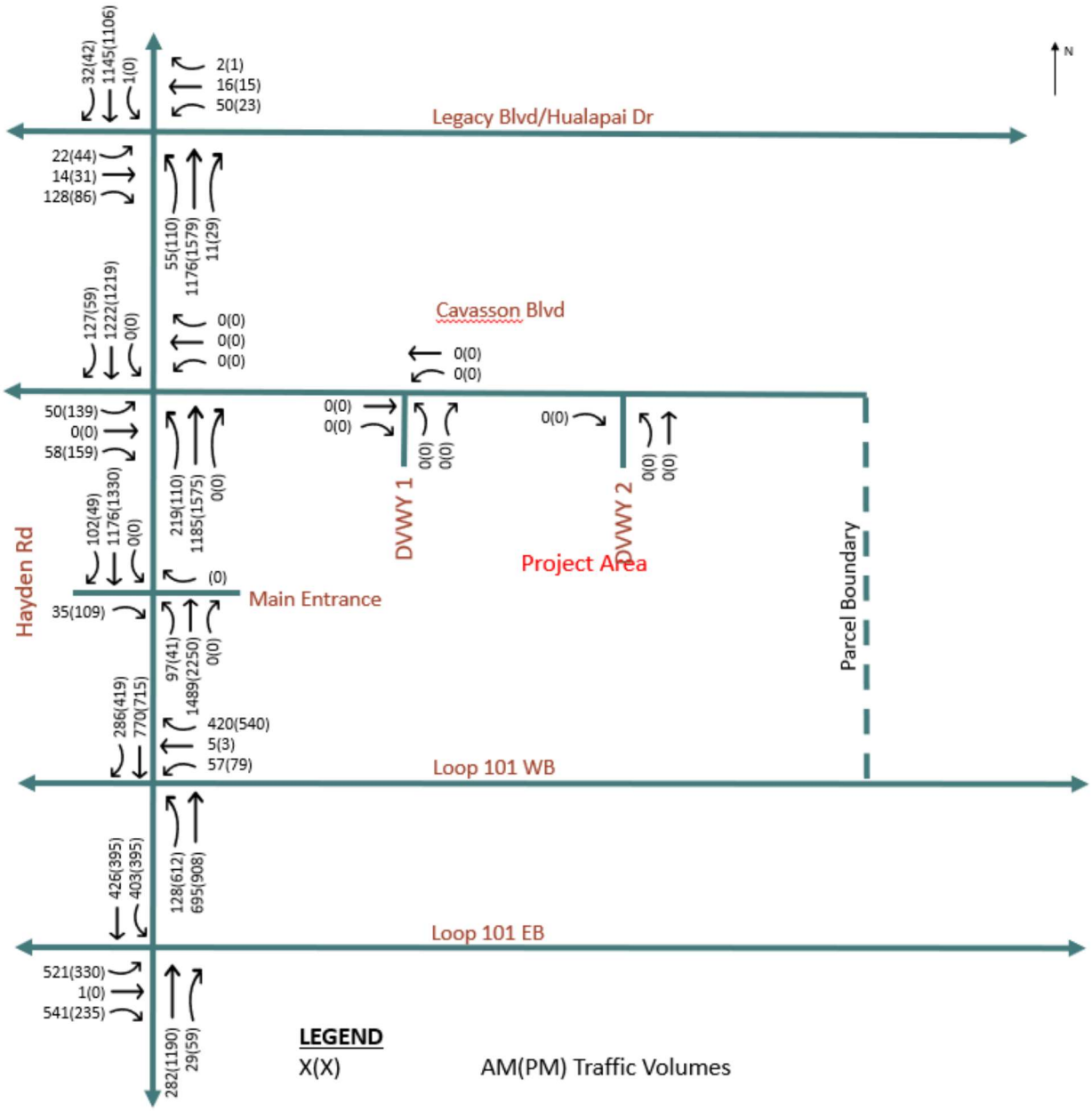

Figure 14 – Background Traffic w/o Parcel B1 Horizon Year (2042)

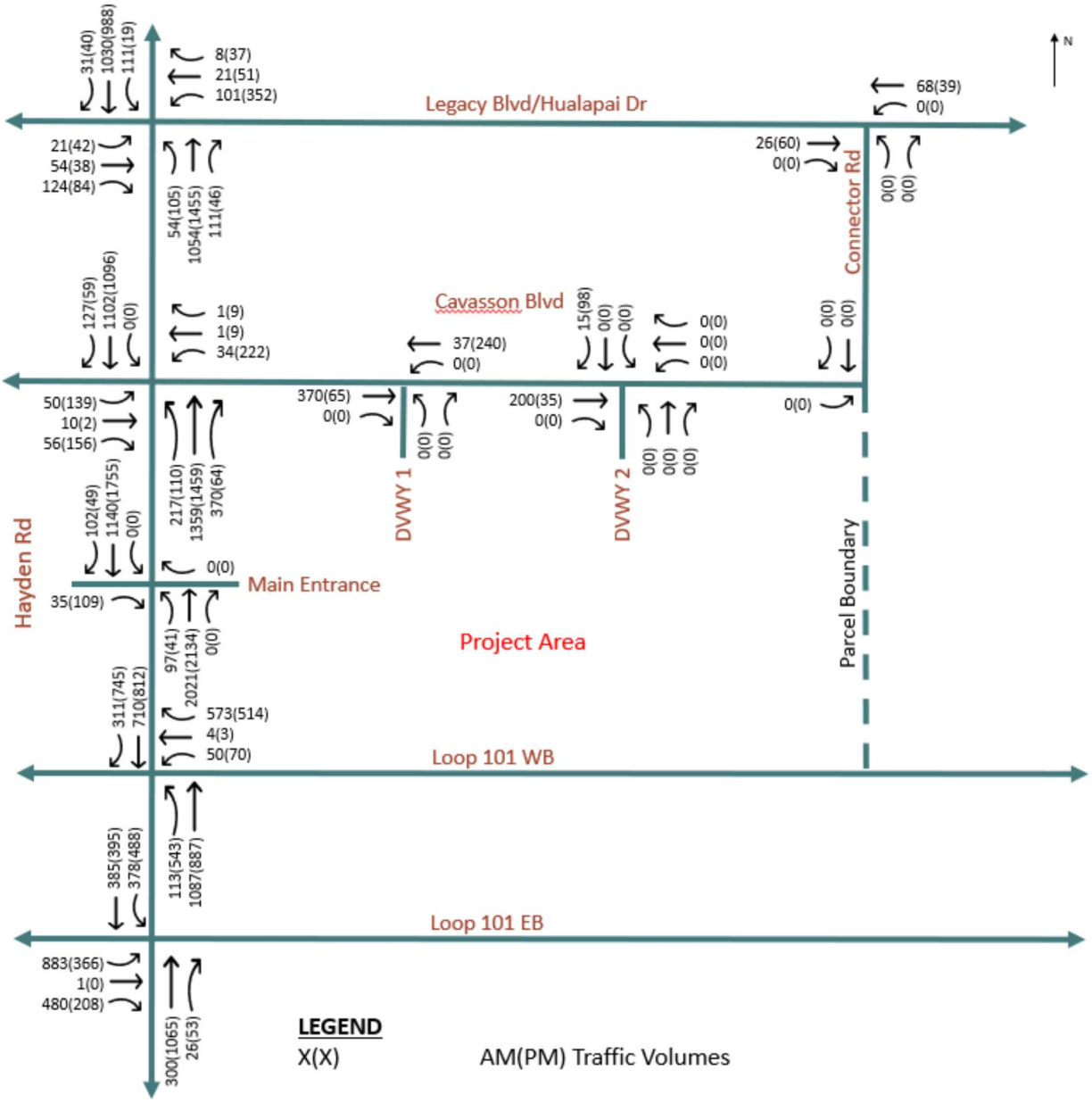

Figure 15 – Background Traffic w/Parcel B1 Horizon Year (2025)

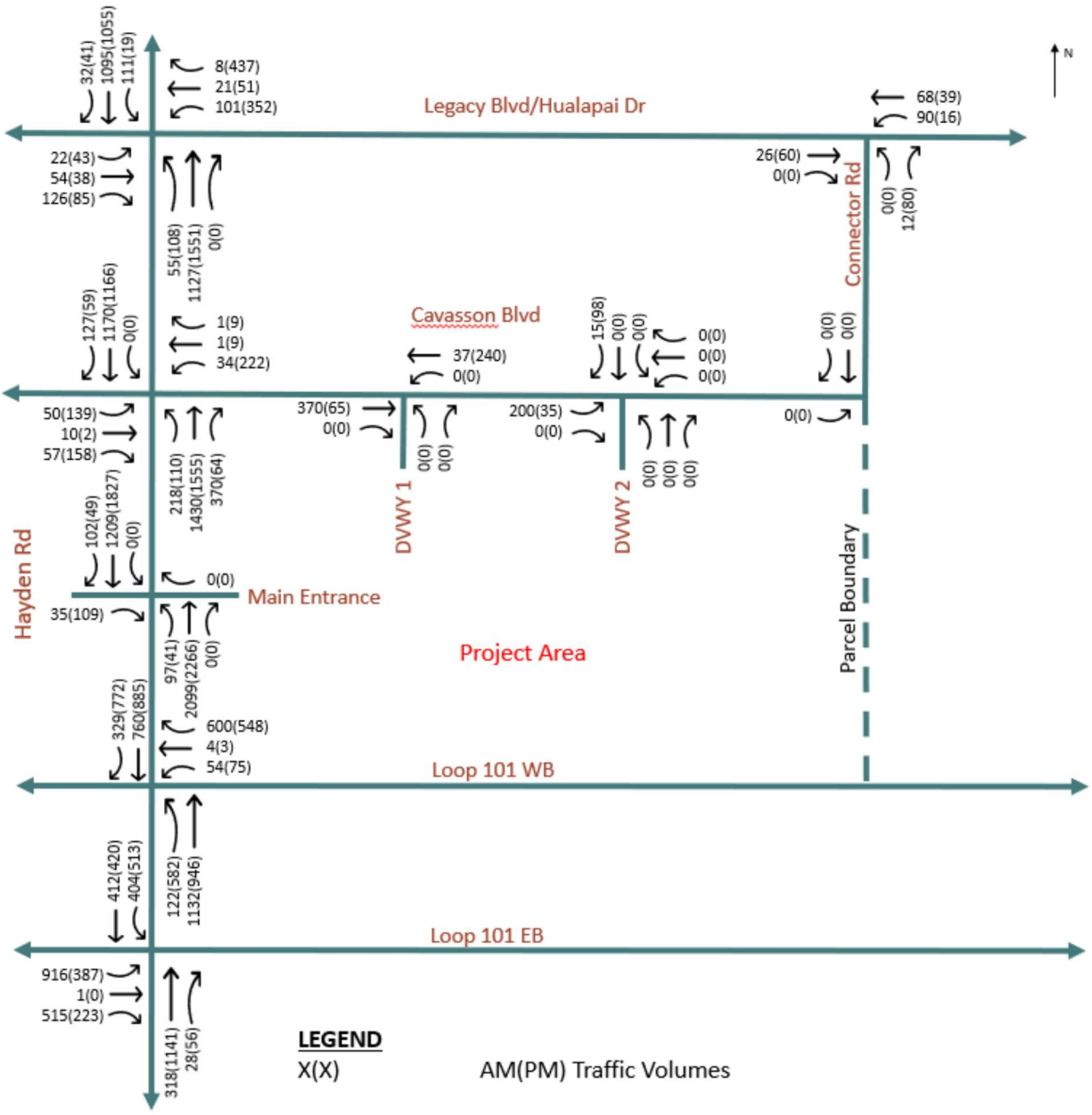

Figure 16 – Background Traffic w/Parcel B1 Horizon Year (2032)

