

Traffic Impact Study

# Parklands Village 2

Aurora, Colorado

Prepared for:

**NL Parklands V4 Land Co., LLC**

**Kimley»Horn**

# T R A F F I C   I M P A C T   S T U D Y

## **Parklands Village 2**

Aurora, Colorado

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## 1.0 EXECUTIVE SUMMARY

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Parklands Village 2 is proposed to be bordered by Alameda Avenue to the north, Mississippi Avenue to the south, Harvest Road to the west, and Powhaton Road to the east in Aurora, Colorado. The project is proposed to include single-family homes, retail uses, and a K-8 school on a total of approximately 566 acres. It is expected that Parklands Village 2 will be completed in the next several years. Therefore, analysis was conducted for the 2025 short-term buildout horizon as well as the 2030 long-term planning horizon.

For the purposes of this analysis, Parklands Village 2 was evaluated with two phases with Phase I constructed on the southeast corner of the Alameda Avenue and Harvest Road intersection. Phase I is planned to be built by 2025 with 329 single-family detached homes, 90 single-family attached homes, and 3.6 acres of public park use. Phase II is planned to be built by 2030 and include an additional 984 single-family detached homes, 207 single-family attached homes, 564 multifamily homes, 54.7 acres of public park use with a 1,054 student K-8 school, 35,000 square feet of office use, and 110,000 square feet of retail uses. The *Parklands Development Master Traffic Study* is currently being finalized which includes the development area of Parklands Village 2. The Parklands master traffic study provided a thorough long-term 2040 analysis of intersections internal to Parklands Village 2 and accesses to the external arterial street system; therefore, the requested City of Aurora scope for this traffic study included a phase I 2025 and buildout 2030 analysis and not a long-term 2040 horizon. Further, the current proposal of Parklands Village 2 is calculated to generate less traffic than evaluated in the master traffic study.

The purpose of this traffic study is to identify project traffic generation characteristics to determine potential project traffic related impacts on the local street system and to develop the necessary mitigation measures required for the identified traffic impacts. The following intersections were incorporated into this traffic study in accordance with the City of Aurora requested scope:

- Alameda Avenue and Harvest Road (Intersection #1)
- Alameda Avenue and Powhaton Road (#2)
- Mississippi Avenue and Harvest Road (#3)
- Mississippi Avenue and Powhaton Road (#15)

In addition, the proposed public street connections to Alameda Avenue, Harvest Road, Mississippi Avenue, and Powhatan Road and the major internal development street intersections were evaluated (Intersections #4-14).

For the purposes of this analysis, Parklands Village 2 was evaluated with two phases, Phase I is expected to generate approximately 3,656 weekday daily trips, with 261 of these trips occurring during the morning peak hour and 354 of these trips occurring during the afternoon peak hour. Accounting for internal capture, the overall Parklands Village 2 development is expected to generate approximately 19,572 weekday daily trips, with 1,361 of these trips occurring during the morning peak hour and 1,811 of these trips occurring during the afternoon peak hour. Of note, the current proposal in this study for Parklands Village 2 generates less traffic than the traffic previously estimated to be generated by Village 2 in the Parklands Development Master Traffic Study. The master study had projected 21,880 weekday daily trips, 1,481 morning peak hour trips, and 2,239 afternoon peak hour trips, after its accounting for internal capture. As such, the current proposal is anticipated to generate 2,308 fewer weekday daily trips, with 120 fewer trips in the morning peak hour and 497 fewer afternoon peak hour trips.

Based on the analysis presented in this report, Kimley-Horn believes Parklands Village 2 will be successfully incorporated into the existing and future roadway network. Analysis of the existing street network, the proposed project development, and expected traffic volumes resulted in the following recommendations:

### **2025 Recommendations**

- With Phase I of construction of this development, a south leg at the Alameda Avenue & Harvest Road (#1) intersection is proposed to be constructed. Additionally, two full movement accesses are proposed along Alameda Avenue, with the first access as the south leg of the Alameda Avenue & Jamestown Way (#4) intersection, and the second access to be constructed as the south leg of the Alameda Avenue & Little River Street (#5) intersection. With construction of the south leg of Harvest Road, an access is proposed to be located at the “Road 4” & Harvest Road (#6) intersection. Road 4 is anticipated to continue through Little River Street (#7) with a single-lane roundabout proposed to be constructed at that intersection.
- The Alameda Avenue & Harvest Road (#1) intersection is proposed to operate with stop control on the north and south Harvest Road legs with, requiring the addition of an R1-1

“STOP” sign on the to-be constructed northbound approach to the intersection. The eastbound and westbound Alameda Avenue approaches and the northbound Harvest Road approach should all operate well during this horizon with a shared lane for left/through/right turning movements in each direction. The southbound approach is recommended to continue with the existing southbound left- and right-turn lanes and use the existing pavement width with some restriping required to provide a southbound through lane.

- The Alameda Avenue & Powhatan Road (#2) intersection should operate well during this horizon without any improvements required to the existing intersection configuration.
- The Mississippi Avenue & Harvest Road (#3) intersection should remain unaffected from Phase I project construction as the two areas will not be directly connected during this phase.
- The Alameda Avenue & Jamestown Way (#4) intersection should operate well with stop control on the newly constructed northbound and the southbound Jamestown Way approaches to the intersection with an R1-1 “STOP” sign placed in each direction. Each approach to the intersection should provide a shared lane for left/through/right turning movements in each direction, with the exception of the eastbound direction, which should provide a shared left/through lane and a separate right turn lane 150 feet in length with a 100-foot taper.
- The Alameda Avenue & Little River Street (#5) is anticipated to operate well with stop control on the proposed-to-be-constructed south leg and the existing north leg of Little River Street with R1-1 “STOP” signs posted in each direction on this street. The eastbound, northbound, and southbound directions should provide a shared lane for left/through/right turning movements while the westbound direction should provide a shared left/through lane and a right turn lane.
- The Road 4 & Harvest Road (#6) intersection will have only two non-opposing legs to the intersection during this horizon, and as such it is anticipated to operate with free southbound left and westbound right turning movements, similar to how Mississippi Avenue & Harvest Road (#3) operates today.
- The Road 4 & Little River Street (#7) intersection is anticipated to be constructed in this phase as a single-lane roundabout although only eastbound left and southbound right turning movements are anticipated to occur during this horizon. The east and south legs to the intersection should be stubbed out for future construction that will be completed during Phase II as the rest of Parklands Village 2 is constructed. R1-2 “YIELD” signs should be placed on the eastbound and southbound approaches to the intersection.

## **2030 Recommendations**

- With Phase II construction, the Alameda Avenue & Harvest Road (#1) intersection is anticipated to require signalization to provide acceptable operations. An eastbound right turn lane is anticipated to be required at this intersection, which should provide 150 in length with a 120-foot taper. A westbound left turn lane should be provided with 150 feet in length and a 100-foot taper. The northbound direction should provide dual northbound left turn lanes with 275 feet in length with a 160-foot taper, a through lane, and a separate through/right turn lane.
- The intersection of Alameda Avenue & Powhatan Road (#2) is anticipated to need separate eastbound left and right turn lanes, each with 150 feet in length with a 100-foot taper. A southbound right turn lane 150 feet in length with a 140-foot taper should also be provided at this intersection.
- As Harvest Road will connect from Mississippi Avenue to Alameda Avenue with Phase II construction, a signal is anticipated to be required at the Mississippi Avenue & Harvest Road West (#3) intersection to provide acceptable operations. The existing two eastbound lanes on Mississippi Avenue should be restriped to provide an eastbound left- and right-turn lanes. The northbound left turn lane should be improved to provide 275 feet in length and a 160-foot taper, while two northbound through lanes should be provided. The southbound direction should provide a through lane and a forced-right turn lane onto Mississippi Avenue.
- A westbound left turn lane is anticipated to be warranted at the Alameda Avenue & Jamestown Way (#4) intersection, which should provide 150 feet in length and a 100-foot taper.
- The Alameda Avenue & Little River Street (#5) intersection should provide an eastbound right turn lane, a northbound left turn lane, and a westbound left turn lane, each 150 feet in length with a 100-foot taper.
- A south leg is anticipated to be constructed at the Road 4 & Harvest Road (#6) intersection as Harvest Road will connect from Mississippi Avenue to Alameda Avenue with project construction. This intersection should provide two through lanes on Harvest Road in each direction and separate northbound right and southbound left turn lanes, each 275 feet in length with a 160-foot taper. The westbound direction should provide separate left and right turn lanes, with the left turn lane providing 150 feet in length with a 100-foot taper.
- The south and east legs of the Road 4 & Little River Street (#7) single-lane roundabout will be constructed with Phase II construction. As such, each direction should provide shared

left/through/right turning movements from a single lane in each direction with R1-2 “YIELD” signs posted on each approach to the roundabout.

- A south leg to the Alameda Avenue & New Castle Way (#8) intersection is proposed to be constructed with Phase II development. This intersection should operate well with stop control through the 2030 horizon with R1-1 “STOP” signs posted on the northbound and southbound New Castle Way approaches to the intersection. These two approaches should operate well with shared left/through/right turning movements from one lane in each direction. An eastbound right turn lane and a westbound left turn lane should each be provided with 150 feet in length and a 100-foot taper.
- The Road 4 & New Castle Way (#9) intersection is anticipated to be an unsignalized ‘T’-intersection with an R1-1 “STOP” sign posted on the southbound New Castle Way approach. The eastbound direction should provide one lane for shared left/through turning movements while the westbound direction should provide one lane for shared through/right turning movements. The southbound direction should operate well with one lane for shared left/right turning movements.
- The Road 4 & Powhatan Road (#10) intersection is not anticipated to require signalization by 2030. As such, it is proposed to be a four leg stop-controlled intersection with stop control on the eastbound and westbound approaches to the intersection. The east leg is assumed to be constructed by others before this horizon year as development is ongoing in the Sand Creek Ranch development area to the east of Powhatan Road. The eastbound and westbound directions should each provide a left turn lane with 150 feet in length and a 100-foot taper and a shared through/right turn lane with R1-1 “STOP” signs posted on each approach to the intersection.
- The Street B & Harvest Road (#11) intersection is anticipated to be a stop-controlled ‘T’-intersection with an R1-1 “STOP” sign posted on the westbound Street B approach. The westbound direction should provide a continuous left turn lane and a right turn lane with 150 feet in length and a 100-foot taper. Two through lanes in each direction along Harvest Road should be provided in addition to a northbound right and southbound left turn lanes with 275 feet in length and a 160-foot taper.
- The Mississippi Avenue & Harvest Road East (#12) intersection is anticipated to be a stop-controlled ‘T’-intersection with an R1-1 “STOP” sign posted on the westbound Mississippi Avenue approach. The westbound direction should provide a continuous left turn lane and a right turn lane with 150 feet in length and a 100-foot taper. Two through lanes in each direction

along Harvest Road should be provided in addition to a northbound right and southbound left turn lanes with 275 feet in length and a 160-foot taper.

- Mississippi Avenue & Little River Street (#13) is anticipated to be a stop-controlled 'T'-intersection with an R1-1 "STOP" sign posted on the southbound Little River Street approach to the intersection. A southbound left turn lane 150 feet in length with a 100-foot taper and a separate continuous southbound right turn lane should be provided.
- The Street C & Powhaton Road (#14) intersection is anticipated to a stop-controlled 'T'-intersection with an R1-1 "STOP" sign posted on the eastbound Street C approach to the intersection. The eastbound direction should provide one lane for shared left/right turning movements. A northbound left turn lane should be provided with 150 feet in length and a 140-foot taper. Vehicles turning southbound right at this intersection should be able to turn from the outer shared southbound through/right turn lane.
- The intersection of Mississippi Avenue and Powhaton Road (#15) is anticipated to operate well as a stop-controlled 'T'-intersection with an R1-1 "STOP" sign posted on the eastbound Mississippi Avenue approach to the intersection. The eastbound direction should provide one lane for shared left/right turning movements. A northbound left turn lane should be provided with 150 feet in length and a 140-foot taper. Vehicles turning southbound right at this intersection should be able to turn from the outer shared southbound through/right turn lane.

### **General Notes and Recommendations**

- The roadway geometry and control recommendations provided in this study are evaluated based on the anticipated needs at the study area intersections during these horizons. As such, the recommended turn lanes provided in this study are based on the 2025 and 2030 needs rather than aligning with the roadway geometry provided in the Parklands Village Master Traffic Study. It should be noted that additional roadway improvements and intersection control may be needed at the external intersections as development continues to occur in this area—such as the provision of two through lanes in each direction along Alameda Avenue between Harvest Road and Powhaton Road—for which the Parklands Village Master Traffic Study can be referenced.
- Of note, northbound left turning vehicles at the Alameda Avenue & Harvest Road (#1) intersection were proposed to occur from a single northbound left turn lane through the 2040 horizon in the Parklands Village Master Traffic Study. However, in this study it is recommended that dual northbound left turn lanes be provided at this intersection.

- Any onsite or offsite improvements should be incorporated into the Civil Drawings and conform to standards of the City of Aurora and the Manual on Uniform Traffic Control Devices (MUTCD) – 2009 Edition.

## 2.0 INTRODUCTION

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Kimley-Horn and Associates, Inc. has prepared this report to document the results of a Traffic Impact Study for Parklands Village 2 proposed to be bordered by Alameda Avenue to the north, Mississippi Avenue to the south, Harvest Road to the west, and Powhaton Road to the east in Aurora, Colorado. A vicinity map illustrating the Parklands Village 2 development location is shown in **Figure 1**. Parklands Village 2 is proposed to include single-family homes, retail uses, and a K-8 school on a total of approximately 566 acres. A conceptual site plan is attached in **Appendix H**.

For the purposes of this analysis, Parklands Village 2 was evaluated with two phases with Phase I constructed on the southeast corner of the Alameda Avenue and Harvest Road intersection. Phase I is planned to be built by 2025 with 329 single-family detached homes, 90 single-family attached homes, and 3.6 acres of public park use. Phase II is planned be built by 2030 and include an additional 984 single-family detached homes, 207 single-family attached homes, 564 multifamily homes, 54.7 acres of public park use with a 1,054 student K-8 school, 35,000 square feet of office use, and 110,000 square feet of retail uses. The *Parklands Development Master Traffic Study* is currently being finalized which includes the development area of Parklands Village 2. The Parklands master traffic study provided a thorough long-term 2040 analysis of intersections internal to Parklands Village 2 and accesses to the external arterial street system; therefore, the requested City of Aurora scope for this traffic study included a phase I 2025 and buildout 2030 analysis and not a long-term 2040 horizon. Further, the current proposal of Parklands Village 2 is calculated to generate less traffic than evaluated in the master traffic study.

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- Alameda Avenue and Harvest Road (Intersection #1)
- Alameda Avenue and Powhaton Road (#2)
- Mississippi Avenue and Harvest Road (#3)
- Mississippi Avenue and Powhaton Road (#15)



In addition, the proposed public street connections to Alameda Avenue, Harvest Road, Mississippi Avenue, and Powhatan Road and the major internal development street intersections were evaluated (Intersections #4-14).

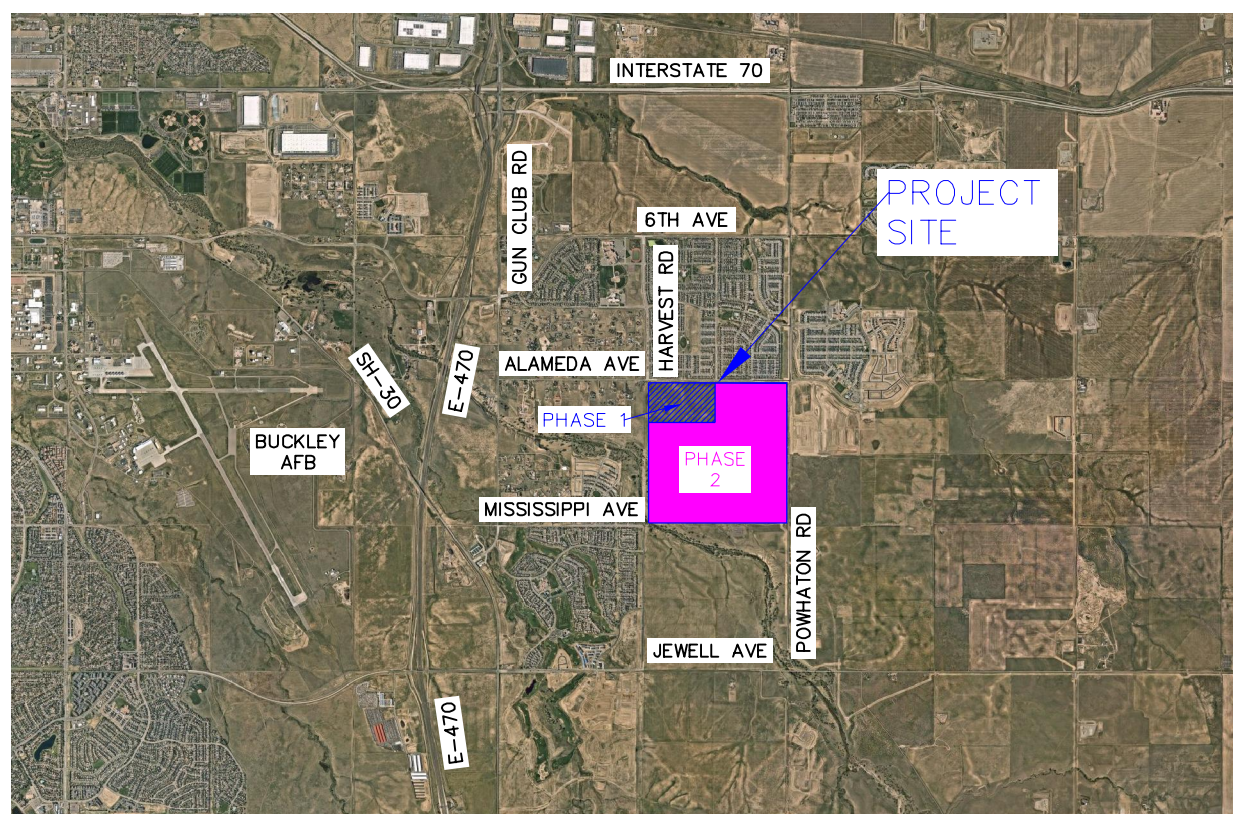


FIGURE 1  
PARKLANDS VILLAGE 2  
AURORA, COLORADO  
VICINITY MAP

## 3.0 EXISTING AND FUTURE CONDITIONS

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### 3.1 Existing Study Area

The existing site is comprised of vacant land. To the north are single-family residential homes and directly to the east, west, and south is vacant land. Extending to the east is vacant and agricultural land and to the west are single-family homes and the Colorado E-470 freeway.

### 3.2 Existing Roadway Network

Regional access to Parklands Village 2 will be provided by E-470 and Interstate 70 (I-70). Primary access will be provided by Alameda Avenue, Mississippi Avenue, Harvest Road, and Powhatan Road. Direct access to Phase I will be provided by a full movement access along Alameda Avenue at Jamestown Way, a future south leg of Little River Street along Alameda Avenue, and a full movement access along Harvest Road. Direct access to Phase II will be provided by a proposed south leg at the Alameda Avenue / New Castle Way intersection, two (2) full movement accesses along Powhatan Road, a future west leg at the Mississippi Avenue / Powhatan Road intersection, and two (2) full movement accesses along the future Harvest Road extension.

Alameda Avenue extends east/west with one through lane in each direction. Sidewalks exist on the north side of Alameda Avenue fronting the newer single-family constructed homes. The posted speed limit west of Harvest Road is 35 miles per hour, while east of Harvest Road has a posted speed limit of 30 miles per hour.

Harvest Road currently only extends northbound and southbound with two through lanes of travel between 6<sup>th</sup> Avenue and Alameda Avenue. However, Harvest Road is a two-lane roadway between Jewell Avenue and Mississippi Avenue. The roadway provides a raised median separating opposing travel lanes and sidewalks on the east and west side. The posted speed limit is 45 miles per hour.

Powhatan Road is a two-lane roadway north of 1<sup>st</sup> Avenue/Ellsworth Avenue and south of Alameda Avenue. The roadway widens to four lanes with a raised median between Alameda Avenue and 1<sup>st</sup> Avenue/Ellsworth Avenue. The posted speed limit is 40 miles per hour with sidewalks along the four-lane section on the east and west side.



Mississippi Avenue extends east/west as a two-lane roadway between Gun Club Road and Duquesne Street and widens into four-lanes to Harvest Road. Sidewalk is provided on the south side of Mississippi Avenue and some sections along the north side. The posted speed limit is 30 miles per hour.

The T-intersection of Alameda Avenue and Harvest Road (#1) is unsignalized and operates with stop control on the southbound approach of Harvest Road. The eastbound approach of Alameda Avenue provides a single lane for shared left and through movements. The westbound approach of Alameda Avenue provides a shared through/right turn lane. The southbound approach provides a separate left and right turn lane. An aerial photo of the existing intersection configuration is below (north is up - typical).



*Alameda Avenue and Harvest Road (#1)*

The unsignalized intersection of Alameda Avenue and Powhatan Road (#2) operates with stop control on the eastbound and westbound approaches of Alameda Avenue. The northbound and southbound approaches of Powhatan Road provide a separate left turn lane, a through lane, and a shared through/right turn lane. The eastbound and westbound approaches provide a single lane for shared movements. An aerial photo of the existing intersection configuration is below.



*Alameda Avenue and Powhatan Road (#2)*



The unsignalized intersection of Mississippi Avenue and Harvest Road (#3) does not provide intersection control and currently only has two legs with a 90 degree bend. Harvest Road transitions into Mississippi Avenue northbound and Mississippi Avenue transitions into Harvest Road eastbound. An aerial photo of the existing intersection configuration is below.



*Mississippi Avenue and Harvest Road (#3)*

The intersection lane configuration and control for the study area intersections are shown in **Figure 2**.

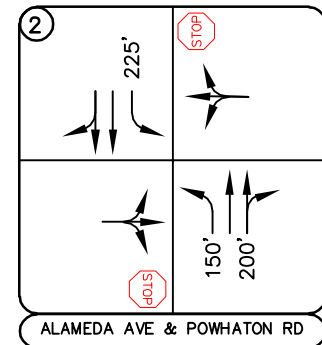
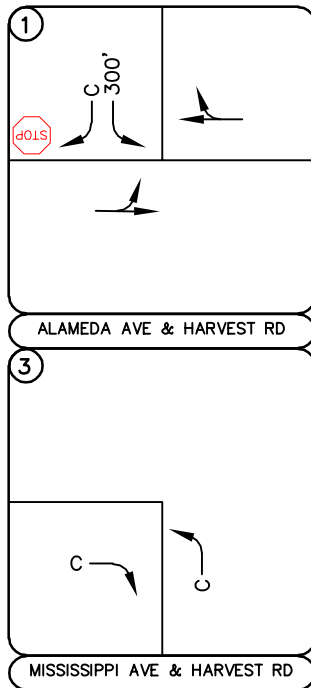
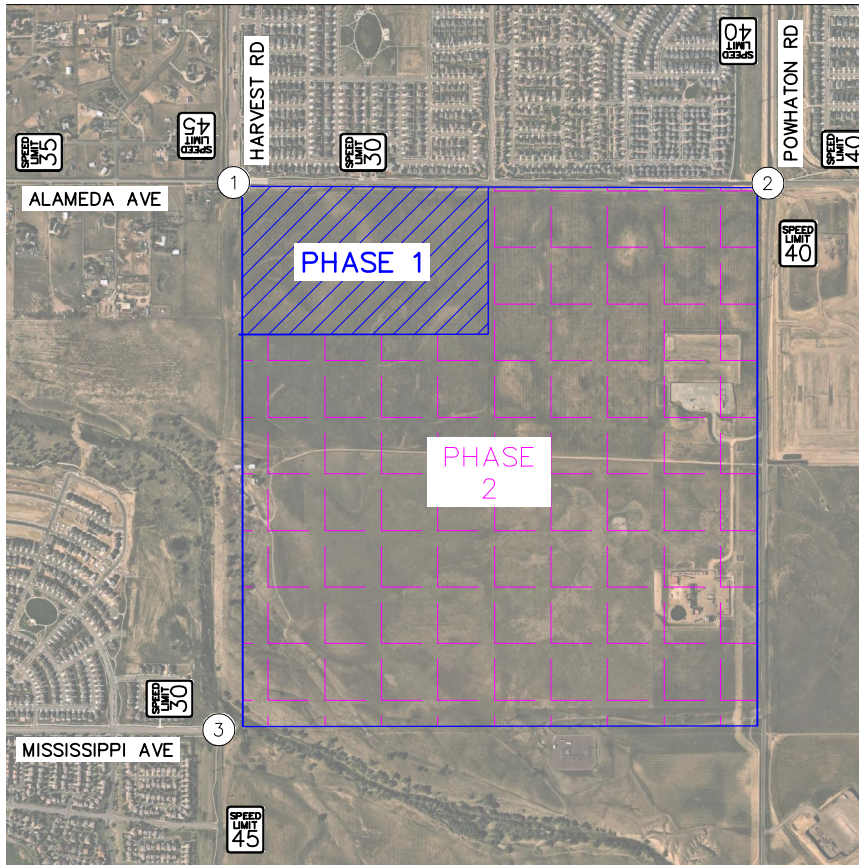
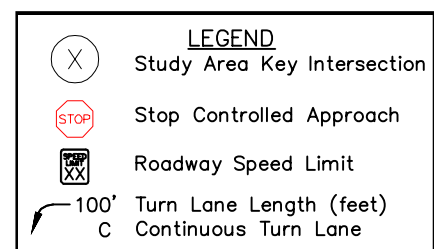


FIGURE 2  
 PARKLANDS VILLAGE 2  
 AURORA, COLORADO  
 EXISTING GEOMETRY AND CONTROL



### 3.3 Existing Traffic Volumes

Existing turning movement counts were conducted at the study intersections in June 2021 during the weekday morning and afternoon peak hours for the *Parklands Master Traffic Study* updated March 2022 study. Per previous coordination with City of Aurora staff, these counts were authorized to be used in this study. The counts were conducted during the morning and afternoon peak hours of adjacent street traffic in 15-minute intervals from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM on this count date. The existing year 2021 intersection traffic volumes are shown in **Figure 3**. The 2021 counts were grown by the standard Aurora two (2) percent annual growth to estimate 2022 traffic volumes. In addition, the intersection of Alameda Avenue and Powhaton Road was under construction during year 2021. Therefore, the inherent increase in traffic volumes at that intersection have been accounted for with the adjusted 2022 volumes. The 2022 adjusted traffic volumes are shown in **Figure 4**.

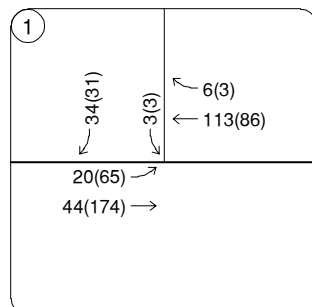
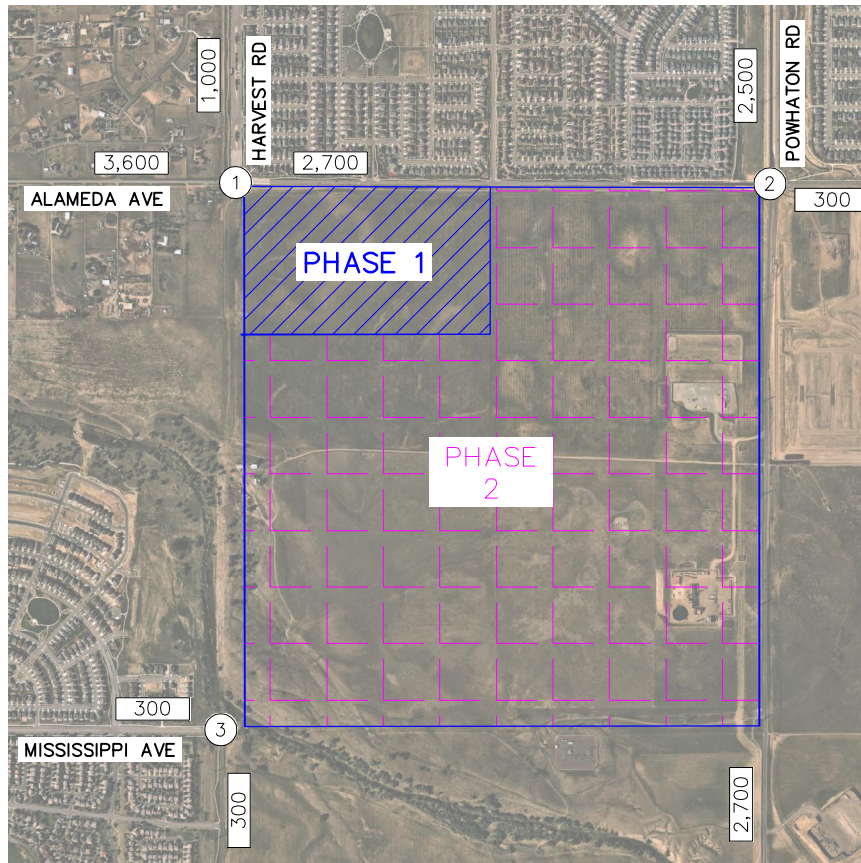
### 3.4 Unspecified Development Traffic Growth

According to information provided on the CDOT website, the 20-year growth factor along State Highway 30 in this area is approximately 1.48. This growth factor equates to an annual growth rate of 1.96 percent. Traffic information from the CDOT Online Transportation Information System (OTIS) website is provided in **Appendix B**. This aligns well with the City of Aurora typical standard of 2.0 percent annual traffic growth. As such, a 2.0 percent annual growth rate was used to calculate future traffic volumes at the study area intersections to estimate short-term 2025 traffic volumes. The 2025 and 2030 background traffic volumes also added additional volumes on top of the 2.0 percent growth at the intersection of Alameda Avenue and Powhaton Road (#2) to account for additional traffic volume generated by ongoing residential development construction to the east of Powhaton Road.

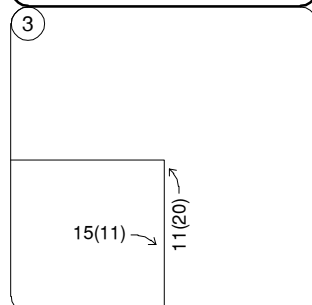
To align with the procedure followed in the Parklands Development Master Traffic Study prepared by Fox Tuttle Transportation Group in March 2022, the City of Aurora Northeast Area Transportation Study (NEATS) Refresh Final Report 2030 Daily Traffic Volumes were used as a basis to form 2030 background traffic volume estimates at the external study area intersections on Alameda Avenue, Mississippi Avenue, Harvest Road, and Powhaton Road. However, while the Parklands Development Master Traffic Study assumed that the 2040 Daily Traffic Volumes provided in NEATS accounted for the Parklands Development traffic, in this study it was conservatively assumed that the 2030 Daily Traffic Volumes in NEATS do not account for any



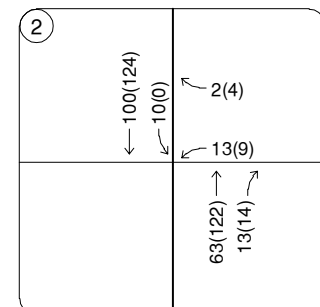
Parklands development traffic. This was done to conservatively estimate 2030 traffic volumes, which ensures that the 2030 proposed roadway network in this study can accommodate Parklands Village project traffic. However, with this conservative estimate, it was determined that 2030 traffic volume projections along Powhatan Road would exceed 2040 traffic projections in the Parklands master traffic study; therefore, the methodology for traffic volumes along Powhatan Road were deviated from NEATS projections. An annual growth rate of two percent was applied to traffic volumes along Powhatan Road in addition to directly adding Parklands Village 1 and Sand Creek Ranch development traffic. The traffic volumes generated by the 2030 NEATS estimates were compared on a movement-by-movement basis to the traffic volumes that would be generated with a continued 2.0 percent annual growth through the 2030 horizon and the maximum traffic volume estimated by either method was used for the traffic volume at each turning movement at the study area intersections. In addition to that, it was assumed in this study that all of Parklands Village 1—located to the south of Parklands Village 2—would be completed by the 2030 horizon with or without construction of Parklands Village 2. As such, the traffic anticipated to be generated by Parklands Village 1 within this study area was added to the 2030 background traffic volumes. Parklands Village 1 traffic generation information can be found within the Parklands Development Master Traffic Study attached in **Appendix B**. The calculated background traffic volumes for 2025 and 2030 are shown in **Figure 5** and **Figure 6**, respectively.