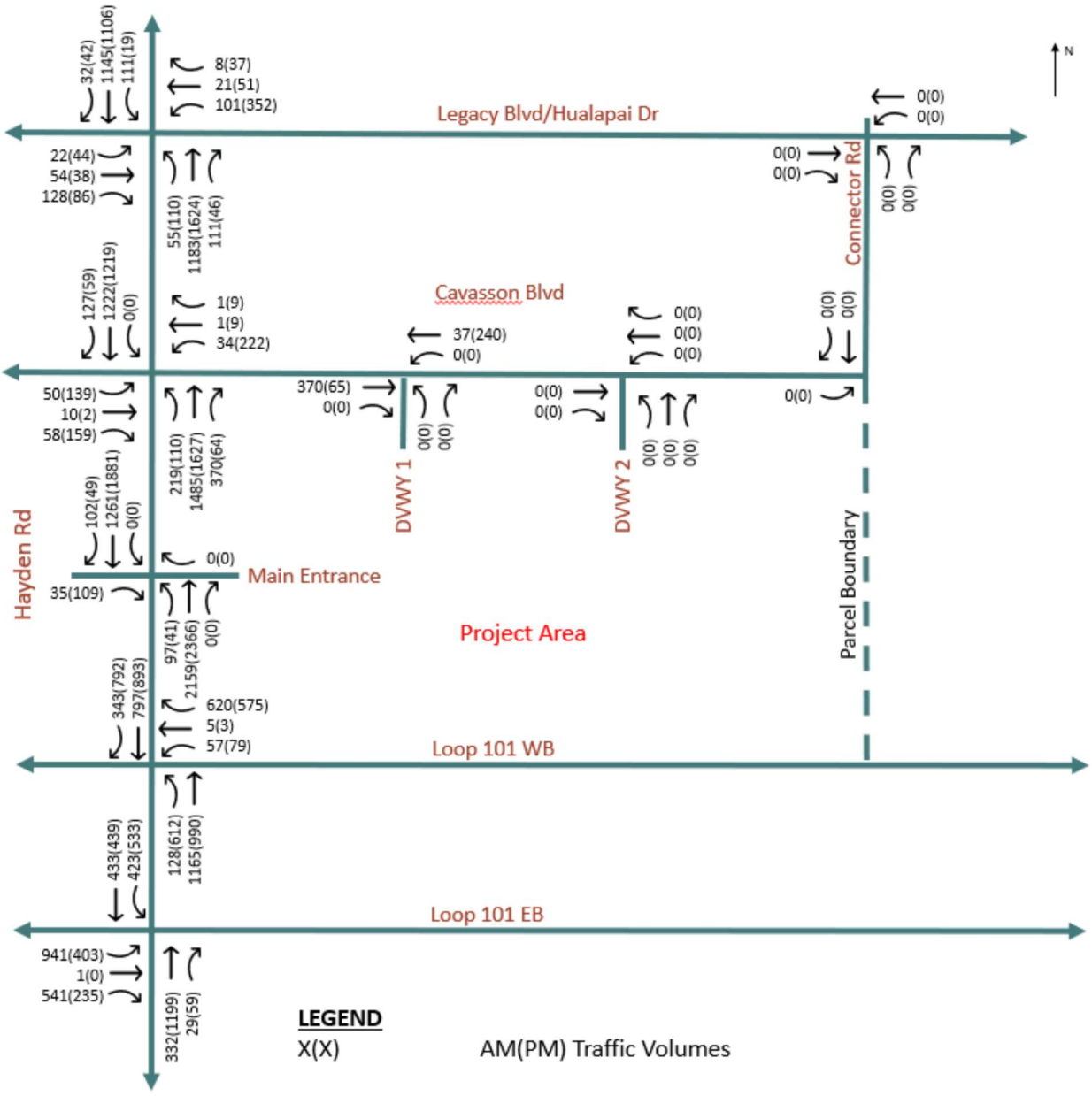

Figure 17 – Background Traffic w/Parcel B1 Horizon Year (2042)

C. Total Traffic Each Horizon Year

The background traffic as well as the Banner Project site traffic were combined for each horizon year with and without the inclusion of Parcel B1. The following figures summarize the resulting turning movements for each intersection.