ALAMEDA AVE & HARVEST RD



MISSISSIPPI AVE & HARVEST RD

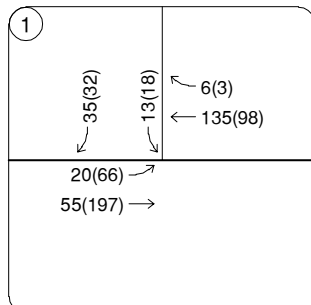
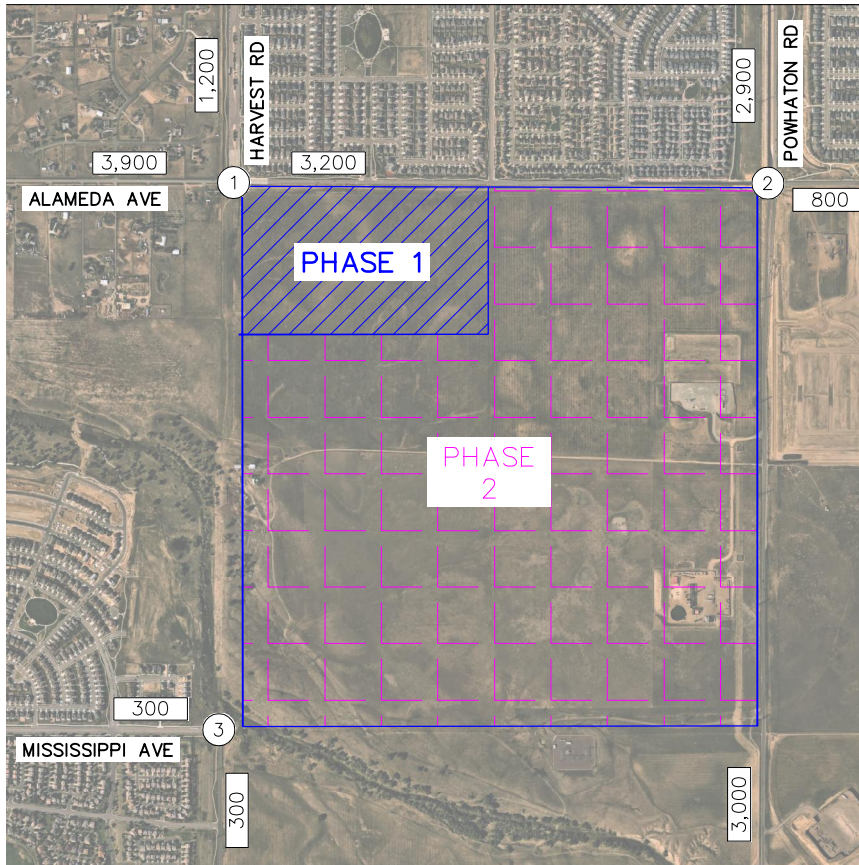


ALAMEDA AVE & POWHATON RD

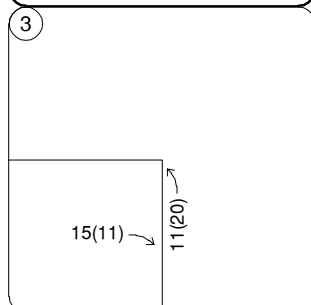
### LEGEND

- (X) Study Area Key Intersection
- xxx(xxx) Weekday AM(PM)  
Peak Hour Traffic Volumes
- xx,x00 Estimated Daily Traffic Volume

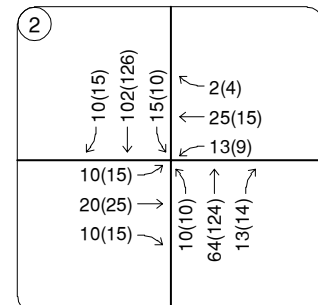
FIGURE 3  
 PARKLANDS VILLAGE 2  
 AURORA, COLORADO  
 2021 EXISTING TRAFFIC VOLUMES



ALAMEDA AVE & HARVEST RD



MISSISSIPPI AVE & HARVEST RD



ALAMEDA AVE & POWHATON RD

### LEGEND

- (X) Study Area Key Intersection
- xxx(xxx) Weekday AM(PM)  
Peak Hour Traffic Volumes
- xx,x00 Estimated Daily Traffic Volume

FIGURE 4  
 PARKLANDS VILLAGE 2  
 AURORA, COLORADO  
 2022 ADJUSTED TRAFFIC VOLUMES



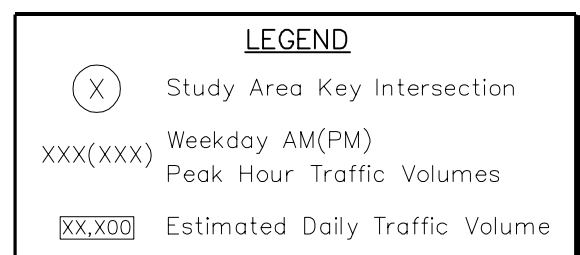
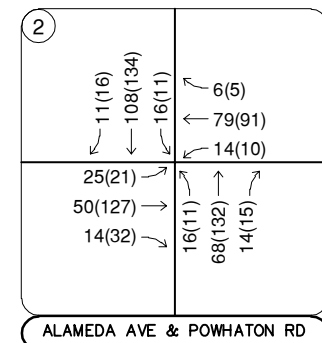
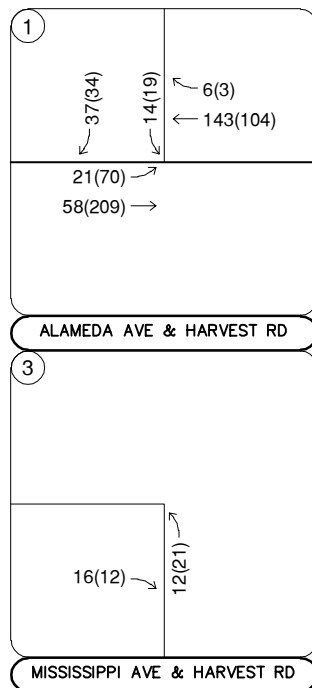
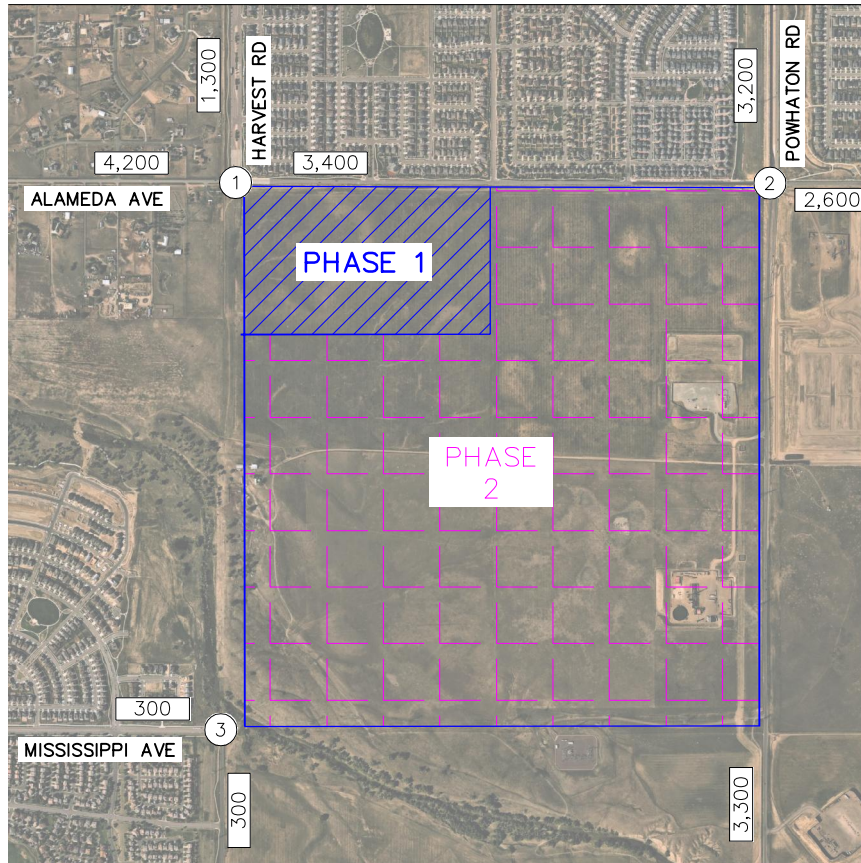
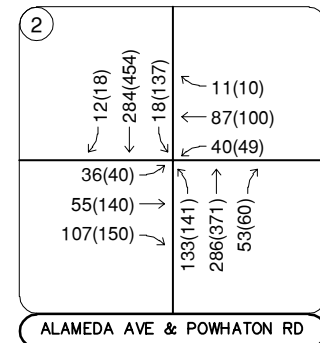
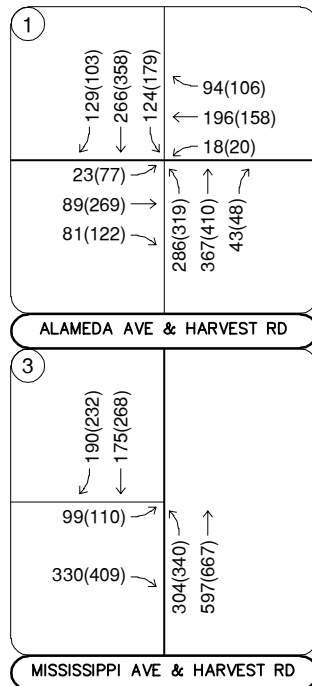
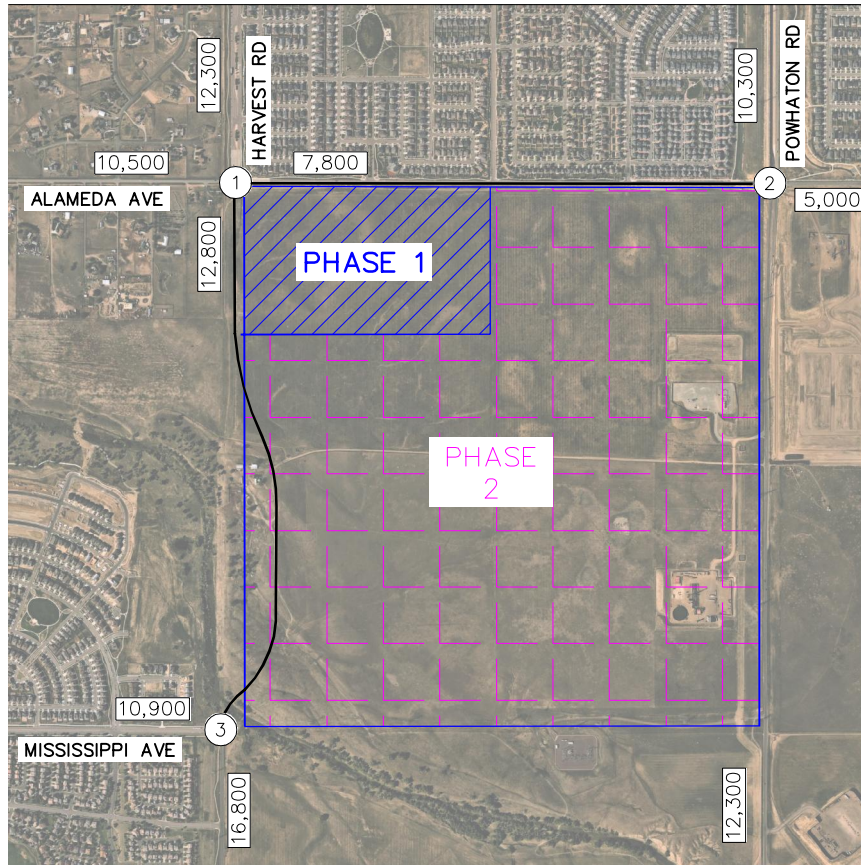


FIGURE 5  
 PARKLANDS VILLAGE 2  
 AURORA, COLORADO  
 2025 BACKGROUND TRAFFIC VOLUMES



LEGEND	
(X)	Study Area Key Intersection
xxx(XXX)	Weekday AM(PM) Peak Hour Traffic Volumes
XX,X00	Estimated Daily Traffic Volume

FIGURE 6  
PARKLANDS VILLAGE 2  
AURORA, COLORADO  
2030 BACKGROUND TRAFFIC VOLUMES

## 4.0 PROJECT TRAFFIC CHARACTERISTICS

### 4.1 Trip Generation

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Manual*<sup>1</sup> published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. For this study, Kimley-Horn used the ITE Trip Generation Report fitted curve equations that apply to Single-family Detached Housing (ITE Land Use Cod 210), Single-family Attached Housing (ITE 215), Multifamily Mid-Rise Housing (ITE 221) and average rate equations that apply to Public Park (ITE 411), Elementary School (ITE 520), Middle School (ITE 522), General Office Building (ITE 710), Shopping Plaza (ITE 821), and Strip Retail Plaza (ITE 822) for traffic associated with the development.

For the purposes of this analysis, Parklands Village 2 was evaluated with two phases, Phase I is expected to generate approximately 3,656 weekday daily trips, with 261 of these trips occurring during the morning peak hour and 354 of these trips occurring during the afternoon peak hour. **Table 1** summarizes the estimated trip generation for the Parklands Village 2: Phase I development.

**Table 1 – Parklands Village 2: Phase I Traffic Generation**

Land Use and Size	Weekday Vehicle Trips						
	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Single-Family Detached Housing (ITE 210) – 329 Dwelling Units	3,018	57	163	220	192	112	304
Single-Family Attached Housing (ITE 215) – 90 Dwelling Units	636	13	28	41	29	21	50
Public Park (ITE 411) – 3.6 Acres	2	0	0	0	0	0	0
<b>Total Project Trips</b>	<b>3,656</b>	<b>70</b>	<b>191</b>	<b>261</b>	<b>221</b>	<b>133</b>	<b>354</b>

<sup>1</sup> Institute of Transportation Engineers, *Trip Generation Manual*, Eleventh Edition, Washington DC, 2021.

As the full buildout of Parklands Village 2 is proposed to contain a mix of uses, internal capture trips are expected to occur on site as well. These internal capture trips are shared trips from vehicles already within the internal street network. These shared trips reduce the number of total external trips and were calculated using as a basis the internal capture rates provided in the previously approved Parklands Development Master Traffic Study prepared by the Fox Tuttle Transportation Group, LLC in an updated March 2022 study. Based on the figures and trip generation tables provided in that study, 25 percent of residential trips, 30 percent of commercial trips, and 90 percent of school trips were assumed to be internal to the overall Parklands Development area. As the Parklands Village 2 development is a smaller scale than the overall Parklands Development area, these internal capture rates were reduced for use in this study, with 15 percent of residential trips, 30 percent of commercial trips, and 75 percent of school trips estimated to be internal to the site. The volumes captured internal to the site were added to the internal study area intersections.

Accounting for internal capture, the overall Parklands Village 2 development is expected to generate approximately 19,572 weekday daily trips, with 1,361 of these trips occurring during the morning peak hour and 1,811 of these trips occurring during the afternoon peak hour. Calculations were based on the procedure and information provided in the *ITE Trip Generation Manual, 11<sup>th</sup> Edition – Volume 1: User's Guide and Handbook*, 2021. **Table 2** summarizes the estimated trip generation for Parklands Village 2. The trip generation worksheets are included in **Appendix C**.

Of note, the current proposal in this study for Parklands Village 2 generates less traffic than the traffic previously estimated to be generated by Village 2 in the Parklands Development Master Traffic Study. The master study had projected 21,880 weekday daily trips, 1,481 morning peak hour trips, and 2,239 afternoon peak hour trips, after its accounting for internal capture. As such, the current proposal is anticipated to generate 2,308 fewer weekday daily trips, with 120 fewer trips in the morning peak hour and 497 fewer afternoon peak hour trips.

**Table 2 – Parklands Village Traffic Generation**

Land Use and Size (ITE Code)		Trip Type	Internal/ External Capture Adjust	Weekday Vehicle Trips						
				Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Single-Family Detached Housing - 329 DU	(ITE 210)	External	0.85	2,566	48	139	187	163	95	258
Single-Family Attached Housing - 90 DU	(ITE 215)	External	0.85	542	11	24	35	25	18	43
Public Park - 3.6 Acres	(ITE 411)	External	0.85	2	0	0	0	0	0	0
<b>Phase 1 Area Total External Project Trips</b>				<b>3,110</b>	<b>59</b>	<b>163</b>	<b>222</b>	<b>188</b>	<b>113</b>	<b>301</b>
Single-Family Detached Housing - 984 DU	(ITE 210)	External	0.85	7,030	132	375	507	456	268	724
Single-Family Attached Housing - 207 DU	(ITE 215)	External	0.85	1,300	27	60	87	58	44	102
Multifamily Mid-Rise Housing - 564 DU	(ITE 221)	External	0.85	2,178	41	137	178	114	73	187
Public Park - 54.7 Acres	(ITE 411)	External	1.00	42	1	0	1	3	3	6
Elementary School - 715 Students	(ITE 520)	External	0.25	406	72	61	132	13	16	29
Middle/Junior High School - 339 Students	(ITE 522)	External	0.25	178	31	26	57	6	7	13
General Office Building - 35,000 SF	(ITE 710)	External	0.70	266	33	4	37	6	29	35
Shopping Plaza - 95,000 SF	(ITE 821)	External	0.70	4,490	71	43	115	169	176	345
Strip Retail Plaza - 15,000 SF	(ITE 822)	External	0.70	572	15	10	25	34	35	69
<b>Phase 2 Area Total External Project Trips</b>				<b>16,462</b>	<b>423</b>	<b>716</b>	<b>1,139</b>	<b>859</b>	<b>651</b>	<b>1,510</b>
<b>Total External Project Trips</b>				<b>19,572</b>	<b>482</b>	<b>879</b>	<b>1,361</b>	<b>1,047</b>	<b>764</b>	<b>1,811</b>

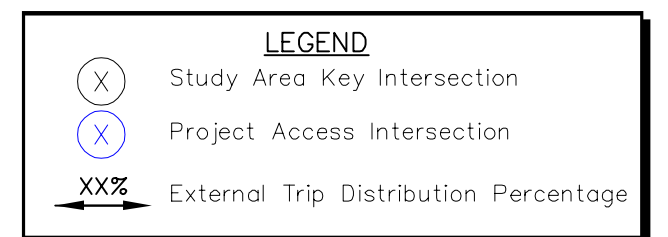
#### 4.2 Trip Distribution

Distribution of site traffic on the street system was based on the area street system characteristics, existing traffic patterns, existing and anticipated surrounding demographic information, and the proposed access system for the project. The directional distribution of traffic is a means to quantify the percentage of site-generated traffic that approaches the site from a given direction and departs the site back to the original source. The external project trip distribution for Phase I buildout year 2025 of the Parklands Village 2 development is illustrated in **Figure 7**. The external project trip distribution for the entire Parklands Village 2 development area proposed to be built out by 2030 is illustrated in **Figure 8**. Detailed trip distribution figures by intersection are attached in **Appendix D**.

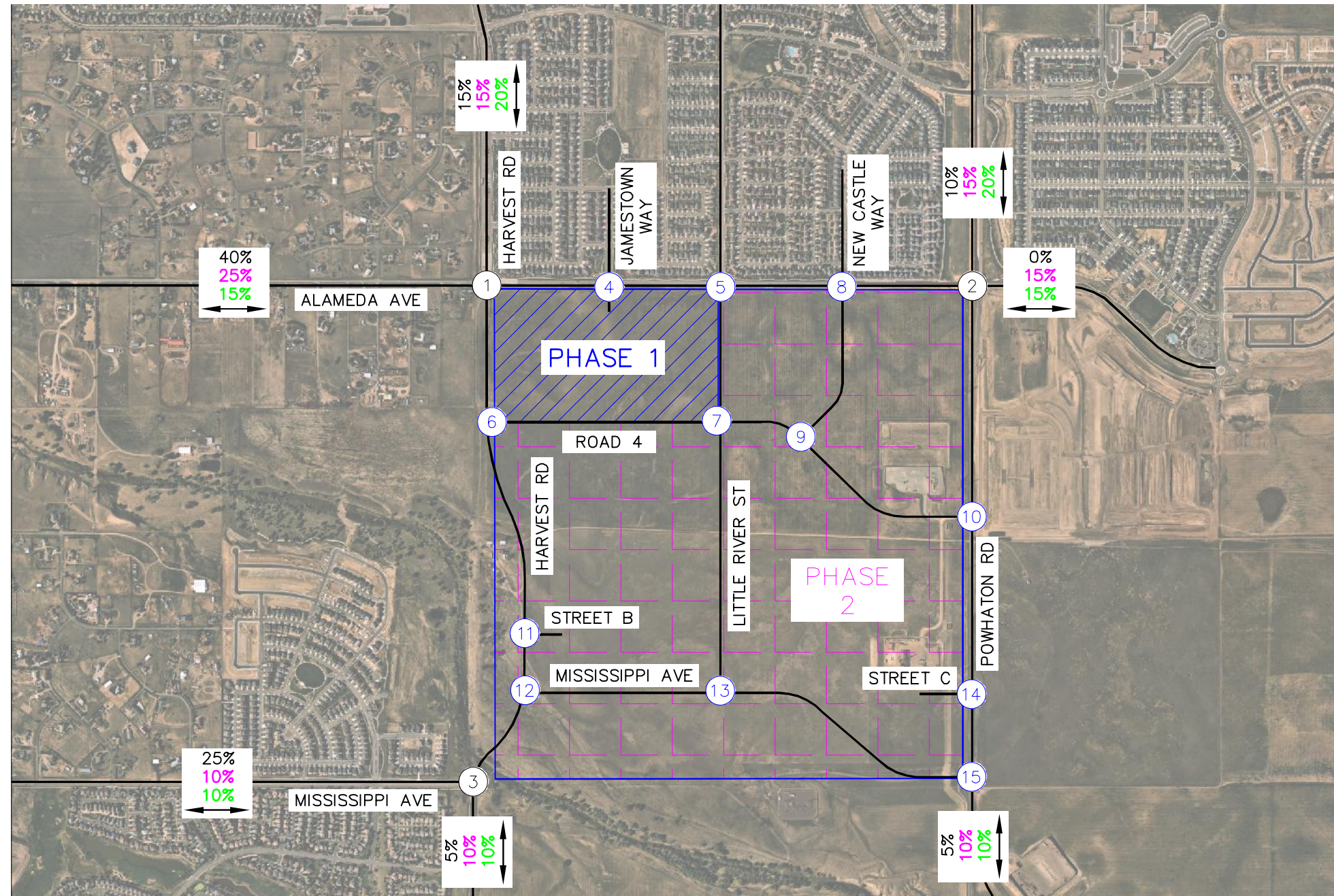




FIGURE 7  
PARKLANDS VILLAGE 2  
AURORA, COLORADO  
2025 PROJECT TRIP DISTRIBUTION

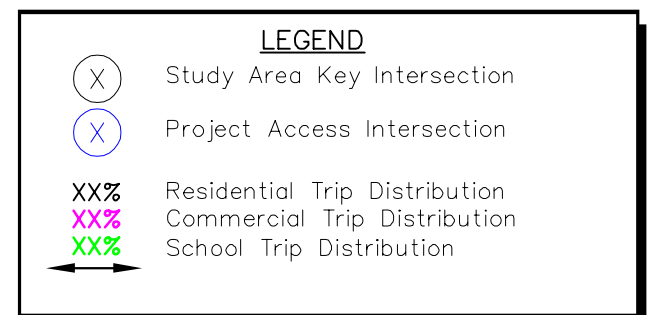






Note:  
15% Residential  
30% Commercial  
75% School  
of total project trips are assumed to be internal to Parklands. The external trip distributions shown in this figure are applied to External Project Trips only.

FIGURE 8  
PARKLANDS VILLAGE 2  
AURORA, COLORADO  
2030 EXTERNAL PROJECT TRIP DISTRIBUTION



#### 4.3 Traffic Assignment

Parklands Village 2 traffic assignment was obtained by applying the project trip distribution to the estimated traffic generation of the development shown in **Table 1** and **Table 2**. Traffic assignment for Phase I is shown in **Figure 9** and traffic assignment for the entire development in 2030 is shown in **Figure 10**.

#### 4.4 Total (Background Plus Project) Traffic

Site traffic volumes were added to the background volumes to represent estimated traffic conditions for the short-term 2025 Phase 1 horizon and 2030 full buildout horizon. These total traffic volumes for the study area are illustrated for the 2025 and 2030 horizon years in **Figures 11** and **12**, respectively.



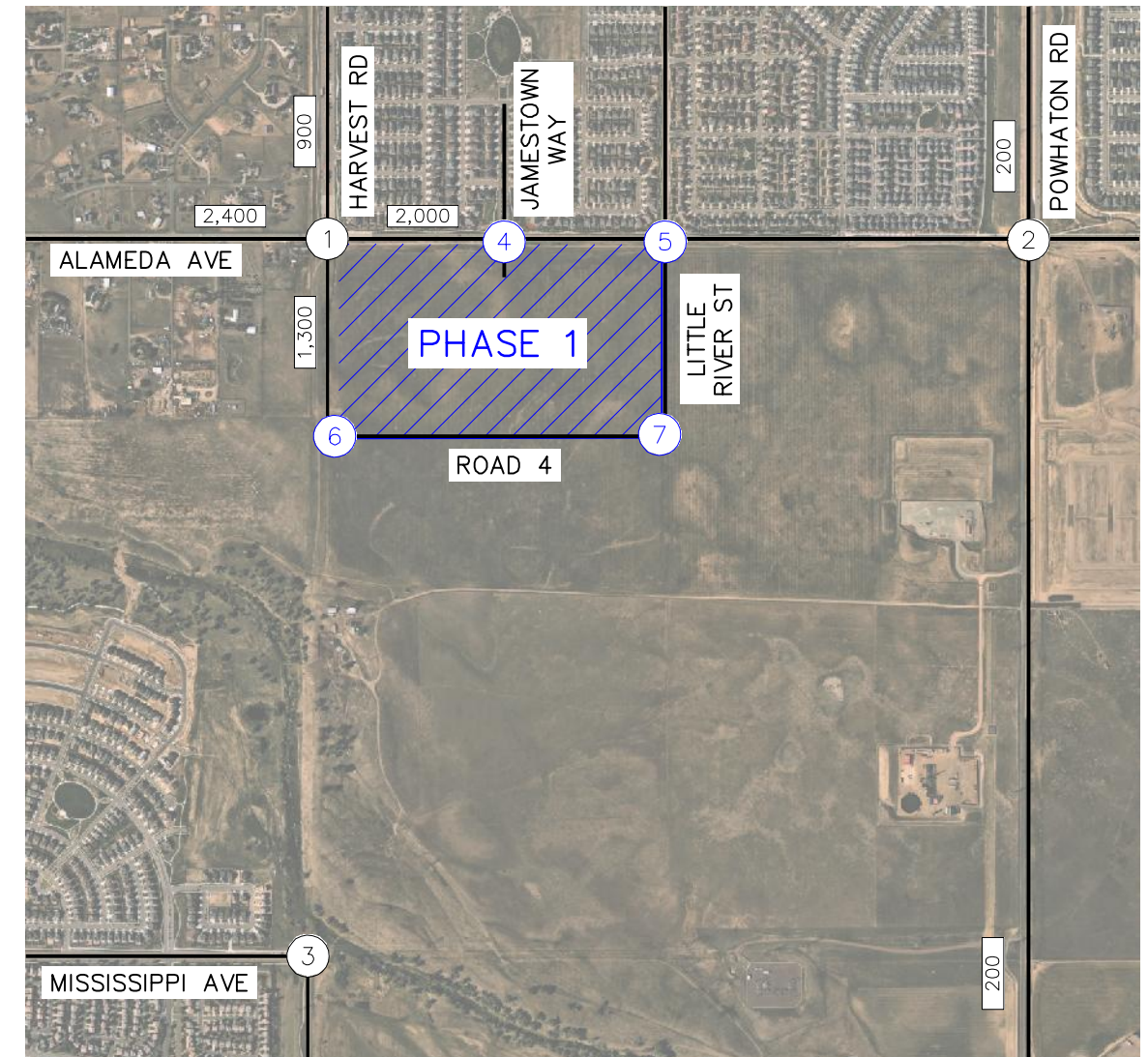
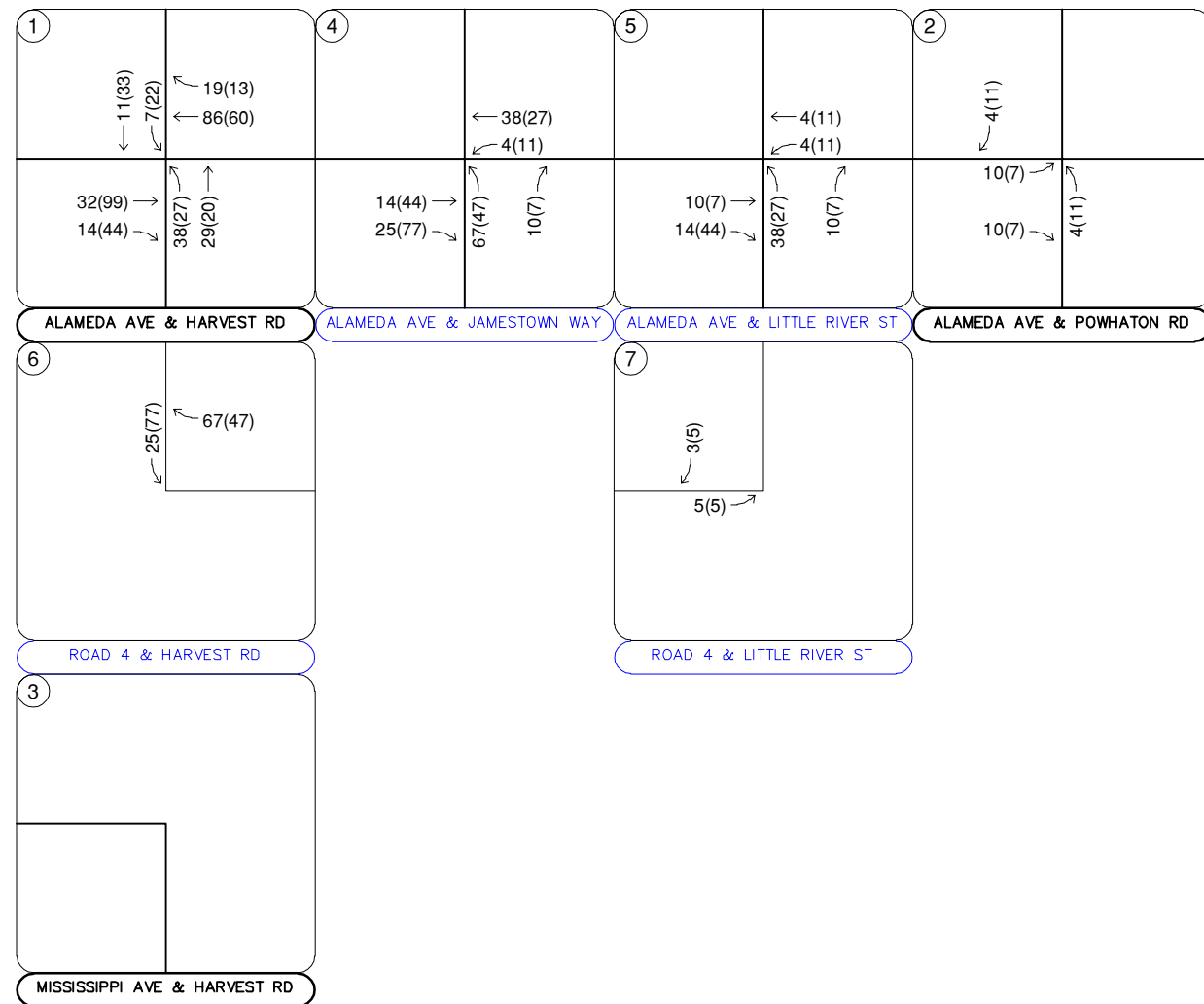


FIGURE 9  
PARKLANDS VILLAGE 2  
AURORA, COLORADO  
2025 PROJECT TRAFFIC ASSIGNMENT

LEGEND	
(X)	Study Area Key Intersection
(X)	Project Access Intersection
xxx(xxx)	Weekday AM(PM) Peak Hour Traffic Volumes
xx,x00	Estimated Daily Traffic Volume

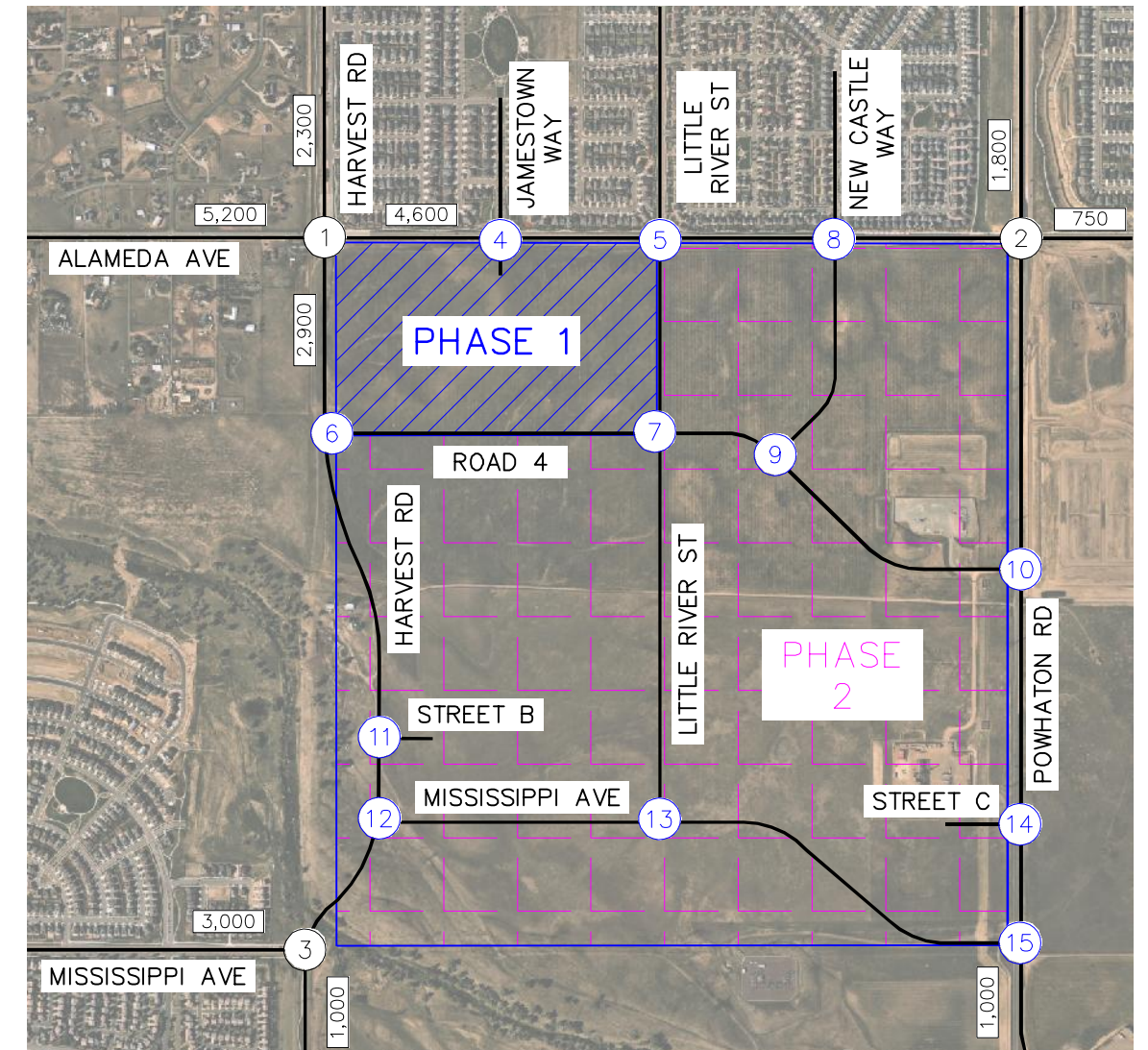
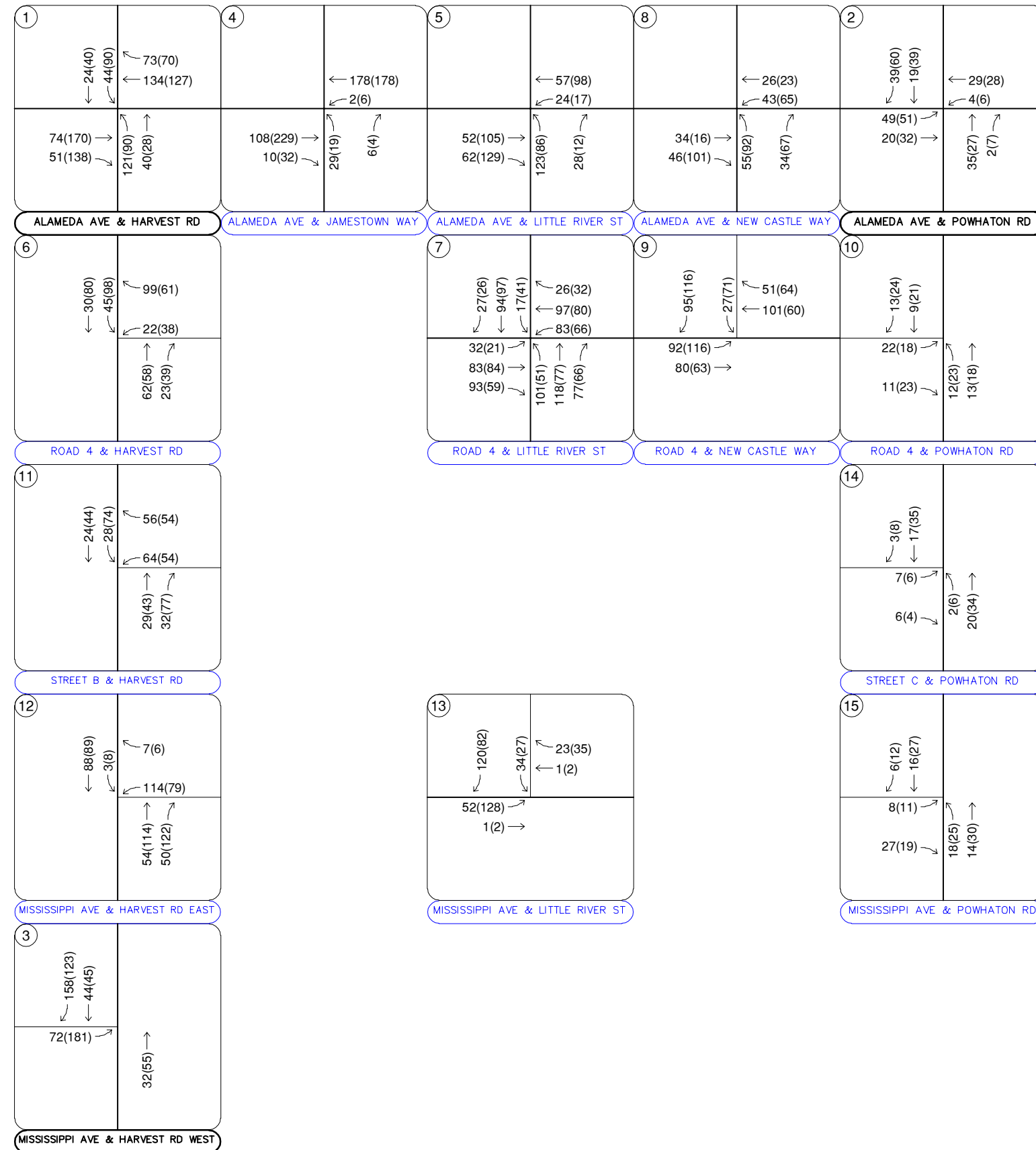
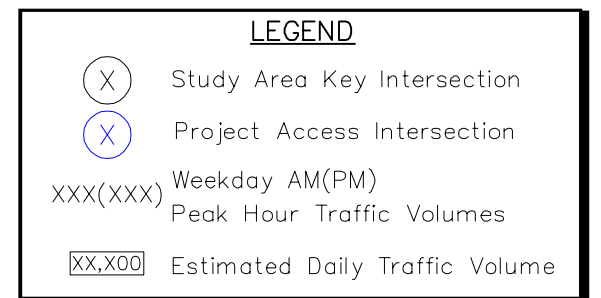


FIGURE 10  
PARKLANDS VILLAGE 2  
AURORA, COLORADO  
2030 PROJECT TRAFFIC ASSIGNMENT





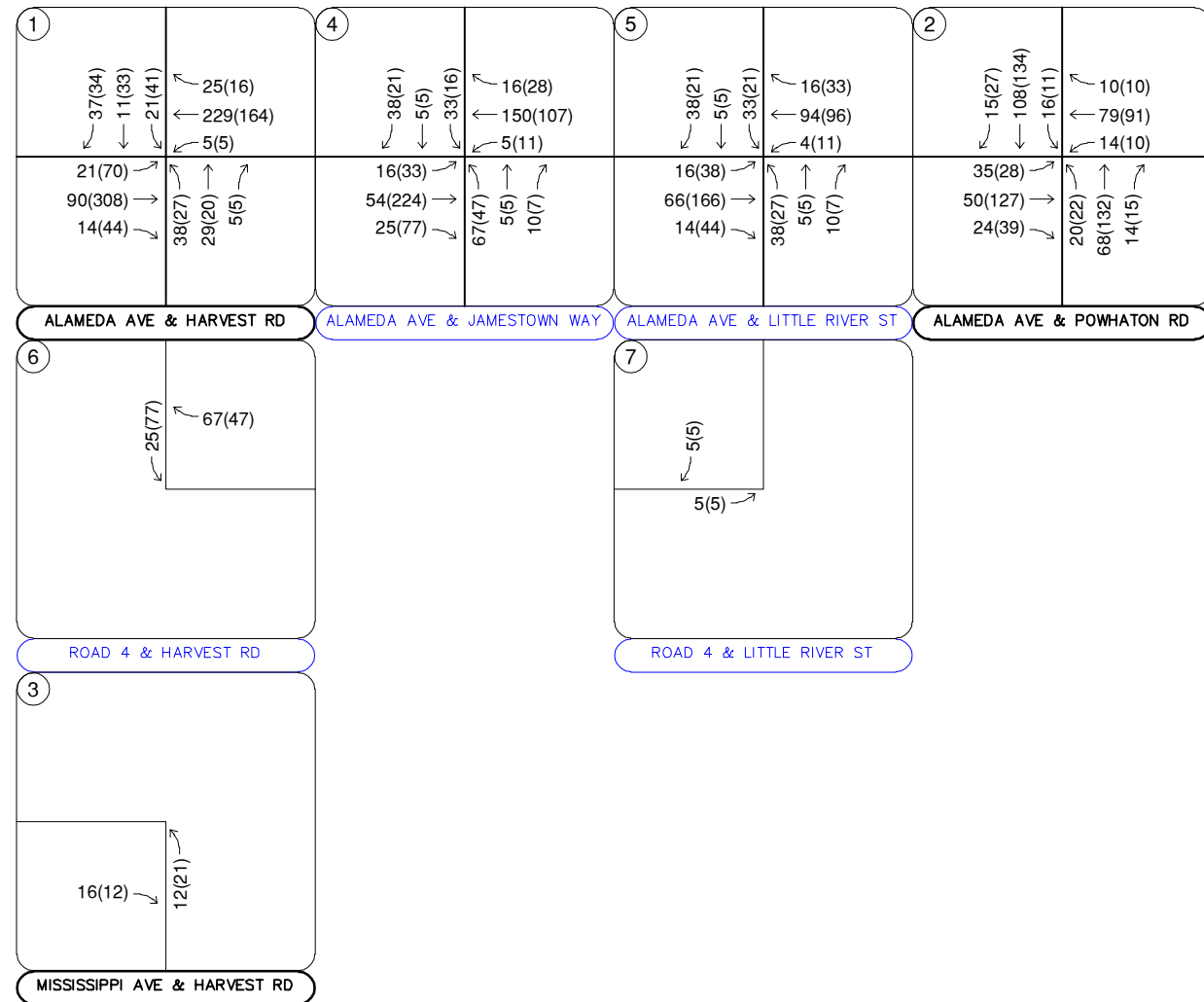
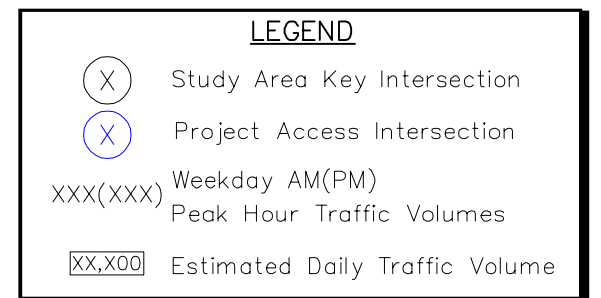


FIGURE 11  
PARKLANDS VILLAGE 2  
AURORA, COLORADO  
2025 TOTAL TRAFFIC VOLUMES



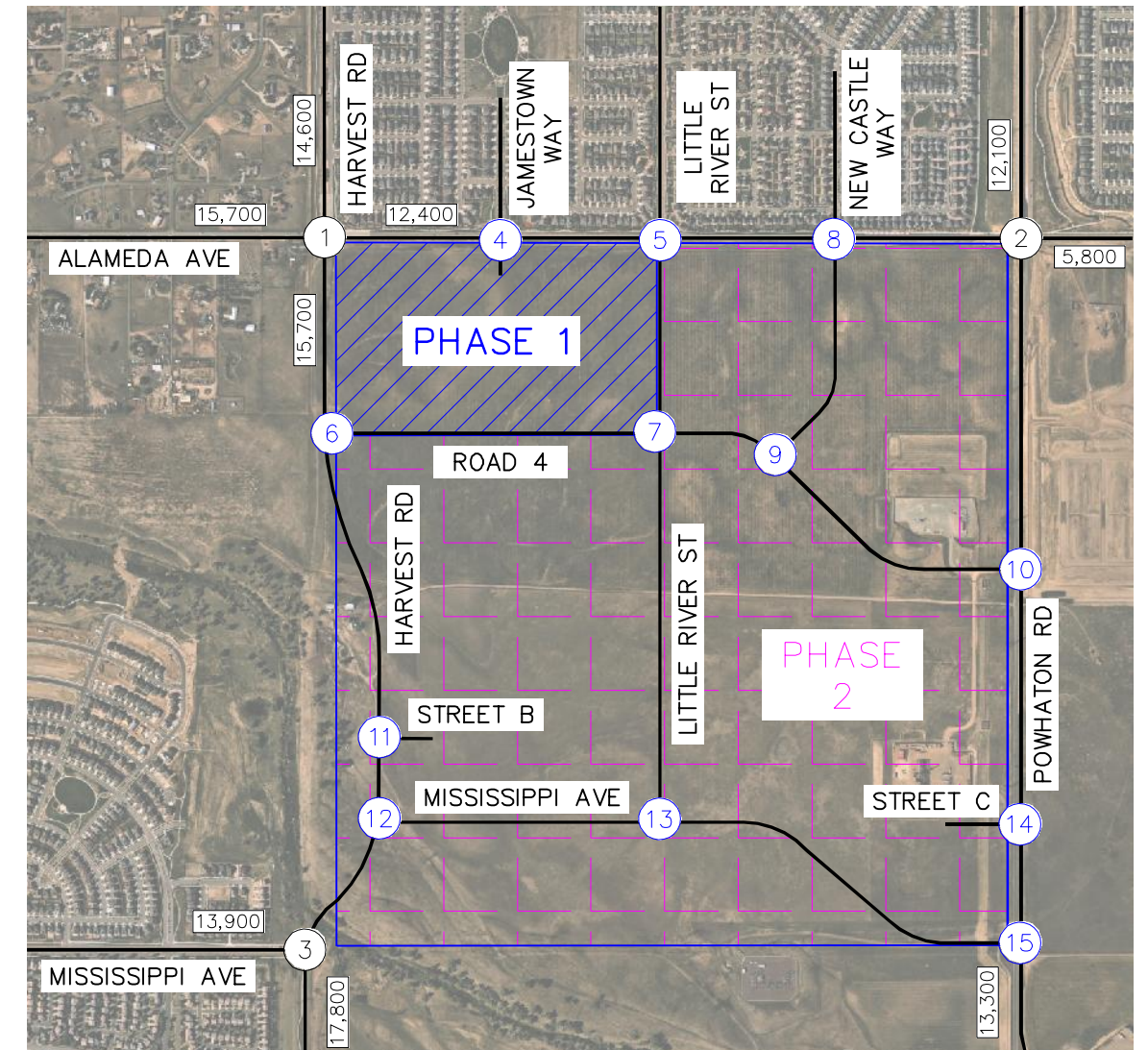
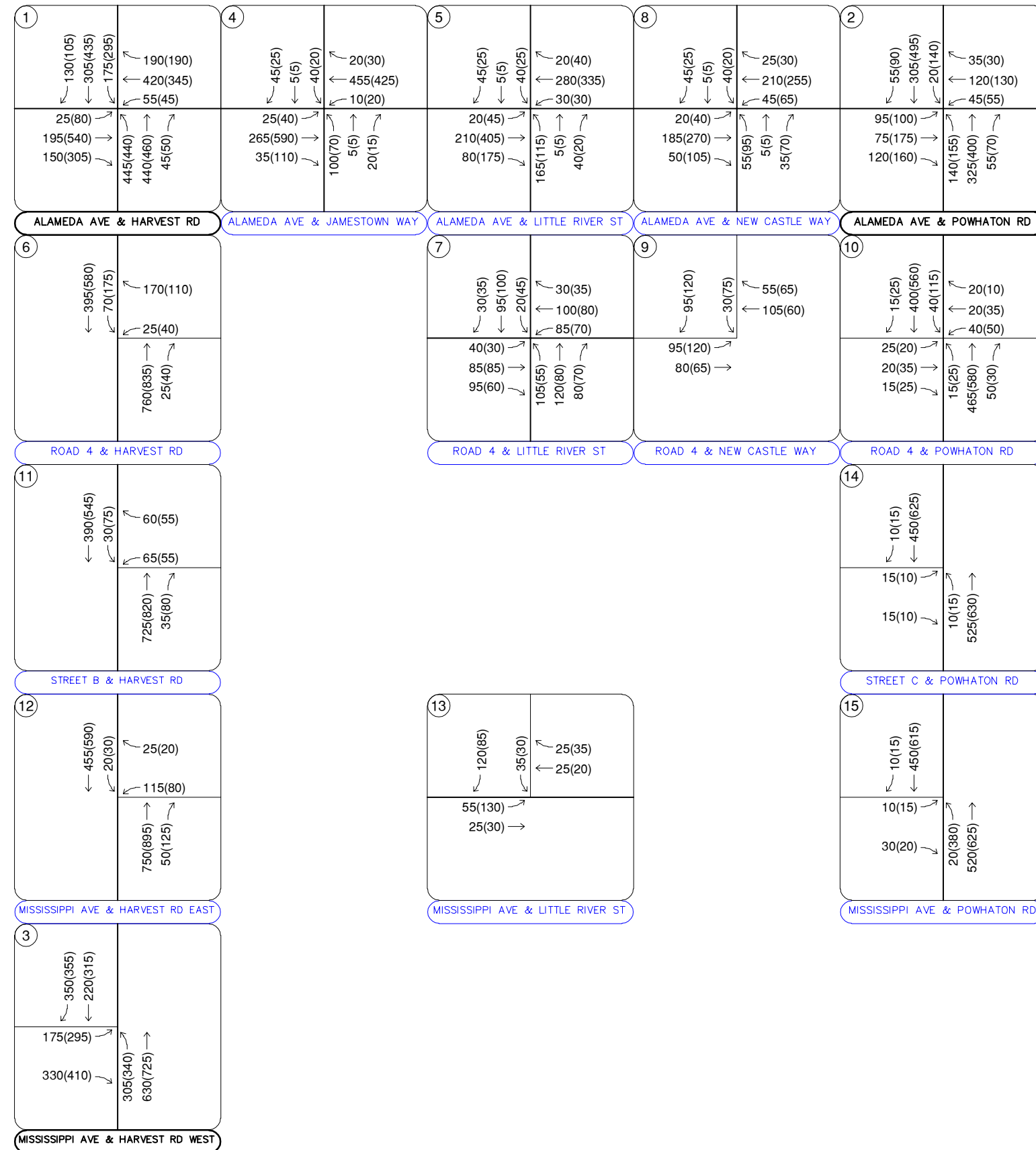
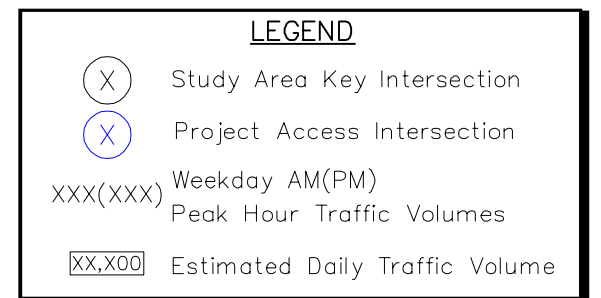


FIGURE 12  
PARKLANDS VILLAGE 2  
AURORA, COLORADO  
2030 TOTAL TRAFFIC VOLUMES





## 5.0 TRAFFIC OPERATIONS ANALYSIS

Kimley-Horn's analysis of traffic operations in the site vicinity was conducted to determine potential capacity deficiencies in the 2025 and 2030 development horizons at the identified key intersections. The acknowledged source for determining overall capacity is the 6<sup>th</sup> Edition of the *Highway Capacity Manual (HCM)*<sup>2</sup>.

### 5.1 Analysis Methodology

Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion). For intersections and roadways in this study area, standard traffic engineering practice recommends overall intersection LOS D and movement/approach LOS E as the minimum desirable thresholds for acceptable operations. **Table 3** shows the definition of level of service for signalized and unsignalized intersections.

**Table 3 – Level of Service Definitions**

Level of Service	Signalized Intersection Average Total Delay (sec/veh)	Unsignalized Intersection Average Total Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Definitions provided from the Highway Capacity Manual, Sixth Edition, Transportation Research Board, 2016.

Study area intersections were analyzed based on average total delay analysis for signalized and unsignalized intersections. Under the unsignalized analysis, the LOS for a two-way stop-controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. LOS for a two-way stop-controlled intersection is not defined for the intersection as a whole. LOS for signalized, roundabout, and all-way stop controlled intersections are defined for each approach and for the overall intersection.

<sup>2</sup> Transportation Research Board, *Highway Capacity Manual*, Sixth Edition, Washington DC, 2016.



## 5.2 Key Intersection Operational Analysis

Calculations for the operational level of service at the key intersections for the study area are provided in **Appendix E**. The existing year analysis is based on the lane geometry and intersection control shown in **Figure 2**. Existing peak hour factors were utilized in the existing and 2025 horizon analysis years while the HCM urban standard of 0.92 was used for the 2030 horizon analysis. Synchro traffic analysis software was used to analyze the signalized and unsignalized key intersections for HCM level of service.

### **Alameda Avenue and Harvest Road (#1)**

The intersection of Alameda Avenue and Harvest Road (#1) is unsignalized and operates with stop control on the southbound approach of Harvest Road. The intersection movements operate acceptably at LOS B or better during both peak hours under existing conditions. With project traffic, the south leg of the intersection will be constructed. The northbound approach operates acceptably as a single lane, shared with all movements in the short-term 2025 horizon. In addition, left and right turn lanes along Alameda Avenue are not needed operationally.

By 2030, an MUTCD signal warrant was completed for the morning and afternoon peak periods with and without project traffic. All four hours meet signal warrant criteria for the intersection with the 2030 projected background traffic volumes. The signal warrant analysis worksheet is attached in **Appendix G**. The background conditions assumed left turn lanes on all four approaches, and right turn lanes on the eastbound and westbound approaches. With the addition of project traffic, dual northbound left turn lanes are needed and two northbound and southbound through lanes are likely planned. The northbound and southbound right turn lanes can be absorbed with the second through lane. With signalization and future geometry, the intersection is anticipated to operate with an acceptable level of service during both peak hours. **Table 4** provides the results of the LOS analysis conducted at this intersection.

**Table 4 – Alameda Avenue & Harvest Road (#1) LOS Results**

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
<b>2022 Existing</b>				
Eastbound Left	7.7	A	7.5	A
Southbound Left	10.3	B	12.1	B
Southbound Right	9.3	A	8.9	A
<b>2025 Background</b>				
Eastbound Left	7.7	A	7.6	A
Southbound Left	10.4	B	12.7	B
Southbound Right	9.4	A	9.0	A
<b>2025 Background Plus Project #</b>				
Northbound Approach	14.3	B	19.4	C
Eastbound Left	8.0	A	7.8	A
Westbound Left	7.5	A	8.1	A
Southbound Left	13.3	B	18.8	C
Southbound Through	12.7	B	17.9	C
Southbound Right	10.2	B	9.4	A
<b>2030 Background ##</b>	13.5	B	16.1	B
<b>2030 Background Plus Project ###</b>	36.4	D	38.7	D

# = Addition of South Leg, SB Through Lane;

## = Signalized; Separate EB and WB Left and Right Turn Lanes; Separate NB Left Turn Lane,

### = Dual NB Left Turn Lanes, EB Right Overlap Phasing, Two NB/SB Through Lanes

### Alameda Avenue and Powhaton Road (#2)

The unsignalized intersection of Alameda Avenue and Powhaton Road (#2) operates with stop control on the eastbound and westbound approaches of Alameda Avenue. The intersection movements operate acceptably at LOS B or better during both peak hours under existing conditions. The intersection movements are anticipated to operate acceptably with the Phase I project traffic in year 2025 without intersection improvements.

With the full buildout of the development in 2030, an MUTCD Four Hour Signal Warrant analysis was completed with and without the project traffic in 2030. The signal is warranted based on projected background traffic volumes. The signal warrant analysis worksheet is attached in **Appendix G**. Separate eastbound and westbound left turn lanes are recommended with signalization. In addition, with project traffic the eastbound right and southbound right turn lanes are warranted. Therefore, with signalization and the full buildout to the development, the intersection is anticipated to operate at LOS B during the morning peak hour and LOS C during the afternoon peak hour. **Table 5** provides the results of the LOS analysis conducted at this intersection.

**Table 5 – Alameda Avenue and Powhaton Road LOS Results**

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
<b>2022 Existing</b>				
Northbound Left	7.5	A	7.5	A
Eastbound Approach	10.4	B	10.7	B
Westbound Approach	10.7	B	10.8	B
Southbound Left	7.4	A	7.6	A
<b>2025 Background</b>				
Northbound Left	7.5	A	7.6	A
Eastbound Approach	11.5	B	13.6	B
Westbound Approach	11.6	B	12.7	B
Southbound Left	7.5	A	7.6	A
<b>2025 Background Plus Project</b>				
Northbound Left	7.5	A	7.6	A
Eastbound Approach	9.9	A	10.9	B
Westbound Approach	10.7	B	10.7	B
Southbound Left	7.5	A	7.6	A
<b>2030 Background #</b>	12.7	B	18.8	B
<b>2030 Background Plus Project ##</b>	23.7	B	24.3	C

# = Signalized; Separate EB and WB Left Turn Lanes

## = Separate EB Right Turn Lane; Separate SB Right Turn Lane

### Mississippi Avenue and Harvest Road (#3)

The unsignalized intersection of Mississippi Avenue and Harvest Road (#3) does not provide intersection control and currently only has two legs with a 90-degree bend. Harvest Road transitions into Mississippi Avenue northbound and Mississippi Avenue transitions into Harvest Road eastbound. Therefore, no delay is reported for the existing or 2025 background scenarios. However, by 2030 the north leg of the intersection—connecting Harvest Road from Mississippi Avenue to Alameda Avenue—will be constructed. The intersection meets the MUTCD Four Hour Signal Warrants based on the 2030 background traffic volumes. The signal warrant analysis worksheet is attached in **Appendix G**. Separate eastbound left and right turn lanes along with separate northbound left and southbound right turn lanes are needed when signalized. Two northbound and southbound through lanes are planned in the future. The outside southbound through lane is recommended to be a force right turn lane at the intersection until development to the south is constructed. With signalization, the intersection is anticipated to operate with LOS C during both peak hours. **Table 6** provides the results of the LOS analysis conducted at this intersection.

**Table 6 – Mississippi Avenue and Harvest Road LOS Results**

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
<b>2030 Background</b>	19.6	B	16.9	B
<b>2030 Background Plus Project #</b>	22.9	C	27.9	C

# = Two NB Through Lanes

### Project Accesses

With completion of the Parklands Village 2 project, Phase I is planned to provide access on the south leg of the Alameda Avenue & Jamestown Way (#4) intersection, extending Little River Street south of Alameda Avenue (#5) and providing an access along Little River Street (#6), and providing a full movement access (#7) along the Harvest Road extension. The Jamestown Way access is recommended to provide an R1-1 “STOP” sign on the northbound approach exiting the development. Likewise, the extension of Little River Street is recommended to provide an R1-1 “STOP” sign on the northbound approach. The accesses proposed on the extensions of Harvest Road and Little River Street will terminate at the southern end of the Phase I development. Therefore, no delays will be reported in the Phase I short-term horizon. **Table 7** provides the results of the level of service for the project street accesses for Phase I. As shown in the table, the project access intersections along Alameda Avenue are anticipated to have all movements operating with acceptable LOS C or better with the Phase I development.

**Table 7 – Phase I Project Access Level of Service Results**

Intersection	2025 Total			
	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
<b>Alameda Ave &amp; Jamestown Way (#4)</b>				
Northbound Approach	11.6	B	14.4	B
Eastbound Left	7.6	A	7.6	A
Westbound Left	7.4	A	7.9	A
Southbound Approach	10.0	B	11.4	B
<b>Alameda Ave &amp; Little River (#5)</b>				
Northbound Approach	10.7	B	12.4	B
Eastbound Left	7.5	A	7.5	A
Westbound Left	7.3	A	7.6	A
Southbound Approach	9.7	A	10.5	B



With the full buildout of the Parklands Village 2, the Phase I accesses will remain. However, five (5) additional external accesses, two (2) major intersections, and one (1) internal access will be constructed. A full movement access is proposed to align with New Castle Way (#8) along Alameda Avenue, a full movement access at future “Road 4” along Powhatan Road (#10), a full movement at proposed Street C along Powhatan Road (#14), a full movement at proposed Street B along Harvest Road (#11), and a full movement intersection from the Little River Street extension to the Mississippi Avenue extension (#13) will serve the remaining development from the external arterial roadways. Mississippi Avenue is planned to extend from Harvest Road to Powhatan Road to complete the east/west connection. The additional major intersections of Mississippi Avenue & Harvest Road (East) (#12) and Mississippi Avenue & Powhatan Road (#15) will be constructed with the full buildout of the development.

All project accesses along Alameda Avenue, Mississippi Avenue, Harvest Road, and Powhatan Road are planned to operate with stop control with an R1-1 “STOP” sign on the minor approaches with initial buildout. It should be noted that the Parklands Master Traffic Study identifies signal control at the intersections of Road 4/Harvest Road (#6), Road 4/Powhatan Road (#10), and Mississippi Avenue/Little River Street (#13) by the long-term 2040 horizon. However, these three intersections are expected to operate acceptably with stop control with 2030 traffic volume projections. In addition, the internal intersections are planned to operate as stop control with the exception of future Road 4 and Little River Street extension (#7). This intersection is planned as a single-lane roundabout. Turn lane warrants and needs were determined at all external intersection connections to arterial roadways at which the project traffic contributes. Of note, if a left turn lane is warranted based on the project traffic volumes, then an opposing left turn lane is assumed to be provided. All accesses are anticipated to operate with LOS C or better during both peak hours.

The annual daily traffic and roadway classification for the internal intersections are shown in **Figure 13**.

**Table 8** provides the results of the level of service for the internal intersections as well as the accesses to the external street system associated with the full development of Parklands Village 2.

**Table 8 – Full Build Project Access Level of Service Results**

Intersection	Intersection Control	2025 Total			
		AM Peak Hour		PM Peak Hour	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
<b>Alameda Ave &amp; Jamestown Way (#4)</b> Northbound Approach Eastbound Left Westbound Left Southbound Approach	TWSC	19.5	C	24.5	C
		8.5	A	8.5	A
		7.9	A	9.7	A
		15.2	C	17.9	C
<b>Alameda Ave &amp; Little River (#5)</b> Northbound Left Northbound Through/Right Eastbound Left Westbound Left Southbound Approach	TWSC	23.0	C	20.8	C
		9.8	A	11.4	B
		7.9	A	8.2	A
		7.9	A	9.1	A
		13.8	B	14.8	B
<b>Road 4 &amp; Harvest Rd (#6)</b> Westbound Left Westbound Right Southbound Left	TWSC	11.4	B	13.3	B
		11.2	B	10.8	B
		8.4	A	8.9	A
<b>Road 4 &amp; Little River (#7)</b>	Roundabout	5.6	A	5.0	A
<b>Alameda Ave &amp; New Castle (#8)</b> Northbound Approach Eastbound Left Westbound Left Southbound Approach	TWSC	12.6	B	17.1	C
		7.7	A	7.9	A
		7.9	A	8.3	A
		11.9	B	13.6	B
<b>Road 4 &amp; New Castle (#9)</b> Eastbound Left Southbound Approach	TWSC	7.8	A	7.7	A
		10.6	B	12.0	B
<b>Road 4 &amp; Powhatan Rd (#10)</b> Northbound Left Eastbound Left Eastbound Right Westbound Left Westbound Right Southbound Left	TWSC	7.7	A	8.0	A
		13.2	B	19.0	C
		13.2	B	19.6	C
		15.0	C	21.0	C
		13.0	B	20.3	C
		8.7	A	9.5	A
<b>Street B &amp; Harvest Rd (#11)</b> Westbound Left Westbound Right Southbound Left	TWSC	11.7	B	12.7	B
		10.0	B	10.3	B
		8.2	A	8.6	A
<b>Mississippi Ave &amp; Harvest Rd East (#12)</b> Westbound Left Westbound Right Southbound Left	TWSC	11.9	B	12.3	B
		9.9	A	10.2	B
		8.2	A	8.9	A
<b>Mississippi Ave &amp; Little River St (#13)</b> Eastbound Left Southbound Left Southbound Right	TWSC	7.4	A	7.6	A
		9.9	A	11.6	B
		9.0	A	8.8	A
<b>Street C &amp; Powhatan Rd (#14)</b> Northbound Left Eastbound Approach	TWSC	7.7	A	8.0	A
		10.3	B	11.0	B
<b>Mississippi Ave &amp; Powhatan Rd (#15)</b> Northbound Left Eastbound Approach	TWSC	7.7	A	9.3	A
		9.7	A	15.3	C

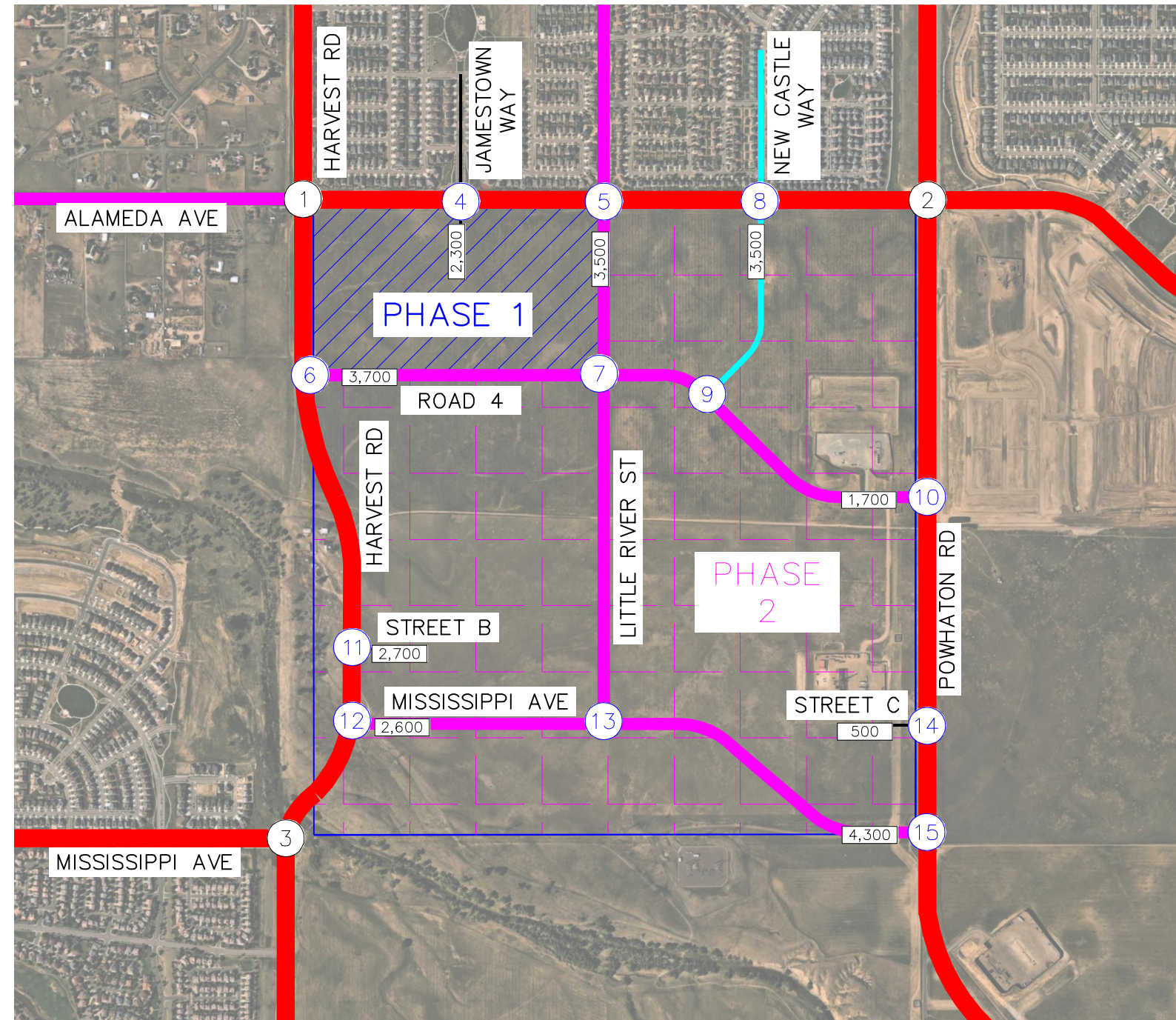


FIGURE 13  
PARKLANDS VILLAGE 2  
AURORA, COLORADO  
INTERNAL INTERSECTION ROADWAY CLASSIFICATION

LEGEND	
<span style="color: red;">—</span>	ARTERIAL ROADWAY
<span style="color: magenta;">—</span>	COLLECTOR ROADWAY
<span style="color: cyan;">—</span>	LOCAL ROADWAY
<span style="border: 1px solid black; padding: 2px;">XX,X00</span>	ESTIMATED 2030 DAILY TRAFFIC VOLUME



### 5.3 Turn Bay Length Analysis

The City of Aurora defaults to the Colorado Department of Transportation (CDOT) State Highway Access Code (SHAC) guidelines to determine if turn lanes are warranted at key intersections and accesses. CDOT classifies their state highways based on roadway types. The Non-Rural Arterial Category NR-C (low to moderate travel speeds and moderate volumes) was assigned to Alameda Avenue and Mississippi Avenue, based on matching the characteristics of the CDOT roadways. Whereas the Non-Rural Arterial Category NR-B (moderate travel speed and moderate traffic volumes) was assigned to Harvest Road and Powhaton Road based on matching the characteristics of the CDOT roadways.

According to the State Highway Access Code for category NR-B and NR-C roadways the following thresholds apply for an auxiliary lane:

- A left turn lane with storage length plus taper is required for any access with a projected peak hour left ingress turning volume greater than 25 vehicles per hour (vph). If the posted speed limit is greater than 40 miles per hour, a deceleration lane and taper is required for any access with a projected peak hour left ingress turning volume greater than 10 vph. The taper length will be included within the deceleration length.
- A right turn lane with storage length plus taper is required for any access with a projected peak hour right ingress turning volume greater than 50 vehicles per hour (vph). If the posted speed limit is greater than 40 miles per hour, a right turn lane deceleration lane and taper is required for any access with a project peak hour right ingress turning volume greater than 25 vehicles per hour.

**Table 9** summarizes if auxiliary turn lanes are warranted and if so, the turn lane length requirements are based on CDOT State Highway Access Code guidelines.

**Table 9 – Turn Lane Warrant and Length Summary**

Intersection	2025 Buildout			2030 Buildout		
	Volume	Warranted ?	Turn Lane Length	Volume	Warranted ?	Turn Lane Length
<b>Alameda Ave &amp; Harvest Rd (#1)</b>						
Northbound Left	38	X		445	Y	275'+160'T
Southbound Left	41	Y		295	Y	275'+160'T
Eastbound Right	44	N		305	Y	150'+120'T
Westbound Right	25	N		190	Y	150'+100'T
<b>Alameda Ave &amp; Powhatan Rd (#2)</b>						
Northbound Left	22	X		190	Y	150'+140'T
Eastbound Left	23	N		100	Y	150'+100'T
Westbound Left	14	N		55	Y	150'+100'T
Northbound Right	15	N		130	Y	150'+140'T
Eastbound Right	23	N		160	Y	150'+100'T
Southbound Right	27	N		155	Y	150'+140'T
<b>Mississippi Ave &amp; Harvest Rd West (#3)</b>						
Northbound Left	-	-	-	340	Y	275'+160'T
Southbound Right	-	-	-	355	Y	C
<b>Alameda Ave &amp; Jamestown (#4)</b>						
Westbound Left	11	N		20	X	150'+100'T
Eastbound Right	77	Y	150'+100'T	110	Y	150'+100'T
<b>Alameda Ave &amp; Little River St (#5)</b>						
Westbound Left	11	N		30	Y	150'+100'T
Eastbound Right	44	N		175	Y	150'+100'T
<b>Road 4 &amp; Harvest Rd (#6)</b>						
Southbound Left	77	N		175	Y	275'+160'T
Northbound Right	-	-		40	Y	275'+160'T
<b>Alameda Ave &amp; New Castle (#8)</b>						
Westbound Left	-	-		65	Y	150'+100'T
Eastbound Right	-	-		105	Y	150'+100'T
<b>Road 4 &amp; Powhatan Rd (#10)</b>						
Northbound Left	-	-		25	Y	150'+140'T
Southbound Right	-	-		25	N	
<b>Street B &amp; Harvest Rd (#11)</b>						
Southbound Left	-	-		75	Y	275'+160'T
Northbound Right	-	-		80	Y	275'+160'T
<b>Mississippi &amp; Harvest Rd East (#12)</b>						
Southbound Left	-	-		30	Y	275'+160'T
Northbound Right	-	-		125	Y	275'+160'T
<b>Street C &amp; Powhatan Rd (#14)</b>						
Northbound Left	-	-		15	Y	150'+140'T
Southbound Right	-	-		15	N	
<b>Mississippi &amp; Powhatan Rd (#15)</b>						
Northbound Left	-	-		25	Y	150'+140'T
Southbound Right	-	-		15	N	

Y = Yes; N = No; X = Explanation Provided Below



### Phase I (2025) Turn Lane Evaluation

The northbound left turn lane at the Alameda Avenue and Harvest Road (#1) intersection during the short-term 2025 horizon meets the turn lane volume threshold for requiring a separate left turn lane. However, the opposing through volumes are less than 100 vehicles per hour and this turn lane may be dropped based on CDOT standards. The northbound approach operates with stop control and will operate acceptable with a single lane in the short-term. Left turn lanes will be implemented on the eastbound, westbound, and northbound approaches of this intersection upon signalization in the future.

A northbound left turn lane is not warranted but currently exists at the Alameda Avenue and Powhatan Road (#2) intersection. However, traffic volume projections in 2030 are expected to meet warrants for this northbound left turn lane.

### Full Buildout (2030) Turn Lane Evaluation

A westbound left turn lane is technically not warranted at the Alameda Avenue and Jamestown Way intersection (#4); however, the arterial cross section for Alameda Avenue will include left turn lanes at all full movement intersections. Further, this westbound left turn will be incorporated within the shadow of the eastbound left turn lane warranted at this intersection.

## **5.4 Vehicle Queuing Analysis**

A vehicle queuing analysis was conducted for the study area intersections. The queuing analysis was performed using Synchro presenting the results of the 95<sup>th</sup> percentile queue lengths. Results are shown in the following **Table 10** with calculations provided within the level of service operational sheets of **Appendix E** for unsignalized intersections and **Appendix F** for signalized intersections.