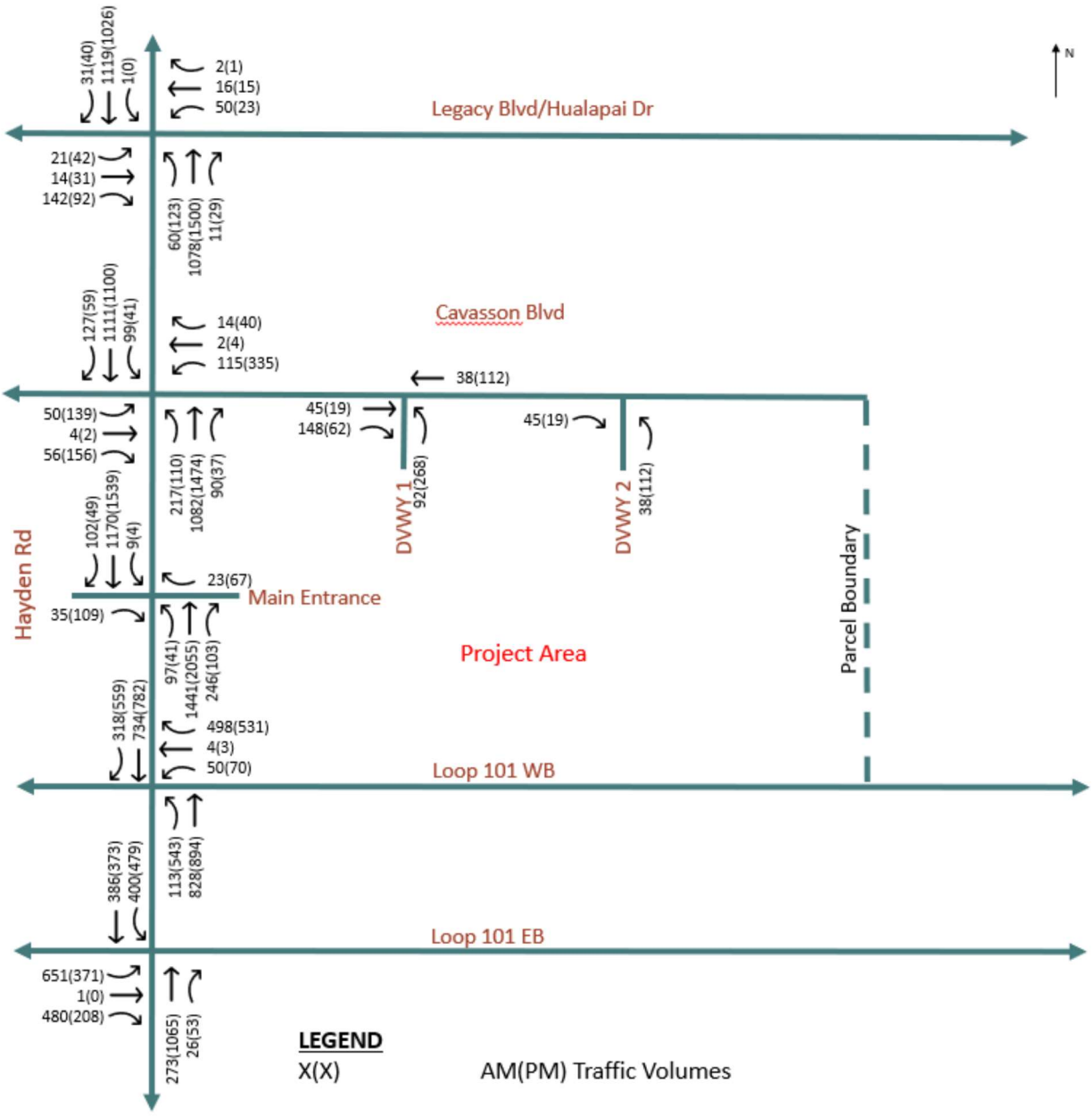

Figure 18 – Total Traffic Horizon Year (2025) w/o Parcel B1

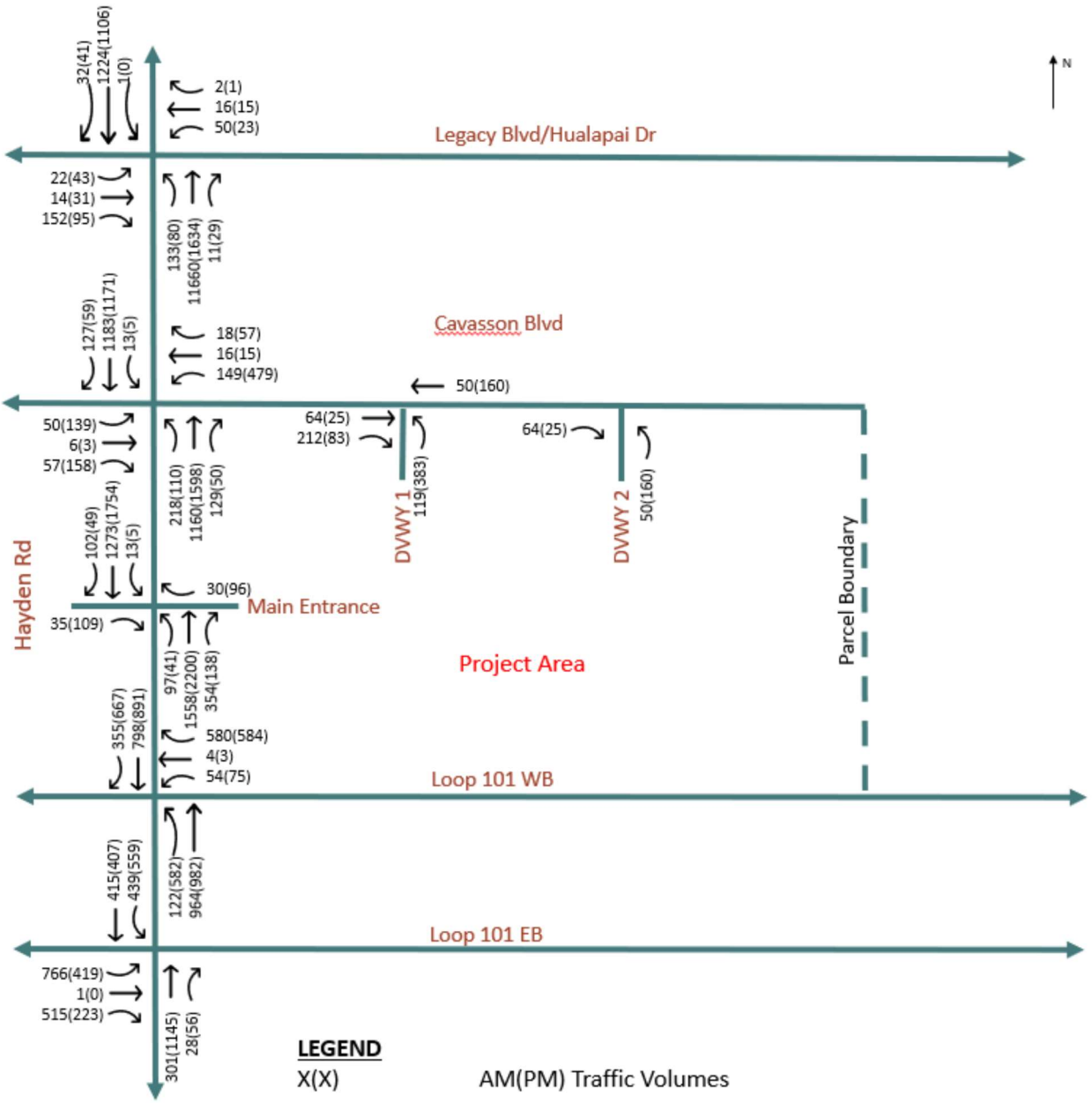

Figure 19 – Total Traffic Horizon Year (2032) w/o Parcel B1

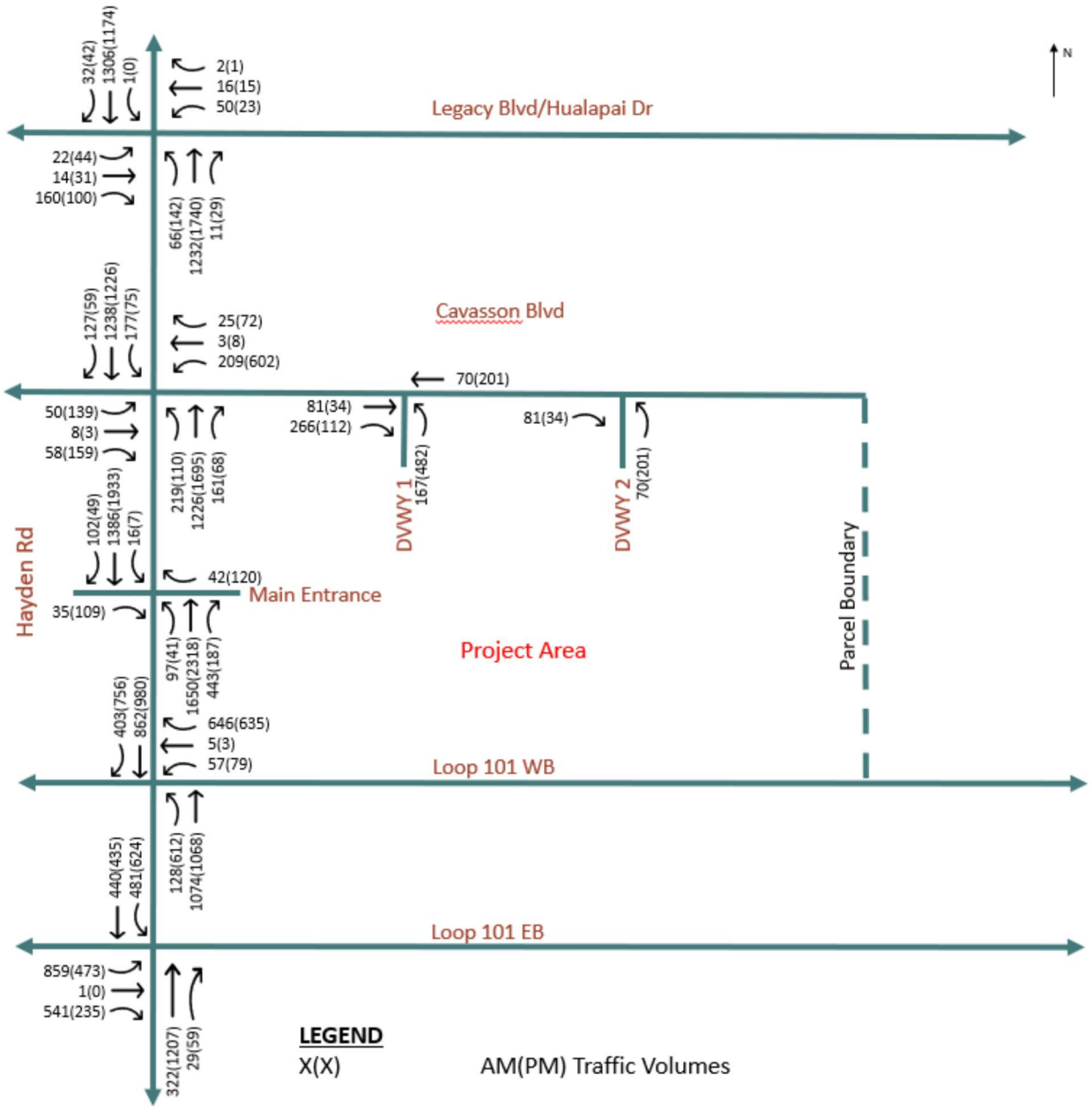

Figure 20 – Total Traffic Horizon Year (2042) w/o Parcel B1

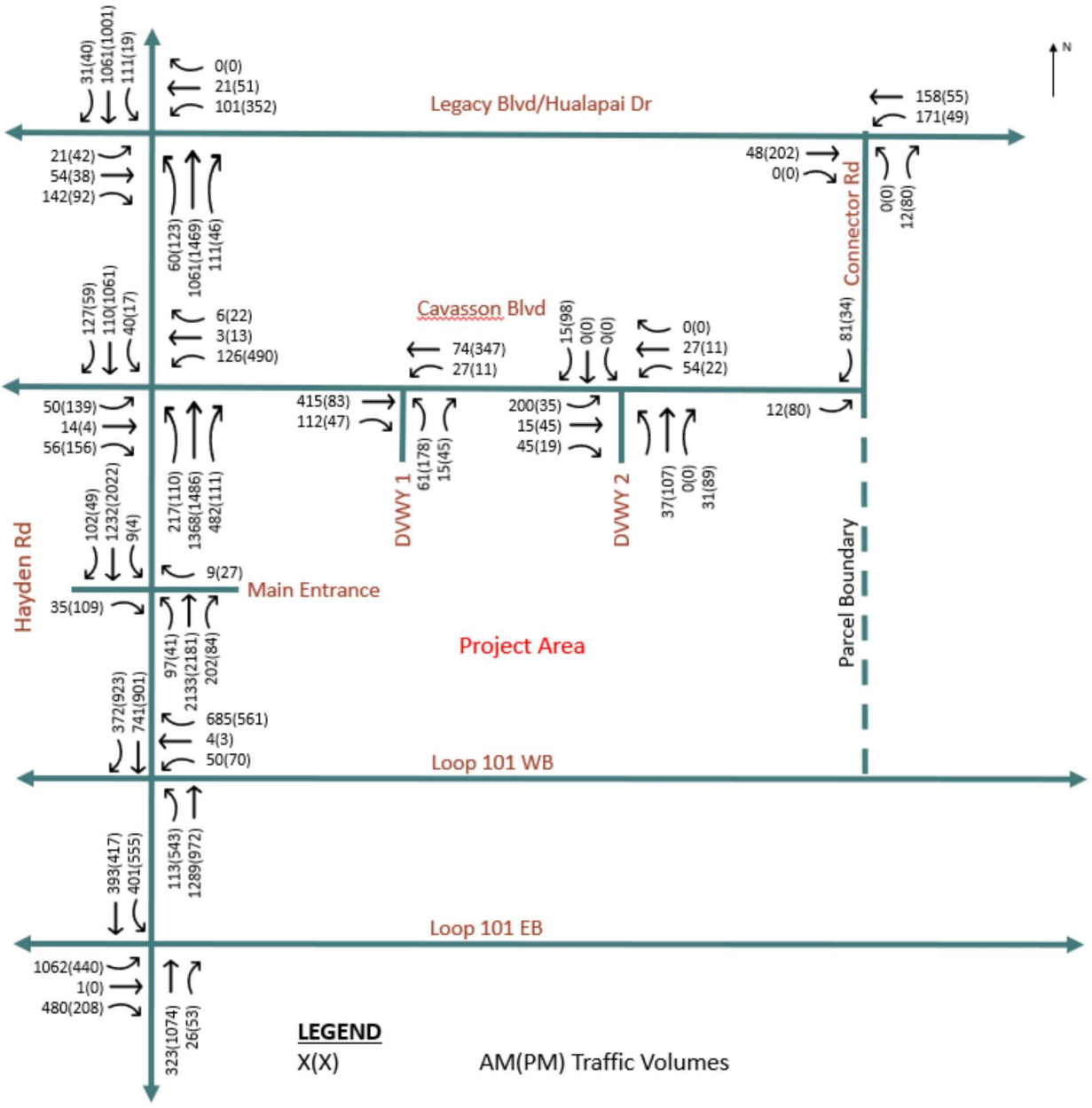

Figure 21 – Total Traffic Horizon Year (2025) w/Parcel B1

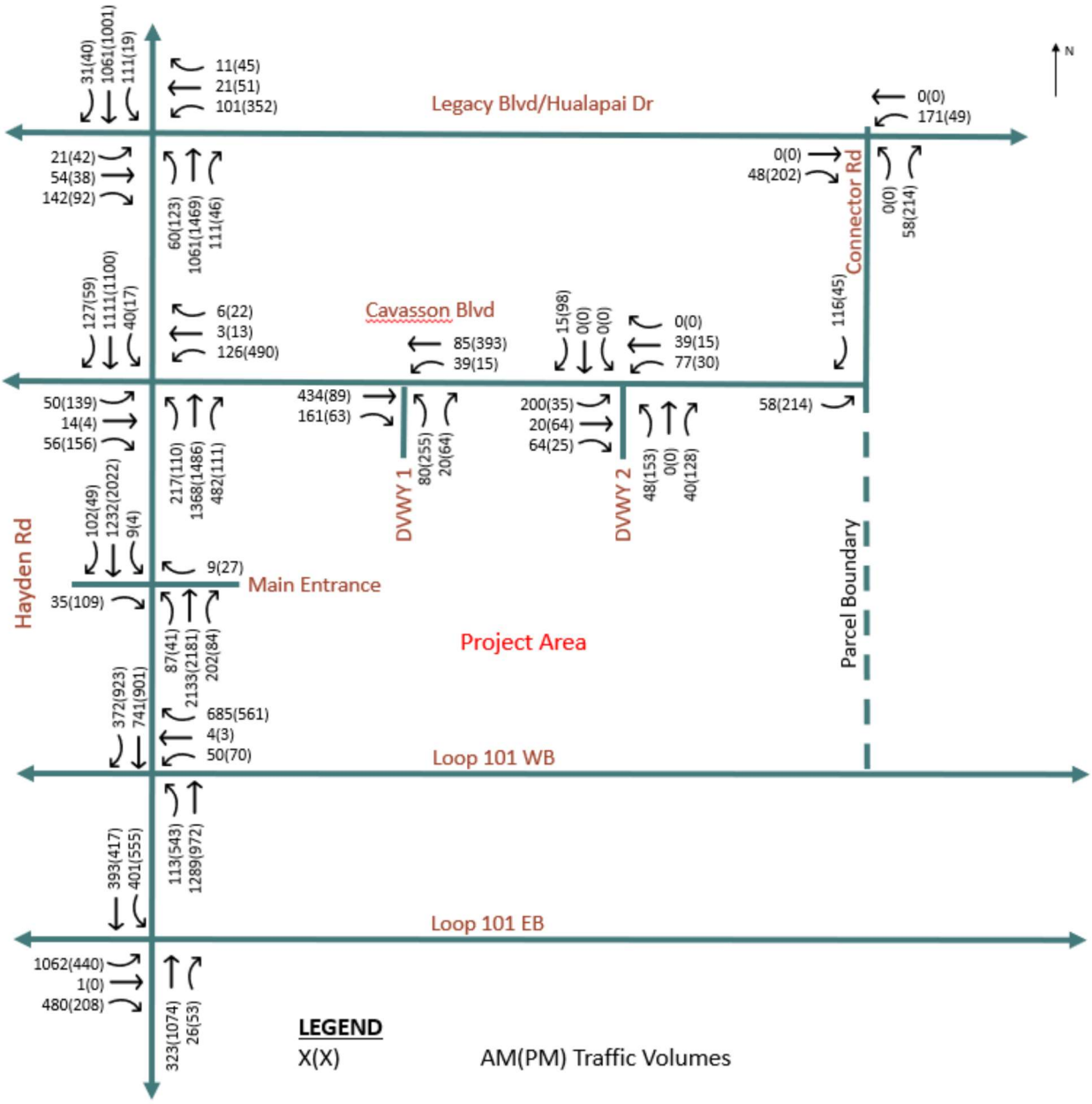

Figure 22 – Total Traffic Horizon Year (2032) w/Parcel B1

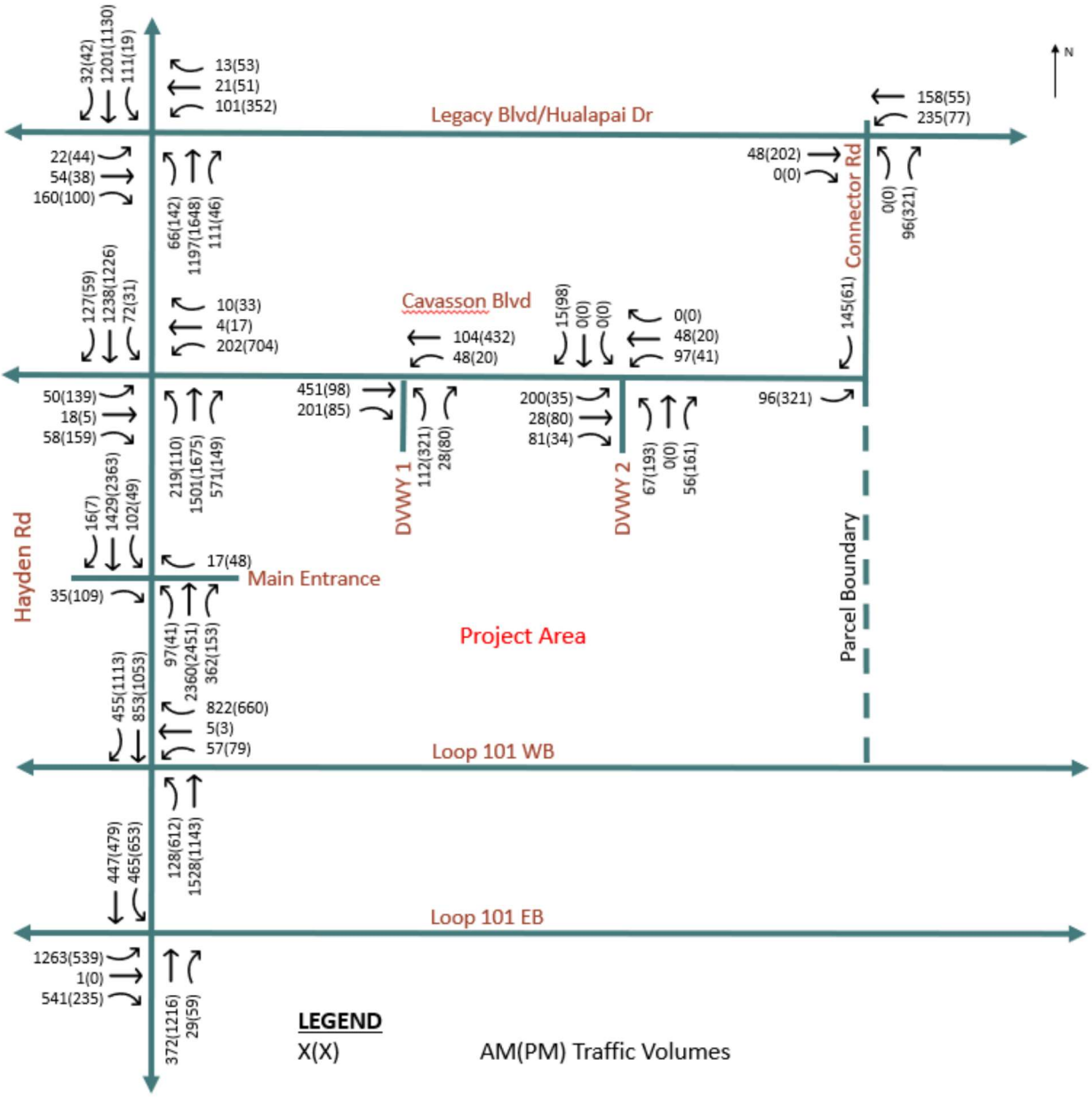

Figure 23 – Total Traffic Horizon Year (2042) w/Parcel B1

V. Traffic Analysis

A. Capacity & Level of Service

Using Synchro 11 software, capacity analysis was completed to determine the level of service (LOS) and delay in seconds for each intersection within the study area as well as the three (3) site driveways. The background traffic with and without parcel B1 followed by the total traffic with and without parcel B1 were analyzed for each horizon year. The resulting level of service and delay are summarized in **Table 9** through **Table 20**.

Please shrink the width of your cells and rotate so it is readable.