**Table 10 – Turn Lane Queuing Analysis Results**

Intersection Turn Lane	Existing Turn Lane Length (feet)	2025 Calculated Queue (feet)	2025 Recommended Length (feet)	2030 Calculated Queue (feet)	2030 Recommended Length (feet)
<b>Alameda &amp; Harvest (#1)</b>					
Eastbound Left	DNE	-	DNE	67'	150'+120'T
Eastbound Right	DNE	-	DNE	109'	150'+120'T
Westbound Left	DNE	-	DNE	52'	150'+100'T
Westbound Right	DNE	-	DNE	116'	150'+100'T
Northbound Left	DNE	-	DNE	249' DL	275'+160'T DL
Southbound Left	300'	25'	300'	240'	300'
<b>Alameda &amp; Powhatan (#2)</b>					
Eastbound Left	DNE	-	DNE	91'	150'+100'T
Eastbound Right	DNE	-	DNE	48'	150'+100'T
Westbound Left	DNE	-	DNE	64'	150'+100'T
Northbound Left	150'	25'	150'	93'	150'
Southbound Left	225'	25'	225'	85'	225'
Southbound Right	DNE	-	DNE	32'	150'+140'T
<b>Mississippi &amp; Harvest (#3)</b>					
Eastbound Left	DNE	-	DNE	309'	C
Eastbound Right	DNE	-	DNE	82'	C
Northbound Left	DNE	-	DNE	186'	275'+160'T
Southbound Right	DNE	-	DNE	151'	275'+160'T
<b>Alameda &amp; Jamestown (#4)</b>					
Eastbound Left	DNE	-	DNE	25'	150'+100'T
Eastbound Right	DNE	150'+100'T	DNE	25'	150'+100'T
Westbound Left	DNE	-	DNE	25'	150'+100'T
<b>Alameda &amp; Little River (#5)</b>					
Northbound Left	DNE	-	DNE	25'	150'+100'T
Eastbound Left	DNE	-	DNE	25'	150'+100'T
Eastbound Right	DNE	-	DNE	25'	150'+100'T
Westbound Left	DNE	-	DNE	25'	150'+100'T
Westbound Right	100'	25'	100'	25'	150'+100'T
<b>Road 4 &amp; Harvest (#6)</b>					
Westbound Left	DNE	-	DNE	25'	150'+100'T
Westbound Right	DNE	-	DNE	25'	275'+160'T
Southbound Left	DNE	-	DNE	25'	275'+160'T
<b>Alameda &amp; New Castle (#8)</b>					
Eastbound Left	DNE	-	DNE	25'	150'+100'T
Eastbound Right	DNE	-	DNE	25'	150'+100'T
Westbound Left	DNE	-	DNE	25'	150'+100'T
<b>Road 4 &amp; Powhatan (#10)</b>					
Eastbound Left	DNE	-	DNE	25'	150'+100'T
Northbound Left	DNE	-	DNE	25'	150'+140'T
<b>Street B &amp; Harvest (#11)</b>					
Northbound Right	DNE	-	DNE	25'	275'+160'T
Southbound Left	DNE	-	DNE	25'	275'+160'T
<b>Mississippi &amp; Harvest (#12)</b>					
Northbound Right	DNE	-	DNE	25'	275'+160'T
Southbound Left	DNE	-	DNE	25'	275'+160'T
<b>Mississippi &amp; Harvest (#12)</b>					
Southbound Left	DNE	-	DNE	25'	150'+100'T
<b>Street C &amp; Powhatan (#14)</b>					
Northbound Left	DNE	-	DNE	25'	150'+140'T
<b>Mississippi &amp; Powhatan (#15)</b>					
Northbound Left	DNE	-	DNE	50'	150'+140'T

DNE = Does Not Exist; C = Continuous Lane; T = Taper; DL = Dual Left **Blue** Text = Recommendation

The vehicle queues at all queues at the study area key intersections are anticipated to remain within the existing or recommended turn lane lengths through 2030.

### **5.5 Pedestrian Connectivity/Safety and Traffic Calming**

Sidewalks will be provided along the project's frontage on Alameda Avenue, Powhatan Road, Harvest Road, and Mississippi Avenue. In addition, sidewalks will be constructed within the development along public and local roadways to connect the residential to the retail/school uses and vice versa. The major internal intersections should be constructed with ADA ramps and crosswalk pavement markings. A proposed K-8 School along the southwest corner of Road 4 and Little River Street will provide additional school zone signs and warnings. S1-1 School Advance Warning signs could be placed prior to all four of the approaches of the Road 4/Little River Street intersection. In addition, a school speed limit assembly could be placed along the school's frontage roads of Road 4 and Little River Street to warn vehicles of a lower speed limit when school is in session. A S4-3 SCHOOL sign with a R2-1 SPEED LIMIT 15/20 and a S4-1 School Times are typically placed near schools. Additional mid-block crossing may be needed west of the school along Road 4 and south of the school along Little River Street. Pedestrian crosswalk pavement markings and the S1-1 and a W16-7p downward diagonal arrow should be placed near these midblock crossings.

Speed cushions, chicanes, lane narrowing, and compact roundabouts are not expected to be necessary internal to the project site.

The Federal Highway Administration (FHWA) Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations should be used as guidance during design implementation of uncontrolled locations. Uncontrolled pedestrian crossing locations occur where sidewalks or designated walkways intersect a roadway at a location where no traffic control is present. Uncontrolled pedestrian crossing locations correspond to higher pedestrian crash rates, often due to inadequate pedestrian crossing accommodations. Safe Transportation for Every Pedestrian (STEP) program promotes the following six effective and lower-cost countermeasures that communities can deploy based on their specific needs:

- Crosswalk visibility enhancements (i.e., high-visibility crosswalk markings, parking restriction on crosswalk approach, improved lighting, advance Yield Here To [Stop Here

For] Pedestrians sign and yield [stop] line, In- Street Pedestrian Crossing sign, and curb extension).

- Raised crosswalk.
- Pedestrian refuge island.
- Pedestrian Hybrid Beacon (PHB).
- Road Diet.
- Rectangular Rapid-Flashing Beacon (RRFB).

As identified previously, near the school, crosswalk visibility will need to be enhanced to provide a safe and comfortable connection from the surrounding residential homes to the school for the students. It is not believed raised crosswalks, refuge islands, PHB, RRFB, or road diets will be needed near the school or on the internal intersections. These recommendations are consistent with the surrounding residential developments to the north and east.

## 5.6 Improvement Summary

Based on the results of the intersection operational and vehicle queuing analysis, the key intersection recommended improvements and control are shown in **Figure 14** for the Phase I 2025 buildout year and **Figure 15** for the full development 2030 buildout year.

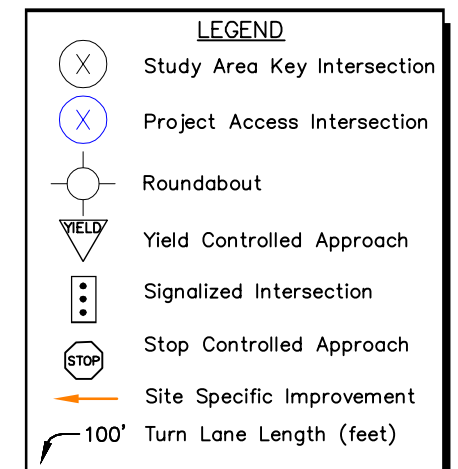
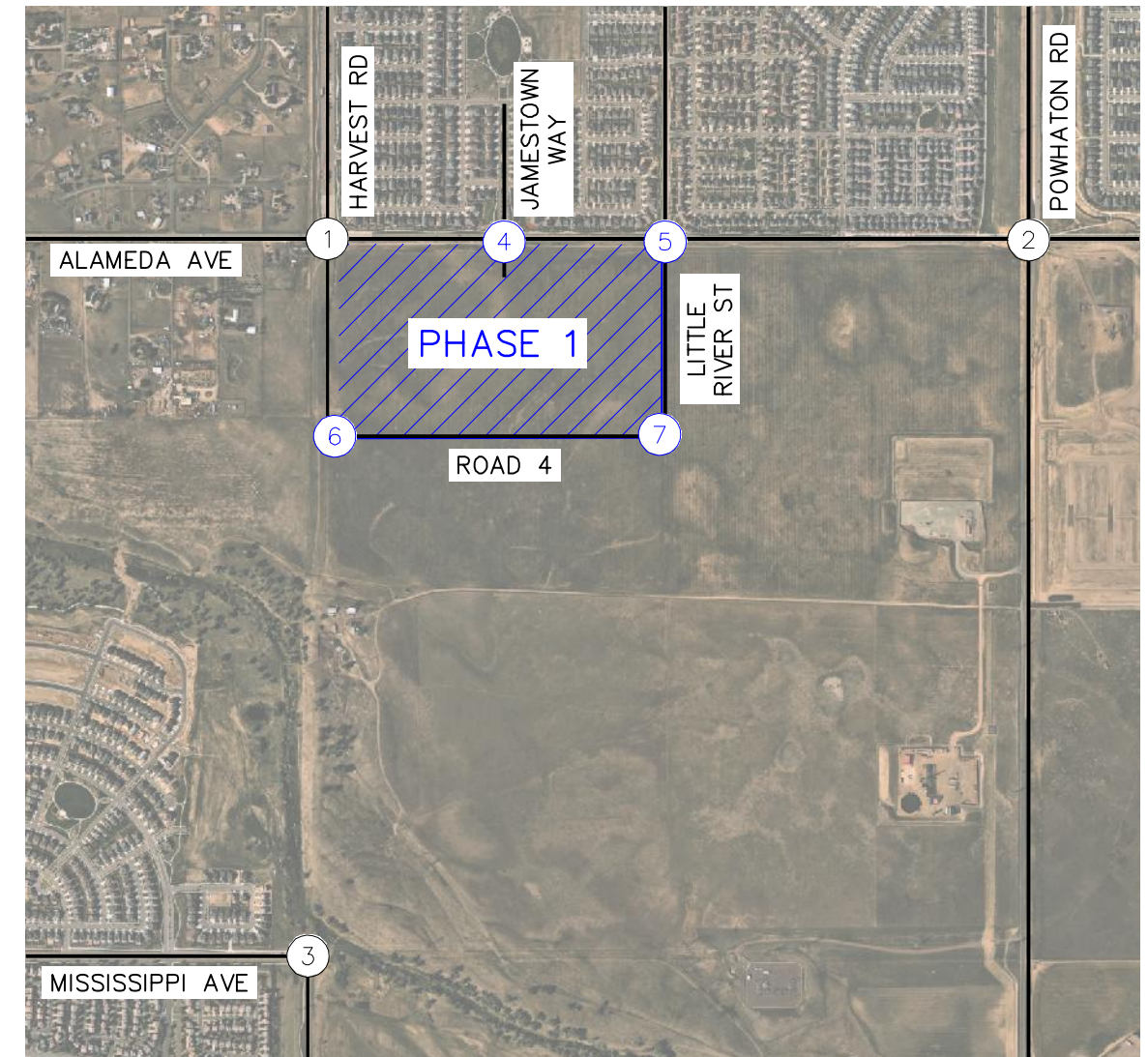
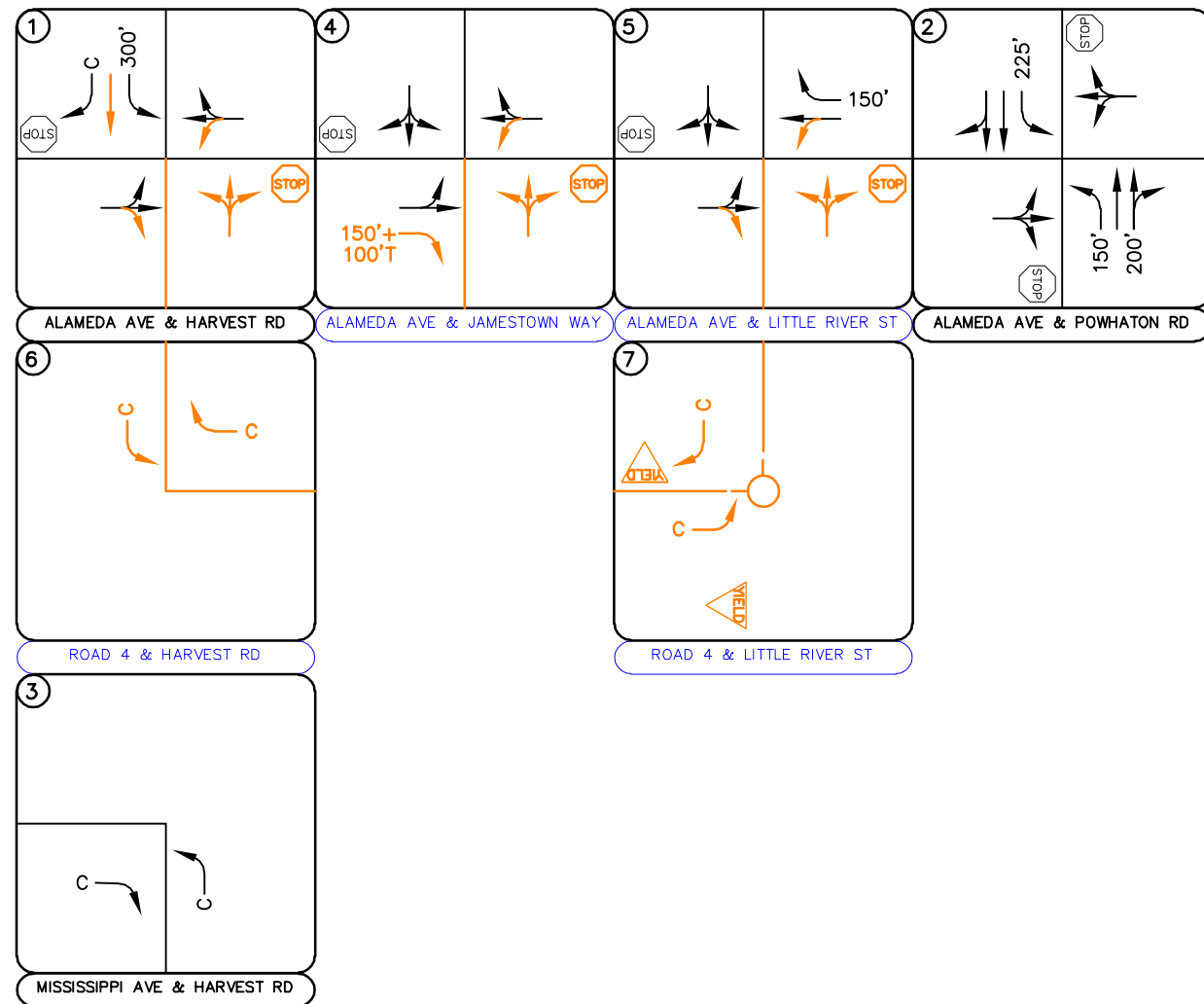


FIGURE 14  
PARKLANDS VILLAGE 2  
AURORA, COLORADO  
2025 RECOMMENDED GEOMETRY AND CONTROL



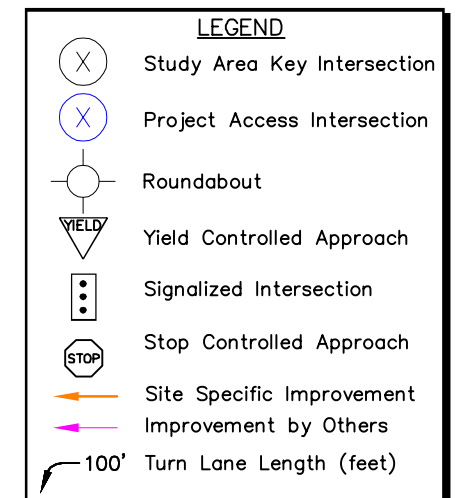
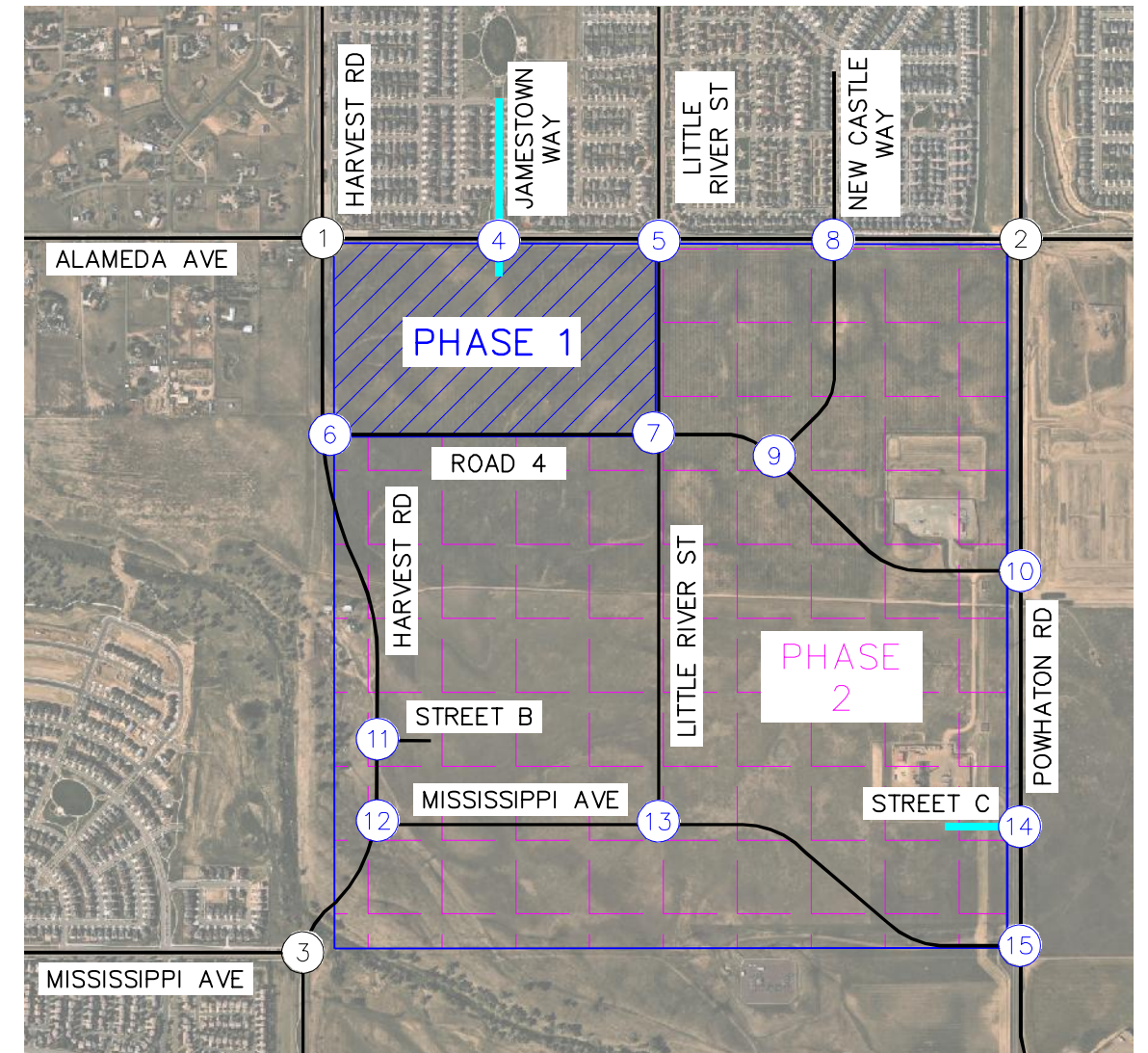
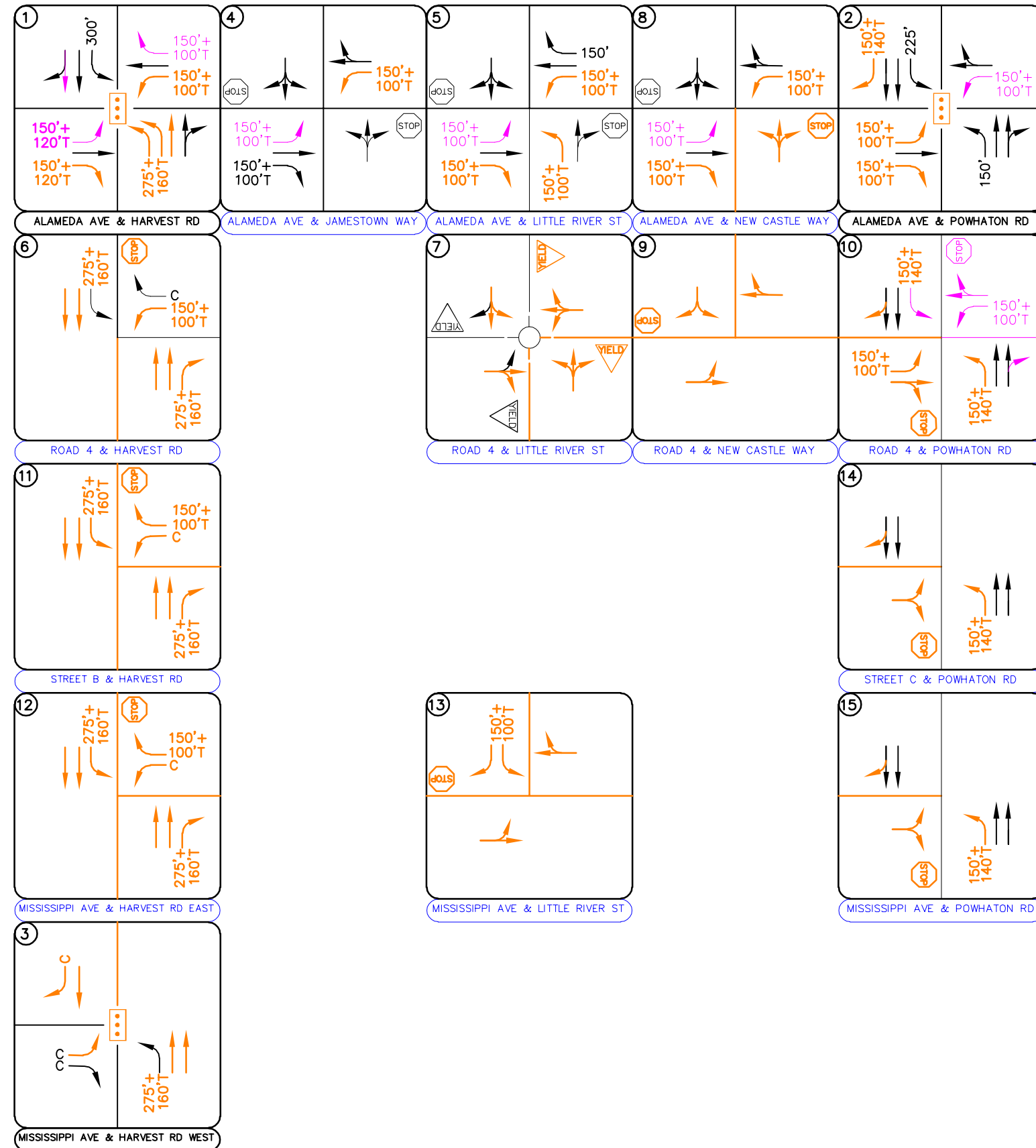


FIGURE 15  
PARKLANDS VILLAGE 2  
AURORA, COLORADO  
2030 RECOMMENDED GEOMETRY AND CONTROL

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

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Based on the analysis presented in this report, Kimley-Horn believes Parklands Village 2 will be successfully incorporated into the existing and future roadway network. Analysis of the existing street network, the proposed project development, and expected traffic volumes resulted in the following recommendations:

### **2025 Recommendations**

- With Phase I of construction of this development, a south leg at the Alameda Avenue & Harvest Road (#1) intersection is proposed to be constructed. Additionally, two full movement accesses are proposed along Alameda Avenue, with the first access as the south leg of the Alameda Avenue & Jamestown Way (#4) intersection, and the second access to be constructed as the south leg of the Alameda Avenue & Little River Street (#5) intersection. With construction of the south leg of Harvest Road, an access is proposed to be located at the “Road 4” & Harvest Road (#6) intersection. Road 4 is anticipated to continue through Little River Street (#7) with a single-lane roundabout proposed to be constructed at that intersection.
- The Alameda Avenue & Harvest Road (#1) intersection is proposed to operate with stop control on the north and south Harvest Road legs with, requiring the addition of an R1-1 “STOP” sign on the to-be constructed northbound approach to the intersection. The eastbound and westbound Alameda Avenue approaches and the northbound Harvest Road approach should all operate well during this horizon with a shared lane for left/through/right turning movements in each direction. The southbound approach is recommended to continue with the existing southbound left- and right-turn lanes and use the existing pavement width with some restriping required to provide a southbound through lane.
- The Alameda Avenue & Powhaton Road (#2) intersection should operate well during this horizon without any improvements required to the existing intersection configuration.
- The Mississippi Avenue & Harvest Road (#3) intersection should remain unaffected from Phase I project construction as the two areas will not be directly connected during this phase.
- The Alameda Avenue & Jamestown Way (#4) intersection should operate well with stop control on the newly-constructed northbound and the southbound Jamestown Way approaches to the intersection with an R1-1 “STOP” sign placed in each direction. Each approach to the intersection should provide a shared lane for left/through/right turning movements in each direction, with the exception of the eastbound direction, which should

provide a shared left/through lane and a separate right turn lane 150 feet in length with a 100-foot taper.

- The Alameda Avenue & Little River Street (#5) is anticipated to operate well with stop control on the proposed-to-be-constructed south leg and the existing north leg of Little River Street with R1-1 “STOP” signs posted in each direction on this street. The eastbound, northbound, and southbound directions should provide a shared lane for left/through/right turning movements while the westbound direction should provide a shared left/through lane and a right turn lane.
- The Road 4 & Harvest Road (#6) intersection will have only two non-opposing legs to the intersection during this horizon, and as such it is anticipated to operate with free southbound left and westbound right turning movements, similar to how Mississippi Avenue & Harvest Road (#3) operates today.
- The Road 4 & Little River Street (#7) intersection is anticipated to be constructed in this phase as a single-lane roundabout although only eastbound left and southbound right turning movements are anticipated to occur during this horizon. The east and south legs to the intersection should be stubbed out for future construction that will be completed during Phase II as the rest of Parklands Village 2 is constructed. R1-2 “YIELD” signs should be placed on the eastbound and southbound approaches to the intersection.

### **2030 Recommendations**

- With Phase II construction, the Alameda Avenue & Harvest Road (#1) intersection is anticipated to require signalization to provide acceptable operations. An eastbound right turn lane is anticipated to be required at this intersection, which should provide 150 in length with a 120-foot taper. A westbound left turn lane should be provided with 150 feet in length and a 100-foot taper. The northbound direction should provide dual northbound left turn lanes with 275 feet in length with a 160-foot taper, a through lane, and a separate through/right turn lane.
- The intersection of Alameda Avenue & Powhatan Road (#2) is anticipated to need separate eastbound left and right turn lanes, each with 150 feet in length with a 100-foot taper. A southbound right turn lane 150 feet in length with a 140-foot taper should also be provided at this intersection.
- As Harvest Road will connect from Mississippi Avenue to Alameda Avenue with Phase II construction, a signal is anticipated to be required at the Mississippi Avenue & Harvest Road West (#3) intersection to provide acceptable operations. The existing two eastbound lanes on

Mississippi Avenue should be restriped to provide an eastbound left- and right-turn lanes. The northbound left turn lane should be improved to provide 275 feet in length and a 160-foot taper, while two northbound through lanes should be provided. The southbound direction should provide a through lane and a forced-right turn lane onto Mississippi Avenue.

- A westbound left turn lane is anticipated to be warranted at the Alameda Avenue & Jamestown Way (#4) intersection, which should provide 150 feet in length and a 100-foot taper.
- The Alameda Avenue & Little River Street (#5) intersection should provide an eastbound right turn lane, a northbound left turn lane, and a westbound left turn lane, each 150 feet in length with a 100-foot taper.
- A south leg is anticipated to be constructed at the Road 4 & Harvest Road (#6) intersection as Harvest Road will connect from Mississippi Avenue to Alameda Avenue with project construction. This intersection should provide two through lanes on Harvest Road in each direction and separate northbound right and southbound left turn lanes, each 275 feet in length with a 160-foot taper. The westbound direction should provide separate left and right turn lanes, with the left turn lane providing 150 feet in length with a 100-foot taper.
- The south and east legs of the Road 4 & Little River Street (#7) single-lane roundabout will be constructed with Phase II construction. As such, each direction should provide shared left/through/right turning movements from a single lane in each direction with R1-2 “YIELD” signs posted on each approach to the roundabout.
- A south leg to the Alameda Avenue & New Castle Way (#8) intersection is proposed to be constructed with Phase II development. This intersection should operate well with stop control through the 2030 horizon with R1-1 “STOP” signs posted on the northbound and southbound New Castle Way approaches to the intersection. These two approaches should operate well with shared left/through/right turning movements from one lane in each direction. An eastbound right turn lane and a westbound left turn lane should each be provided with 150 feet in length and a 100-foot taper.
- The Road 4 & New Castle Way (#9) intersection is anticipated to be an unsignalized ‘T’-intersection with an R1-1 “STOP” sign posted on the southbound New Castle Way approach. The eastbound direction should provide one lane for shared left/through turning movements while the westbound direction should provide one lane for shared through/right turning movements. The southbound direction should operate well with one lane for shared left/right turning movements.



- The Road 4 & Powhatan Road (#10) intersection is not anticipated to require signalization by 2030. As such, it is proposed to be a four leg stop-controlled intersection with stop control on the eastbound and westbound approaches to the intersection. The east leg is assumed to be constructed by others before this horizon year as development is ongoing in the Sand Creek Ranch development area to the east of Powhatan Road. The eastbound and westbound directions should each provide a left turn lane with 150 feet in length and a 100-foot taper and a shared through/right turn lane with R1-1 “STOP” signs posted on each approach to the intersection.
- The Street B & Harvest Road (#11) intersection is anticipated to be a stop-controlled ‘T’-intersection with an R1-1 “STOP” sign posted on the westbound Street B approach. The westbound direction should provide a continuous left turn lane and a right turn lane with 150 feet in length and a 100-foot taper. Two through lanes in each direction along Harvest Road should be provided in addition to a northbound right and southbound left turn lanes with 275 feet in length and a 160-foot taper.
- The Mississippi Avenue & Harvest Road East (#12) intersection is anticipated to be a stop-controlled ‘T’-intersection with an R1-1 “STOP” sign posted on the westbound Mississippi Avenue approach. The westbound direction should provide a continuous left turn lane and a right turn lane with 150 feet in length and a 100-foot taper. Two through lanes in each direction along Harvest Road should be provided in addition to a northbound right and southbound left turn lanes with 275 feet in length and a 160-foot taper.
- Mississippi Avenue & Little River Street (#13) is anticipated to be a stop-controlled ‘T’-intersection with an R1-1 “STOP” sign posted on the southbound Little River Street approach to the intersection. A southbound left turn lane 150 feet in length with a 100-foot taper and a separate continuous southbound right turn lane should be provided.
- The Street C & Powhatan Road (#14) intersection is anticipated to a stop-controlled ‘T’-intersection with an R1-1 “STOP” sign posted on the eastbound Street C approach to the intersection. The eastbound direction should provide one lane for shared left/right turning movements. A northbound left turn lane should be provided with 150 feet in length and a 140-foot taper. Vehicles turning southbound right at this intersection should be able to turn from the outer shared southbound through/right turn lane.
- The intersection of Mississippi Avenue and Powhatan Road (#15) is anticipated to operate well as a stop-controlled ‘T’-intersection with an R1-1 “STOP” sign posted on the eastbound Mississippi Avenue approach to the intersection. The eastbound direction should provide one



lane for shared left/right turning movements. A northbound left turn lane should be provided with 150 feet in length and a 140-foot taper. Vehicles turning southbound right at this intersection should be able to turn from the outer shared southbound through/right turn lane.

### **General Notes and Recommendations**

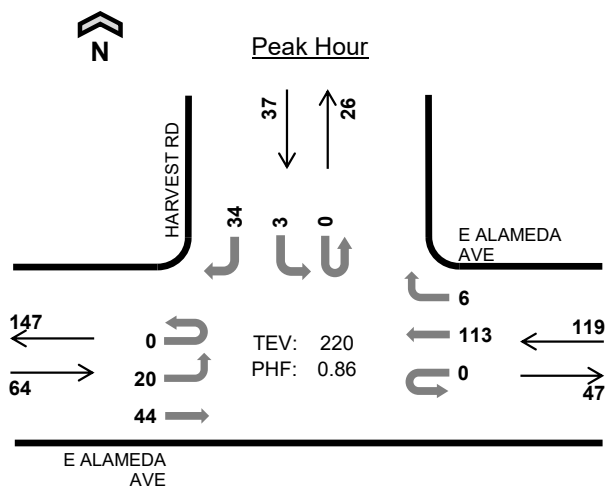
- The roadway geometry and control recommendations provided in this study are evaluated based on the anticipated needs at the study area intersections during these horizons. As such, the recommended turn lanes provided in this study are based on the 2025 and 2030 needs rather than aligning with the roadway geometry provided in the Parklands Village Master Traffic Study. It should be noted that additional roadway improvements and intersection control may be needed at the external intersections as development continues to occur in this area—such as the provision of two through lanes in each direction along Alameda Avenue between Harvest Road and Powhaton Road—for which the Parklands Village Master Traffic Study can be referenced.
- Of note, northbound left turning vehicles at the Alameda Avenue & Harvest Road (#1) intersection were proposed to occur from a single northbound left turn lane through the 2040 horizon in the Parklands Village Master Traffic Study. However, in this study it is recommended that dual northbound left turn lanes be provided at this intersection.
- Any onsite or offsite improvements should be incorporated into the Civil Drawings and conform to standards of the City of Aurora and the Manual on Uniform Traffic Control Devices (MUTCD) – 2009 Edition.

# APPENDICES

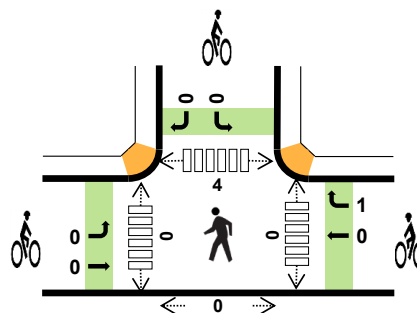
# APPENDIX A

## Intersection Count Sheets

# HARVEST RD E ALAMEDA AVE



Date: Wed, Jun 23, 2021  
Count Period: 7:00 AM to 9:00 AM  
Peak Hour: 7:15 AM to 8:15 AM



	HV %:	PHF
EB	7.8%	0.89
WB	6.7%	0.83
NB	-	-
SB	5.4%	0.84
TOTAL	6.8%	0.86

## Two-Hour Count Summaries

Interval Start		E ALAMEDA AVE				E ALAMEDA AVE				0				HARVEST RD				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	3	8	0	0	0	22	0	0	0	0	0	0	0	0	7	40	0
7:15 AM		0	6	11	0	0	0	36	0	0	0	0	0	0	0	0	11	64	0
7:30 AM		0	6	12	0	0	0	25	0	0	0	0	0	0	0	0	10	53	0
7:45 AM		0	4	9	0	0	0	23	3	0	0	0	0	0	1	0	4	44	201
8:00 AM		0	4	12	0	0	0	29	3	0	0	0	0	0	2	0	9	59	220
8:15 AM		0	3	11	0	0	0	31	2	0	0	0	0	1	1	0	11	60	216
8:30 AM		0	4	9	0	0	0	22	0	0	0	0	0	0	2	0	14	51	214
8:45 AM		0	5	11	0	0	0	23	2	0	0	0	0	0	0	0	4	45	215
Count Total		0	35	83	0	0	0	211	10	0	0	0	0	1	6	0	70	416	0
Peak Hour	All	0	20	44	0	0	0	113	6	0	0	0	0	0	3	0	34	220	0
	HV	0	0	5	0	0	0	4	4	0	0	0	0	0	2	0	0	15	0
	HV%	-	0%	11%	-	-	-	4%	67%	-	-	-	-	-	67%	-	0%	7%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0
7:15 AM	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0
7:30 AM	2	1	0	0	3	0	0	0	0	0	0	0	2	0	2
7:45 AM	2	3	0	0	5	0	1	0	0	1	0	0	1	0	1
8:00 AM	0	2	0	2	4	0	0	0	0	0	0	0	1	0	1
8:15 AM	2	3	0	0	5	0	0	0	0	0	0	0	1	0	1
8:30 AM	0	1	0	2	3	0	0	0	0	0	0	0	0	0	0
8:45 AM	1	4	0	2	7	0	0	0	0	0	0	0	0	0	0
Count Total	9	17	0	6	32	0	1	0	0	1	0	0	5	0	5
Peak Hr	5	8	0	2	15	0	1	0	0	1	0	0	4	0	4

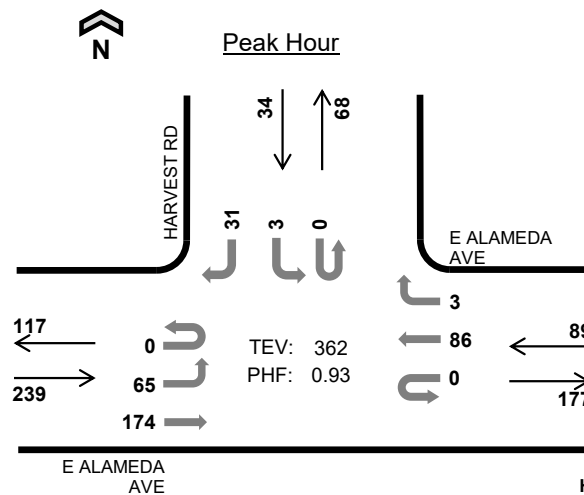


Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	E ALAMEDA AVE				E ALAMEDA AVE				0				HARVEST RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0
7:15 AM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	3	0
7:30 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3	0
7:45 AM	0	0	2	0	0	0	0	3	0	0	0	0	0	0	0	0	5	13
8:00 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2	0	4	15
8:15 AM	0	1	1	0	0	0	1	2	0	0	0	0	0	0	0	0	5	17
8:30 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	3	17
8:45 AM	0	1	0	0	0	0	2	2	0	0	0	0	0	0	0	0	7	19
Count Total	0	2	7	0	0	0	9	8	0	0	0	0	0	4	0	2	32	0
Peak Hour	0	0	5	0	0	0	4	4	0	0	0	0	0	2	0	0	15	0

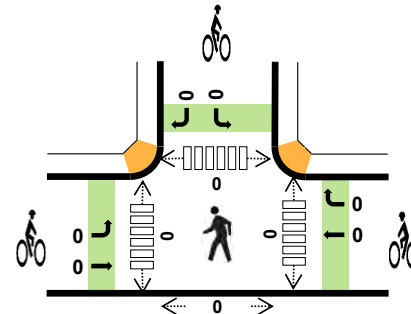
Two-Hour Count Summaries - Bikes																		
Interval Start	E ALAMEDA AVE			E ALAMEDA AVE			0			HARVEST RD			15-min Total	Rolling One Hour				
	Eastbound			Westbound			Northbound			Southbound								
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT						
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	1	1	1			
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1			
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1			
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1			
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Count Total	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0			
Peak Hour	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0			

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

# HARVEST RD E ALAMEDA AVE



Date: Wed, Jun 23, 2021  
Count Period: 4:00 PM to 6:00 PM  
Peak Hour: 5:00 PM to 6:00 PM



	HV %:	PHF
EB	0.8%	0.89
WB	1.1%	0.86
NB	-	-
SB	0.0%	0.85
TOTAL	0.8%	0.93

## Two-Hour Count Summaries

Interval Start		E ALAMEDA AVE				E ALAMEDA AVE				0				HARVEST RD				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	14	27	0	0	0	25	3	0	0	0	0	0	0	0	8	77	0
4:15 PM		0	16	43	0	0	0	27	1	0	0	0	0	0	1	0	10	98	0
4:30 PM		0	16	27	0	0	0	19	0	0	0	0	0	0	0	0	9	71	0
4:45 PM		0	14	31	0	0	0	15	0	0	0	0	0	0	0	0	11	71	317
5:00 PM		0	17	37	0	0	0	20	0	0	0	0	0	0	0	0	5	79	319
5:15 PM		0	15	38	0	0	0	26	0	0	0	0	0	0	0	0	10	89	310
5:30 PM		0	15	52	0	0	0	20	1	0	0	0	0	0	1	0	8	97	336
5:45 PM		0	18	47	0	0	0	20	2	0	0	0	0	0	2	0	8	97	362
Count Total		0	125	302	0	0	0	172	7	0	0	0	0	0	4	0	69	679	0
Peak Hour	All	0	65	174	0	0	0	86	3	0	0	0	0	0	3	0	31	362	0
	HV	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3	0
	HV%	-	3%	0%	-	-	-	1%	0%	-	-	-	-	-	0%	-	0%	1%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0
4:15 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0
4:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
4:45 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
5:00 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	6	4	0	0	10	0	0	0	0	0	0	0	0	0	0
Peak Hr	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	E ALAMEDA AVE				E ALAMEDA AVE				0				HARVEST RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	3	0
4:15 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0
4:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7
5:00 PM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	6
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Count Total	0	3	3	0	0	0	4	0	0	0	0	0	0	0	0	0	10	0
Peak Hour	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3	0

Two-Hour Count Summaries - Bikes																		
Interval Start	E ALAMEDA AVE			E ALAMEDA AVE			0			HARVEST RD						15-min Total	Rolling One Hour	
	Eastbound			Westbound			Northbound			Southbound								
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT			
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

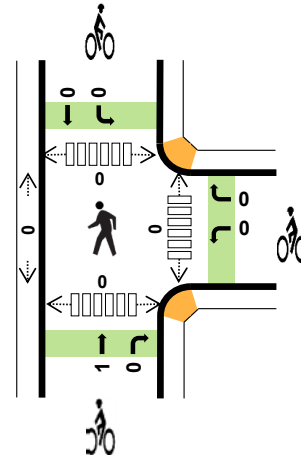
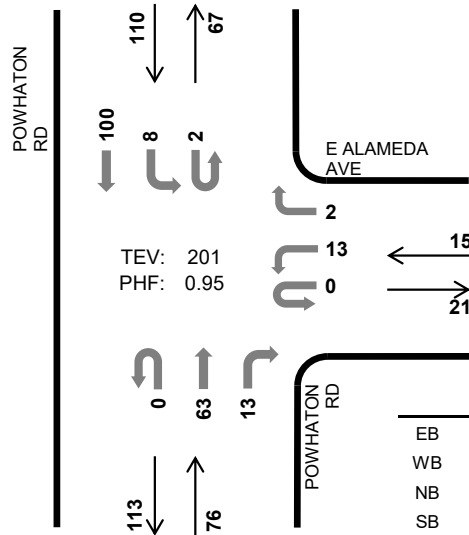
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

# POWHATON RD E ALAMEDA AVE



Peak Hour

Date: Wed, Jun 23, 2021  
Count Period: 7:00 AM to 9:00 AM  
Peak Hour: 7:15 AM to 8:15 AM



	HV %:	PHF
EB	-	-
WB	6.7%	0.75
NB	3.9%	0.86
SB	6.4%	0.89
TOTAL	5.5%	0.95

## Two-Hour Count Summaries

Interval Start		0				E ALAMEDA AVE				POWHATON RD				POWHATON RD				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	0	0	0	0	2	0	0	0	0	19	0	0	0	27	0	48	0
7:15 AM		0	0	0	0	0	2	0	0	0	0	11	3	1	1	29	0	47	0
7:30 AM		0	0	0	0	0	4	0	0	0	0	20	2	0	2	25	0	53	0
7:45 AM		0	0	0	0	0	3	0	1	0	0	19	3	0	1	22	0	49	197
8:00 AM		0	0	0	0	0	4	0	1	0	0	13	5	1	4	24	0	52	201
8:15 AM		0	0	0	0	0	1	0	1	0	0	14	3	0	0	25	0	44	198
8:30 AM		0	0	0	0	0	3	0	1	0	0	10	2	0	1	20	0	37	182
8:45 AM		0	0	0	0	0	2	0	0	0	0	13	3	0	0	24	0	42	175
Count Total		0	0	0	0	0	21	0	4	0	0	119	21	2	9	196	0	372	0
Peak Hour	All	0	0	0	0	0	13	0	2	0	0	63	13	2	8	100	0	201	0
	HV	0	0	0	0	0	1	0	0	0	0	2	1	1	2	4	0	11	0
	HV%	-	-	-	-	-	8%	-	0%	-	-	3%	8%	50%	25%	4%	-	5%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	1	3	4	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	1	4	5	0	0	1	0	1	0	0	0	0	0
8:15 AM	0	0	1	4	5	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	1	4	5	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	1	5	6	0	0	0	0	0	0	0	0	0	0
Count Total	0	2	6	21	29	0	0	1	0	1	0	0	0	0	0
Peak Hr	0	1	3	7	11	0	0	1	0	1	0	0	0	0	0



Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	0				E ALAMEDA AVE				POWHATON RD				POWHATON RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	2	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	4	0
7:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	8
8:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	1	2	0	5	11
8:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	5	12
8:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3	0	5	16
8:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	5	0	6	21
Count Total	0	0	0	0	0	2	0	0	0	0	5	1	1	3	17	0	29	0
Peak Hour	0	0	0	0	0	1	0	0	0	0	2	1	1	2	4	0	11	0

Two-Hour Count Summaries - Bikes																		
Interval Start	0			E ALAMEDA AVE			POWHATON RD			POWHATON RD			15-min Total	Rolling One Hour				
	Eastbound			Westbound			Northbound			Southbound								
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT						
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	1				
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1				
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1				
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1				
Count Total	0	0	0	0	0	0	0	1	0	0	0	0	1	0				
Peak Hour	0	0	0	0	0	0	0	1	0	0	0	0	1	0				

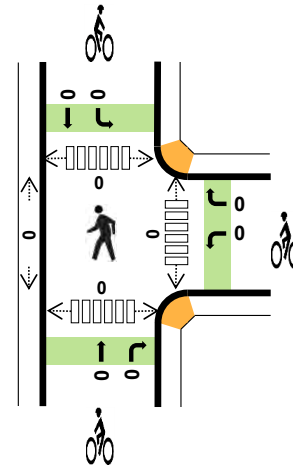
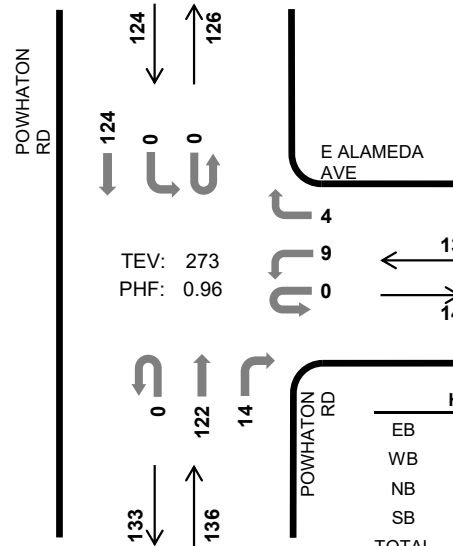
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

# POWHATON RD E ALAMEDA AVE



Peak Hour

Date: Wed, Jun 23, 2021  
Count Period: 4:00 PM to 6:00 PM  
Peak Hour: 4:15 PM to 5:15 PM



	HV %:	PHF
EB	-	-
WB	7.7%	0.54
NB	1.5%	0.92
SB	5.6%	0.94
TOTAL	3.7%	0.96

## Two-Hour Count Summaries

Interval Start		0				E ALAMEDA AVE				POWHATON RD				POWHATON RD				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	0	0	0	0	4	0	2	0	0	24	7	0	0	25	0	62	0
4:15 PM		0	0	0	0	0	3	0	3	0	0	30	4	0	0	31	0	71	0
4:30 PM		0	0	0	0	0	2	0	1	0	0	32	4	0	0	30	0	69	0
4:45 PM		0	0	0	0	0	3	0	0	0	0	23	6	0	0	33	0	65	267
5:00 PM		0	0	0	0	0	1	0	0	0	0	37	0	0	0	30	0	68	273
5:15 PM		0	0	0	0	0	7	0	3	0	0	30	4	0	0	20	0	64	266
5:30 PM		0	0	0	0	0	7	0	4	0	0	30	2	0	1	30	0	74	271
5:45 PM		0	0	0	0	0	3	0	3	0	0	44	2	0	1	10	0	63	269
Count Total		0	0	0	0	0	30	0	16	0	0	250	29	0	2	209	0	536	0
Peak Hour	All	0	0	0	0	0	9	0	4	0	0	122	14	0	0	124	0	273	0
	HV	0	0	0	0	0	1	0	0	0	0	1	1	0	0	7	0	10	0
	HV%	-	-	-	-	-	11%	-	0%	-	-	1%	7%	-	-	6%	-	4%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

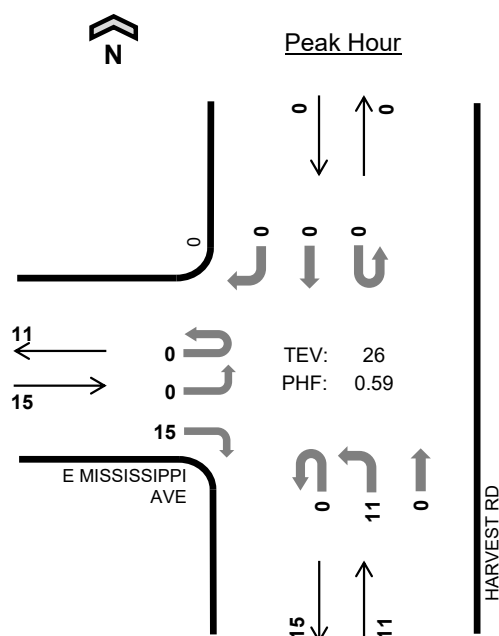
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	1	4	5	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	1	1	1	3	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	2	1	0	3	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	3	0	1	4	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	8	3	8	19	0	0	0	0	0	0	0	0	0	0
Peak Hr	0	1	2	7	10	0	0	0	0	0	0	0	0	0	0

Two-Hour Count Summaries - Heavy Vehicles																			
Interval Start	0				E ALAMEDA AVE				POWHATON RD				POWHATON RD				15-min Total	Rolling One Hour	
	Eastbound				Westbound				Northbound				Southbound						
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
4:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	2	0	
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	5	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
5:00 PM	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	3	10
5:15 PM	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	3	8
5:30 PM	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	1	0	4	10
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
Count Total	0	0	0	0	0	5	0	3	0	0	2	1	0	0	0	8	0	19	0
Peak Hour	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	7	0	10	0

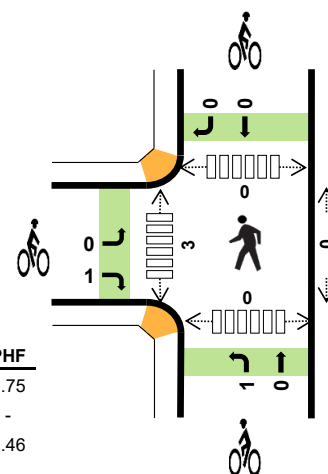
Two-Hour Count Summaries - Bikes																	
Interval Start	0			E ALAMEDA AVE			POWHATON RD			POWHATON RD			15-min Total	Rolling One Hour			
	Eastbound			Westbound			Northbound			Southbound							
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT					
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

# HARVEST RD E MISSISSIPPI AVE



Date: Wed, Jun 23, 2021  
Count Period: 7:00 AM to 9:00 AM  
Peak Hour: 7:45 AM to 8:45 AM



	HV %:	PHF
EB	40.0%	0.75
WB	-	-
NB	45.5%	0.46
SB	-	-
TOTAL	42.3%	0.59

## Two-Hour Count Summaries

Interval Start		E MISSISSIPPI AVE				0				HARVEST RD				0				15-min Total	Rolling One Hour	
		Eastbound				Westbound				Northbound				Southbound						
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
7:00 AM		0	0	0	4	0	0	0	0	0	4	0	0	0	0	0	0	0	8	0
7:15 AM		0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
7:30 AM		0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0
7:45 AM		0	0	0	5	0	0	0	0	0	6	0	0	0	0	0	0	0	11	24
8:00 AM		0	0	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	4	20
8:15 AM		0	0	0	5	0	0	0	0	0	2	0	0	0	0	0	0	0	7	24
8:30 AM		0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	4	26
8:45 AM		0	0	0	3	0	0	0	0	0	2	0	0	0	0	0	0	0	5	20
Count Total		0	0	0	26	0	0	0	0	0	18	0	0	0	0	0	0	0	44	0
Peak Hour	All	0	0	0	15	0	0	0	0	0	11	0	0	0	0	0	0	0	26	0
	HV	0	0	0	6	0	0	0	0	0	5	0	0	0	0	0	0	0	11	0
	HV%	-	-	-	40%	-	-	-	-	-	45%	-	-	-	-	-	-	-	42%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	0	1	0	2	0	0	0	0	0	0	1	0	0	1
7:15 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	1	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	2	0	3	0	5	0	0	1	0	1	0	1	0	0	1
8:00 AM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
8:15 AM	2	0	2	0	4	0	0	0	0	0	0	1	0	0	1
8:30 AM	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1
8:45 AM	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0
Count Total	10	0	7	0	17	1	0	1	0	2	0	4	0	1	5
Peak Hr	6	0	5	0	11	1	0	1	0	2	0	3	0	0	3



Two-Hour Count Summaries - Heavy Vehicles																			
Interval Start	E MISSISSIPPI AVE				0				HARVEST RD				0				15-min Total	Rolling One Hour	
	Eastbound				Westbound				Northbound				Southbound						
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
7:00 AM	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0
7:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	2	0	0	0	0	0	0	3	0	0	0	0	0	0	5	8
8:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7
8:15 AM	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	4	10
8:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	11
8:45 AM	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	3	9
Count Total	0	0	0	10	0	0	0	0	0	0	7	0	0	0	0	0	0	17	0
Peak Hour	0	0	0	6	0	0	0	0	0	0	5	0	0	0	0	0	0	11	0

Two-Hour Count Summaries - Bikes																		
Interval Start	E MISSISSIPPI AVE				0				HARVEST RD				0				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT			
7:00 AM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
7:15 AM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
7:30 AM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
7:45 AM	0	0	0		0	0	0		1	0	0		0	0	0		1	1
8:00 AM	0	0	1		0	0	0		0	0	0		0	0	0		1	2
8:15 AM	0	0	0		0	0	0		0	0	0		0	0	0		0	2
8:30 AM	0	0	0		0	0	0		0	0	0		0	0	0		0	2
8:45 AM	0	0	0		0	0	0		0	0	0		0	0	0		0	1
Count Total	0	0	1		0	0	0		1	0	0		0	0	0		2	0
Peak Hour	0	0	1		0	0	0		1	0	0		0	0	0		2	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

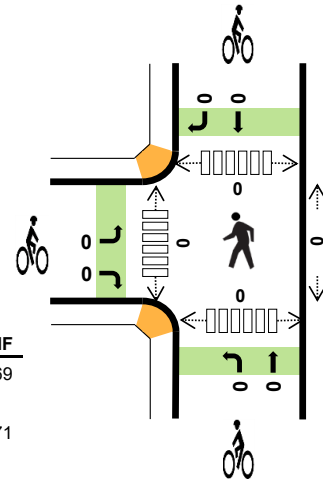
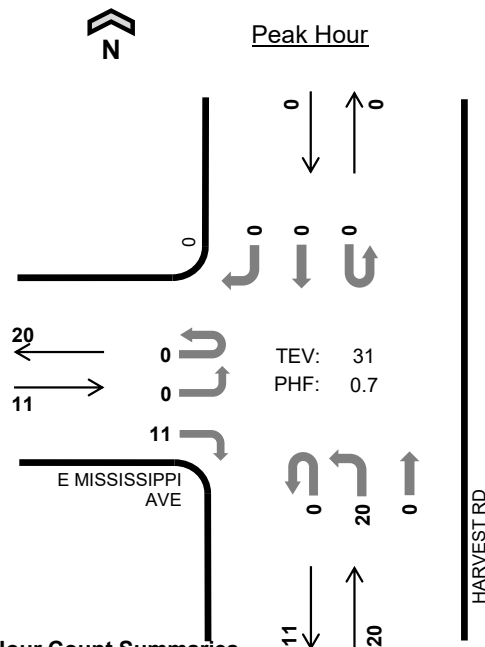
# HARVEST RD E MISSISSIPPI AVE



Date: Wed, Jun 23, 2021

Count Period: 4:00 PM to 6:00 PM

Peak Hour: 4:45 PM to 5:45 PM



	HV %:	PHF
EB	27.3%	0.69
WB	-	-
NB	5.0%	0.71
SB	-	-
TOTAL	12.9%	0.70

## Two-Hour Count Summaries

Interval Start		E MISSISSIPPI AVE				0				HARVEST RD				0				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	0	0	4	0	0	0	0	0	3	0	0	0	0	0	0	7	0
4:15 PM		0	0	0	3	0	0	0	0	0	4	0	0	0	0	0	0	7	0
4:30 PM		0	0	0	5	0	0	0	0	0	4	0	0	0	0	0	0	9	0
4:45 PM		0	0	0	2	0	0	0	0	0	4	0	0	0	0	0	0	6	29
5:00 PM		0	0	0	3	0	0	0	0	0	5	0	0	0	0	0	0	8	30
5:15 PM		0	0	0	2	0	0	0	0	0	4	0	0	0	0	0	0	6	29
5:30 PM		0	0	0	4	0	0	0	0	0	7	0	0	0	0	0	0	11	31
5:45 PM		0	0	0	1	0	0	0	0	0	3	0	0	0	0	0	0	4	29
Count Total		0	0	0	24	0	0	0	0	0	34	0	0	0	0	0	0	58	0
Peak Hour	All	0	0	0	11	0	0	0	0	0	20	0	0	0	0	0	0	31	0
	HV	0	0	0	3	0	0	0	0	0	1	0	0	0	0	0	0	4	0
	HV%	-	-	-	27%	-	-	-	-	-	5%	-	-	-	-	-	-	13%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	1	0	1	0	0	0	0	0	0	3	0	0	3
4:30 PM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0
4:45 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
5:00 PM	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0
5:15 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	5	0	3	0	8	0	0	0	0	0	0	3	0	0	3
Peak Hr	3	0	1	0	4	0	0	0	0	0	0	0	0	0	0

Two-Hour Count Summaries - Heavy Vehicles																			
Interval Start	E MISSISSIPPI AVE				0				HARVEST RD				0				15-min Total	Rolling One Hour	
	Eastbound				Westbound				Northbound				Southbound						
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
4:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
4:30 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
4:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5
5:00 PM	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2	6
5:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Count Total	0	0	0	5	0	0	0	0	0	3	0	0	0	0	0	0	0	8	0
Peak Hour	0	0	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	4	0

Two-Hour Count Summaries - Bikes																		
Interval Start	E MISSISSIPPI AVE				0				HARVEST RD				0				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT			
4:00 PM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
4:15 PM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
4:30 PM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
4:45 PM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
5:00 PM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
5:15 PM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
5:30 PM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
5:45 PM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
Count Total	0	0	0		0	0	0		0	0	0		0	0	0		0	0
Peak Hour	0	0	0		0	0	0		0	0	0		0	0	0		0	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Location: HARVEST RD N-O JEWELL AVE  
 Date Range: 6/24/2021 - 6/30/2021  
 Site Code: 01

Time	Thursday			Friday			Saturday			Sunday			Monday			Tuesday			Wednesday			Mid-Week Average		
	6/24/2021			6/25/2021			6/26/2021			6/27/2021			6/28/2021			6/29/2021			6/30/2021					
	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total
12:00 AM	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	3
1:00 AM	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
2:00 AM	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	1
3:00 AM	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
4:00 AM	3	14	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	14	17
5:00 AM	4	12	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	12	16
6:00 AM	10	26	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	26	36
7:00 AM	18	33	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	33	51
8:00 AM	19	21	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	21	40
9:00 AM	13	19	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	19	32
10:00 AM	18	16	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	16	34
11:00 AM	26	17	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	17	43
12:00 PM	21	25	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	25	46
1:00 PM	23	30	53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23	30	53
2:00 PM	46	21	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46	21	67
3:00 PM	29	30	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	30	59
4:00 PM	37	29	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37	29	66
5:00 PM	35	27	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35	27	62
6:00 PM	50	26	76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	26	76
7:00 PM	38	8	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	8	46
8:00 PM	17	15	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	15	32
9:00 PM	15	8	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	8	23
10:00 PM	11	4	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	4	15
11:00 PM	5	1	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	1	6
<b>Total</b>	<b>441</b>	<b>383</b>	<b>824</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>441</b>	<b>383</b>	<b>824</b>
<b>Percent</b>	<b>54%</b>	<b>46%</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>54%</b>	<b>46%</b>	-

1. Mid-week average includes data between Tuesday and Thursday.

Location: HARVEST RD S/O E MISSISSIPPI AVE  
 Date Range: 6/23/2021 - 6/29/2021  
 Site Code: 02

Time	Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Tuesday			Mid-Week Average		
	6/23/2021			6/24/2021			6/25/2021			6/26/2021			6/27/2021			6/28/2021			6/29/2021					
	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total
12:00 AM	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	3
1:00 AM	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
2:00 AM	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	1
3:00 AM	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
4:00 AM	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
5:00 AM	3	3	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	6
6:00 AM	9	7	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	7	16
7:00 AM	12	13	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	13	25
8:00 AM	8	12	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	12	20
9:00 AM	14	19	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	19	33
10:00 AM	9	8	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	8	17
11:00 AM	15	15	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	15	30
12:00 PM	23	13	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23	13	36
1:00 PM	16	11	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	11	27
2:00 PM	19	8	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	27
3:00 PM	9	16	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	16	25
4:00 PM	15	14	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	14	29
5:00 PM	19	10	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	10	29
6:00 PM	14	10	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	10	24
7:00 PM	10	12	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	12	22
8:00 PM	10	2	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	2	12
9:00 PM	7	4	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	4	11
10:00 PM	7	3	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	3	10
11:00 PM	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3
<b>Total</b>	<b>223</b>	<b>183</b>	<b>406</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>223</b>	<b>183</b>	<b>406</b>
<b>Percent</b>	<b>55%</b>	<b>45%</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>55%</b>	<b>45%</b>	-

1. Mid-week average includes data between Tuesday and Thursday.



Location: E JEWELL AVE E/O HARVEST RD  
 Date Range: 6/23/2021 - 6/29/2021  
 Site Code: 04

Time	Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Tuesday			Mid-Week Average		
	6/23/2021			6/24/2021			6/25/2021			6/26/2021			6/27/2021			6/28/2021			6/29/2021					
	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00 AM	8	10	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	10	18
1:00 AM	5	2	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	2	7	
2:00 AM	12	3	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	3	15	
3:00 AM	5	6	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	6	11	
4:00 AM	28	7	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	7	35	
5:00 AM	64	53	117	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	64	53	117	
6:00 AM	61	90	151	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	61	90	151	
7:00 AM	81	127	208	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	81	127	208	
8:00 AM	81	112	193	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	81	112	193	
9:00 AM	79	90	169	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	79	90	169	
10:00 AM	76	98	174	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	76	98	174	
11:00 AM	73	95	168	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	73	95	168	
12:00 PM	126	98	224	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	126	98	224	
1:00 PM	116	97	213	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	116	97	213	
2:00 PM	117	127	244	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	117	127	244	
3:00 PM	144	147	291	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	144	147	291	
4:00 PM	151	143	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	151	143	294	
5:00 PM	166	132	298	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	166	132	298	
6:00 PM	130	91	221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	91	221	
7:00 PM	92	60	152	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	92	60	152	
8:00 PM	79	63	142	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	79	63	142	
9:00 PM	63	42	105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	63	42	105	
10:00 PM	29	35	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	35	64	
11:00 PM	17	22	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	22	39	
Total	1,803	1,750	3,553	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,803	1,750	3,553	
Percent	51%	49%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51%	49%	-	

1. Mid-week average includes data between Tuesday and Thursday.

Location: E ALAMEDA AVE W/O HARVEST RD  
 Date Range: 6/23/2021 - 6/29/2021  
 Site Code: 05

Time	Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Tuesday			Mid-Week Average		
	6/23/2021			6/24/2021			6/25/2021			6/26/2021			6/27/2021			6/28/2021			6/29/2021					
	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00 AM	27	5	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27	5	32
1:00 AM	11	3	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	3	14
2:00 AM	3	6	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	6	9
3:00 AM	2	13	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	13	15
4:00 AM	4	34	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	34	38
5:00 AM	12	91	103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	91	103
6:00 AM	33	120	153	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	120	153
7:00 AM	59	138	197	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	59	138	197
8:00 AM	58	143	201	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58	143	201
9:00 AM	60	109	169	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60	109	169
10:00 AM	71	83	154	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	83	154
11:00 AM	101	118	219	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	101	118	219
12:00 PM	125	129	254	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	125	129	254
1:00 PM	116	95	211	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	116	95	211
2:00 PM	161	85	246	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	161	85	246
3:00 PM	132	112	244	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	132	112	244
4:00 PM	188	126	314	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	188	126	314
5:00 PM	241	117	358	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	241	117	358
6:00 PM	195	120	315	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	195	120	315
7:00 PM	172	91	263	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	172	91	263
8:00 PM	137	70	207	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	137	70	207
9:00 PM	96	47	143	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96	47	143
10:00 PM	83	21	104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	83	21	104
11:00 PM	42	8	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42	8	50
Total	2,129	1,884	4,013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,129	1,884	4,013
Percent	53%	47%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	53%	47%	-

1. Mid-week average includes data between Tuesday and Thursday.

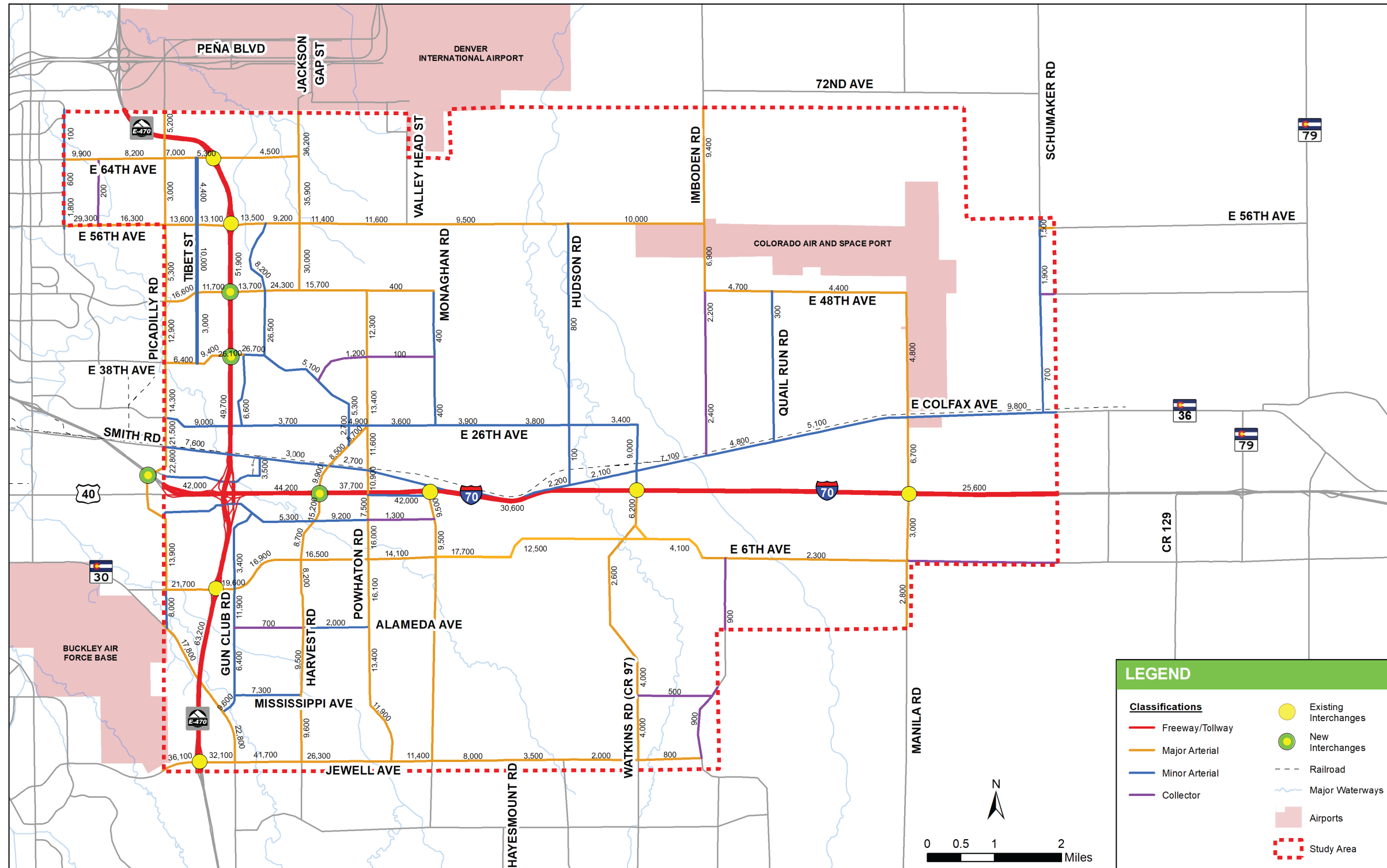
# APPENDIX B

## Future Traffic Projections and Master Traffic Study

ROUTE	REFPT	ENDREFPT	AADT	AADTYR	OFFPKTRK	YR20FACTOR	GROWTHRATE	DHV	LOCATION
030A	12.585	15.036	9300	2021	6.4	1.42	1.80%	11.5	ON SH 30 6TH AVE W/O PICCADILLY RD AURORA
030A	15.036	19.293	19000	2021	4.9	1.53	2.10%	10.5	ON SH 30 S/O JEWELL AVE AURORA
Average						1.475	1.96%		



**Figure 12.**  
**2030 Daily Traffic Volumes**

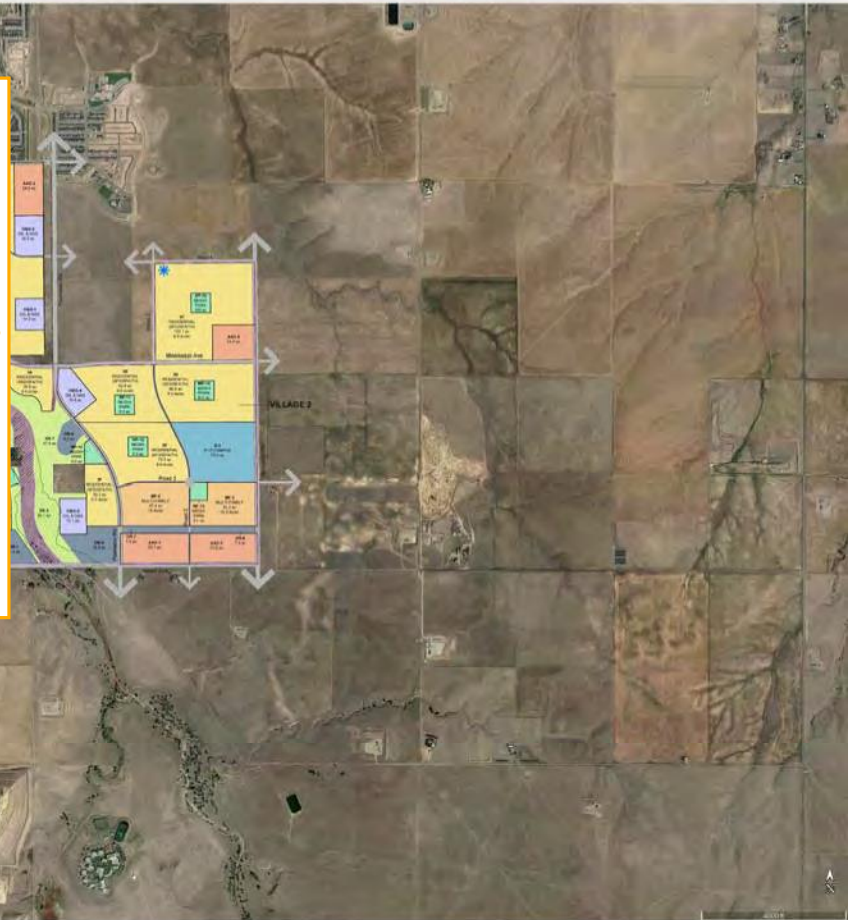




# Parklands Development Master Traffic Study

comments provide on 03/39/22  
seg

1. For future reference add ADT volumes to volume figures for ease of reference
3. discuss the need/requirements for acceleration lanes from from free-flow right turn lanes at signalized intersections
2. See comments throughout report
3. Engineer stamp and signature required



**1<sup>st</sup> Submittal Date:** October 1, 2021

**Updated:** March 4, 2022

**Submitted To:**

Clayton Properties Group II  
4908 Tower Rd  
Denver, Colorado 80249

**Submitted By:**

Fox Tuttle Transportation Group, LLC  
1624 Market Street, Suite 202  
Denver, CO 80202

## **Parklands Master Traffic Study**

### **Updates from Previous Submittal – Change Log:**

Preface: This report represents version #2 of the Parklands Master Traffic Study. The following is a log of updates that were incorporated into this report based on the changes to the site plan and comments received from the City of Aurora:

1. Updated signal timings at intersections to minimize LOS E and F on movements. Updated analysis and tables accordingly.
2. Updated land use sizes, added new planning areas, and updated any land use changes. Updated trip generation estimates, volumes, analysis, tables, and figures accordingly.
3. Changed traffic control at internal Intersection #104 (Flatrock Trail at Road 1) from roundabout to side-street stop-controlled.
4. Added channelized right-turn lane for northwest-bound right-turn at SH 30 and Gun Club Road (#3).
5. Added channelized right-turn lane for northbound right-turn at Jewell Avenue and Gun Club Road (#4).
6. New signal at recommended at the intersection of Mississippi Avenue at Road 2(#110) based on the signal warrant evaluation.
7. Added signal warrant worksheets to **Appendix**.
8. Added figures for internal distribution. Refer to **Figure 5B** and **Figure 5C**.
9. Updated **Figure 6** (now 6A) per City suggestions.
10. Added figure for roadway classification. Refer to **Figure 6B**.