Table 9 – Background Traffic Phase 1 Opening Day w/o Parcel B1 (2025) LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	19	B	26.3	C	18.1	B	4.9	A	-	-	-	-	-	-	-	-	15.5	B	0.2	A	41.4	D	4.8	A	-	-
	PM	18.2	B	19.3	B	9.5	A	4.8	A	-	-	-	-	-	-	-	-	21.1	C	1.5	A	32.5	C	7.1	A	-	-
Hayden Rd & Loop 101 WB	AM	10.6	B	-	-	-	-	-	-	15.2	B	5	A	4.7	A	22.7	C	7.2	A	-	-	-	-	16.7	B	4.4	A
	PM	22.7	C	-	-	-	-	-	-	25.1	C	13	B	12.7	B	41.7	D	5.7	A	-	-	-	-	38	D	18.3	B
Hayden Rd & Main Entrance	AM	1.1	A	-	-	-	-	15.1	C	-	-	-	-	0	A	24	C	0	A	0	A	0	A	0	A	0	A
	PM	0.9	A	-	-	-	-	20.5	C	-	-	-	-	0	A	20.5	C	0	A	0	A	0	A	0	A	0	A
Hayden Rd & Cavasson Blvd	AM	9.2	A	29.7	C	-	-	8.8	A	-	-	-	-	-	-	46.5	D	5.5	A	-	-	-	-	5.6	A	1	A
	PM	13.0	B	15.9	B	-	-	7.5	A	-	-	-	-	-	-	25.6	C	9.6	A	-	-	-	-	16.8	B	7.8	A
Hayden Rd & Legacy Blvd/ Hualapai Dr	AM	11.0	B	15.1	B	14.5	B	10	A	16	B	14.6	B	0	A	13.4	B	11	B	11	B	7	A	10.8	B	2.8	A
	PM	13.1	B	16.2	B	15	B	6.2	A	15.6	B	14.9	B	0	A	22	C	15.1	B	15.1	B	0	A	10.1	B	2.5	A

Table 10 – Background Traffic Phase 2 Opening Day w/o Parcel B1 (2032) LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	19.8	B	30.6	C	21.4	C	5.1	A	-	-	-	-	-	-	-	-	15.5	B	0.2	A	41.5	D	4.7	A	-	-
	PM	19.2	B	19.6	B	10.2	B	4.8	A	-	-	-	-	-	-	-	-	23	C	1.8	A	32.9	C	7.2	A	-	-
Hayden Rd & Loop 101 WB	AM	10.9	B	-	-	-	-	-	-	15.2	B	6	A	5.8	A	22.4	C	7.1	A	-	-	-	-	17.2	B	4.6	A
	PM	26.1	C	-	-	-	-	-	-	25.1	C	17.4	B	17.1	B	54.2	D	5.8	A	-	-	-	-	38.8	D	19.1	B
Hayden Rd & Main Entrance	AM	1.1	A	-	-	-	-	15.7	B	-	-	-	-	0	A	26.7	D	0	A	0	A	0	A	0	A	0	A
	PM	0.9	A	-	-	-	-	21.9	C	-	-	-	-	0	A	23.5	C	0	A	0	A	0	A	0	A	0	A
Hayden Rd & Cavasson Blvd	AM	10.6	B	29.7	C	-	-	8.8	A	-	-	-	-	-	-	64.6	E	5.7	A	-	-	-	-	5.7	A	1	A
	PM	13.8	B	15.9	B	-	-	9	A	-	-	-	-	-	-	32.7	C	10	A	-	-	-	-	17.7	B	8.1	A
Hayden Rd & Legacy Blvd/ Hualapai Dr	AM	11.2	B	15.5	B	14.9	B	11.3	B	16.4	B	14.9	B	0	A	15	B	11.1	B	11.1	B	6	A	10.9	B	2.7	A
	PM	15.0	B	16.2	B	15	B	7.8	A	15.6	B	14.9	B	0	A	30.5	C	17.7	B	17.7	B	0	A	10.6	B	2.5	A

Table 11 – Background Traffic Phase 3 Opening Day w/o Parcel B1 (2042) LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	21	C	33.1	C	23.5	C	5.3	A	-	-	-	-	-	-	-	-	15.3	B	0.2	A	46.1	D	4.6	A	-	-
	PM	20.5	C	20	B	10.7	B	4.7	A	-	-	-	-	-	-	-	-	25.6	C	1.9	A	33.2	C	7.3	A	-	-
Hayden Rd & Loop 101 WB	AM	11.2	B	-	-	-	-	-	-	15.2	B	7.5	A	7.2	A	21.9	C	6.8	A	-	-	-	-	17.6	B	4.7	A
	PM	18.2	B	-	-	-	-	-	-	25.1	C	20.8	C	20.4	C	29.6	C	6	A	-	-	-	-	28	C	7.1	A
Hayden Rd & Main Entrance	AM	12.1	B	-	-	-	-	16.2	C	-	-	-	-	0	A	29	D	0	A	0	A	0	A	0	A	0	A
	PM	0.9	A	-	-	-	-	23.1	C	-	-	-	-	0	A	25.1	D	0	A	0	A	0	A	0	A	0	A
Hayden Rd & Cavasson Blvd	AM	12.1	B	29.7	C	-	-	8.7	A	-	-	-	-	-	-	85.1	F	5.8	A	-	-	-	-	5.8	A	1	A
	PM	14.7	B	15.9	B	-	-	3.7	A	-	-	-	-	-	-	35	C	10.3	B	-	-	-	-	20.3	C	4.8	A
Hayden Rd & Legacy Blvd/ Hualapai Dr	AM	11.7	B	15.5	B	14.9	B	12.2	B	16.4	B	14.9	B	0	A	17.2	B	11.6	B	11.6	B	6	A	11.3	B	2.7	A
	PM	17.0	B	16.2	B	15	B	8.7	A	15.6	B	14.9	B	0	A	40.6	D	20.4	C	20.4	C	0	A	11	B	2.5	A

Table 12 – Background Traffic Phase 1 Opening Day w/Parcel B1 (2025) LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	32	C	46.3	D	53.2	D	7.7	A	-	-	-	-	-	-	-	-	15.8	B	0.2	A	54.5	D	5.1	A	-	-
	PM	21.6	C	20.2	C	10.9	B	4.8	A	-	-	-	-	-	-	-	-	22.8	C	1.6	A	43.7	D	7.3	A	-	-
Hayden Rd & Loop 101 WB	AM	13.0	B	-	-	-	-	-	-	14.8	B	20.8	C	16.1	B	19.6	B	9.6	A	-	-	-	-	16.2	B	4.4	A
	PM	31.3	C	-	-	-	-	-	-	30	C	19.8	B	19.3	B	79.7	E	5.2	A	-	-	-	-	24.9	C	42.1	D
Hayden Rd & Main Entrance	AM	1.0	A	-	-	-	-	15.9	C	-	-	-	-	0	A	27.4	D	0	A	0	A	0	A	0	A	0	A
	PM	1.5	A	-	-	-	-	38.1	E	-	-	-	-	0	A	46	E	0	A	0	A	0	A	0	A	0	A
Hayden Rd & Cavasson Blvd	AM	13.8	B	27.2	C	34.3	C	9.9	A	27	C	29	C	29	C	83.6	F	10	A	1.6	A	0	A	9.1	A	1.6	A
	PM	22.4	C	44.3	D	29	C	19.3	B	32.8	C	15.5	B	15.5	B	77.2	E	19.6	B	0.3	A	0	A	18.8	B	0.3	A
Hayden Rd & Legacy Blvd/ Hualapai Dr	AM	13.1	B	15.5	B	15.2	B	9.9	A	18.4	B	15	B	2.6	A	12.7	B	11.3	B	11.3	B	58.5	E	10.4	B	2.7	A
	PM	18.6	B	15.8	B	14.7	B	6.4	A	51.3	D	14.8	B	8.9	A	23.6	C	17.7	B	17.7	B	11.1	B	10.5	B	2.6	A
Cavasson Blvd & Legacy Blvd/ Hualapai Dr	AM	2.5	A	-	-	0	A	0	A	7.5	A	0	A	-	-	0	A	-	-	8.5	A	-	-	-	-	-	-
	PM	2.4	A	-	-	0	A	0	A	7.7	A	0	A	-	-	0	A	-	-	9.3	A	-	-	-	-	-	-

Table 13 – Background Traffic Phase 2 Opening Day w/Parcel B1 (2032) LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	27	C	34.9	C	37.6	D	9.6	A	-	-	-	-	-	-	-	-	20.1	C	0.2	A	47.1	D	10.8	B	-	-
	PM	23.8	C	20.7	C	11.5	B	4.8	A	-	-	-	-	-	-	-	-	24.9	C	1.8	A	50.3	D	7.4	A	-	-
Hayden Rd & Loop 101 WB	AM	13.6	B	-	-	-	-	-	-	14.9	B	22.7	C	17.1	B	32.5	C	9	A	-	-	-	-	16.4	B	4.4	A
	PM	37.5	D	-	-	-	-	-	-	45.4	D	32.4	C	31.7	C	96.5	F	2.6	A	-	-	-	-	27.4	C	50.2	D
Hayden Rd & Main Entrance	AM	1.0	A	-	-	-	-	16.6	B	-	-	-	-	0	A	30.7	D	0	A	0	A	0	A	0	A	0	A
	PM	1.6	A	-	-	-	-	42.3	E	-	-	-	-	0	A	52.3	F	0	A	0	A	0	A	0	A	0	A
Hayden Rd & Cavasson Blvd	AM	13.9	B	32	C	39.2	D	11.9	B	31.8	C	33	C	33	C	94	F	9.2	A	1.5	A	0	A	8.5	A	1.4	A
	PM	25.1	C	44.3	D	29	C	20.3	C	32.8	C	15.5	B	15.5	B	115.6	F	22.8	C	0.7	A	0	A	19.3	B	0.3	A
Hayden Rd & Legacy Blvd/ Hualapai Dr	AM	11.7	B	20.4	C	20	B	11.5	B	24.2	C	19.6	B	4.2	A	10.9	B	9.9	A	9.9	A	43.6	D	9	A	2.2	A
	PM	20.7	C	15.9	B	14.7	B	7.9	A	51.3	D	14.8	B	8.9	A	33.2	C	21.4	C	21.4	C	11.1	B	11	B	2.6	A
Cavasson Blvd & Legacy Blvd/ Hualapai Dr	AM	2.5	A	-	-	0	A	0	A	7.5	A	0	A	-	-	0	A	-	-	8.5	A	-	-	-	-	-	-
	PM	5.7	A	-	-	0	A	0	A	7.8	A	0	A	-	-	0	A	-	-	10.7	B	-	-	-	-	-	-

Table 14 – Background Traffic Phase 3 Opening Day w/Parcel B1 (2042) LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	27	C	35.6	D	37.1	D	11	B	-	-	-	-	-	-	-	-	22.8	C	0.3	A	42.6	D	11.9	B	-	-
	PM	22.4	C	24.6	C	14.6	B	5.3	A	-	-	-	-	-	-	-	-	26.9	C	2.3	A	35.6	D	6.8	A	-	-
Hayden Rd & Loop 101 WB	AM	14.0	B	-	-	-	-	-	-	14.9	B	24.5	C	17.8	B	33.6	C	9.1	A	-	-	-	-	16.6	B	4.5	A
	PM	28.2	C	-	-	-	-	-	-	30.2	C	31.6	C	30.8	C	61.3	E	5.4	A	-	-	-	-	22.1	C	35.7	D
Hayden Rd & Main Entrance	AM	1.1	A	-	-	-	-	17.2	B	-	-	-	-	0	A	33.9	D	0	A	0	A	0	A	0	A	0	A
	PM	1.7	A	-	-	-	-	46.2	D	-	-	-	-	0	A	57.7	F	0	A	0	A	0	A	0	A	0	A
Hayden Rd & Cavasson Blvd	AM	13.0	B	36.9	D	44.2	D	12.9	B	36.6	D	37	D	37	D	93.7	F	7.6	A	1.4	A	0	A	7.9	A	1.2	A
	PM	18.6	B	44.3	D	29	C	22.8	C	56.4	E	20.7	C	20.7	C	46.9	D	14.6	B	2.1	A	0	A	12.7	B	2.3	A
Hayden Rd & Legacy Blvd/ Hualapai Dr	AM	11.6	B	22.9	C	22.4	C	13.1	B	27.3	C	22	C	4.9	A	10.5	B	9.5	A	9.5	A	45.6	D	8.6	A	2	A
	PM	21.5	C	20.1	C	18.8	B	8.8	A	60.7	E	18.9	B	12.1	B	33.5	C	20.6	C	20.6	C	14.1	B	11.5	B	2.5	A
Cavasson Blvd & Legacy Blvd/ Hualapai Dr	AM	2.5	A	-	-	0	A	0	A	7.5	A	0	A	0	A	0	A	-	-	8.5	A	-	-	-	-	-	-
	PM	6.5	A	-	-	0	A	0	A	7.9	A	0	A	0	A	0	A	-	-	11.3	B	-	-	-	-	-	-

Table 15 – Total Traffic Phase 1 Opening Day w/o Parcel B1 (2025) LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	25.9	C	38.2	D	35.1	D	5.3	A	-	-	-	-	-	-	-	-	15.2	B	0.1	A	50.7	D	6.7	A	-	-
	PM	22.1	C	20.4	C	11.3	B	4.7	A	-	-	-	-	-	-	-	-	23.6	C	1.6	A	44.3	D	7.2	A	-	-
Hayden Rd & Loop 101 WB	AM	11.9	B	-	-	-	-	-	-	15.2	B	13.9	B	13.7	B	19.4	B	7.6	A	-	-	-	-	17.1	B	4.7	A
	PM	25.2	C	-	-	-	-	-	-	30.1	C	23.8	C	23.2	C	59.6	E	5.3	A	-	-	-	-	29.3	C	18.9	B
Hayden Rd & Main Entrance	AM	1.3	A	-	-	-	-	16.1	C	-	-	-	-	18.6	C	28.7	D	0	A	0	A	30.3	C	0	A	0	A
	PM	1.8	A	-	-	-	-	29	D	-	-	-	-	40.1	E	33.1	D	0	A	0	A	50.8	D	0	A	0	A
Hayden Rd & Cavasson Blvd	AM	14.7	B	32	C	38.8	D	11.9	B	33.4	C	19.6	B	19.6	B	79.3	E	8.3	A	1.5	A	15.4	B	8.4	A	1.4	A
	PM	24.1	C	44.3	D	29	C	22.6	C	35.8	D	13.1	B	13.1	B	91.9	F	19.9	B	0.1	A	48	D	19	B	0.3	A
Hayden Rd & Legacy Blvd/ Hualapai Dr	AM	11.5	B	15.5	B	14.9	B	12.9	B	16.4	B	14.9	B	0	A	19.2	B	11	B	-	-	6	A	11.3	B	2.7	A
	PM	16.1	B	16.2	B	15	B	8.2	A	15.6	B	14.9	B	0	A	39.7	D	18.8	B	-	-	-	-	10.5	B	2.5	A
Cavasson Blvd & Driveway 1	AM	3.9	A	-	-	0	A	0	A	0	A	0	A	-	-	8.7	A	-	-	0	A	-	-	-	-	-	-
	PM	7.6	A	-	-	0	A	0	A	0	A	0	A	-	-	9	A	-	-	0	A	-	-	-	-	-	-
Cavasson Blvd & Driveway 2	AM	3.8	A	-	-	0	A	0	A	0	A	0	A	-	-	8.8	A	-	-	0	A	-	-	-	-	-	-
	PM	8.0	A	-	-	0	A	0	A	0	A	0	A	-	-	9.5	A	-	-	0	A	-	-	-	-	-	-