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**APPENDIX**

Level of Service Definitions

Existing Traffic Data

Intersection Capacity Worksheets

Signal Warrant Worksheets



# PARKLANDS MASTER TRAFFIC STUDY

## 1.0 Introduction

The Fox Tuttle Transportation Group has prepared this traffic impact study for the development of the Parklands project, Villages 1, 2, and 3. The 1,980± acres of vacant property are located in the City of Aurora between Alameda Avenue and Jewell Avenue and between future Harvest Road and Monaghan Road. It is understood that the Parklands development will be a combination of single-family and multi-family residential homes, parks, open space, schools, and commercial areas comprising retail and office space. The project includes the construction or expansion of several roads, including Harvest Road, Mississippi Avenue, Powhaton Road, Monaghan Road, and several collector roads for internal circulation. The property will be developed over time with the assumed completion by Year 2040. **Figure 1** provides a vicinity map for the proposed project.

The purpose of this study is to update the original master traffic study (*Eastern Hills FDP Traffic Analysis, Turner Collie & Braden, December 2001*) and assist in identifying potential traffic impacts within the study area as a result of this project. The traffic study addresses existing and long-term peak hour intersection conditions in the study area with and without the project-generated traffic. The information contained in this study is anticipated to be used by the City of Aurora staff in identifying any intersection or roadway deficiencies and potential improvements for the build-out condition and long-term future scenarios.

This study focused on the weekday AM and PM peak hours which represents the periods of highest trip generation for the proposed use and adjacent street traffic. The study is consistent with the requirements of the City of Aurora's *Traffic Impact Study Guidelines (June 2015)*. The following supporting documents were reviewed and incorporated into this analysis as appropriate:

- *Northeast Area Transportation Study*. City of Aurora Planning & Development Services Department. October 2018.
- *Harmony Traffic Impact Analysis*. LSC Transportation Consultants, Inc. March 2017.
- *Murphy Creek East*. LSC Transportation Consultants, Inc. March 2019.
- *Prosper Traffic Impact Study*. Felsburg Holt & Ullevig. July 2014.

- Sandy Creek Traffic Impact Analysis. Felsburg Holt & Ullevig. December 2012.

## 2.0 Project Description

The Parklands Aurora project plans to develop vacant lands with an internal roadway network that is pedestrian and bicyclist friendly. The proposed land use plan includes single- and multi-family residential homes, commercial space, schools, and neighborhood centers. For the purpose of the is traffic study it was assumed that the site plan will include up to:

- 6,967 single-family residential dwelling units
- 2,512 multi-family residential dwelling units
- A 22,000 sq. ft. neighborhood community center
- A 42-acre public park
- 373,000 square feet (sq. ft.) of office space
- 1,124,000 sq. ft. of retail space
- Two K-8 schools
- One P-12 school campus

Note that these land uses represent one of many scenarios that could occur based on market dynamics and represent a reasonable baseline assumption for determining traffic impacts of the site at a master plan level. It is anticipated that this report evaluates the highest density that would be built within the Parklands property.

For the purpose of this traffic study, it was assumed that Parklands project will be completed by Year 2040 and will include the construction of future roadways Harvest Road, Mississippi Avenue, Powhatan Road, Monaghan Road, and internal collector roads. The project proposes multiple access locations along the future roadways to serve the new community. Internally, local streets will be constructed to provide the most beneficial access into and around the site. The planning areas and access are provided on **Figure 2**.

## 3.0 Study Considerations

### 3.1 Data Collection

Intersection turning movement volumes were collected in June 2021 at ten (10) existing intersections and along five (5) roadway segments. The intersection turning movement counts were collected during the weekday AM and PM peak hours, including pedestrians and bicyclists. Daily traffic volumes were collected along Harvest Road, Jewell Avenue, and Alameda Avenue.

Historic data and future projections within and near the project area were gathered from the Northeast Area Transportation Study (NEATS) Refresh; DRCOG database; and from the Colorado Department of Transportation's (CDOT) Transportation Data Management System (TDMS). The existing traffic volumes are illustrated on **Figure 3**. The existing intersection geometry and traffic control are also shown on this figure. Count data sheets are provided in the **Appendix**.

### 3.2 Approved Developments and New Roadways

The Northeast Aurora area is continuing to grow with new developments and new roadways to provide connection for current and future land uses. Adjacent to the Parklands Aurora property, the following known development projects are approved, and portions of the site are under construction: (1) Murphy Creek, (2) Prosper, (3) Sandy Creek, (4) Adonea, (5) Harmony, (6) Harvest Crossing, and (7) Waterstone. The trips from each of these developments were assumed to be included within the background growth in NEATS.

There are many recent and future roadway and intersection construction projects within or near the study area that will serve the existing and future traffic volumes. Several of the study intersections have been expanded to accommodate auxiliary lanes and/or upgraded to be signalized. With the development of Parklands:

1. **Harvest Road:** Constructed between Mississippi Avenue and Alameda Avenue. Widened between Jewell Avenue and Mississippi Avenue.
2. **Mississippi Avenue:** Extended east from Harvest Road to future Monaghan Road.
3. **Powhaton Road:** Widened between Mississippi Avenue and Jewell Avenue. Realignment near Jewell Avenue.
4. **Monaghan Road:** Constructed on the future alignment along the east boundary of the project.

5. **Internal Circulation:** Several collector and local roads will be constructed for accessibility.

### 3.3 Evaluation Methodology

The traffic operations analysis addressed signalized and unsignalized intersection operations using the procedures and methodologies set forth by the Highway Capacity Manual (HCM)<sup>1</sup>. Existing peak hour factors (PHF) by approach and peak hour were applied to the study intersections for the existing scenarios. For future scenarios, the PHF were set to 0.92 in the future unless the existing PHF was greater than these values. Study intersections were evaluated using Synchro software (v10).

### 3.4 Level of Service Capacity Analysis

A Level of Service analysis was conducted to determine the existing and future performance of the study area intersections and accesses to determine the most appropriate intersection traffic controls and auxiliary lanes for future conditions.

To measure and describe the operational status of the study intersections, transportation engineers and planners commonly use a grading system referred to as “Level of Service” (LOS) that is defined by the *HCM*. LOS characterizes the operational conditions of an intersections traffic flow, ranging from LOS A (indicating very good, free flow operations) and LOS F (indicating congested and sometimes oversaturated conditions). These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with traveling through the intersections. The intersection LOS is represented as a delay in seconds per vehicle for the intersection as a whole and for each turning movement.

Typically, LOS A through C is considered to be acceptable for the overall intersection operations and LOS D overall during peak hours is acceptable. Individual movements may be allowed to fall to LOS E at signalized intersections. Minor movements at unsignalized intersections, such as left turns onto a major arterial, may be allowed to fall below LOS D, specifically where there are low volumes, where this is an alternate travel route, and/or no viable mitigation option per the City of Aurora’s Traffic Impact Study Guidelines. Criteria contained in the *HCM* was applied for these analyses in order to determine peak hour LOS for each scenario. A more detailed discussion of LOS methodology is contained in the **Appendix** for reference.

---

<sup>1</sup> Highway Capacity Manual, Highway Research Board Special Report 209, Transportation Research Board, National Research Council, 6<sup>th</sup> Edition (2016).

## 4.0 Existing Conditions

### 4.1 Roadways

The study area boundaries are based on the amount of traffic to be generated by the project and potential impact to the existing roadway network. The primary public roadways that serve the project site are discussed in the following text and illustrated on **Figure 1**.

**State Highway 30** (SH 30) is a two-lane undivided state highway that provides access between the study site and eastern Aurora. In the vicinity of the study area, it is classified by CDOT as a NR-B: Non-Rural Arterial. The highway extends north and south from the project site, curving west to the north to become 6<sup>th</sup> Avenue and changes to Gun Club Road south of Jewell Avenue. This roadway has a posted speed limit of 55 miles per hour (mph) and serves approximately 17,700 vehicles per day (vpd) just south of the intersection with Jewell Ave (CDOT, Year 2020).

**Gun Club Rd** is a two-lane, north-south, regional roadway that provides access through rural and growing parts of eastern Aurora, connecting the study area to an interchange at I-70/E-470 to the north and transitioning to Aurora Parkway to the south. North of the intersection with SH 30, Gun Club Road serves roughly 10,000 vpd (CDOT, Year 2020) and has a posted speed of 45 mph, while the section south of Jewell Avenue serves roughly 17,700 vpd (CDOT, Year 2020) and has a posted speed of 55 mph.

**Harvest Road** is a north-south road with two presently discontinuous sections: The north section is a four-lane major arterial running between 6<sup>th</sup> Avenue and Alameda Avenue. The posted speed limit is 45 mph and there is approximately 1,200 vpd north of Alameda Avenue (Count, Year 2021). The south section is a two-lane major arterial that extends from Mississippi Avenue to Jewell Avenue. The posted speed limit for this section is 45 mph and Harvest Road serves approximately 800 vpd (Count, Year 2021). Harvest Road provides access to the existing communities of Murphy Creek, Cross Creek, Traditions, and Adonea which are adjacent to the project site. Future plans indicate that Harvest Road will be extended to the south and the north as development occurs.

**Powhaton Road** is a north-south local road connecting the study area to an interchange with I-70 to the north and currently ending at Jewell Avenue. Powhaton Rd is generally two lanes and undivided with a short divided, four-lane section near E Alameda Ave. The speed limit is 25 mph.

**Mississippi Avenue** is an east-west minor arterial that extends from Gun Club Road to Harvest Road. West of Coolidge Street/Duquesne Street, Mississippi Avenue is two-lanes and transitions



to four-lanes to the east along the Waterstone neighborhood. Mississippi Avenue provides local access to adjacent residential communities at Murphy Creek and Waterstone. The speed limit in is 35 mph. Mississippi Avenue serves approximately 1,500 vpd just west of Gun Club Road (CDOT, Year 2020). Future plans indicate that Mississippi Avenue will be extended to the east as development occurs.

**Alameda Avenue** is a two-lane local roadway that runs east-west along the north boundary of the project site. It provides access between Gun Club Rd and the Traditions and Adonea subdivisions. Currently, Alameda Avenue ends just west of Powhaton Road. The posted speed limit is 25 mph within the study area and serves approximately 4,000 vpd (Count, Year 2021). Future plans indicate that Alameda Avenue will be extended to the east as development occurs.

**Jewell Avenue** is an east-west roadway that provides local access the Murphy Creek neighborhood, rural homes to the east, and E-470 to the west. Jewell Avenue has transitions from two-lanes to four-lanes within the study area. Between E-470 and SH 30, Jewell Avenue is a two-lane major arterial with a posted speed limit of 45 mph. East of SH 30, Jewell Avenue becomes four-lanes along the Murphy Creek community (roughly ½ mile) and then narrows back to two lanes with the speed remaining 45 mph. East of Powhaton Road, Jewell Avenue it becomes a local road with a 25-mph speed limit. Jewell Ave carries roughly 13,600 vpd between E-470 and SH 30 (CDOT, Year 2021) and 5,000 vpd east of SH 30 near the project area (CDOT, Year 2020).

## 4.2 Intersections

The study area includes ten (10) existing intersections that are listed below with the current traffic control and were analyzed for existing and future background year traffic operations:

- 1) Gun Club Road at Mississippi Avenue [side-street stop control]
- 2) Gun Club Road at Alameda Avenue [side-street stop control]
- 3) SH 30 at Gun Club Road [signalized]
- 4) Harvest Road at Mississippi Avenue [side-street stop control]
- 5) Harvest Road at Jewell Avenue [side-street stop control]
- 6) Jewell Avenue at SH 30/Gun Club Road [signalized]
- 7) Harvest Road at Flatrock Trail [side-street stop control]
- 8) Harvest Road at Louisiana Parkway [side-street stop control]

9) Harvest Road at Alameda Avenue [side-street stop control]

10) Powhaton Road at Alameda Avenue [side-street stop control]

The existing lane configuration at each of the study locations is illustrated on **Figure 3**.

#### 4.3 Pedestrian and Bicycle

Currently, there are sidewalks on the north side of Jewell Avenue and on the south side for ½ mile east of SH 30; on the west side of Harvest Road between Mississippi Avenue and Jewell Avenue; both sides of Harvest Road north of Alameda Avenue; the north side of Alameda Avenue east of Harvest Road; and both sides of Mississippi Avenue. There are no sidewalks along SH 30, Gun Club Road, or Powhaton Road within the study area.

The High Plains Trail/E-470 Regional Trail follows the alignment of the E-470 toll road to the west of the study area, connecting several communities including the Town of Parker, City of Aurora, and City of Lone Tree. This multi-use path provides access to Chatfield Reservoir, the Platte River Trail, the Cherry Creek Trail, and several local recreational/commuter trails.

There are no on-street bike facilities or designated bike routes within the project study area. Bikes are encouraged to travel on the multi-use paths and are permitted to travel within general purpose lanes or shoulders of the study roadways.

#### 4.4 Transit

Currently, there is no transit service within the study area.

#### 4.5 Year 2021 Existing Intersection Capacity Analysis

The existing volumes, lane configuration, and traffic control are illustrated on **Figure 3**. The results of the LOS calculations for the intersections are summarized in **Table 1**. The details of LOS for each movement are provided in **Table 2** (refer to **Appendix**). The intersection Level of Service worksheets are attached in the **Appendix**. **All the study intersections currently operate overall at LOS D or better in both peak hours.**

**Table 1: Existing Overall Level of Service Summary**

No.	Intersection	Traffic Control	AM Peak Hour	PM Peak Hour
1	Gun Club Rd. & Alameda Ave.	Stop	A (C)	A (E)
2	Gun Club Rd. & Mississippi Ave.	Stop	A (C)	A (E)
3	SH-30 & Gun Club Rd.	Signal	C	E
4	SH-30/Gun Club Rd. & Jewell Ave.	Signal	C	C
5	Harvest Rd. & Jewell Ave.	Stop	A (A)	A (A)
6	Harvest Rd. & Flatrock Tr.	Stop	A (A)	A (A)
7	Harvest Rd. & Louisiana Pkwy.	Stop	A (A)	A (A)
8	Harvest Rd. & Mississippi Ave. <sup>1</sup>	Stop	N/A	N/A
9	Harvest Rd. & Alameda Ave.	Stop	A (A)	A (B)
10	Powhaton Rd. & Alameda Ave.	Stop	A (A)	A (A)

*Note: Level of Service for unsignalized intersections is listed as Overall (Worst Movement)*

<sup>1</sup> Due to current two-leg road configuration, LOS cannot be calculated for this intersection. LOS results will be provided for any future scenarios that result in a configuration with more than 2 legs.

The following study intersections currently operate at LOS E/F or have movements that operate at LOS E/F during the one of both peak hours:

- **#1 – Gun Club Road & Alameda Avenue:** This side-street stop-controlled intersection currently operates overall at LOS A in both peak hours; however, the westbound approach operates at LOS E during the PM peak hour. The 95<sup>th</sup> percentile queue was estimated to be 93 feet (about four vehicles).

**Recommendations:** No mitigation measures recommended. The delay is less than one minute, and the queue is minimal. Delay is expected for the side-street approaches on arterial roadways.

- **#2 – Gun Club Road & Mississippi Avenue:** This side-street stop-controlled intersection currently operates overall at LOS A in both peak hours; however, the westbound approach operates at LOS E during the PM peak hour. The 95<sup>th</sup> percentile queue was estimated to be 120 feet (about five vehicles).

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**Recommendations:** No mitigation measures recommended. The delay is less than one minute, and the queue is minimal. Delay is expected for the side-street approaches on arterial roadways.

- **#3 – 6<sup>th</sup> Avenue (SH-30) & Gun Club Road:** This signalized intersection currently operates overall at LOS C in the AM peak hour and LOS E in the PM peak hour. The westbound left-turn operates at LOS E during both peak hours due to the high volume and limited green time. The 95<sup>th</sup> percentile queue was estimated to be up to 445 feet, which is approaching the upstream commercial intersection. The northbound right-turn operates at LOS F during the PM peak hour, due to the volume approaching 600 vph.

**Recommendations:** Install a right turn overlap phase for northbound right turns, to allow those drivers to proceed concurrently with the westbound turning phases. It is likely that Synchro is overestimating the northbound right-turn delay by assuming every vehicle stops fully on red and waits to proceed. An overlap phase will improve operations to LOS C overall.

- **#4 – Gun Club Road (SH-30) & Jewell Avenue:** This signalized intersection currently operates overall at LOS C in both peak hours; however, there are several movements that currently operate at LOS E/F in one or both peak hours. The eastbound through operate at LOS E in both peak hours and westbound through operates at LOS F in both peak hours. The eastbound right-turn operates at LOS E in the AM peak hour. It is anticipated that the high delays are resultant of high volumes on Gun Club Road (SH 30) and limited green time for Jewell Avenue. All of the 95<sup>th</sup> percentile queues were estimated to be maintained in the existing storage lengths.

**Recommendations:** Provide an overlap phase for the eastbound right-turn movement. Consider retiming the signal to provide more green time to the side streets, which can be accomplished without sacrificing operational performance for the main street. If 10 seconds were redistributed from the main through phase to the side street, then the operations of the side-street through movements will improve to LOS D in the AM peak hour (from LOS E) and LOS E in the PM peak hour (from LOS F). The overall LOS remains LOS C.

## 5.0 Future Conditions

### 5.1 Annual Growth Factor and Future Volume Methodology

In order to forecast the future peak hour traffic volumes, background traffic growth assumptions were estimated based on the City's NEATS Refresh report. The study incorporated vehicular traffic associated with the Parklands project and nearby developments. The forecasted volumes included the extension of and completion of Alameda Avenue, Mississippi Avenue, Harvest Road, Powhatan Road, and Monaghan Road. The following methodology was used to attain the Year 2040 background peak hour traffic projections:

1. Year 2040 roadway volumes from the NEATS Refresh were assumed to include the Parklands site-generated trips. These volumes represent the "Year 2040 background + project" scenario.
2. Estimate turning movement intersection volumes from roadway link volumes at the arterial/arterial roadways.
3. Estimated the site-generated trips for Parklands and assign to the roadway network. Refer to **Section 6.0** for more details on trip generation, distribution, and assignment assumptions.
4. Subtracted the Parklands trips from the Year 2040 background + project volumes. These volumes represent the "Year 2040 background" scenario.

Using these assumptions, the Year 2040 background traffic is summarized on **Figure 4A** (existing intersections) and **Figure 4B** (new external intersections).

### 5.2 Year 2040 Anticipated Transportation Network

For comparison purposes, this traffic study assumes that some of the planned roadways in NEATS Refresh report will be completed by Year 2040 background. If the future scenarios were evaluated with the existing roadway network, then it would be difficult to compare intersection operates when many of the intersections will be altered due to future volumes, capacity, and routing that are not associated with the project. It is understood that many of these roadways or segments of these roadways will be built with the Parklands development. The following roadway and intersection improvements were assumed to be completed by Year 2040:

- **Gun Club Road** – Widen to two lanes per direction north of 6<sup>th</sup> Avenue (SH 30). Widen to three lanes per direction south of Jewell Avenue.
- **6<sup>th</sup> Avenue (SH 30)** – Widen to two lanes per direction north of Jewell Avenue.



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- **Harvest Road** – Construct two lanes per direction from Mississippi Avenue to Alameda Avenue. Widened to two lanes per direction between Jewell Avenue and Mississippi Avenue. NEATS Refresh indicates that this roadway would ultimately be three lanes per direction; however, the NEATS Refresh volumes are not approaching the threshold to widen beyond two lanes per direction in Year 2040.
  - **Mississippi Avenue** – Extend east from Harvest Road to future Monaghan Road. Widen and construct to be two lanes per direction.
  - **Powhaton Road** – Widened to two lanes per direction with wide median between Mississippi Avenue and Jewell Avenue. Realignment Powhaton Road near Jewell Avenue.
  - **Monaghan Road**: Construct two lanes per direction on the future alignment.

In addition to the through lanes on the arterial roadways, the following turn lanes were assumed to be constructed for future background volumes and capacity:

- **Gun Club Road & Alameda Avenue** – Add one westbound left-turn lane; one southbound left-turn lane; and one northbound right-turn lane.
- **Gun Club Road & Mississippi Avenue** – Add one westbound left-turn lane and southbound dual left-turn lanes.
- **6<sup>th</sup> Avenue (SH 30) & Gun Club Road** – Add second westbound left-turn lane.
- **Jewell Avenue & Gun Club Road (SH 30)** – Add second eastbound left-turn lane; second northbound left-turn lane.
- **Jewell Avenue & Harvest Road** – Construct northbound approach with one left-turn lane, one through lane, and one through/right-turn lane. Add one eastbound right-turn lane; one westbound left-turn lane, one westbound right-turn lane; one southbound left-turn lane, and one southbound right-turn lane.
- **Harvest Road & Flatrock Trail** – Construct northbound left-turn lane.
- **Harvest Road & Louisiana Parkway** – Construct northbound left-turn lane.
- **Harvest Road & Mississippi Avenue (south T-intersection)** – Construct one northbound left-turn lane and one southbound right-turn lane.

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- **Harvest Road & Mississippi Avenue (north T-intersection)** – Construct westbound approach with one westbound left-turn lane and one westbound right-turn lane. Construct one northbound right-turn lane and one southbound left-turn lane.
  - **Harvest Road & Alameda Avenue** – Add northbound approach with one left-turn lane, two through lanes, and one right-turn lane. Add one eastbound left-turn and the outside through lane will become a shared through/right-turn lane; one westbound left-turn lane; one westbound right-turn lane.
  - **Alameda Avenue & Powhatan Road** – Add eastbound approach with one left-turn lane and one shared through/right-turn lane. Add one northbound left-turn lane and one westbound left-turn lane. The outside southbound through lane will become a shared through/right-turn lane.
  - **[Future] Powhatan Road & Mississippi Avenue** – Construct eastbound and westbound approaches with one left-turn lane; one through lane; and one shared through/right-turn lane. Add one northbound left-turn lane; one northbound right-turn lane; one southbound left-turn lane; and one southbound right-turn lane.
  - **[Future] Monaghan Road & Mississippi Avenue** – Construct eastbound approach with one left-turn lane; one through lane; and one right-turn lane. Construct westbound approach with one left-turn lane and one shared through/right-turn lane. Construct northbound and southbound approaches with one left-turn lane; one through lane and one shared through/right-turn lane.
  - **[Future] Jewell Avenue Monaghan Road** – Add one eastbound left-turn lane; include right-turn on outside through lane; one westbound left-turn lane; and include rights on outside through lane. Construct northbound approach with one left-turn lane; one through lane; and one right-turn lane. Construct southbound approach with one left-turn lane; one through lane; and one right-turn lane.

These roadway and intersection improvements were assumed to be in place in the background condition for the long-term scenario for comparison purposes with the project trips and are shown on **Figure 4A** (existing intersections) and **Figure 4B** (new external intersections).

### 5.3 Year 2040 Background Intersection Capacity Analysis

The study area intersections were evaluated to determine baseline operations for the Year 2040 background scenario and to identify any capacity constraints associated with background traffic in the long-term scenario (refer to **Section 5.1** for growth assumptions). The long-term background volumes, lane configuration, and traffic control are illustrated on **Figure 4A** (existing intersections) and **Figure 4B** (new external intersections).

The Level of Service criteria discussed previously was applied to the study area intersections to determine the impacts with the long-term background volumes. The analysis assumed the signal timing at all signalized intersections would be adjusted to accommodate the additional lanes, additional approaches, and change in traffic volumes.

The results of the LOS calculations for the intersections are summarized in **Table 3**. The details of LOS for each movement are provided in **Table 2** (refer to **Appendix**). The intersection Level of Service worksheets are attached in the **Appendix**.

**Table 3: Year 2040 Background Overall Level of Service Summary**

No.	Intersection	Traffic Control	AM Peak Hour	PM Peak Hour
1	Gun Club Rd. & Alameda Ave.	Signal	B	B
2	Gun Club Rd. & Mississippi Ave.	Signal	C	B
3	SH-30 & Gun Club Rd.	Signal	C	C
4	SH-30/Gun Club Rd. & Jewell Ave.	Signal	D	D
5	Harvest Rd. & Jewell Ave.	Signal	D	C
6	Harvest Rd. & Flatrock Tr.	Stop	A (C)	A (C)
7	Harvest Rd. & Louisiana Pkwy.	Stop	A (C)	A (C)
8	Harvest Rd. & Mississippi Ave.	Signal	B	A
9	Harvest Rd. & Alameda Ave.	Signal	C	C
10	Powhaton Rd. SB & Alameda Ave.	Stop	A (D)	B (F)
11	Harvest Rd. & Mississippi Ave.	Signal	B	B
12	Powhaton Rd. & Mississippi Ave.	Stop	A (C)	A (C)
13	Jewell Ave. & Powhaton Rd.	Signal	C	C
14	Monaghan Rd. & Mississippi Ave.	Stop	A (B)	A (B)
15	Jewell Ave. & Monaghan Rd.	Stop	A (F)	A (F)

*Note: Level of Service for unsignalized intersections is listed as Overall (Worse Movement)*

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In summary, majority of the study intersections warranted a signal and operates are acceptable with the change in traffic control and additional through and auxiliary lanes. The following intersections or movements were calculated to begin operating at LOS E/F in one or both peak hour in Year 2040 background as described below:

- **#4 – Jewell Avenue at Gun Club Road:** This signalized intersection was estimated to begin operating at LOS D in both peak hours; however, there were several movements that began to operate at LOS E/F during one or both peak hours. All four left-turn movements were calculated to operate at LOS E in both peak hours due to the high volumes, protected only phasing, and limited green time. The eastbound right-turn movement was estimated to operate at LOS E in the PM peak hour due to limited green time. The 95<sup>th</sup> percentile queues for all of these movements were calculated to be maintained within the existing storage lengths.

**Recommendations:** No mitigation measures recommended. This intersection is built out with the auxiliary lanes necessary to accommodate the volumes. It is expected that protected-only left-turns will operate below LOS D at large intersections with limited green time to serve the high volumes on all approaches.

- **#10 – Powhaton Road at Alameda Avenue:** This future side-street stop-controlled intersection was estimated to operate overall at LOS A in the AM peak hour and LOS B in the PM peak hour; however, a few side-street movements were estimated to operate at LOS E/F in the PM peak hour. The eastbound left-turn was estimated to operate at LOS F and the 95<sup>th</sup> percentile queue was calculated to be 30 feet. The westbound movements were estimated to operate at LOS E with the 95<sup>th</sup> percentile calculated to be three vehicles or less.

**Recommendations:** No mitigation measures recommended. The volumes are not approaching signal warrant thresholds and delays are expected on side-street approaches on arterial roadways.

- **#15 – Jewell Avenue at Monaghan Road:** This future side-street stop-controlled intersection was estimated to operate overall at LOS A in the AM peak hour and LOS B in the PM peak hour; however, a few side-street movements were estimated to operate at LOS E/F in one or both peak hours. The 95<sup>th</sup> percentile calculated to be five vehicles or less.

**Recommendations:** No mitigation measures recommended. The volumes are not approaching signal warrant thresholds and delays are expected on side-street approaches on arterial roadways.

## 6.0 Future Conditions with the Parklands Development

The Parklands development is anticipated to include a mix of single-family and multi-family residential homes with schools, parks, a community center, office space, and commercial retail land uses. The site is planned to be developed over several years and divided into three Villages (1, 2, and 3). For the purpose of this traffic study, it was assumed that these three Villages will be completed by Year 2040.

The National Cooperative Highway Research Program (NCHRP)'s Report 365: Travel Estimation Techniques for Urban Planning<sup>2</sup> provides trip characteristics for and data to support household-based approaches for trip estimation and modeling. These types of trips are contained within the Parklands property to shop at or work at or recreate at land uses within the site without traveling on the external roadways. Data in NCHRP 365 shows that on average 20% of home-based trips are to/from work, 57% are "home-based other", which would include trips to/from schools, to/from retail, etc., and the remaining 23% being "non-home based", which could be deliveries, mail, and other services.

Assumptions for Parklands trips were made using the NCHRP data as a basis. It was assumed that retail trips were 30% internal home-based trips, office space trips were 30% internal home-based trips, and school trips were 90% internal home-based trips. Trips associated with the community center were assumed to include 50% internal home-based trips since it is anticipated that this will be a local amenity.

Since the schools are anticipated to primarily serve the residences of Parklands and adjacent neighborhoods, it was assumed that majority of the trips would be internal, diverted, or non-auto. Typically, school traffic does not create new traffic, instead redirects home-to-work and work-to-home trips. It is anticipated that 90% of the school trips will be from the homes within Parklands and the remaining trips will travel from the nearby neighborhoods. It was assumed that each of the K-8 schools will serve the Village that it is located in, and the high school will serve all of Parklands.

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<sup>2</sup> NCHRP Report 365 – Travel Estimation Techniques for Urban Planning. Transportation Research Board. Washington, D.C. 1998.

It should be noted that the internal commercial and school traffic was not removed from the trip volume, but they were redirected from residential trips since those trips will continue on to their destination after their stop within Parklands.

## 6.1 Trip Generation

A trip generation estimate was performed to determine the traffic characteristics of the proposed density and land uses of the Parklands development. The trip rates contained in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*<sup>3</sup> were applied to estimate the traffic for the proposed land uses:

- #210 "Single-family Detached Housing"
- #221 "Multi-family Housing (Mid-Rise)"
- #411 "Public Park"
- #495 "Recreational Community Center"
- #520 "Elementary School"
- #522 "Middle School/Junior High School"
- #530 "High School"
- #710 "General Office Building"
- #820 "Shopping Center"

**Table 4** provides the detailed trip generation estimates for the Parklands project (refer to the **Appendix**). The proposed project is expected to experience mostly new trips, also known as 'primary trips', as well as pass-by trips, multi-use trips, and non-auto trips which are discussed below:

Primary Trips. These trips are made specifically to visit the site and are considered "new" trips. Primary trips would not have been made if the proposed project did not exist. Therefore, this is the only trip type that increases the total number of trips made on a regional basis.

Pass-By Trips. Pass-by trips do not create any increase in the traffic volumes within the primary impact area. In fact, the only impact of the pass-by trips is at the site driveways and adjacent intersections where through movements become turning movements into and out of the site. Therefore, pass-by trips have no additional impact on the road system beyond the site's driveways or immediately adjacent intersections. With or without pass-by trips, the total trips to/from a project will remain the same. Pass-by was only applied to the retail portions of the project. For pass-by trips, the methodology set forth in ITE's *Trip Generation Manual* (Chapter 10) was utilized.

Multi-Use (Internal) Trips. These internal trips occur from one land use or building to another within the site boundaries. Multi-use or multi-purpose trips typically do not affect the exterior site access points, nor add any additional traffic volumes to the adjacent street network. Within

<sup>3</sup> *Trip Generation Manual, 10<sup>th</sup> Edition*, Institute of Transportation Engineers, 2017.



Parklands, some of the internal trips will travel along the internal site circulation road network since there is a limited local street network between land uses as discussed previously.

Non-Auto Trips. These trips are those that are completed by walking, biking, or transit. The non-auto trips for the Parklands Aurora site were assumed to be included in the internal percentages.

**The Parklands project was estimated to generate approximately 93,220 daily trips with approximately 5,940 trips in the AM peak hour and 9,415 trips in the PM peak hour.**

## 6.2 Trip Distribution and Assignment

The estimated trip volumes were distributed onto the study area street network based on existing traffic characteristics, land uses, and traffic patterns in the area, as well as regional growth and future roadway infrastructure. The trip distributions were estimated based on distributions utilized for adjacent development. The following distributions by land use type as listed below and presented in **Table 5** and on **Figure 5**.

**Table 5: Distribution Summary per Land Use Type**

To/From	Trip Distribution Per Land Use Type		
	Residential	Commercial	School
West Jewell Avenue	20%	10%	0%
East Jewell Avenue	5%	10%	1%
South Gun Club Road	15%	5%	0.5%
North Gun Club Road	15%	10%	0.5%
Northwest SH 30	10%	5%	0.5%
North Harvest Road	15%	10%	1%
South Harvest Road	0%	5%	1%
North Powhatan Road	10%	10%	1%
North Monaghan Road	5%	10%	1%
South Monaghan Road	5%	5%	1%
East Mississippi Avenue	0%	5%	0.5%
East Alameda Avenue	0%	5%	1%
Adjacent Neighborhoods	0%	5%	1%
Internal	0%	30%	90%

Using these distribution assumptions, the projected site traffic for each planning area was assigned to the study area roadway network and appropriate accesses for the weekday AM and PM peak hour periods during based on the most convenient route. The proposed accesses for the Parklands project are shown on **Figure 6**.

The new site-generated trips for the existing study intersections are shown on **Figure 7A** (existing intersections), **Figure 7B** (new external intersections), and **Figure 7C** (access and internal intersections).

### 6.3 Proposed Roadway Network and Access

Access to the Parklands site is planned via multiple driveways along the Jewell Avenue, Harvest Road, and the future arterial and collector roadways. This high-level traffic study focused on the intersections along the arterials and collectors and did not identify local street intersections/accesses. The proposed access and internal intersections are shown and labeled on **Figure 6**. The Manual on Uniform Traffic Control Devices<sup>4</sup> (MUTCD) signal warrants for the peak hour were utilized, for planning purposes, to determine if a signal should be considered as the traffic control at the future intersections. The following external intersections have volumes that meet the need for a signal with project trips on shown in **Figure 7A**:

- #6 Harvest Road & Flatrock Trail
- #7 Harvest Road & Louisiana Parkway
- #10 Powhatan Road & Alameda Avenue
- #12 Powhatan Road & Mississippi Avenue
- #14 Monaghan Road & Mississippi Avenue
- #15 Jewell Avenue & Monaghan Road

There are several internal and accesses intersections that are proposed to be signalized if volumes warrant or a roundabout as illustrated on **Figure 7B** and **Figure 7C**. The need for turn lanes at all study intersections was based on turn volume, opposing volume, and roadway classification. Internally, collector streets will be constructed to provide the most beneficial access into and around the site with pedestrian and bicycle friendly amenities.

### 6.4 Future Pedestrian and Bicycle Facilities

add NEATS  
improvements

The Parklands project proposes to have sidewalks and multi-use paths throughout the property to connect internally and externally. Refer to the design plans for the locations, widths, and connections of the pedestrian and bicycle facilities associated with this project.

<sup>4</sup> Manual on Uniform Traffic Control Devices. Federal Highway Administration. Washington, D.C. 2009.

According to the City of Aurora's Bike Map, it is planned that the Triple Creek Trail be completed between the Pronghorn Natural Area to the south and the Aurora Sports Park to the northwest. The Triple Creek Trail is planned to travel through the Parklands project site and at completion will connect to the existing Sand Creek Regional Greenway, Aurora Reservoir, other local and regional recreational amenities. The future First Creek Trail is also planned by the City of Aurora to connect to the Triple Creek Trail within the Parklands property. This trail will travel east of the project and then north towards and beyond I-70 connecting to other growth areas of Aurora.

## 6.5 Year 2040 Background + Project Intersection Capacity Analysis

This section discusses impacts associated with the addition of the Parklands development trips in the short-term scenario. The site-generated volumes were added to the Year 2040 background volumes and are illustrated on **Figure 8A** (existing intersections), **Figure 8B** (new external intersections), **Figure 8C** (access and internal intersections). These figures also illustrate the necessary traffic control and lane configurations for all of the study intersections and proposed accesses. Note that there is potential that additional access locations be identified at the filing level which will need to include an updated traffic study or traffic letter (per City requirement) to ensure the future proposed access has the appropriate permitted movements and traffic control. The analysis assumed the signal timing at all existing and future signalized intersections would be adjusted to accommodate future conditions, therefore, optimized timing was utilized.