Table 16 – Total Traffic Phase 2 Opening Day w/o Parcel B1 (2032) LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	27	C	36.9	D	37.3	D	10.7	B	-	-	-	-	-	-	-	-	21	C	0.3	A	43.1	D	10.4	B	-	-
	PM	23.9	C	29.7	C	18.9	B	5.9	A	-	-	-	-	-	-	-	-	26.7	C	2.9	A	39.3	D	6.4	A	-	-
Hayden Rd & Loop 101 WB	AM	14.0	B	-	-	-	-	-	-	14.9	B	22.1	C	17.8	B	35.1	D	8.6	A	-	-	-	-	16.9	B	4.7	A
	PM	43.3	D	-	-	-	-	-	-	35.3	D	56.3	E	54.8	D	100.8	F	5.3	A	-	-	-	-	30.7	C	55.5	E
Hayden Rd & Main Entrance	AM	1.5	A	-	-	-	-	17.3	B	-	-	-	-	20.7	C	34.6	C	0	A	0	A	41	D	0	A	0	A
	PM	2.9	A	-	-	-	-	38.1	D	-	-	-	-	68.1	E	46	D	0	A	0	A	64.4	E	0	A	0	A
Hayden Rd & Cavasson Blvd	AM	18.0	B	36.9	D	44	D	12.9	B	39.8	D	19.6	B	19.6	B	134.1	F	6.3	A	0.8	A	34.6	C	8.1	A	1.2	A
	PM	26.6	C	49.8	D	34	C	28.9	C	55.4	E	21.1	C	21.1	C	105.7	F	17.8	B	0.1	A	90.3	F	17.9	B	0.6	A
Hayden Rd & Legacy Blvd/ Hualapai Dr	AM	13.6	B	15.5	B	14.8	B	15.5	B	16.3	B	14.8	B	0	A	32.3	C	12.8	B	12.8	B	6	A	13.3	B	2.7	A
	PM	15.1	B	23.9	C	22.1	C	11.6	B	22.9	C	21.9	C	0	A	47.3	D	16.7	B	16.7	B	0	A	9	A	1.8	A
Cavasson Blvd & Driveway 1	AM	2.7	A	-	-	0	A	0	A	0	A	0	A	-	-	10.1	B	-	-	0	A	-	-	-	-	-	-
	PM	8.9	A	-	-	0	A	0	A	0	A	0	A	-	-	15.2	C	-	-	0	A	-	-	-	-	-	-
Cavasson Blvd & Driveway 2	AM	3.8	A	-	-	0	A	0	A	0	A	0	A	-	-	8.7	A	-	-	0	A	-	-	-	-	-	-
	PM	7.9	A	-	-	0	A	0	A	0	A	0	A	-	-	9.2	A	-	-	0	A	-	-	-	-	-	-

Table 17 – Total Traffic Phase 3 Opening Day w/o Parcel B1 (2042) LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	27	C	33.8	C	36.5	D	10.3	B	-	-	-	-	-	-	-	-	22.7	C	0.3	A	44.6	D	11.4	B	-	-
	PM	25.5	C	26.3	C	16.3	B	5.3	A	-	-	-	-	-	-	-	-	30.9	C	2.4	A	40.5	D	6.8	A	-	-
Hayden Rd & Loop 101 WB	AM	14.2	B	-	-	-	-	-	-	14.9	B	24.3	C	18.8	B	38.4	D	8.8	A	-	-	-	-	16.1	B	4.5	A
	PM	42.6	D	-	-	-	-	-	-	35.2	D	55.2	E	53.8	D	101.9	F	5.3	A	-	-	-	-	28.1	C	56.9	E
Hayden Rd & Main Entrance	AM	1.8	A	-	-	-	-	18.6	B	-	-	-	-	23.2	C	43.3	D	0	A	0	A	54.3	D	0	A	0	A
	PM	4.9	A	-	-	-	-	50	D	-	-	-	-	122.5	F	63.4	E	0	A	0	A	83.9	F	0	A	0	A
Hayden Rd & Cavasson Blvd	AM	17.5	B	36.9	D	44.1	D	12.9	B	42.3	D	18.5	B	18.5	B	101.1	F	6.3	A	0.9	A	51.9	D	7.9	A	1.2	A
	PM	36.1	D	59.9	E	43.7	D	42.2	D	108.5	F	27.9	C	27.9	C	51.6	D	16.9	B	0.9	A	197.8	F	16.5	B	1.1	A
Hayden Rd & Legacy Blvd/ Hualapai Dr	AM	13.3	B	15.5	B	14.8	B	15.5	B	16.3	B	14.8	B	0	A	33.8	C	12.3	B	12.3	B	6	A	13.1	B	2.7	A
	PM	14.3	B	23.9	C	22.1	C	11	B	22.9	C	21.9	C	0	A	42.1	D	15.6	B	15.6	B	0	A	8.8	A	1.8	A
Cavasson Blvd & Driveway 1	AM	3.1	A	-	-	0	A	0	A	0	A	0	A	-	-	10.8	B	-	-	0	A	-	-	-	-	-	-
	PM	12.6	B	-	-	0	A	0	A	0	A	0	A	-	-	21.6	C	-	-	0	A	-	-	-	-	-	-
Cavasson Blvd & Driveway 2	AM	4.1	A	-	-	0	A	0	A	0	A	0	A	-	-	8.8	A	-	-	0	A	-	-	-	-	-	-
	PM	8.1	A	-	-	0	A	0	A	0	A	0	A	-	-	9.5	A	-	-	0	A	-	-	-	-	-	-

Table 18 – Total Traffic Phase 1 Opening Day w/Parcel B1 (2025) LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	27.8	C	35.2	D	37	D	8.1	A	-	-	-	-	-	-	-	-	23.6	C	0.3	A	46.2	D	13	B	-	-
	PM	26.7	C	21.5	C	12.5	B	4.7	A	-	-	-	-	-	-	-	-	23.1	C	1.6	A	66.3	E	7.4	A	-	-
Hayden Rd & Loop 101 WB	AM	14.7	B	-	-	-	-	-	-	14.1	B	27.7	C	18.8	B	35.7	D	10.2	B	-	-	-	-	16.3	B	4.6	A
	PM	47.3	D	-	-	-	-	-	-	55.4	E	42.3	D	41.2	D	117.7	F	3.9	A	-	-	-	-	24.4	C	76.5	E
Hayden Rd & Main Entrance	AM	1.2	A	-	-	-	-	16.8	C	-	-	-	-	28.6	D	32	D	0	A	0	A	68.8	F	0	A	0	A
	PM	2.3	A	-	-	-	-	58.2	F	-	-	-	-	33.3	C	75.1	F	0	A	0	A	58.2	F	0	A	0	A
Hayden Rd & Cavasson Blvd	AM	12.4	B	32	C	38.8	D	11.8	B	33.7	C	25.6	C	25.6	C	67.7	E	9	A	1.7	A	11.7	B	8.3	A	1.4	A
	PM	25.7	C	44.3	D	29	C	22.5	C	44.2	D	12.6	B	12.6	B	82.5	F	22.1	C	3.1	A	23.4	C	18.8	B	0.3	A
Hayden Rd & Legacy Blvd/ Hualapai Dr	AM	13.4	B	15.5	B	15.2	B	11.5	B	18.4	B	15	B	3.5	A	14.7	B	11.4	B	11.4	B	60.9	E	10.6	B	2.7	A
	PM	19.2	B	15.8	B	14.7	B	7.3	A	51.3	D	14.8	B	9.6	A	33.1	C	18.2	B	18.2	B	11.1	B	10.6	B	2.6	A
Cavasson Blvd & Driveway 1	AM	1.7	A	-	-	0	A	0	A	8.7	A	0	A	-	-	12.7	B	-	-	11.1	B	-	-	-	-	-	-
	PM	4.2	A	-	-	0	A	0	A	7.5	A	0	A	-	-	14.3	B	-	-	8.9	A	-	-	-	-	-	-
Cavasson Blvd & Driveway 2	AM	6.9	A	7.6	A	0	A	0	A	7.4	A	0	A	0	A	16.6	C	0	A	8.5	A	0	A	0	A	8.5	A
	PM	7.9	A	7.3	A	0	A	0	A	7.4	A	0	A	0	A	12.1	B	0	A	8.9	A	0	A	0	A	8.7	A
Cavasson Blvd & Legacy Blvd/ Hualapai Dr	AM	4.2	A	-	-	0	A	0	A	7.6	A	0	A	-	-	0	A	-	-	8.7	A	-	-	-	-	-	-
	PM	4.9	A	-	-	0	A	0	A	7.8	A	0	A	-	-	0	A	-	-	10.2	B	-	-	-	-	-	-

Table 19 – Total Traffic Phase 2 Opening Day w/Parcel B1 (2032) LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	30.3	C	32.2	C	36.9	D	10.8	B	-	-	-	-	-	-	-	-	30.9	C	0.5	A	53.1	D	17.6	B	-	-
	PM	24.0	C	26.8	C	16.7	B	5.3	A	-	-	-	-	-	-	-	-	28.3	C	2.3	A	38.4	D	6.9	A	-	-
Hayden Rd & Loop 101 WB	AM	16.2	B	-	-	-	-	-	-	13.2	B	30	C	20	B	39.9	D	11.9	B	-	-	-	-	17.6	B	5.1	A
	PM	65.5	E	-	-	-	-	-	-	55.7	E	75.2	E	73.6	E	143.1	F	4	A	-	-	-	-	23.9	C	120.1	F
Hayden Rd & Main Entrance	AM	1.5	A	-	-	-	-	17.9	C	-	-	-	-	32.1	D	38.6	E	0	A	0	A	103.2	F	0	A	0	A
	PM	3.2	A	-	-	-	-	82.8	F	-	-	-	-	42.2	E	112.4	F	0	A	0	A	74.7	E	0	A	0	A
Hayden Rd & Cavasson Blvd	AM	12.3	B	36.9	D	44.6	D	12.9	B	40	D	27.8	C	27.8	C	70.7	E	7.7	A	1.6	A	15.6	B	7.8	A	1.2	A
	PM	30.9	C	44.3	D	29	C	22.7	C	65.8	E	13.2	B	13.2	B	118.3	F	23.4	C	3.3	A	28.2	C	19.4	B	0.3	A
Hayden Rd & Legacy Blvd/ Hualapai Dr	AM	11.3	B	22.9	C	22.4	C	15.2	B	27.3	C	22	C	7.2	A	11.4	B	9.2	A	9.2	A	35.9	D	8.6	A	2	A
	PM	21.0	C	20.1	C	18.8	B	8.8	A	60.7	E	18.9	B	13.6	B	41.6	D	18.8	B	18.8	B	14.1	B	11.2	B	2.5	A
Cavasson Blvd & Driveway 1	AM	2.0	A	-	-	0	A	0	A	9	A	0	A	-	-	13.6	B	-	-	11.3	B	-	-	-	-	-	-
	PM	6.1	A	-	-	0	A	0	A	7.6	A	0	A	0	A	18.3	B	-	-	9	A	-	-	-	-	-	-
Cavasson Blvd & Driveway 2	AM	6.9	A	7.7	A	0	A	0	A	7.5	A	0	A	0	A	18.9	B	0	A	8.6	A	0	A	0	A	8.6	A
	PM	8.4	A	7.3	A	0	A	0	A	7.5	A	0	A	0	A	13.6	B	0	A	9.2	A	0	A	0	A	8.8	A
Cavasson Blvd & Legacy Blvd/ Hualapai Dr	AM	4.6	A	-	-	0	A	0	A	7.7	A	0	A	-	-	0	A	-	-	8.7	A	-	-	-	-	-	-
	PM	5.7	A	-	-	0	A	0	A	7.8	A	0	A	-	-	0	A	-	-	10.7	B	-	-	-	-	-	-

Table 20 – Total Traffic Phase 3 Opening Day w/Parcel B1 (2042) LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	35	D	38.6	D	46.3	D	12.8	B	-	-	-	-	-	-	-	-	31.1	C	1.2	A	60.3	E	17.8	B	-	-
	PM	25.3	C	34.3	C	22.8	C	5.9	A	-	-	-	-	-	-	-	-	27.8	C	2.7	A	40.1	D	6.5	A	-	-
Hayden Rd & Loop 101 WB	AM	17.7	B	-	-	-	-	-	-	13.5	B	37.9	D	23.9	C	50.8	D	12.2	B	-	-	-	-	16.8	B	5	A
	PM	85.8	F	-	-	-	-	-	-	59.5	E	123	F	118.8	F	191.5	F	4.4	A	-	-	-	-	24.2	C	150.4	F
Hayden Rd & Main Entrance	AM	1.9	A	-	-	-	-	19.2	C	-	-	-	-	36.1	E	47.5	E	0	A	0	A	151.6	F	0	A	0	A
	PM	4.2	A	-	-	-	-	112.4	F	-	-	-	-	53.6	F	160.1	F	0	A	0	A	95.9	F	0	A	0	A
Hayden Rd & Cavasson Blvd	AM	14.6	B	36.9	D	44.7	D	12.9	B	42.1	D	25.7	C	25.7	C	95.9	F	9.2	A	2	A	22.8	C	7.9	A	1.2	A
	PM	33.5	C	59.9	E	43.8	D	28.6	C	68.7	E	21.4	C	21.4	C	97.4	F	25.2	C	3.9	A	58.4	E	21.3	C	1.4	A
Hayden Rd & Legacy Blvd/ Hualapai Dr	AM	11.4	B	25.4	C	24.8	C	18.2	B	30.4	C	24.4	C	9.3	A	12.2	B	8.9	A	8.9	A	38.5	D	8.3	A	1.8	A
	PM	23.0	C	21.8	C	20.4	C	10.7	B	67.3	E	20.5	C	15.8	B	58.5	E	20.2	C	20.2	C	15.1	B	11.5	B	2.4	A
Cavasson Blvd & Driveway 1	AM	2.6	A	-	-	0	A	0	A	9.3	A	0	A	-	-	15	C	-	-	11.6	B	-	-	-	-	-	-
	PM	9.0	A	-	-	0	A	0	A	7.7	A	0	A	-	-	26.3	D	-	-	9.2	A	-	-	-	-	-	-
Cavasson Blvd & Driveway 2	AM	7.4	A	7.7	A	0	A	0	A	7.6	A	0	A	0	A	22.3	C	0	A	8.7	A	0	A	0	A	8.6	A
	PM	9.1	A	7.3	A	0	A	0	A	7.5	A	0	A	0	A	15.9	B	0	A	9.5	A	0	A	0	A	8.8	A
Cavasson Blvd & Legacy Blvd/ Hualapai Dr	AM	4.9	A	-	-	0	A	0	A	7.8	A	0	A	-	-	0	A	-	-	8.8	A	-	-	-	-	-	-
	PM	6.5	A	-	-	0	A	0	A	7.8	A	0	A	-	-	0	A	-	-	11.3	B	-	-	-	-	-	-

B. Traffic Signals

All intersections within the study area in need of a traffic signal are already signalized. The signal for intersection of Hayden Road & Cavasson Boulevard will need to be updated to include signal control for the new east leg of Cavasson Boulevard.

C. Site Circulation & Parking

The site plan in **Figure 2** depicts the parking and parking garage planned for each phase of the medical campus.

Provide a Turning Movement exhibit showing existing lanes and proposed lanes to mitigate impacts.

VI. Improvement Analysis

A. Improvements to Accommodate Base Traffic

A few updates were determined to help accommodate the base traffic (excluding the site traffic) for a few intersections. The intersection of Hayden Road & Loop 101 westbound ramps has a failing level of service and a queue that extends beyond the storage for the turn lane for the northbound left turn traffic by the estimated phase 2 opening day with the background traffic only. The first recommendation is to reconfigure the pavement marking for the northbound and southbound throughput traffic to provide one additional lane in each direction. The pavement already exists but has a hatched pavement marking that prevents the use of the lanes through the traffic interchange. It is recommended to make the additional southbound through lane at the Loop 101 westbound ramps a shared through/right turn lane. Recognizing that Hayden is a 4-lane roadway south of the Loop 101, making the additional southbound lane into a dedicated dual right turn lane would be beneficial as an interim solution until such time as Hayden Road is widened to the south of the Loop 101.

Additionally at the Loop 101 westbound ramp and Hayden Road intersection, the northbound left turn is failing by 2032, a simple approach could be to change the northbound left turn lane from a protected left to a protected/permissive left assuming sight distance requirements can be met. This significantly reduces the delay and queue for the northbound left turn. According to The City of Scottsdale Design Standards & Policies Manual, if a left turn exceeds 300 left turns in an hour, dual left turn lanes should be considered. Based on the counts collected, the northbound left turn far exceeds the 300 vehicles as of January 2022. The manual also states that an opposing vehicle count of 1000 vehicles would also warrant consideration of a dual left. In this case the opposing through and right turn traffic is also just below the threshold of 1000 vehicles and the background traffic is anticipated to exceed 1000 vehicles by phases 1 opening day without the addition of Banner traffic or parcel B1 traffic. Therefore, the ~~City and ADOT~~ may want to investigate a northbound dual left turn lane at this interchange.

Project's responsibility?

The northbound left turn at Hayden Road & Cavasson Boulevard The turning movement is currently a permissive left turn. The turning movement has a failing level of service and queue that exceeds the storage length of the turn lane by Phase 2 timeframe (2032) with background traffic only (excluding parcel B1). Once Parcel B1 is added to the background traffic, it begins to fail by Phase 1 timeframe (2025). During the morning peak hour, the delay is 64.6 seconds with a LOS E by 2032. The northbound left begins to fail for the background traffic with the addition of Parcel B1 by 2025 (Phase 1 timeframe). The delay with the addition of Parcel B1 is 83.6 second (LOS F) during the morning peak hour and 77.2 seconds (LOS E) during the afternoon peak hour. The addition of the site traffic also has some impacts to the northbound left turn lane at Cavasson Boulevard & Hayden Road due to the addition of the east leg of the intersection as well as overall increased traffic to the intersection. Without the addition of Parcel B1, the northbound left turn has a delay of 79.3 seconds (LOS E) for the morning peak and 91.9 seconds (LOS F) for the afternoon peak hour by Phase 1 opening day 2025. With the addition of both Banner Phase 1 and Parcel B1, the morning peak hour delay is 67.7 seconds (LOS E) and the afternoon peak hour delay is 82.5 seconds (LOS F).

If the northbound left turning movement at Hayden Road & Cavasson Boulevard is updated to a protected/permissive left turn, the delay and queue are significantly reduced. The turning movement delay

was found to decrease to an acceptable level of service for the background traffic only scenarios as well as with the addition of the Banner traffic scenarios when the northbound and southbound left turns are made a protected/permissive. The LOS becomes a D with 45.5 second delay in the morning peak hour and C with a 34.5 second delay in the afternoon peak hour for the northbound left background traffic scenario by 2025 with the improvement and remaining an acceptable level of service for by 2032 and 2042. One Parcel B1 is added to the background traffic and the improvement is made to the intersection, the delay is decreased to 18 seconds (LOS B) for the morning peak and 31 seconds (LOS C) for the afternoon peak hour by 2025. Note the signal timing was also optimized in all scenarios. The LOS and delay remain at an acceptable level of service by 2032 and 2042.

Table 21 through **Table 26** summarize the resulting LOS and delay after making these improvements as well as the improvements described in the following section to accommodate site traffic. As shown in the table, the mitigated turning movements improved in some cases significantly with the changes.

Table 21 – Mitigated Background Traffic Phase 1 w/o Parcel B1 LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	18.4	B	26.3	C	18.1	B	4.9	A	-	-	-	-	-	-	-	-	15.5	B	0.2	A	40.7	D	4.7	A	-	-
	PM	18.1	B	19.3	B	9.5	A	4.8	A	-	-	-	-	-	-	-	-	21.1	C	1.5	A	32.5	C	6.7	A	-	-
Hayden Rd & Loop 101 WB	AM	10.0	A	-	-	-	-	-	-	15.2	B	5	A	4.7	A	9	A	7.2	A	-	-	-	-	15.3	B	5.3	A
	PM	16.9	B	-	-	-	-	-	-	25.1	C	13	B	12.7	B	24.9	C	5.7	A	-	-	-	-	26.2	C	8.3	A
Hayden Rd & Cavasson Blvd	AM	26.8	C	11.4	B	-	-	0.2	A	-	-	-	-	-	-	45.5	D	25.3	C	-	-	-	-	29.4	C	3.1	A
	PM	30.3	C	44.3	D	-	-	0.8	A	-	-	-	-	-	-	27	C	34.5	C	-	-	-	-	29.2	C	0.3	A

Table 22 – Mitigated Background Traffic Phase 2 w/o Parcel B1 LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	19.7	B	30.6	C	21.4	C	5.1	A	-	-	-	-	-	-	-	-	15.5	B	0.2	A	40.9	D	4.4	A	-	-
	PM	19.2	B	19.6	B	10.2	B	4.8	A	-	-	-	-	-	-	-	-	23	C	1.8	A	32.9	C	6.8	A	-	-
Hayden Rd & Loop 101 WB	AM	10.5	B	-	-	-	-	-	-	15.2	B	6	A	5.8	A	10	A	7.1	A	-	-	-	-	15.9	B	5.4	A
	PM	18.8	B	-	-	-	-	-	-	25.1	C	17.4	B	17.1	B	29.8	C	5.8	A	-	-	-	-	26.9	C	8.4	A
Hayden Rd & Cavasson Blvd	AM	24.2	C	13.5	B	-	-	0.3	A	-	-	-	-	-	-	34.6	C	22.6	C	-	-	-	-	27.6	C	3.5	A
	PM	33.3	C	44.3	D	-	-	0.8	A	-	-	-	-	-	-	27	C	39.8	D	-	-	-	-	30.4	C	0.3	A

Table 23 – Mitigated Background Traffic Phase 3 w/o Parcel B1 LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	22.7	C	33.1	C	23.5	C	5.3	A	-	-	-	-	-	-	-	-	15.3	B	0.2	A	51.9	D	5.8	A	-	-
	PM	20.5	C	20	B	10.7	B	4.7	A	-	-	-	-	-	-	-	-	25.6	C	1.9	A	33.2	C	6.8	A	-	-
Hayden Rd & Loop 101 WB	AM	14.2	B	-	-	-	-	-	-	15.2	B	7.5	A	7.2	A	9.8	A	6.8	A	-	-	-	-	24	C	12.4	B
	PM	20.0	B	-	-	-	-	-	-	25.1	C	20.8	C	20.4	C	34.2	C	6	A	-	-	-	-	26.4	C	8.1	A
Hayden Rd & Cavasson Blvd	AM	25.4	C	13.5	B	-	-	0.3	A	-	-	-	-	-	-	35.3	D	23.4	C	-	-	-	-	29.4	C	3.5	A
	PM	24.2	C	49.6	D	-	-	1.2	A	-	-	-	-	-	-	19.1	B	27.5	C	-	-	-	-	21.5	C	0.3	A

Table 24 – Mitigated Background Traffic Phase 1 w/Parcel B1 LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	31.3	C	46.3	D	53.2	D	7.7	A	-	-	-	-	-	-	-	-	15.8	B	0.2	A	53.3	D	5.1	A	-	-
	PM	21.5	C	20.2	C	10.9	B	4.8	A	-	-	-	-	-	-	-	-	22.8	C	1.6	A	43.7	D	6.8	A	-	-
Hayden Rd & Loop 101 WB	AM	12.7	B	-	-	-	-	-	-	14.8	B	20.8	C	16.1	B	8	A	9.6	A	-	-	-	-	13.2	B	5.1	A
	PM	25.4	C	-	-	-	-	-	-	30	C	19.8	B	19.3	B	25.5	C	5.2	A	-	-	-	-	43.8	D	22	C
Hayden Rd & Cavasson Blvd	AM	18.2	B	26.5	C	33.9	C	0.7	A	26.3	C	28.5	C	28.5	C	18	B	16.5	B	2.5	A	0	A	27.4	C	2.9	A
	PM	33.3	C	44.3	D	29	C	7.8	A	32.8	C	15.5	B	15.5	B	31	C	41.4	D	0.6	A	0	A	29.2	C	0.3	A

Table 25 – Mitigated Background Traffic Phase 2 w/Parcel B1 LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	26.8	C	34.9	C	37.6	D	9.6	A	-	-	-	-	-	-	-	-	20.1	C	0.2	A	47.1	D	10.1	B	-	-
	PM	20.8	C	27.8	C	16.4	B	5.9	A	-	-	-	-	-	-	-	-	24.2	C	2.4	A	32.1	C	5.9	A	-	-
Hayden Rd & Loop 101 WB	AM	12.9	B	-	-	-	-	-	-	14.9	B	22.7	C	17.1	B	9.6	A	9	A	-	-	-	-	15	B	5.1	A
	PM	23.9	C	-	-	-	-	-	-	45.4	D	32.4	C	31.7	C	19.4	B	2.6	A	-	-	-	-	41.7	D	9.7	A
Hayden Rd & Cavasson Blvd	AM	24.9	C	13.5	B	19.7	B	0.5	A	13.4	B	17	B	17	B	35	C	30	C	4.9	A	0	A	27.6	C	3.5	A
	PM	35.1	D	44.3	D	29	C	7.8	A	32.8	C	15.5	B	15.5	B	27	C	44.5	D	0.3	A	0	A	30.4	C	0.3	A

Table 26 – Mitigated Background Traffic Phase 3 w/Parcel B1 LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	26.9	C	35.6	D	37.1	D	11	B	-	-	-	-	-	-	-	-	22.8	C	0.3	A	42.6	D	11.1	B	-	-
	PM	20.5	C	20	B	10.7	B	4.7	A	-	-	-	-	-	-	-	-	25.6	C	1.9	A	33.2	C	7.3	A	-	-
Hayden Rd & Loop 101 WB	AM	16.0	B	-	-	-	-	-	-	14.9	B	24.5	C	17.8	B	9.8	A	9.1	A	-	-	-	-	22.6	C	11.4	B
	PM	18.2	B	-	-	-	-	-	-	25.1	C	20.8	C	20.4	C	29.6	C	6	A	-	-	-	-	28	C	7.1	A
Hayden Rd & Cavasson Blvd	AM	26.9	C	13.5	B	19.7	B	0.5	A	13.4	B	17	B	17	B	44.5	D	33.2	C	5.4	A	0	A	27.6	C	3.3	A
	PM	26.8	C	39.9	D	24	C	9.7	A	52.9	D	17.7	B	17.7	B	19.5	B	29.2	C	0.3	A	0	A	22.9	C	0.3	A

B. Recommended Improvements to Accommodate Banner Project Site Traffic

Several improvements were found to be necessary to accommodate the combination of the base traffic and the Banner Project site traffic. As previously mentioned, changing the northbound left turn at Hayden Road & Cavasson Boulevard to protected/permissive phasing helps the base traffic to operate more efficiently at Hayden Road. When conducting the analysis, it was assumed the southbound left turn at the Cavasson Boulevard and Hayden Road intersection would match the existing northbound left turn and be a permissive left. The southbound left begins to fail, however, by the estimated Phase 2 opening day. The model was therefore updated to be a protected/permissive southbound left turn and the results showed that the LOS and Delay were significantly reduced. Therefore, it is recommended to make the southbound left turn a protected/permissive left turn. The protected/permissive improvements decrease the delay to 19.6 seconds (LOS B) and 30.2 (LOS C) for the morning and afternoon peak hour without Parcel B1 by Phase 1 opening day (2025). The turn remains at an acceptable level of service by Phases 2 & 3 opening days.
Note the signal timing was optimized using Synchro software after the update was made to the turning movement.