The results of the LOS calculations for the intersections are summarized in **Table 6**. The details of the LOS for each movement are listed in **Table 2** (existing intersections) and **Table 7** (proposed accesses). The intersection Level of Service worksheets are attached in the **Appendix**.

**Table 6: Year 2040 Background + Project Overall Level of Service Summary**

No.	Intersection	Traffic Control	AM Peak Hour	PM Peak Hour
1	Gun Club Rd. & Alameda Ave.	Signal	B	B
2	Gun Club Rd. & Mississippi Ave.	Signal	C	C
3	SH-30 & Gun Club Rd.	Signal	C	C
4	SH-30/Gun Club Rd. & Jewell Ave.	Signal	E	E
5	Harvest Rd. & Jewell Ave.	Signal	D	D
6	Harvest Rd. & Flatrock Tr.	Signal	B	D
7	Harvest Rd. & Louisiana Pkwy.	Signal	B	C

No.	Intersection	Traffic Control	AM Peak Hour	PM Peak Hour
8	Harvest Rd. & Mississippi Ave.	Signal	B	B
9	Harvest Rd. & Alameda Ave.	Signal	C	C
10	Powhatan Rd. SB & Alameda Ave.	Signal	C	C
11	Harvest Rd. & Mississippi Ave.	Signal	B	B
12	Powhatan Rd. & Mississippi Ave.	Signal	C	D
13	Jewell Ave. & Powhatan Rd.	Signal	C	C
14	Monaghan Rd. & Mississippi Ave.	Signal	B	C
15	Jewell Ave. & Monaghan Rd.	Signal	D	D
101	Jewell Ave. & Flatrock Tr.	Signal	D	D
102	Jewell Ave. & Louisiana Pkwy.	Signal	C	D
103	Jewell Ave. & Road 2	Signal	C	C
104	Flatrock Tr. At Road 1	Stop	A (A)	A (A)
105	Louisiana Pkwy. at Road 1	Stop	A (B)	A (B)
106	Powhatan Rd. & Road 3	Signal	C	C
107	Road 3 & Road 2	Rdabt	A (A)	C (C)
108	Monaghan Rd & Road 3	Signal	B	C
109	Mississippi Ave. & Little River St.	Signal	B	B
110	Mississippi Ave. & Road 2	Signal	C	D
111	Harvest Rd. & Road 4	Signal	C	C
112	Road 4 & Little River St.	Rdabt	A (A)	A (A)
113	Powhatan Rd. & Road 4	Signal	C	C
114	Road 2 & Road 4	Stop	A (C)	C (D)
115	Monaghan Rd. & Road 4	Stop	A (C)	C (D)
116	Alameda Ave. & Jamestown Way	Stop	A (B)	A (C)
117	Alameda Ave. & Little River St.	Stop	A (B)	A (C)
118	Alameda Ave. & New Castle Way	Stop	A (C)	A (C)

Note: Level of Service for unsignalized intersections is listed as Overall (Worse Movement)

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The study intersections are anticipated to operate similarly to the background conditions with the Parklands project trips. The following intersections are anticipated to have one or more movements that begin to operate below LOS D with the additional project trips:

- **#4 – Jewell Avenue at Gun Club Road:** This signalized intersection was estimated to begin operating at LOS E in both peak hours with several movements operating at LOS E/F during one or both peak hours. All four dual left-turn movements were calculated to operate at LOS E/F in both peak hours due to the high volumes, protected only phasing, and limited green time. The westbound and southbound through movements operate at LOS E in the AM peak hour. The eastbound and northbound through movements operate at LOS E in the PM peak hour. The 95<sup>th</sup> percentile queues can be maintained within the future storage lengths.

**Recommendations:** No mitigation measures recommended. This intersection is built out with the auxiliary lanes necessary to accommodate the volumes. The analysis assumed that this intersection would need to increase the cycle length to 150 seconds to operate at LOS E overall.

The unlisted proposed internal and access intersections are anticipated to operate overall at LOS C or better in both peak hours with all of the movements performing at LOS D or better.

## 7.0 Queuing Analysis

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A queuing analysis was performed to determine if the 95<sup>th</sup> percentile queues would be accommodated by the existing storage length, to determine the storage lengths for future auxiliary lanes, and if any of the queues would impact an upstream intersection/access. **Table 8** provides the existing and proposed storage lengths, as well as the 95<sup>th</sup> percentile queues for each existing and future scenario as calculated by Synchro (assuming each vehicle utilizes 25 feet of space). It should be noted that the 95<sup>th</sup> percentile queue length is a theoretical queue that is 1.65 standard deviations above the average queue length. In theory, the 95<sup>th</sup> percentile queue would be exceeded 5% of the time based on the average queue length, but it is also possible that a queue this long may not occur.

Recommendations for turn lanes at the existing and internal/access intersections were discussed in previous sections and are summarized on **Figure 8A**, **Figure 8B**, and **Figure 8C**. Recommended turn lanes storage lengths and taper lengths are listed in **Table 8**, which are based on the CDOT State Highway Access Code for the assumed posted speed of each study roadway. Classification of NR-B was utilized for the study roadways.

## 8.0 Roadway Capacity

The City of Aurora defines the roadway capacity in the *Northeast Aurora Transportation Study (NEATS Refresh)* report. Roadway capacity can be defined as “the maximum traffic volume that a roadway can carry at a desired level of service”. Roadway capacity varies for different roadway classifications, surface types, number of lanes, geometric widths, area type (rural, urban), and terrain type (level, rolling, mountainous). *NEATS Refresh* provides acceptable buildout performance (LOS D-E threshold) based on classification, number of lanes and the Year 2040 daily volume. **Table 9** provides the roadway level of service within the Parklands study area.

**Table 9: Year 2040 Roadway Level of Service Summary**

Roadway	NEATS Classification	Lanes per Direction	Segment	2040	
				Volume	LOS
SH 30	Major Arterial	2	Northwest of Gun Club Rd.	21,400	B
		3	Gun Club Rd. to Jewell Ave.	26,500	B
Gun Club Road	Minor Arterial	2	South of Jewell Ave.	25,100	C
			Jewell Ave. to Mississippi Ave.	18,700	B
			Mississippi Ave. to Alameda Ave.	24,900	C
Jewell Avenue	Major Arterial	3	Gun Club Rd. to Harvest Rd.	46,300	C
			Harvest Rd. to Powhatan Rd.	38,000	B
			Powhatan Rd. to Monaghan Rd.	28,900	B
Mississippi Avenue	Major Arterial	2	Gun Club Rd. to Harvest Rd.	15,400	A
			Harvest Rd. to Powhatan Rd.	17,200	B
			Powhatan Rd. to Monaghan Rd.	15,500	B
Alameda Avenue	Collector	1	Gun Club Rd. to Harvest Rd.	4,100	A
	Minor Arterial	2	Harvest Rd. to Powhatan Rd.	7,700	A
			Powhatan Rd. to Monaghan Rd.	5,500	A
Harvest Road	Major Arterial	2	Jewell Rd. to Mississippi Ave.	20,400	B
			Mississippi Ave. to Alameda Ave.	27,600	B
Powhatan Road	Major Arterial	2	Jewell Rd. to Mississippi Ave.	21,000	B
			Mississippi Ave. to Alameda Ave.	19,700	B
Monaghan Road	Major Arterial	2	Jewell Rd. to Mississippi Ave.	9,000	A
			Mississippi Ave. to Alameda Ave.	8,400	A



## 9.0 Conclusions

The Parklands development project proposes to develop up to 6,967 single-family homes, 2,512 multi-family homes, 1,124,000 sq. ft. of commercial retail space, 373,000 sq. ft. of office space, two Kindergarten-8<sup>th</sup> schools, one Preschool-12<sup>th</sup>, and community amenities. The 1,980± acres of vacant property are located in between Harvest Road and future Monaghan Road, Alameda Avenue to Jewell Avenue. The project includes the construction or expansion of several roads, including Harvest Road, Mississippi Avenue, Powhaton Road, Monaghan Road, and several collector roads for internal circulation. In addition to the arterial roadways, several new collector roadways will be constructed within each Village of Parklands. The property will be developed over time with the assumed completion with the next 20 years. Internally, local streets will be constructed to provide the most beneficial access into and around the site for people driving, walking, and biking.

The project is estimated to generate approximately 93,220 daily trips with about 5,940 trips occurring in the AM peak hour and 9,415 trips occurring in the PM peak hour at full build-out. **It was determined that the proposed roadway system can adequately accommodate the projected traffic volumes for buildout conditions.** The following recommendations should be considered:

### **Background Conditions (Non-Project Related):**

- **Gun Club Road** – Widen to two lanes per direction north of 6<sup>th</sup> Avenue (SH 30). Widen to three lanes per direction south of Jewell Avenue.
- **6<sup>th</sup> Avenue (SH 30)** – Widen to two lanes per direction north of Jewell Avenue.
- **Gun Club Road & Alameda Avenue** – Signalize. Add one westbound left-turn lane; one southbound left-turn lane; and one northbound right-turn lane.
- **Gun Club Road & Mississippi Avenue** – Signalize. Add one westbound left-turn lane and southbound dual left-turn lanes.
- **6<sup>th</sup> Avenue (SH 30) & Gun Club Road** – Add second westbound left-turn lane.
- **Jewell Avenue & Gun Club Road (SH 30)** – Add second eastbound left-turn lane; second northbound left-turn lane.
- **Jewell Avenue & Harvest Road** – Construct northbound approach with one left-turn lane, one through lane, and one through/right-turn lane.

- **[Future] Jewell Avenue Monaghan Road** – Construct northbound approach with one left-turn lane; one through lane; and one shared through/right-turn lane. The outside eastbound through lane will be shared with right-turns. Construct one westbound left-turn lane.
- **All signalized intersections:** Adjust signal timing as appropriate for increases in volume. Balance the green time to serve all the movements and pedestrian crossings. All adjustments to signal timing will need to be evaluated for progression along the appropriate corridor.

### **Project Conditions:**

- **Harvest Road** – Construct two lanes per direction from Mississippi Avenue to Alameda Avenue. Widened to two lanes per direction between Jewell Avenue and Mississippi Avenue.
- **Mississippi Avenue** – Extend east from Harvest Road to future Monaghan Road. Widen and construct with two lanes per direction.
- **Powhatan Road** – Widened to two lanes per direction from Mississippi Avenue to Jewell Avenue. Realignment Powhatan Road near Jewell Avenue.
- **Monaghan Road:** Construct two lanes per direction from Jewell Avenue to north of Mississippi Avenue on the future alignment.
- **Gun Club Road & Mississippi Avenue** – Add second westbound left-turn lane.
- **6<sup>th</sup> Avenue (SH 30) & Gun Club Road** – Add second southbound left-turn lane.
- **Jewell Avenue & Gun Club Road (SH 30)** – Add second westbound left-turn lane, second southbound left-turn lane, and northbound right-turn lane.
- **Jewell Avenue & Harvest Road** – Signalize. Construct southbound approach with one left-turn lane, two through lanes, and channelized right-turn lane. Add second eastbound left-turn lane; one westbound left-turn lane, and one westbound right-turn lane.
- **Harvest Road & Flatrock Trail** – Signalize. Construct northbound left-turn lane, southbound left-turn lane, and westbound approach with one left-turn lane and one shared through/right-turn lane. Restripe the eastbound approach to have one left-turn lane and one shared through/right-turn lane.
- **Harvest Road & Louisiana Parkway** – Signalize. Construct northbound left-turn lane, southbound left-turn lane, and westbound approach with one left-turn lane and one shared through/right-turn lane. Restripe the eastbound approach to have one left-turn lane and one shared through/right-turn lane.

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- **Harvest Road & Mississippi Avenue (south T-intersection)** – Signalize. Construct one northbound left-turn lane and one southbound right-turn lane.
  - **Harvest Road & Mississippi Avenue (north T-intersection)** – Signalize. Construct westbound approach with one left-turn lane and one right-turn lane. Construct one northbound right-turn lane and one southbound left-turn lane.
  - **Harvest Road & Alameda Avenue** – Signalize. Add northbound approach with one left-turn lane, two through lanes, and one right-turn lane. Add one eastbound left-turn and the outside through lane will become a shared through/right-turn lane; one westbound left-turn lane; one westbound right-turn lane.
  - **Alameda Avenue & Powhatan Road** – Signalize. Add eastbound approach with one left-turn lane, one through lane, and one right-turn lane (end of second through lane). Add one northbound left-turn lane, one southbound right-turn lane, and one westbound left-turn lane.
  - **[Future] Powhatan Road & Mississippi Avenue** – Construct eastbound and westbound approaches with one left-turn lane; one through lane; and one shared through/right-turn lane. Construct the northbound and southbound approaches with one left-turn lane, two through lanes and one right-turn lane.
  - **[Future] Monaghan Road & Mississippi Avenue** – Construct eastbound approach with one left-turn lane; one through lane; and one right-turn lane. Construct westbound approach with one left-turn lane and one shared through/right-turn lane. Construct northbound and southbound approaches with one left-turn lane; one through lane and one shared through/right-turn lane.
  - **[Future] Jewell Avenue Monaghan Road** – Signalize. Add one eastbound left-turn lane and include westbound right-turns on outside through lane. Construct southbound approach with one left-turn lane; one through lane; and one right-turn lane.

The proposed background and project-related mitigation measures are shown on **Figure 8A** (existing intersections), **Figure 8B** (new external intersections), **Figure 8C** (access and internal intersections). The proposed lengths of auxiliary lanes are listed in **Table 8**.

Note that the traffic study provides technical information and evaluates the need for transportation mitigation as traffic grows, but it does not address infrastructure commitments or obligations of the Parklands project.

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## **Tables and Figures:**

*Table 1 – Existing Overall Level of Service Summary [IN REPORT]*

**Table 2 – Peak Hour Intersection LOS Summary for Existing Intersections**

*Table 3 – Year 2040 Background Overall Level of Service Summary [IN REPORT]*

**Table 4 – Trip Generation Summary**

*Table 5 – Distribution Summary per Land Use Type [IN REPORT]*

*Table 6 – Year 2040 Background + Project Overall Level of Service Summary [IN REPORT]*

**Table 7 – Peak Hour Intersection LOS Summary for Proposed Accesses**

**Table 8 – Peak Hour Estimated 95th Percentile Queue Lengths**

*Table 9 – Year 2040 Roadway Level of Service Summary [IN REPORT]*

*Figure 1 – Vicinity Map*

*Figure 2 – Site Plan*

*Figure 3 – Existing Traffic Volumes*

*Figure 4A – Year 2040 Background Traffic Volumes (Existing Intersections)*

*Figure 4B – Year 2040 Background Traffic Volumes (New External Intersections)*

*Figure 5A – Site Trip Distribution (Overall)*

*Figure 5B – Site Trip Distribution (Commercial)*

*Figure 5C – Site Trip Distribution (Schools)*

*Figure 6A – Map of Site Intersections [Access and Internal]*

*Figure 6B – Future Roadway Classification*

*Figure 7A – Site-Generated New Trips [Existing Intersections]*

*Figure 7B – Site-Generated New Trips [New External Intersections]*

*Figure 7C – Site-Generated New Trips [Access & Internal Intersections]*

*Figure 8A – Year 2040 Background + Project Traffic Volumes [Existing Intersections]*

*Figure 8B – Year 2040 Background + Project Traffic Volumes [New External Intersections]*

*Figure 8C – Year 2040 Background + Project Traffic Volumes [Access & Internal Intersections]*

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Table 2 - Peak Hour Intersection Level of Service Summary for Existing Intersections

Intersection and Lanes Groups	2021 Existing				2040 Background				2040 Bkgd + Project			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
<b>#1. Gun Club Rd. &amp; Alameda Ave.</b>	STOP SIGN CONTROL				SIGNAL CONTROL				SIGNAL CONTROL			
	<b>5</b>	<b>A</b>	<b>5</b>	<b>A</b>	<b>17</b>	<b>B</b>	<b>16</b>	<b>B</b>	<b>16</b>	<b>B</b>	<b>16</b>	<b>B</b>
Westbound Left+Right	22	C	44	E								
Westbound Left					34	C	34	C	39	D	38	D
Westbound Right					32	C	31	C	38	D	37	D
Northbound Through+Right	0	A	0	A								
Northbound Through					19	B	18	B	18	B	18	B
Northbound Right					15	B	15	B	13	B	14	B
Southbound Left+Through	1	A	1	A								
Southbound Left					14	B	13	B	15	B	15	B
Southbound Through					12	B	12	B	11	B	13	B
<b>#2. Gun Club Rd. &amp; Mississippi Ave.</b>	SIGNAL CONTROL				SIGNAL CONTROL				SIGNAL CONTROL			
	<b>3</b>	<b>A</b>	<b>6</b>	<b>A</b>	<b>23</b>	<b>C</b>	<b>16</b>	<b>B</b>	<b>25</b>	<b>C</b>	<b>25</b>	<b>C</b>
Westbound Left+Right	18	C	48	E								
Westbound Left					33	C	33	C	31	C	33	C
Westbound Right					25	C	31	C	47	D	53	D
Northbound Through	0	A	0	A	25	C	18	B	25	C	28	C
Northbound Right	0	A	0	A	19	B	13	B	21	C	24	C
Southbound Left+Through	0	A	1	A								
Southbound Left					18	B	12	B	18	B	23	C
Southbound Through					19	B	12	B	16	B	12	B
<b>#3. SH-30/6th Ave. &amp; Gun Club Rd.</b>	SIGNAL CONTROL				SIGNAL CONTROL				SIGNAL CONTROL			
	<b>24</b>	<b>C</b>	<b>59</b>	<b>E</b>	<b>29</b>	<b>C</b>	<b>26</b>	<b>C</b>	<b>29</b>	<b>C</b>	<b>25</b>	<b>C</b>
Westbound Left	57	E	57	E	32	C	46	D	33	C	47	D
Westbound Right	38	D	31	C	46	D	38	D	47	D	41	D
Northbound Through	15	B	27	C	21	C	17	B	24	C	19	B
Northbound Right	15	B	109	F	0	A	0	A	0	A	0	A
Southbound Left	10	A	22	C	19	B	13	B	18	B	14	B
Southbound Through	9	A	14	B	16	B	7	A	17	B	9	A
<b>#4. SH-30/Gun Club Rd. &amp; Jewell Ave.</b>	SIGNAL CONTROL				SIGNAL CONTROL				SIGNAL CONTROL			
	<b>32</b>	<b>C</b>	<b>34</b>	<b>C</b>	<b>43</b>	<b>D</b>	<b>42</b>	<b>D</b>	<b>59</b>	<b>E</b>	<b>60</b>	<b>E</b>
Eastbound Left	48	D	48	D	67	E	64	E	104	F	82	F
Eastbound Through	68	E	59	E	30	C	40	D	35	D	53	D
Eastbound Right	63	E	45	D	31	C	56	E	22	C	26	C
Westbound Left	46	D	43	D	63	E	61	E	74	E	126	F
Westbound Through	>120	F	97	F	47	D	49	D	54	D	44	D
Westbound Right	49	D	47	D	33	C	44	D	25	C	26	C
Northbound Left	12	B	20	B	66	E	62	E	108	F	80	E
Northbound Through	15	B	21	C	30	C	27	C	53	D	66	E
Northbound Right	8	A	13	B	31	C	28	C	0	A	0	A
Southbound Left	12	B	16	B	75	E	73	E	89	F	118	F
Southbound Through	17	B	25	C	37	D	22	C	78	E	45	D
Southbound Right	11	B	17	B	36	D	24	C	49	D	32	C
<b>#5. Harvest Rd. &amp; Jewell Ave.</b>	STOP SIGN CONTROL				SIGNAL CONTROL				SIGNAL CONTROL			
	<b>2</b>	<b>A</b>	<b>2</b>	<b>A</b>	<b>36</b>	<b>D</b>	<b>32</b>	<b>C</b>	<b>40</b>	<b>D</b>	<b>39</b>	<b>D</b>
Eastbound Left	8	A	8	A	54	D	29	C	55	D	54	D
Eastbound Through	0	A	0	A	24	C	30	C	22	C	34	C
Eastbound Right					24	C	32	C	19	B	22	C
Westbound Through+Right	0	A	0	A								
Westbound Left					54	D	32	C	55	D	51	D
Westbound Through					28	C	38	D	47	D	38	D
Westbound Right					32	C	52	D	17	B	26	C
Northbound Left					46	D	28	C	46	D	49	D
Northbound Through+Right					49	D	30	C	51	D	47	D
Southbound Left+Right	9	A	10	A								
Southbound Left					37	D	18	B	55	D	46	D
Southbound Through					37	D	22	C	48	D	49	D
Southbound Right					52	D	24	C	0	A	0	A
<b>#6. Harvest Rd. &amp; Flatrock Tr.</b>	STOP SIGN CONTROL				STOP SIGN CONTROL				SIGNAL CONTROL			
	<b>2</b>	<b>A</b>	<b>2</b>	<b>A</b>	<b>1</b>	<b>A</b>	<b>2</b>	<b>A</b>	<b>17</b>	<b>B</b>	<b>42</b>	<b>D</b>
Eastbound Left+Right	9	A	9	A	17	C	22	C				
Eastbound Left									35	C	34	C
Eastbound Through+Right									36	D	37	D
Westbound Left									36	D	32	C
Westbound Through+Right									38	D	43	D
Northbound Left+Through	1	A	1	A								
Northbound Left					10	A	9	A	15	B	23	C
Northbound Through					0	A	0	A	25	C	43	D
Northbound Right									17	B	25	C
Southbound Left									18	B	55	D
Southbound Through+Right	0	A	0	A	0	A	0	A	5	A	43	D

Table 2 - Peak Hour Intersection Level of Service Summary for Existing Intersections

Intersection and Lanes Groups	2021 Existing				2040 Background				2040 Bkgrd + Project			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
<b>#7. Harvest Rd. &amp; Louisiana Pkwy.</b>	STOP SIGN CONTROL				STOP SIGN CONTROL				SIGNAL CONTROL			
	<b>5</b>	<b>A</b>	<b>5</b>	<b>A</b>	<b>0</b>	<b>A</b>	<b>2</b>	<b>A</b>	<b>17</b>	<b>B</b>	<b>34</b>	<b>C</b>
Eastbound Left+Right	9	A	9	A	16	C	21	C				
Eastbound Left									29	C	36	D
Eastbound Through+Right									30	C	39	D
Westbound Left									29	C	36	D
Westbound Through+Right									35	C	46	D
Northbound Left+Through	3	A	4	A								
Northbound Left					10	A	9	A	20	C	17	B
Northbound Through					0	A	0	A	11	B	55	D
Northbound Right									5	A	32	C
Southbound Left									20	B	51	D
Southbound Through+Right	0	A	0	A	0	A	0	A	18	B	5	A
<b>#8. Harvest Rd. &amp; Mississippi Ave.</b>					SIGNAL CONTROL				SIGNAL CONTROL			
					<b>11</b>	<b>B</b>	<b>8</b>	<b>A</b>	<b>20</b>	<b>B</b>	<b>12</b>	<b>B</b>
Eastbound Left					28	C	32	C	42	D	48	D
Eastbound Right					29	C	33	C	45	D	43	D
Northbound Left					14	B	9	A	15	B	9	A
Northbound Through					15	B	12	B	0	A	1	A
Southbound Through					0	A	0	A	26	C	1	A
Southbound Right					0	A	1	A	25	C	3	A
<b>#9. Harvest Rd. &amp; Alameda Ave.</b>	STOP SIGN CONTROL				SIGNAL CONTROL				SIGNAL CONTROL			
	<b>2</b>	<b>A</b>	<b>2</b>	<b>A</b>	<b>26</b>	<b>C</b>	<b>25</b>	<b>C</b>	<b>30</b>	<b>C</b>	<b>31</b>	<b>C</b>
Eastbound Left+Through	2	A	2	A								
Eastbound Left					32	C	33	C	37	D	38	D
Eastbound Through+Right					36	D	29	C	40	D	39	D
Westbound Left+Right	0	A	0	A								
Westbound Left					32	C	29	C	31	C	30	C
Westbound Through					34	C	29	C	26	C	26	C
Westbound Right					35	D	29	C	28	C	27	C
Northbound Left					21	C	25	C	21	C	28	C
Northbound Through					30	C	33	C	33	C	29	C
Northbound Right					26	C	29	C	11	B	15	B
Southbound Left	10	A	12	B	15	B	15	B	28	C	30	C
Southbound Through					23	C	20	B	29	C	36	D
Southbound Right	9	A	9	A	22	C	18	B	25	C	22	C
<b>#10a. Powhatan Rd. SB &amp; Alameda Ave.</b>	STOP SIGN CONTROL											
	<b>1</b>	<b>A</b>	<b>1</b>	<b>A</b>								
Westbound Left	10	A	9	A								
Southbound Left	0	A	0	A								
Southbound Through	0	A	0	A								
<b>#10b. Powhatan Rd. NB &amp; Alameda Ave.</b>	<b>2</b>	<b>A</b>	<b>1</b>	<b>A</b>								
Eastbound Left+Through	9	A	0	A								
Westbound Through+Right	9	A	10	A								
Northbound Through+Left	0	A	0	A								
Northbound Through+Right	0	A	0	A								
<b>#10. Powhatan Rd. &amp; Alameda Ave.</b>					STOP SIGN CONTROL				SIGNAL CONTROL			
					<b>8</b>	<b>A</b>	<b>11</b>	<b>B</b>	<b>24</b>	<b>C</b>	<b>23</b>	<b>C</b>
Eastbound Left					28	D	65	F	40	D	46	D
Eastbound Through+Right					19	C	33	D				
Eastbound Through									44	D	50	D
Eastbound Right									44	D	44	D
Westbound Left					34	D	46	E	40	D	44	D
Westbound Through+Right					11	B	38	E	47	D	54	D
Northbound Left					8	A	9	A	12	B	13	B
Northbound Through+Left					0	A	0	A	16	B	15	B
Southbound Left					8	A	8	A	12	B	11	B
Southbound Through+Right					0	A	0	A				
Southbound Through									16	B	17	B
Southbound Right									14	B	14	B
<b>#11. Harvest Rd. &amp; Mississippi Ave.</b>					SIGNAL CONTROL				SIGNAL CONTROL			
					<b>17</b>	<b>B</b>	<b>12</b>	<b>B</b>	<b>14</b>	<b>B</b>	<b>14</b>	<b>B</b>
Westbound Left					35	D	34	C	32	C	40	D
Westbound Right					35	D	34	C	43	D	33	C
Northbound Through					21	C	13	B	6	A	6	A
Northbound Right					16	B	11	B	1	A	6	A
Southbound Left					10	B	10	A	15	B	40	D
Southbound Through					9	A	10	B	1	A	1	A



Table 2 - Peak Hour Intersection Level of Service Summary for Existing Intersections

Intersection and Lanes Groups	2021 Existing				2040 Background				2040 Bkgrd + Project			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
<b>#12. Powhatan Rd. &amp; Mississippi Ave.</b>					STOP SIGN CONTROL				SIGNAL CONTROL			
Eastbound Left					3	A	6	A	34	C	37	D
Eastbound Through+Right					18	C	16	C	51	D	33	C
Eastbound Through					15	B	14	B				
Eastbound Right									43	D	40	D
Westbound Left									31	C	37	D
Westbound Through+Right					16	C	21	C	39	D	54	D
Westbound Through					16	C	13	B	54	D	40	D
Westbound Right					8	A	8	A	50	D	55	D
Northbound Left					0	A	0	A				
Northbound Through+Right									20	C	30	C
Northbound Through									20	B	28	C
Northbound Right					8	A	8	A	18	B	25	C
Southbound Left					0	A	0	A				
Southbound Through+Right									27	C	33	C
Southbound Through									24	C	29	C
Southbound Right												
<b>#13. Jewell Ave. &amp; Powhatan Rd.</b>					SIGNAL CONTROL				SIGNAL CONTROL			
Eastbound Left					31	C	22	C	34	C	33	C
Eastbound Through					40	D	27	C	52	D	54	D
Eastbound Right					13	B	24	C	13	B	15	B
Westbound Through					39	D	22	C	32	C	26	C
Westbound Right					38	D	26	C	28	C	32	C
Southbound Left					27	C	19	B	31	C	39	D
Southbound Right					35	D	18	B	54	D	52	D
<b>#14. Monaghan Rd. &amp; Mississippi Ave.</b>					STOP SIGN CONTROL				SIGNAL CONTROL			
Eastbound Left					6	A	6	A	20	B	23	C
Eastbound Through					13	B	14	B	36	D	47	D
Eastbound Right					15	B	13	B	40	D	37	D
Westbound Left					9	A	9	A	35	C	35	C
Westbound Through+Right					15	B	12	B	36	D	34	C
Westbound Through					13	B	14	B	42	D	44	D
Westbound Right					8	A	8	A	9	A	10	A
Northbound Left					0	A	0	A	10	B	11	B
Northbound Through+Right					8	A	8	A	9	A	10	A
Northbound Through					0	A	0	A	11	B	13	B
Northbound Right												
<b>#15. Monaghan Rd. &amp; Jewell Ave.</b>					STOP SIGN CONTROL				SIGNAL CONTROL			
Eastbound Left					9	A	8	A	54	D	55	D
Eastbound Through+Right					0	A	0	A				
Eastbound Through									37	D	37	D
Eastbound Right									37	D	35	C
Westbound Left					11	B	12	B	55	D	54	D
Westbound Through+Right					0	A	0	A				
Westbound Through									35	C	35	D
Westbound Right									35	C	32	C
Northbound Left					49	E	27	D	35	D	41	D
Northbound Through+Right					33	D	33	D	36	D	41	D
Northbound Through					58	F	108	F	34	C	41	D
Northbound Right					41	E	31	D	26	C	39	D
Southbound Left					11	B	10	A	29	C	27	C
Southbound Through+Right												
Southbound Through												
Southbound Right												

Note: Delay represented in average seconds per vehicle.

Table 4 - Trip Generation Summary (external)

Land Use		Size	Unit	Non-Auto Factor <sup>(1)</sup>	Internal Capture Adjust <sup>(2)</sup>	Average Daily		AM Peak Hour				PM Peak Hour			
						Rate	Total	Rate	Total	In	Out	Rate	Total	In	Out
Parklands Village 1															
1A	ITE 210 - Single-Family Detached Housing	37	DU	1.00	0.75	9.44	262	0.74	21	5	16	0.99	27	17	10
1B	ITE 210 - Single-Family Detached Housing	317	DU	1.00	0.75	9.44	2,244	0.74	176	44	132	0.99	235	148	87
1C	ITE 210 - Single-Family Detached Housing	192	DU	1.00	0.75	9.44	1,359	0.74	107	27	80	0.99	143	90	53
1D	ITE 210 - Single-Family Detached Housing	221	DU	1.00	0.75	9.44	1,565	0.74	123	31	92	0.99	164	103	61
1E	ITE 210 - Single-Family Detached Housing	108	DU	1.00	0.75	9.44	765	0.74	60	15	45	0.99	80	50	30
1F	ITE 210 - Single-Family Detached Housing	134	DU	1.00	0.75	9.44	949	0.74	74	19	55	0.99	99	62	37
1G	ITE 210 - Single-Family Detached Housing	295	DU	1.00	0.75	9.44	2,089	0.74	164	41	123	0.99	219	138	81
1H	ITE 210 - Single-Family Detached Housing	284	DU	1.00	0.75	9.44	2,011	0.74	158	40	118	0.99	211	133	78
1I	ITE 210 - Single-Family Detached Housing	207	DU	1.00	0.75	9.44	1,466	0.74	115	29	86	0.99	154	97	57
1J	ITE 210 - Single-Family Detached Housing	63	DU	1.00	0.75	9.44	446	0.74	35	9	26	0.99	47	30	17
MF-1	ITE 221 - Multi-Family Housing (Mid-Rise)	600	DU	1.00	0.75	5.44	2,448	0.36	162	42	120	0.44	198	121	77
NC-1	ITE 495 - Recreational Community Center	22	KSF	0.90	0.50	28.82	282	1.76	17	11	6	2.31	23	11	12
S-1a	ITE 520 - Elementary School	677	Students	1.00	0.10	1.89	128	0.67	45	24	21	0.17	12	6	6
S-1b	ITE 522 - Middle School/Junior High	321	Students	1.00	0.10	2.13	68	0.58	19	10	9	0.17	5	2	3
AAC-1a	ITE 710 - General Office Building	60.0	KSF	1.00	0.70	9.74	409	1.16	49	42	7	1.15	48	8	40
AAC-1b	ITE 820 - Shopping Center	181.0	KSF	1.00	0.70	37.75	4,783	0.94	119	74	45	3.81	483	232	251
Pass-By Trips: Sopping Center					0.34	1,626		0		0	0	164		79	85
New Trips for Shopping Center						3,157		119		74	45	319		153	166
Village 1 - Total New Trips:							19,648	1,444		463	981	1,984		1,169	815
Village 1 - Total Pass-By Trips:							1,626	0		0	0	164		79	85
Village 1 - Total Trips:							21,274	1,444		463	981	2,148		1,248	900

Table 4 - Trip Generation Summary (external)

Land Use		Size	Unit	Non-Auto Factor <sup>(1)</sup>	Internal Capture Adjust <sup>(2)</sup>	Average Daily		AM Peak Hour				PM Peak Hour			
						Rate	Total	Rate	Total	In	Out	Rate	Total	In	Out
Parklands Village 3															
3A	ITE 210 - Single-Family Detached Housing	161	DU	1.00	0.75	9.44	1140	0.74	89	22	67	0.99	120	76	44
3B	ITE 210 - Single-Family Detached Housing	502	DU	1.00	0.75	9.44	3554	0.74	279	70	209	0.99	373	235	138
3D	ITE 210 - Single-Family Detached Housing	692	DU	1.00	0.75	9.44	4899	0.74	384	96	288	0.99	514	324	190
3E	ITE 210 - Single-Family Detached Housing	586	DU	1.00	0.75	9.44	4149	0.74	325	81	244	0.99	435	274	161
3C	ITE 210 - Single-Family Detached Housing	1001	DU	1.00	0.75	9.44	7087	0.74	556	139	417	0.99	743	468	275
3F	ITE 210 - Single-Family Detached Housing	151	DU	1.00	0.75	9.44	1069	0.74	84	21	63	0.99	112	71	41
MF-2	ITE 221 - Multi-Family Housing (Mid-Rise)	853	DU	1.00	0.75	5.44	3,480	0.36	230	60	170	0.44	281	171	110
MF-3	ITE 221 - Multi-Family Housing (Mid-Rise)	659	DU	1.00	0.75	5.44	2,689	0.36	178	46	132	0.44	217	132	85
S-2a	ITE 520 - Elementary School	1,165	Students	1.00	0.10	1.89	220	0.67	78	42	36	0.17	20	10	10
S-2b	ITE 522 - Middle School/Junior High	555	Students	1.00	0.10	2.13	118	0.58	32	17	15	0.17	9	4	5
S-2c	ITE 530 - High School	1,684	Students	1.00	0.10	2.03	342	0.52	88	59	29	0.14	24	12	12
AAC-4a	ITE 710 - General Office Building	91	KSF	1.00	0.70	9.74	620	1.16	74	64	10	1.15	73	12	61
AAC-4b	ITE 820 - Shopping Center	275	KSF	1.00	0.70	37.75	7,267	0.94	181	112	69	3.81	733	352	381
AAC-5a	ITE 710 - General Office Building	90	KSF	1.00	0.70	9.74	614	1.16	73	63	10	1.15	72	12	60
AAC-5b	ITE 820 - Shopping Center	269	KSF	1.00	0.70	37.75	7,108	0.94	177	110	67	3.81	717	344	373
Pass-By Trips: Shopping Center					0.34	4,888		0		0	0	493		237	256
New Trips for Shopping Center						9,487		358		222	136	957		459	498
AAC-6a	ITE 710 - General Office Building	66	KSF	1.00	0.70	9.74	450	1.16	54	46	8	1.15	53	8	45
AAC-6b	ITE 820 - Shopping Center	199	KSF	1.00	0.70	37.75	5,259	0.94	131	81	50	3.81	531	255	276
Pass-By Trips: Shopping Center					0.34	1,788		0		0	0	181		87	94
New Trips for Shopping Center						3,471		131		81	50	350		168	182
Village 3 - Total New Trips:							43,389	3,013		1,129	1,884	4,353		2,436	1,917
Village 3 - Total Pass-By Trips:							6,676	0		0	0	674		324	350
Village 3 - Total Trips:							50,065	3,013		1,129	1,884	5,027		2,760	2,267