Table 27 through **Table 32** summarize the resulting LOS and delay with also making the southbound left at Hayden Road and Cavasson Boulevard a protected permissive left. As shown in the table, the mitigated turning movement improved significantly with this change.

Table 27 – Mitigated Total Traffic Phase 1 w/o Parcel B1 LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	27	C	33.8	C	36.5	D	10.3	B	-	-	-	-	-	-	-	-	22.7	C	0.3	A	44.6	D	11.4	B	-	-
	PM	25.5	C	26.3	C	16.3	B	5.3	A	-	-	-	-	-	-	-	-	30.9	C	2.4	A	40.5	D	6.8	A	-	-
Hayden Rd & Loop 101 WB	AM	14.2	B	-	-	-	-	-	-	14.9	B	24.3	C	18.8	B	38.4	D	8.8	A	-	-	-	-	16.1	B	4.5	A
	PM	42.6	D	-	-	-	-	-	-	35.2	D	55.2	E	53.8	D	101.9	F	5.3	A	-	-	-	-	28.1	C	56.9	E
Hayden Rd & Main Entrance	AM	1.8	A	-	-	-	-	18.6	B	-	-	-	-	23.2	C	43.3	D	0	A	0	A	54.3	D	0	A	0	A
	PM	4.9	A	-	-	-	-	50	D	-	-	-	-	122.5	F	63.4	E	0	A	0	A	83.9	F	0	A	0	A
Hayden Rd & Cavasson Blvd	AM	20.5	C	22.5	C	29	C	0.6	A	23.3	C	15.7	B	15.7	B	19.6	B	18	B	1.8	A	14	B	27.8	C	2.2	A
	PM	35.3	D	44.3	D	29	C	11.6	B	35.8	D	8.6	A	8.6	A	30.2	C	44.9	D	0.2	A	17.7	B	29.7	C	0.3	A
Hayden Rd & Legacy Blvd	AM	13.3	B	15.5	B	14.8	B	15.5	B	16.3	B	14.8	B	0	A	33.8	C	12.3	B	12.3	B	6	A	13.1	B	2.7	A
	PM	14.3	B	23.9	C	22.1	C	11	B	22.9	C	21.9	C	0	A	42.1	D	15.6	B	15.6	B	0	A	8.8	A	1.8	A
Cavasson Blvd & Driveway 1	AM	3.9	A	-	-	0	A	0	A	0	A	0	A	-	-	8.7	A	-	-	0	A	-	-	-	-	-	-
	PM	7.6	A	-	-	0	A	0	A	0	A	0	A	-	-	9	A	-	-	0	A	-	-	-	-	-	-
Cavasson Blvd & Driveway 2	AM	3.8	A	-	-	0	A	0	A	0	A	0	A	-	-	8.8	A	-	-	0	A	-	-	-	-	-	-
	PM	8.0	A	-	-	0	A	0	A	0	A	0	A	-	-	9.5	A	-	-	0	A	-	-	-	-	-	-
Cavasson Blvd & Legacy Blvd	AM	27	C	33.8	C	36.5	D	10.3	B	-	-	-	-	-	-	-	-	22.7	C	0.3	A	44.6	D	11.4	B	-	-
	PM	25.5	C	26.3	C	16.3	B	5.3	A	-	-	-	-	-	-	-	-	30.9	C	2.4	A	40.5	D	6.8	A	-	-

Table 28 – Mitigated Total Traffic Phase 2 w/o Parcel B1 LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	27	C	33.8	C	36.5	D	10.3	B	-	-	-	-	-	-	-	-	22.7	C	0.3	A	44.6	D	11.4	B	-	-
	PM	25.5	C	26.3	C	16.3	B	5.3	A	-	-	-	-	-	-	-	-	30.9	C	2.4	A	40.5	D	6.8	A	-	-
Hayden Rd & Loop 101 WB	AM	13.8	B	-	-	-	-	-	-	14.9	B	22.1	C	17.8	B	10.8	B	8.6	A	-	-	-	-	18.3	B	4.7	A
	PM	39.8	D	-	-	-	-	-	-	34.8	C	54.1	D	52.3	D	99.2	F	5.4	A	-	-	-	-	42.2	D	6.4	A
Hayden Rd & Main Entrance	AM	1.8	A	-	-	-	-	18.6	B	-	-	-	-	23.2	C	43.3	D	0	A	0	A	54.3	D	0	A	0	A
	PM	4.9	A	-	-	-	-	50	D	-	-	-	-	122.5	F	63.4	E	0	A	0	A	83.9	F	0	A	0	A
Hayden Rd & Cavasson Blvd	AM	22.9	C	22.5	C	29.2	C	0.8	A	23.8	C	14.3	B	14.3	B	23.3	C	23.4	C	3.8	A	17.9	B	27.5	C	4.4	A
	PM	51.1	D	44.3	D	29	C	13.7	B	43.2	D	8	A	8	A	27	C	77.7	E	0.2	A	19.5	B	33	C	0.3	A
Hayden Rd & Legacy Blvd	AM	13.3	B	15.5	B	14.8	B	15.5	B	16.3	B	14.8	B	0	A	33.8	C	12.3	B	12.3	B	6	A	13.1	B	2.7	A
	PM	14.3	B	23.9	C	22.1	C	11	B	22.9	C	21.9	C	0	A	42.1	D	15.6	B	15.6	B	0	A	8.8	A	1.8	A
Cavasson Blvd & Driveway 1	AM	2.7	A	-	-	0	A	0	A	0	A	0	A	-	-	10.1	B	-	-	0	A	-	-	-	-	-	-
	PM	8.9	A	-	-	0	A	0	A	0	A	0	A	-	-	15.2	C	-	-	0	A	-	-	-	-	-	-
Cavasson Blvd & Driveway 2	AM	3.8	A	-	-	0	A	0	A	0	A	0	A	-	-	8.7	A	-	-	0	A	-	-	-	-	-	-
	PM	7.9	A	-	-	0	A	0	A	0	A	0	A	-	-	9.2	A	-	-	0	A	-	-	-	-	-	-
Cavasson Blvd & Legacy Blvd	AM	27	C	33.8	C	36.5	D	10.3	B	-	-	-	-	-	-	-	-	22.7	C	0.3	A	44.6	D	11.4	B	-	-
	PM	25.5	C	26.3	C	16.3	B	5.3	A	-	-	-	-	-	-	-	-	30.9	C	2.4	A	40.5	D	6.8	A	-	-

Table 29 – Mitigated Total Traffic Phase 3 w/o Parcel B1 LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	27	C	33.8	C	36.5	D	10.3	B	-	-	-	-	-	-	-	-	22.7	C	0.3	A	44.6	D	11.4	B	-	-
	PM	25.5	C	26.3	C	16.3	B	5.3	A	-	-	-	-	-	-	-	-	30.9	C	2.4	A	40.5	D	6.8	A	-	-
Hayden Rd & Loop 101 WB	AM	13.8	B	-	-	-	-	-	-	14.2	B	22.5	C	17.4	B	13.4	B	9.4	A	-	-	-	-	17.1	B	4.4	A
	PM	38.7	D	-	-	-	-	-	-	30.1	C	46.4	D	45.4	D	99.1	F	5.6	A	-	-	-	-	44.4	D	6.4	A
Hayden Rd & Main Entrance	AM	1.8	A	-	-	-	-	18.6	B	-	-	-	-	23.2	C	43.3	D	0	A	0	A	54.3	D	0	A	0	A
	PM	4.9	A	-	-	-	-	50	D	-	-	-	-	122.5	F	63.4	E	0	A	0	A	83.9	F	0	A	0	A
Hayden Rd & Cavasson Blvd	AM	23.5	C	22.5	C	29.2	C	0.8	A	25.1	C	13.2	B	13.2	B	21.5	C	25.5	C	4	A	19.4	B	28	C	4.5	A
	PM	39.7	D	46.8	D	34	C	10	A	54.3	D	8.2	A	8.2	A	46.6	D	47	D	0.3	A	39	D	31.2	C	0.3	A
Hayden Rd & Legacy Blvd	AM	13.3	B	15.5	B	14.8	B	15.5	B	16.3	B	14.8	B	0	A	33.8	C	12.3	B	12.3	B	6	A	13.1	B	2.7	A
	PM	14.3	B	23.9	C	22.1	C	11	B	22.9	C	21.9	C	0	A	42.1	D	15.6	B	15.6	B	0	A	8.8	A	1.8	A
Cavasson Blvd & Driveway 1	AM	3.1	A	-	-	0	A	0	A	0	A	0	A	-	-	10.8	B	-	-	0	A	-	-	-	-	-	-
	PM	12.6	B	-	-	0	A	0	A	0	A	0	A	-	-	21.6	C	-	-	0	A	-	-	-	-	-	-
Cavasson Blvd & Driveway 2	AM	4.1	A	-	-	0	A	0	A	0	A	0	A	-	-	8.8	A	-	-	0	A	-	-	-	-	-	-
	PM	8.1	A	-	-	0	A	0	A	0	A	0	A	-	-	9.5	A	-	-	0	A	-	-	-	-	-	-
Cavasson Blvd & Legacy Blvd	AM	27	C	33.8	C	36.5	D	10.3	B	-	-	-	-	-	-	-	-	22.7	C	0.3	A	44.6	D	11.4	B	-	-
	PM	25.5	C	26.3	C	16.3	B	5.3	A	-	-	-	-	-	-	-	-	30.9	C	2.4	A	40.5	D	6.8	A	-	-

Table 30 – Mitigated Total Traffic Phase 1 w/Parcel B1 LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	27.8	C	35.2	D	37	D	8.1	A	-	-	-	-	-	-	-	-	23.6	C	0.3	A	46.2	D	13	B	-	-
	PM	26.7	C	21.5	C	12.5	B	4.7	A	-	-	-	-	-	-	-	-	23.1	C	1.6	A	66.3	E	7.4	A	-	-
Hayden Rd & Loop 101 WB	AM	14.7	B	-	-	-	-	-	-	14.1	B	27.7	C	18.8	B	35.7	D	10.2	B	-	-	-	-	16.3	B	4.6	A
	PM	47.3	D	-	-	-	-	-	-	55.4	E	42.3	D	41.2	D	117.7	F	3.9	A	-	-	-	-	24.4	C	76.5	E
Hayden Rd & Main Entrance	AM	1.2	A	-	-	-	-	16.8	C	-	-	-	-	28.6	D	32	D	0	A	0	A	68.8	F	0	A	0	A
	PM	2.3	A	-	-	-	-	58.2	F	-	-	-	-	33.3	C	75.1	F	0	A	0	A	58.2	F	0	A	0	A
Hayden Rd & Cavasson Blvd	AM	18.7	B	22.4	C	29	C	0.6	A	23.4	C	20	B	20	B	19.3	B	18.5	B	3.2	A	12.3	B	27.8	C	2.2	A
	PM	33.3	C	44.3	D	29	C	13.1	B	44.2	D	12.6	B	12.6	B	27	C	38.6	D	1.5	A	15.2	B	29.3	C	0.3	A
Hayden Rd & Legacy Blvd	AM	13.4	B	15.5	B	15.2	B	11.5	B	18.4	B	15	B	3.5	A	14.7	B	11.4	B	11.4	B	60.9	E	10.6	B	2.7	A
	PM	19.2	B	15.8	B	14.7	B	7.3	A	51.3	D	14.8	B	9.6	A	33.1	C	18.2	B	18.2	B	11.1	B	10.6	B	2.6	A
Cavasson Blvd & Driveway 1	AM	1.7	A	-	-	0	A	0	A	8.7	A	0	A	-	-	12.7	B	-	-	11.1	B	-	-	-	-	-	-
	PM	4.2	A	-	-	0	A	0	A	7.5	A	0	A	-	-	14.3	B	-	-	8.9	A	-	-	-	-	-	-
Cavasson Blvd & Driveway 2	AM	6.9	A	7.6	A	0	A	0	A	7.4	A	0	A	0	A	16.6	C	0	A	8.5	A	0	A	0	A	8.5	A
	PM	7.9	A	7.3	A	0	A	0	A	7.4	A	0	A	0	A	12.1	B	0	A	8.9	A	0	A	0	A	8.7	A
Cavasson Blvd & Legacy Blvd	AM	4.2	A	-	-	0	A	0	A	7.6	A	0	A	-	-	0	A	-	-	8.7	A	-	-	-	-	-	-
	PM	4.9	A	-	-	0	A	0	A	7.8	A	0	A	-	-	0	A	-	-	10.2	B	-	-	-	-	-	-

Table 31 – Mitigated Total Traffic Phase 2 w/Parcel B1 LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	30.3	C	32.2	C	36.9	D	10.8	B	-	-	-	-	-	-	-	-	30.9	C	0.5	A	53.1	D	17.6	B	-	-
	PM	24.0	C	26.8	C	16.7	B	5.3	A	-	-	-	-	-	-	-	-	28.3	C	2.3	A	38.4	D	6.9	A	-	-
Hayden Rd & Loop 101 WB	AM	19.1	B	-	-	-	-	-	-	13.2	B	30	C	20	B	11.3	B	20.8	C	-	-	-	-	19.1	B	5.1	A
	PM	33.2	C	-	-	-	-	-	-	43	D	52.8	D	51.9	D	61.8	E	5.3	A	-	-	-	-	40.5	D	12.5	B
Hayden Rd & Main Entrance	AM	1.5	A	-	-	-	-	17.9	C	-	-	-	-	32.1	D	38.6	E	0	A	0	A	103.2	F	0	A	0	A
	PM	3.2	A	-	-	-	-	82.8	F	-	-	-	-	42.2	E	112.4	F	0	A	0	A	74.7	E	0	A	0	A
Hayden Rd & Cavasson Blvd	AM	19.6	B	19.9	B	26.9	C	0.5	A	21.2	C	17.8	B	17.8	B	20.8	C	20.9	C	3.8	A	13.6	B	27.6	C	1.8	A
	PM	41.6	D	44.3	D	29	C	13.4	B	67.3	E	12.1	B	12.1	B	27	C	49.4	D	2.2	A	15.8	B	30.5	C	0.3	A
Hayden Rd & Legacy Blvd	AM	11.3	B	22.9	C	22.4	C	15.2	B	27.3	C	22	C	7.2	A	11.4	B	9.2	A	9.2	A	35.9	D	8.6	A	2	A
	PM	21.0	C	20.1	C	18.8	B	8.8	A	60.7	E	18.9	B	13.6	B	41.6	D	18.8	B	18.8	B	14.1	B	11.2	B	2.5	A
Cavasson Blvd & Driveway 1	AM	2.0	A	-	-	0	A	0	A	9	A	0	A	-	-	13.6	B	-	-	11.3	B	-	-	-	-	-	-
	PM	6.1	A	-	-	0	A	0	A	7.6	A	0	A	0	A	18.3	B	-	-	9	A	-	-	-	-	-	-
Cavasson Blvd & Driveway 2	AM	6.9	A	7.7	A	0	A	0	A	7.5	A	0	A	0	A	18.9	B	0	A	8.6	A	0	A	0	A	8.6	A
	PM	8.4	A	7.3	A	0	A	0	A	7.5	A	0	A	0	A	13.6	B	0	A	9.2	A	0	A	0	A	8.8	A
Cavasson Blvd & Legacy Blvd	AM	4.6	A	-	-	0	A	0	A	7.7	A	0	A	-	-	0	A	-	-	8.7	A	-	-	-	-	-	-
	PM	5.7	A	-	-	0	A	0	A	7.8	A	0	A	-	-	0	A	-	-	10.7	B	-	-	-	-	-	-

Table 32 – Mitigated Total Traffic Phase 3 w/Parcel B1 LOS & Delay

Intersection	Peak Hour	Intersection		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hayden Rd & Loop 101 EB	AM	35	D	38.6	D	46.3	D	12.8	B	-	-	-	-	-	-	-	-	31.1	C	1.2	A	60.3	E	17.8	B	-	-
	PM	25.3	C	34.3	C	22.8	C	5.9	A	-	-	-	-	-	-	-	-	27.8	C	2.7	A	40.1	D	6.5	A	-	-
Hayden Rd & Loop 101 WB	AM	17.7	B	-	-	-	-	-	-	13.5	B	37.9	D	23.9	C	12.5	B	12.2	B	-	-	-	-	19.6	B	5.1	A
	PM	47.1	D	-	-	-	-	-	-	38.2	D	71.7	E	69.1	E	99.8	F	5.8	A	-	-	-	-	56.2	E	21.5	C
Hayden Rd & Main Entrance	AM	1.9	A	-	-	-	-	19.2	C	-	-	-	-	36.1	E	47.5	E	0	A	0	A	151.6	F	0	A	0	A
	PM	4.2	A	-	-	-	-	112.4	F	-	-	-	-	53.6	F	160.1	F	0	A	0	A	95.9	F	0	A	0	A
Hayden Rd & Cavasson Blvd	AM	19.9	B	22.5	C	29.7	C	0.6	A	25	C	18.2	B	18.2	B	20.3	C	20.4	C	3.7	A	15.5	B	28.8	C	2.1	A
	PM	39.8	D	51.4	D	38.8	D	13.7	B	54.9	D	13.1	B	13.1	B	31.7	C	45	D	4.6	A	20.4	C	34.7	C	0.3	A
Hayden Rd & Legacy Blvd	AM	11.4	B	25.4	C	24.8	C	18.2	B	30.4	C	24.4	C	9.3	A	12.2	B	8.9	A	8.9	A	38.5	D	8.3	A	1.8	A
	PM	23.0	C	21.8	C	20.4	C	10.7	B	67.3	E	20.5	C	15.8	B	58.5	E	20.2	C	20.2	C	15.1	B	11.5	B	2.4	A
Cavasson Blvd & Driveway 1	AM	2.6	A	-	-	0	A	0	A	9.3	A	0	A	-	-	15	C	-	-	11.6	B	-	-	-	-	-	-
	PM	9.0	A	-	-	0	A	0	A	7.7	A	0	A	-	-	26.3	D	-	-	9.2	A	-	-	-	-	-	-
Cavasson Blvd & Driveway 2	AM	7.4	A	7.7	A	0	A	0	A	7.6	A	0	A	0	A	22.3	C	0	A	8.7	A	0	A	0	A	8.6	A
	PM	9.1	A	7.3	A	0	A	0	A	7.5	A	0	A	0	A	15.9	B	0	A	9.5	A	0	A	0	A	8.8	A
Cavasson Blvd & Legacy Blvd	AM	4.9	A	-	-	0	A	0	A	7.8	A	0	A	-	-	0	A	-	-	8.8	A	-	-	-	-	-	-
	PM	6.5	A	-	-	0	A	0	A	7.8	A	0	A	-	-	0	A	-	-	11.3	B	-	-	-	-	-	-

When designing and constructing the east leg of Cavasson Boulevard, the capacity analysis found that dual westbound left turn lanes as well as a shared through/right lane will best serve the traffic at the intersection both with and without the addition of Parcel B1. There is a significant queue for the left turn lane anticipated and it is therefore recommended to construct a 300ft storage length for the dual left turns.

With the addition of the east leg of Cavasson Boulevard, the west leg will need to be restriped to provide an eastbound through lane. Based on the capacity analysis as well as the alignment of the east leg of the intersection, it is recommended to maintain the eastbound dual left turns and reconfigure pavement markings for the first right turn line to be a through lane and maintain the outer right turn lane as a dedicated right turn.

The southbound left turn at the main entrance of the Banner Project on Hayden Road will see significant delay, however, a very small percentage of the southbound site traffic is anticipated to use this entrance during the peak hours, therefore the queue length is very minimal. The traffic is more likely to turn left at Cavasson Boulevard where there is a traffic signal.

It is recommended that the two site driveways located along Cavasson Boulevard provide two northbound egress lanes. One lane dedicated to the left turning movement and one dedicated to the northbound right turn lane or shared through/right turn lane depending on the future Parcel B1 driveway locations.

C. Status of Improvements Already Funded, Programmed or Planned

The design for the east leg of Legacy Boulevard/Hualapai Drive is already underway and will connect Hayden Road to existing Hualapai Drive, which in turn connects over to Pima Road. Once Parcel B1 is built, a north/south connector road is also planned for the east side of Parcel B1 that will connect Cavasson Boulevard to Legacy Boulevard/Hualapai Drive and thus providing relief to the intersection of Cavasson Boulevard and Hayden Road. The addition of Parcel B1 and the connector road is anticipated to reduce the amount of Banner Project site traffic at the intersection of Hayden Road and Cavasson Boulevard.

The three Banner Project site driveways were analyzed under the assumption that right turn lanes will be provided at each for ingress site traffic. The capacity analysis revealed that a 100-foot storage length will accommodate the right turning traffic accessing the site.

VII. Findings

A. Site Accessibility

Through capacity and improvement analysis, it was found that providing right turn lanes at all site driveways is beneficial. It was also determined that for the two site driveways along Cavasson Boulevard, it is beneficial to provide separate egress left and right turn lanes to reduce vehicle queues within the parking lot.

B. Traffic Impacts

Through the capacity analysis, it was found that the addition of the Banner Project site traffic has some impacts to the northbound left turn lane at Cavasson Boulevard & Hayden Road. As discussed in the improvement analysis, the turning movement delay was found to decrease when made a protected/permissive left for both the northbound and southbound left turns.

The westbound left turn at Hayden Road and Cavasson Boulevard exceeds 300 vehicles per hour during the afternoon peak hour. Per the City's guidelines, dual left turn lanes should be considered. Through capacity analysis, it was determined that dual left turn lanes would provide the most efficiency for the westbound left turning vehicles thus decreasing delay and creating more space for left turning vehicles to queue.

C. Need for Improvements

Through the capacity analysis of the background base traffic, without Banner traffic, it was found that making improvements to the traffic interchange for the Loop 101 and Hayden Boulevard would decrease delay and vehicle queues. This is particularly the case for the northbound left turn at the westbound ramps. The northbound left currently exceeds 300 vehicles per hour without adding any traffic growth or Banner traffic and according to City of Scottsdale guidelines, the turn should be investigated for dual left turn lanes. Additionally, reconfiguring pavement markings to incorporate the unused pavement to add an additional through lane in the north and south direction would benefit traffic as well as making the northbound left turn a protected/permissive left turn instead of a protected left turn which has been done at other similar Loop 101 interchanges within the City.

VIII. Recommendations

A. Site Access/Circulation Plan

The following list includes the recommendations for site access to the Banner Property:

- Provide northbound right turn lane with a minimum 100-foot storage length at the main entrance along Hayden Road.
- Provide eastbound right turn lane with a minimum 100-foot storage length at the west site driveway along Cavasson Boulevard for Phase 1.
- The east driveway onto the Banner site is not anticipated to have a lot of use until Phases 2 and 3 are constructed. It is therefore recommended to plan for a future eastbound right turn lane with 100-foot storage and further investigate when the right turn lane will be needed with the future phases and as Cavasson Boulevard continues to develop.
- Provide dedicated northbound left turn lanes at two site driveways along Cavasson Boulevard for egress traffic as well as a dedicated northbound right turn lane.

B. Roadway Improvements

1. Off-Site

The following list includes all recommendations of off-site improvements for Base traffic that will also improve traffic once Banner traffic is added:

- Reconfigure pavement markings to make the additional unused pavement a shared through/right southbound lane if not already planned at Hayden Road & the Loop 101 westbound interchange.
- Change the northbound left turn lane at Hayden Road and Cavasson Boulevard to a protected/permissive left turn lane by phase 1 opening day (2025) to reduce delay and queues for the turning movement.

The following list includes all recommendations of off-site improvements to accommodate Banner Project site traffic:

- Cavasson Boulevard along the north boundary of the Banner Property is recommended to be a two-lane roadway section to be widened at the intersection of Hayden Road.
- Provide dual westbound left turn lanes with at least 300-foot storage length at Hayden Road & Cavasson Boulevard and a westbound shared through/right turn lane.
- Reconfigure pavement markings for the 1st eastbound right turn lane to be a through lane at Hayden Road & Cavasson Boulevard while maintaining the eastbound dual left turn lane and outer dedicated right turn lane.

- When updating the signal at Hayden Road & Cavasson to accommodate the new east leg of Cavasson, provide protected/permissive southbound left turn indications. The dual eastbound left turn lanes will need to be updated to protected left indications. The dual westbound left turn lanes will also require protected left turn indications.
- Provide a southbound left turn lane at the main entrance on Hayden Road with a storage length that fits within the constraints of available space within the existing median.

IX. Conclusions

The development of the Banner Project is planned in three phases that are anticipated to be completed over the next 20 years. The first phase includes part of the hospital building as well as a medical office building. The 2nd phase includes a cancer center, and the third phase includes an expansion of the hospital building from the first phase.

The first phase is anticipated to generate 7,485 weekday trips, 601 morning peak hour trips and 633 afternoon peak hour trips. The second phase is anticipated to generate 2,867 weekday trips, 241 morning peak hour trips and 256 afternoon peak hour trips. The third phase is anticipated to generate 3,183 weekday trips, 242 morning peak hour trips and 254 afternoon peak hour trips. The three phases combined are anticipated to generate 13,535 weekday trips, 1,084 morning peak hour trips and 1,143 afternoon peak hour trips.

A significant portion of the Banner Project site traffic is anticipated to use the intersection of Hayden Road & Cavasson Boulevard. Providing dual left turns for the eastbound and westbound approaches significantly benefits the delay and level of service for all turning movements at the intersection. The eastbound approach already has dual left turn lanes and it is recommended for the dual lefts to remain. The westbound approach is recommended to have dual left turn lanes due based on the City's guidelines. The dual lefts also significantly reduce delay and queues for westbound left turning vehicles

The future development of Parcel B1 and thus the north/south connector road will help to lower the traffic demand at the intersection of Hayden Road & Cavasson Boulevard by providing alternative routes for traffic to access Pima Road and the Loop 101.