Parklands Village 2																	
2A	ITE 210 - Single-Family Detached Housing	452	DU	1.00	0.75	9.44	3,200	0.74	251	63	188	0.99	336	212	124		
2B	ITE 210 - Single-Family Detached Housing	397	DU	1.00	0.75	9.44	2,811	0.74	220	55	165	0.99	295	186	109		
2C	ITE 210 - Single-Family Detached Housing	451	DU	1.00	0.75	9.44	3,193	0.74	250	63	187	0.99	335	211	124		
2D	ITE 210 - Single-Family Detached Housing	716	DU	1.00	0.75	9.44	5,069	0.74	397	99	298	0.99	532	335	197		
AAC-2	ITE 221 - Multi-Family Housing (Mid-Rise)	400	DU	1.00	0.75	5.44	1,632	0.36	108	28	80	0.44	132	81	51		
AAC-3a	ITE 710 - General Office Building	66	KSF	1.00	0.70	9.74	450	1.16	54	46	8	1.15	53	8	45		
AAC-3b	ITE 820 - Shopping Center	200	KSF	1.00	0.70	37.75	5,285	0.94	132	82	50	3.81	533	256	277		
CP-1	ITE 411 - Public Park	41.9	ACRE	1.00	1.00	0.78	33	0.02	1	1	0	0.11	5	3	2		
S-3a	ITE 520 - Elementary School	715	Students	1.00	0.10	1.89	135	0.67	48	26	22	0.17	12	6	6		
S-3b	ITE 522 - Middle School/Junior High	339	Students	1.00	0.10	2.13	72	0.58	20	11	9	0.17	6	3	3		
Pass-By Trips: Shopping Center					0.34	1,797		0			0	0	181			87	94
New Trips for Shopping Center						3,488		132			82	50	352			169	183
Village 2 - Total New Trips:							20,083	1,481			474	1,007	2,058			1,214	844
Village 2 - Total Pass-By Trips:							1,797	0			0	0	181			87	94
Village 2 - Total Trips:							21,880	1,481			474	1,007	2,239			1,301	938
Total New Trips:							83,120	5,938			2,066	3,872	8,395			4,819	3,576
Total Pass-By Trips:							10,099	0			0	0	1,019			490	529
Total Trips:							93,219	5,938			2,066	3,872	9,414			5,309	4,105

Table 4 - Trip Generation Summary (internal)

Land Use		Size	Unit	Non-Auto Factor <sup>(1)</sup>	Internal Capture Adjust <sup>(2)</sup>	Average Daily		AM Peak Hour				PM Peak Hour			
						Rate	Total	Rate	Total	In	Out	Rate	Total	In	Out
Parklands Village 1															
1A	ITE 210 - Single-Family Detached Housing	37	DU	0.95	0.00	9.44	0	0.74	0	0	0	0.99	0	0	0
1B	ITE 210 - Single-Family Detached Housing	317	DU	0.95	0.00	9.44	0	0.74	0	0	0	0.99	0	0	0
1C	ITE 210 - Single-Family Detached Housing	192	DU	0.95	0.00	9.44	0	0.74	0	0	0	0.99	0	0	0
1D	ITE 210 - Single-Family Detached Housing	221	DU	0.95	0.00	9.44	0	0.74	0	0	0	0.99	0	0	0
1E	ITE 210 - Single-Family Detached Housing	108	DU	0.95	0.00	9.44	0	0.74	0	0	0	0.99	0	0	0
1F	ITE 210 - Single-Family Detached Housing	134	DU	0.95	0.00	9.44	0	0.74	0	0	0	0.99	0	0	0
1G	ITE 210 - Single-Family Detached Housing	295	DU	0.95	0.00	9.44	0	0.74	0	0	0	0.99	0	0	0
1H	ITE 210 - Single-Family Detached Housing	284	DU	0.95	0.00	9.44	0	0.74	0	0	0	0.99	0	0	0
1I	ITE 210 - Single-Family Detached Housing	207	DU	0.95	0.00	9.44	0	0.74	0	0	0	0.99	0	0	0
1J	ITE 210 - Single-Family Detached Housing	63	DU	0.95	0.00	9.44	0	0.74	0	0	0	0.99	0	0	0
MF-1	ITE 221 - Multi-Family Housing (Mid-Rise)	600	DU	0.95	0.00	5.44	0	0.36	0	0	0	0.44	0	0	0
NC-1	ITE 495 - Recreational Community Center	22	KSF	0.90	0.50	28.82	282	1.76	17	11	6	2.31	23	11	12
S-1a	ITE 520 - Elementary School	677	Students	1.00	0.90	1.89	1,152	0.67	408	220	188	0.17	104	50	54
S-1b	ITE 522 - Middle School/Junior High	321	Students	1.00	0.90	2.13	615	0.58	168	91	77	0.17	49	24	25
AAC-1a	ITE 710 - General Office Building	60.0	KSF	1.00	0.30	9.74	175	1.16	21	18	3	1.15	21	3	18
AAC-1b	ITE 820 - Shopping Center	181.0	KSF	1.00	0.30	37.75	2,050	0.94	51	32	19	3.81	207	99	108
Pass-By Trips: Shopping Center					0.00	0		0		0	0	0		0	0
New Trips for Shopping Center						2,050		51		32	19	207		99	108
Village 1 - Total New Trips:						4,274		665		372	293	404		187	217
Village 1 - Total Pass-By Trips:						0		0		0	0	0		0	0
Village 1 - Total Trips:						4,274		665		372	293	404		187	217

Table 4 - Trip Generation Summary (internal)

Land Use		Size	Unit	Non-Auto Factor <sup>(1)</sup>	Internal Capture Adjust <sup>(2)</sup>	Average Daily		AM Peak Hour				PM Peak Hour			
						Rate	Total	Rate	Total	In	Out	Rate	Total	In	Out
Parklands Village 3															
3A	ITE 210 - Single-Family Detached Housing	161	DU	1.00	0.00	9.44	0	0.74	0	0	0	0.99	0	0	0
3B	ITE 210 - Single-Family Detached Housing	502	DU	1.00	0.00	9.44	0	0.74	0	0	0	0.99	0	0	0
3D	ITE 210 - Single-Famly Detached Housing	692	DU	1.00	0.00	9.44	0	0.74	0	0	0	0.99	0	0	0
3E	ITE 210 - Single-Family Detached Housing	586	DU	1.00	0.00	9.44	0	0.74	0	0	0	0.99	0	0	0
3C	ITE 210 - Single-Family Detached Housing	1001	DU	1.00	0.00	9.44	0	0.74	0	0	0	0.99	0	0	0
3F	ITE 210 - Single-Family Detached Housing	151	DU	1.00	0.00	9.44	0	0.74	0	0	0	0.99	0	0	0
MF-2	ITE 221 - Multi-Family Housing (Mid-Rise)	853	DU	1.00	0.00	5.44	0	0.36	0	0	0	0.44	0	0	0
MF-3	ITE 221 - Multi-Family Housing (Mid-Rise)	659	DU	1.00	0.00	5.44	0	0.36	0	0	0	0.44	0	0	0
S-2a	ITE 520 - Elementary School	1,165	Students	1.00	0.90	1.89	1,982	0.67	702	379	323	0.17	178	85	93
S-2b	ITE 522 - Middle School/Junior High	555	Students	1.00	0.90	2.13	1,064	0.58	290	157	133	0.17	85	42	43
S-2c	ITE 530 - High School	1,684	Students	1.00	0.90	2.03	3,077	0.52	788	528	260	0.14	212	102	110
AAC-4a	ITE 710 - General Office Building	91	KSF	1.00	0.30	9.74	266	1.16	32	28	4	1.15	31	5	26
AAC-4b	ITE 820 - Shopping Center	275	KSF	1.00	0.30	37.75	3,114	0.94	78	48	30	3.81	314	151	163
AAC-5a	ITE 710 - General Office Building	90	KSF	1.00	0.30	9.74	263	1.16	31	27	4	1.15	31	5	26
AAC-5b	ITE 820 - Shopping Center	269	KSF	1.00	0.30	37.75	3,046	0.94	76	47	29	3.81	307	147	160
Pass-By Trips: Sopping Center						0.00		0		0		0		0	
New Trips for Shopping Center								6,160		154		95		59	
												621		298	
														323	
AAC-6a	ITE 710 - General Office Building	66	KSF	1.00	0.30	9.74	193	1.16	23	20	3	1.15	23	4	19
AAC-6b	ITE 820 - Shopping Center	199	KSF	1.00	0.30	37.75	2,254	0.94	56	35	21	3.81	227	109	118
Pass-By Trips: Sopping Center						0.00		0		0		0		0	
New Trips for Shopping Center								8,414		210		130		80	
												848		407	
														441	
Village 3 - Total New Trips:							21,419	2,230		1,364		866		2,029	
Village 3 - Total Pass-By Trips:							0	0		0		0		0	
Village 3 - Total Trips:							21,419	2,230		1,364		866		2,029	

<b>Parklands Village 2</b>														
2A	ITE 210 - Single-Family Detached Housing	452	DU	1.00	0.00	9.44	0	0.74	0	0	0	0.99	0	0
2B	ITE 210 - Single-Family Detached Housing	397	DU	1.00	0.00	9.44	0	0.74	0	0	0	0.99	0	0
2C	ITE 210 - Single-Family Detached Housing	451	DU	1.00	0.00	9.44	0	0.74	0	0	0	0.99	0	0
2D	ITE 210 - Single-Family Detached Housing	716	DU	1.00	0.00	9.44	0	0.74	0	0	0	0.99	0	0
AAC-2	ITE 221 - Multi-Family Housing (Mid-Rise)	400	DU	1.00	0.00	5.44	0	0.36	0	0	0	0.44	0	0
AAC-3a	ITE 710 - General Office Building	66	KSF	1.00	0.30	9.74	193	1.16	23	20	3	1.15	23	4
AAC-3b	ITE 820 - Shopping Center	200	KSF	1.00	0.30	37.75	2,265	0.94	56	35	21	3.81	229	110
CP-1	ITE 411 - Public Park	41.9	ACRE	1.00	0.00	0.78	0	0.02	0	0	0	0.11	0	0
S-3a	ITE 520 - Elementary School	715	Students	1.00	0.90	1.89	1,216	0.67	431	233	198	0.17	109	52
S-3b	ITE 522 - Middle School/Junior High	339	Students	1.00	0.90	2.13	650	0.58	177	96	81	0.17	52	25
Pass-By Trips: Sopping Center					0.00	0		0	0	0		0	0	0
New Trips for Shopping Center						2,265		56	35	21		229	110	119
Village 4 - Total New Trips:						4,324		687	384	303		413	191	222
Village 4 - Total Pass-By Trips:						0		0	0	0		0	0	0
Village 4 - Total Trips:						4,324		687	384	303		413	191	222
Total New Trips:						30,017		3,582	2,120	1,462		2,846	1,326	1,520
Total Pass-By Trips:						0		0	0	0		0	0	0
Total Trips:						30,017		3,582	2,120	1,462		2,846	1,326	1,520

**Table 7 - Peak Hour Intersection Level of Service Summary (Proposed Accesses)**

Intersection and Critical Lanes Groups	2040 Bkgrd + Project			
	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
<b>SIGNAL CONTROL</b>				
<b>#101. Jewell Ave at Flatrock Trail</b>	<b>41</b>	<b>D</b>	<b>38</b>	<b>D</b>
Eastbound Left	67	E	60	E
Eastbound Through+Right	28	C	47	D
Westbound Left	54	D	53	D
Westbound Through	48	D	25	C
Westbound Right	22	C	21	C
Northbound Left	52	D	50	D
Northbound Through+Right	36	D	39	D
Northbound Right	39	D	48	D
Southbound Through+Right	41	D	47	D
<b>#102. Jewell Ave at Louisiana Pkwy</b>	<b>33</b>	<b>C</b>	<b>45</b>	<b>D</b>
Eastbound Left	52	D	55	D
Eastbound Through+Right	27	C	54	D
Westbound Left	54	D	54	D
Westbound Through	36	D	39	D
Westbound Right	20	C	29	C
Northbound Left	37	D	47	D
Northbound Through+Right	40	D	38	D
Southbound Left	38	D	37	D
Southbound Through+Right	38	D	40	D
<b>#103. Jewell Ave at Road 2</b>	<b>27</b>	<b>C</b>	<b>33</b>	<b>C</b>
Eastbound Left	54	D	51	D
Eastbound Through+Right	40	D	39	D
Westbound Left	48	D	54	D
Westbound Through	10	A	17	B
Westbound Right	8	A	16	B
Northbound Left	28	C	32	C
Northbound Through+Right	28	C	31	C
Southbound Left	32	C	37	D
Southbound Through	27	C	30	C
Southbound Right	37	D	48	D
<b>#106. Powhatan Rd at Road 3</b>	<b>28</b>	<b>C</b>	<b>35</b>	<b>C</b>
Eastbound Left+Through+Right	32	C	37	D
Westbound Left	42	D	33	C
Westbound Through+Right	40	D	50	D
Northbound Left	25	C	24	C
Northbound Through	30	C	35	C
Northbound Right	27	C	31	C
Southbound Left	45	D	55	D
Southbound Through	12	B	23	C
Southbound Right	10	A	21	C
<b>#108. Monaghan Rd at Road 3</b>	<b>15</b>	<b>B</b>	<b>20</b>	<b>C</b>
Eastbound Left	31	C	33	C
Eastbound Right	33	C	54	D
Northbound Left	8	A	9	A
Northbound Through	6	A	6	A
Southbound Through+Right	13	B	15	B
<b>#109. Mississippi Ave &amp; Little River St</b>	<b>17</b>	<b>B</b>	<b>12</b>	<b>B</b>
Eastbound Left	8	A	7	A
Eastbound Through	6	A	5	A
Westbound Through	11	B	10	B
Westbound Right	9	A	10	A
Southbound Left	36	D	39	D
Southbound Right	41	D	44	D
<b>#110. Mississippi Ave at Road 2</b>	<b>34</b>	<b>C</b>	<b>40</b>	<b>D</b>
Eastbound Left	34	C	41	D
Eastbound Through	42	D	38	D
Eastbound Right	45	D	42	D
Westbound Left	35	C	37	D
Westbound Through+Right	43	D	52	D
Northbound Left	19	B	27	C
Northbound Through+Right	20	B	25	C
Southbound Left	21	C	24	C
Southbound Through+Right	29	C	44	D
<b>#111. S Harvest Rd &amp; Road 4</b>	<b>27</b>	<b>C</b>	<b>28</b>	<b>C</b>
Westbound Left	38	D	42	D
Westbound Right	34	C	38	D
Northbound Through	38	D	39	D
Northbound Right	25	C	20	B
Southbound Left	17	B	35	D
Southbound Through	13	B	11	B



**Table 7 - Peak Hour Intersection Level of Service Summary (Proposed Accesses)**

Intersection and Critical Lanes Groups	2040 Bkgrd + Project			
	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
<b>#113. Powhaton Rd &amp; Road 4</b>	<b>21</b>	<b>C</b>	<b>24</b>	<b>C</b>
Eastbound Left	31	C	30	C
Eastbound Through+Right	47	D	43	D
Westbound Left	32	C	31	C
Westbound Through+Right	34	C	33	C
Northbound Left	12	B	16	B
Northbound Through+Right	16	B	22	C
Southbound Left	12	B	15	B
Southbound Through+Right	17	B	23	C
<b>STOP SIGN CONTROL</b>				
<b>#104. Flatrock Trail at Road 1</b>	<b>4</b>	<b>A</b>	<b>3</b>	<b>A</b>
Westbound Left+Right	13	A	19	A
Northbound Through+Right	0	A	0	A
Southbound Left	8	A	9	A
Southbound Through	0	A	0	A
<b>#105. Louisiana Pkwy at Road 1</b>	<b>5</b>	<b>A</b>	<b>5</b>	<b>A</b>
Eastbound Left+Through+Right	11	B	13	B
Westbound Left+Through+Right	12	B	14	B
Northbound Left+Through+Right	8	A	8	A
Southbound Left+Through+Right	8	A	8	A
<b>#114. Road 2 &amp; Road 4</b>	<b>9</b>	<b>A</b>	<b>16</b>	<b>C</b>
Eastbound Left+Through+Right	23	C	35	D
Westbound Left+Through+Right	17	C	20	C
Northbound Left+Through+Right	8	A	8	A
Southbound Left+Through+Right	8	A	8	A
<b>#115. Monaghan Rd &amp; Road 4</b>	<b>5</b>	<b>A</b>	<b>8</b>	<b>A</b>
Eastbound Left+Through+Right	20	C	34	D
Westbound Left+Through+Right	18	C	21	C
Northbound Left	8	A	9	A
Southbound Left	8	A	8	A
<b>#116. Jamestown Way &amp; Alameda Ave</b>	<b>4</b>	<b>A</b>	<b>4</b>	<b>A</b>
Eastbound Left	8	A	8	A
Westbound Left	8	A	8	A
Northbound Left+Through+Right	12	B	18	C
Southbound Left+Through+Right	13	B	16	C
<b>#117. Little River St &amp; Alameda Ave</b>	<b>3</b>	<b>A</b>	<b>3</b>	<b>A</b>
Eastbound Left	8	A	8	A
Westbound Left	8	A	8	A
Northbound Left+Through+Right	14	B	18	C
Southbound Left+Through+Right	10	A	16	C
<b>#118. New Castle Way &amp; Alameda Ave</b>	<b>4</b>	<b>A</b>	<b>6</b>	<b>A</b>
Eastbound Left	8	A	8	A
Westbound Left	8	A	8	A
Northbound Left	18	C	24	C
Northbound Through+Right	10	B	11	B
Southbound Left+Through+Right	13	B	16	C
<b>ROUNDABOUT</b>				
<b>#107. Road 3 at Road 2</b>	<b>6</b>	<b>A</b>	<b>12</b>	<b>C</b>
Eastbound Left+Through	6	A	7	A
Eastbound Right	7	A	15	C
Westbound Left+Through	6	A	15	C
Westbound Right	6	A	8	A
Northbound Left+Through	8	A	15	C
Northbound Right	5	A	6	A
Southbound Left+Through	7	A	12	B
Southbound Right	5	A	7	A
<b>#112. Little River St &amp; Road 4</b>	<b>5</b>	<b>A</b>	<b>6</b>	<b>A</b>
Eastbound Left+Through+Right	4	A	6	A
Westbound Left+Through+Right	4	A	6	A
Northbound Left+Through+Right	5	A	5	A
Southbound Left+Through+Right	5	A	5	A

Note: Delay represented in average seconds per vehicle. At stop-controlled intersections, the movements that are free flowing and were estimated to have zero delay are not listed.

Table 8 - Peak Hour Estimated Queues and Proposed Future Storage

95% queue can be used for future storage, per engineering judgment, for non-CDOT facilities. Minimum storage should be 50' and identified in 25' increments, typ.

Intersection and Lanes Groups	Existing Storage	2021 Existing		2040 Background		2040 Proposed	R-1 Taper (feet)	Proposed Future Storage
		95th % Q		95th % Q		95th % Q		
		AM	PM	AM	PM	AM		
<b>#1. Gun Club Rd &amp; Alameda Ave</b>								
Westbound Left+Right	-	68'	93'	129'	98'	143'	123'	143'
Westbound Left	-			31'	14'	42'	42'	25
Westbound Right	-							180
Northbound Through+Right	-	-	-					90
Northbound Through	-			410'	386'	462'	503'	90
Northbound Right	-			94'	110'	68'	62'	162
Southbound Left+Through	-	3'	8'					273
Southbound Left	-			62'	47'	65'	71'	162
Southbound Through	-			212'	178'	250'	369'	273'
<b>#2. Gun Club Rd &amp; Mississippi Ave</b>								
Westbound Left+Right	-	33'	120'	295'	125'	133'	86'	-
Westbound Left	-			31'	30'	128'	170'	-
Westbound Right	-			271'	210'	368'	406'	170'
Northbound Through	-	-	-	36'	9'	58'	83'	35
Northbound Right	-							310
Southbound Left+Through	-	3'	3'					190
Southbound Left	-			18'	23'	117'	264'	120
Southbound Through	-			430'	314'	438'	200'	190'
<b>#3. SH-30/6th Ave &amp; Gun Club Rd</b>								
Westbound Left	-	328'	443'	225'	273'	337'	298'	337'
Westbound Right	-	34'	26'	109'	173'	315'	336'	45
Northbound Through	-	233'	110'	120'	315'	218'	391'	435
Northbound Right	320'	77'	48'	0'	0'	0'	0'	273
Southbound Left	335'	28'	59'	109'	118'	62'	76'	162
Southbound Through	-	156'	280'	154'	50'	205'	125'	273'
<b>#4. SH-30/Gun Club Rd &amp; Jewell Ave</b>								
Eastbound Left	220'	93'	215'	180'	205'	270'	314'	314'
Eastbound Through	-	136'	293'	173'	223'	345'	728'	45
Eastbound Right	330'	19'	26'	54'	69'	122'	199'	435
Westbound Left	300'	146'	123'	43'	114'	279'	332'	435
Westbound Through	-	300'	328'	416'	226'	846'	509'	273
Westbound Right	-	0'	0'	20'	74'	324'	285'	162
Northbound Left	485'	100'	86'	217'	125'	305'	153'	435
Northbound Through	-	599'	513'	206'	257'	258'	344'	273
Northbound Right	360'	10'	30'	0'	0'	0'	0'	162
Southbound Left	200'	8'	6'	176'	200'	208'	392'	435
Southbound Through	-	409'	627'	257'	100'	436'	168'	273
Southbound Right	325'	44'	62'	86'	71'	238'	187'	162
<b>#5. Harvest Rd &amp; Jewell Ave</b>								
Eastbound Left	75'	-	3'	35'	127'	197'	314'	314'
Eastbound Through	-	-	-	153'	155'	242'	551'	45
Eastbound Right	-			75'	150'	0'	42'	435
Westbound Through+Right	-	-	-					273
Westbound Left	-			121'	20'	171'	63'	162
Westbound Through	-			345'	185'	844'	620'	273'
Westbound Right	-			158'	93'	175'	267'	162
Northbound Left	-			107'	105'	112'	158'	435
Northbound Through+Right	-			101'	88'	125'	131'	273
Southbound Left+Right	-	5'	3'					-
Southbound Left	-			178'	64'	249'	166'	273
Southbound Through	-			101'	105'	94'	173'	162
Southbound Right	-			145'	53'	72'	14'	-
<b>#6. Harvest Rd &amp; Flatrock Tr</b>								
Eastbound Left+Right	-	3'	-	5'	33'			-
Eastbound Left	-					19'	67'	67'
Eastbound Through+Right	-					26'	35'	25
Westbound Left	-					79'	113'	180
Westbound Through+Right	-					54'	68'	90
Northbound Left+Through	-	-	-					90
Northbound Left	-			3'	5'	14'	19'	96
Northbound Through	-			-	-	283'	602'	154'
Northbound Right	-					1'	6'	-
Southbound Left	-					55'	268'	-
Southbound Through+Right	-	-	-	-	-	217'	395'	162
<b>#7. Harvest Rd &amp; Louisiana Pkwy</b>								
Eastbound Left+Right	-	3'	3'	3'	25'			-
Eastbound Left	-					23'	72'	-
Eastbound Through+Right	-					21'	31'	25
Westbound Left	-					92'	68'	180
Westbound Through+Right	-					61'	32'	90
Northbound Left+Through	-	-	3'					96
Northbound Left	-			-	5'	13'	8'	-
Northbound Through	-			-	-	307'	590'	162
Northbound Right	-					1'	7'	273'
Southbound Left	-					94'	250'	162
Southbound Through+Right	-	-	-	-	-	560'	115'	273'
<b>#8. Harvest Rd &amp; Mississippi Ave</b>								
Eastbound Left	-			93'	33'	191'	176'	191'
Eastbound Right	-			32'	12'	115'	22'	35
Northbound Left	-			42'	14'	56'	89'	310
Northbound Through	-			134'	132'	22'	312'	190
Southbound Through	-			50'	8'	289'	295'	120
Southbound Right	-			1'	0'	72'	67'	190'

Table 8 - Peak Hour Estimated Queues and Proposed Auxiliary Lanes

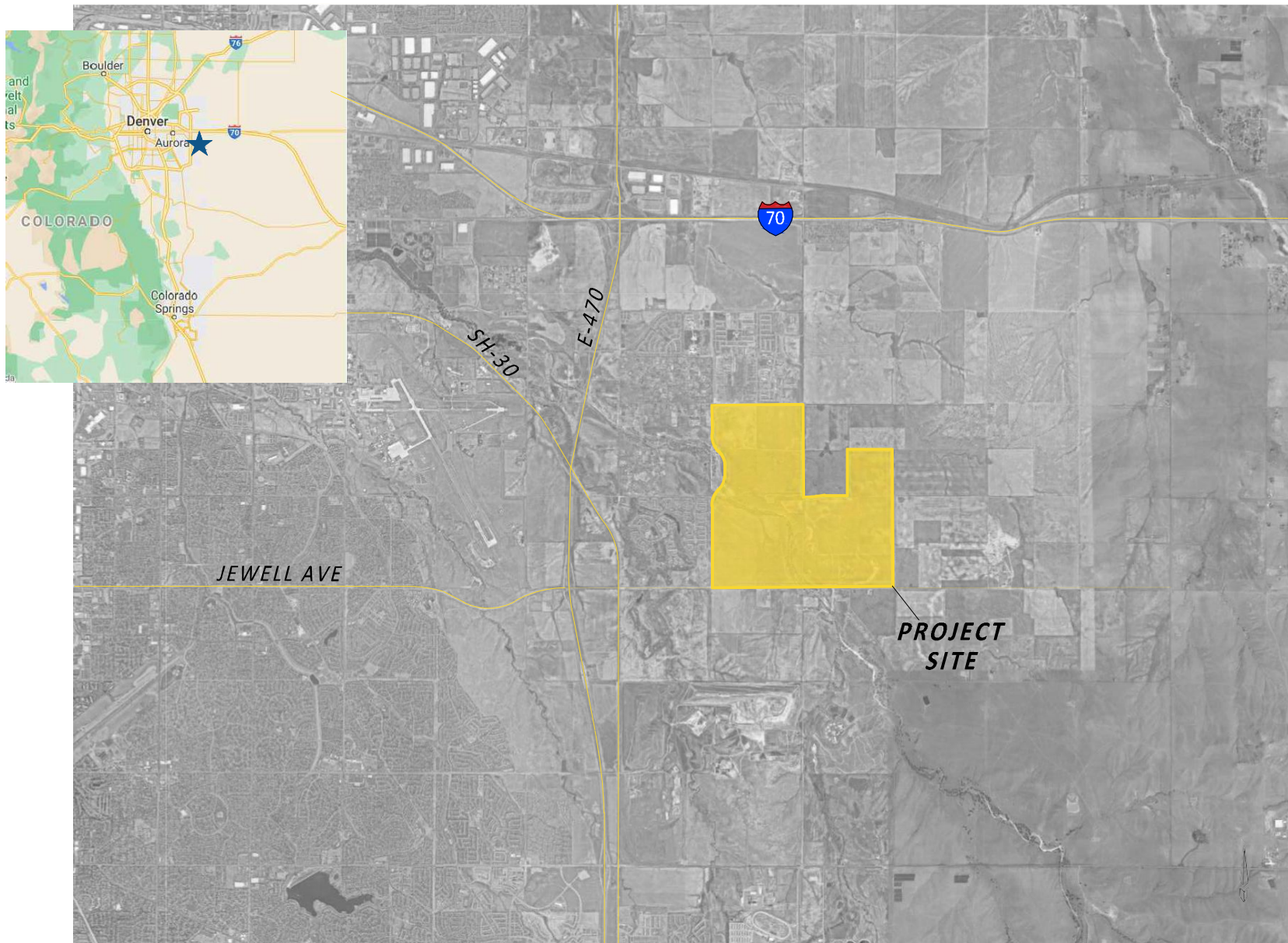
Intersection and Lanes Groups	Existing Storage	2021 Existing		2040 Background		2040 Bkgrd + Project		Max. Queue	CDOT SHAC Requirement (NR-B)				Proposed Future Storage	
		95th % Q		95th % Q		95th % Q			Speed (mph)	Total (feet)	Storage (feet)	Taper (feet)		
		AM	PM	AM	PM	AM	PM							
#9. Harvest Rd & Alameda Ave														
Eastbound Left+Through	-	-	5'					-	-	-	-	-	-	
Eastbound Left	-	-	-		51'	83'	52'	75'	83'	35	310	190	120	190'
Eastbound Through+Right	-	-	-		58'	36'	74'	110'	-	-	-	-	-	-
Westbound Left+Right	-	-	-						-	-	-	-	-	-
Westbound Left	-	-	-		67'	34'	134'	133'	134'	35	310	190	120	190'
Westbound Through	-	-	-		57'	86'	78'	106'	-	-	-	-	-	-
Westbound Right	-	-	-		24'	3'	53'	31'	53'	35	310	190	120	190'
Northbound Left	-	-	-		168'	67'	123'	45'	168'	45	435	273	162	273'
Northbound Through	-	-	-		277'	305'	654'	610'	-	-	-	-	-	-
Northbound Right	-	-	-		26'	43'	18'	64'	64'	45	435	273	162	273'
Southbound Left	300'	-	3'	3'	55'	54'	90'	154'	154'	45	435	273	162	273'
Southbound Through	-	-	-	-	196'	250'	305'	598'	-	-	-	-	-	-
Southbound Right	-	-	-	-	46'	41'	45'	42'	46'	45	435	273	162	273'
#10a. Powhatan Rd SB & Alameda Ave														
Westbound Left	-	-	3'	3'					-	-	-	-	-	-
Southbound Left	100'	-	-	-					-	-	-	-	-	-
Southbound Through	-	-	-	-					-	-	-	-	-	-
#10b. Powhatan Rd NB & Alameda Ave														
Eastbound Left+Through	-	-	-	-					-	-	-	-	-	-
Westbound Through+Right	-	-	3'	3'					-	-	-	-	-	-
Northbound Through+Left	-	-	-	-					-	-	-	-	-	-
Northbound Through+Right	-	-	-	-					-	-	-	-	-	-
#10. Powhatan Rd & Alameda Ave														
Eastbound Left	-	-			20'	30'	102'	83'	102'	35	310	190	120	190'
Eastbound Through+Right	-	-			43'	28'			-	-	-	-	-	-
Eastbound Through	-	-					115'	121'	-	-	-	-	-	-
Eastbound Right	-	-					75'	86'	-	-	-	-	-	-
Westbound Left	-	-			23'	42'	86'	87'	87'	35	310	190	120	190'
Westbound Through+Right	-	-			10'	40'	84'	183'	-	-	-	-	-	-
Northbound Left	-	-			8'	5'	73'	122'	122'	45	435	273	162	273'
Northbound Through+Left	-	-					171'	204'	-	-	-	-	-	-
Southbound Left	-	-			8'	13'	57'	90'	90'	45	435	273	162	273'
Southbound Through+Right	-	-							-	-	-	-	-	-
Southbound Through	-	-					141'	337'	-	-	-	-	-	-
Southbound Right	-	-					0'	8'	8'	45	435	273	162	273'
#11. Harvest Rd & Mississippi Ave														
Westbound Left	-	-			61'	35'	203'	185'	-	-	-	-	-	-
Westbound Right	-	-			23'	28'	381'	320'	381'	35	310	190	120	380'
Northbound Through	-	-			255'	263'	518'	576'	-	-	-	-	-	-
Northbound Right	-	-			21'	55'	49'	516'	516'	45	435	273	162	520'
Southbound Left	-	-			5'	0'	128'	403'	403'	45	435	273	162	405'
Southbound Through	-	-			26'	3'	263'	258'	-	-	-	-	-	-
#12. Powhatan Rd & Mississippi Ave														
Eastbound Left	-	-			18'	5'	165'	109'	165'	35	310	190	120	190'
Eastbound Through+Right	-	-			3'	5'			-	-	-	-	-	-
Eastbound Through	-	-					118'	208'	-	-	-	-	-	-
Eastbound Right	-	-					77'	314'	314'	35	310	190	120	315'
Westbound Left	-	-			-	33'	83'	272'	272'	35	310	190	120	275'
Westbound Through+Right	-	-			3'	5'	207'	213'	-	-	-	-	-	-
Northbound Left	-	-			-	-	165'	197'	197'	45	435	273	162	273'
Northbound Through+Right	-	-			-	-			-	-	-	-	-	-
Northbound Through	-	-					249'	353'	-	-	-	-	-	-
Northbound Right	-	-					124'	113'	124'	45	435	273	162	273'
Southbound Left	-	-			8'	5'	126'	139'	139'	45	435	273	162	273'
Southbound Through+Right	-	-							-	-	-	-	-	-
Southbound Through	-	-					290'	316'	-	-	-	-	-	-
Southbound Right	-	-					0'	48'	48'	45	435	273	162	273'
#13. Jewell Ave & Powhatan Rd														
Eastbound Left	-	-			254'	114'	324'	441'	441'	45	435	273	162	445'
Eastbound Through	-	-			33'	172'	344'	470'	-	-	-	-	-	-
Westbound Through	-	-			181'	66'	342'	358'	-	-	-	-	-	-
Westbound Right	-	-			49'	46'	105'	217'	217'	45	435	273	162	273'
Southbound Left	-	-			19'	154'	105'	372'	-	-	-	-	-	-
Southbound Right	-	-			58'	37'	160'	128'	160'	45	435	273	162	273'
#14. S Monaghan Rd & Mississippi Ave														
Eastbound Left	-	-			5'	8'	82'	115'	115'	35	310	190	120	190'
Eastbound Through	-	-			20'	8'	105'	85'	-	-	-	-	-	-
Eastbound Right	-	-			3'	3'	30'	38'	-	-	-	-	-	-
Westbound Left	-	-			3'	3'	43'	39'	43'	35	310	190	120	190'
Westbound Through+Right	-	-			10'	23'	84'	134'	-	-	-	-	-	-
Northbound Left	-	-			3'	-	69'	47'	69'	45	435	273	162	273'
Northbound Through+Right	-	-			-	-	107'	46'	-	-	-	-	-	-
Southbound Left	-	-			3'	3'	19'	21'	21'	45	435	273	162	273'
Southbound Through+Right	-	-			-	-	75'	90'	-	-	-	-	-	-
#15. Monaghan Rd & Jewell Ave														
Eastbound Left	-	-			3'	3'	62'	182'	182'	45	435	273	162	273'
Eastbound Through+Right	-	-			-	-			-	-	-	-	-	-
Eastbound Through	-	-					225'	258'	-	-	-	-	-	-
Eastbound Right	-	-					133'	125'	133'	45	435	273	162	273'
Westbound Left	-	-			8'	10'	62'	75'	75'	45	435	273	162	273'
Westbound Through+Right	-	-			-	-			-	-	-	-	-	-
Westbound Through	-	-					305'	313'	-	-	-	-	-	-
Westbound Right	-	-					62'	29'	62'	45	435	273	162	273'
Northbound Left	-	-			68'	10'	235'	269'	269'	45	435	273	162	273'
Northbound Through+Right	-	-			20'	30'	62'	108'	-	-	-	-	-	-
Southbound Left	-	-			63'	133'	153'	221'	221'	45	435	273	162	273'
Southbound Through	-	-			30'	5'	70'	45'	-	-	-	-	-	-
Southbound Right	-	-			5'	-	223'	174'	223'	45	435	273	162	273'

Table 8 - Peak Hour Estimated Queues and Proposed Auxiliary Lanes

Intersection and Lanes Groups	Existing Storage	2021 Existing		2040 Background		2040 Bkgrd + Project		Max. Queue	CDOT SHAC Requirement (NR-B)				Proposed Future Storage
		95th % Q		95th % Q		95th % Q			Speed (mph)	Total (feet)	Storage (feet)	Taper (feet)	
		AM	PM	AM	PM	AM	PM						
#101. Jewell Ave at Flatrock Trail													
Eastbound Left	-					117'	206'	206'	45	435	273	162	273'
Eastbound Through+Right	-					295'	557'	-	-	-	-	-	-
Westbound Left	-					45'	23'	45'	45	435	273	162	273'
Westbound Through	-					883'	591'	-	-	-	-	-	-
Westbound Right	-					26'	182'	182'	45	435	273	162	273'
Northbound Left	-					254'	184'	254'	30	250	154	96	255'
Northbound Through+Right	-					45'	39'	-	-	-	-	-	-
Southbound Left	-					210'	322'	322'	30	250	154	96	325'
Southbound Through+Right	-					57'	61'	-	-	-	-	-	-
#102. Jewell Ave at Louisiana Pkwy													
Eastbound Left	-					69'	143'	143'	45	435	273	162	273'
Eastbound Through+Right	-					389'	550'	-	-	-	-	-	-
Westbound Left	-					28'	28'	28'	45	435	273	162	273'
Westbound Through	-					682'	397'	-	-	-	-	-	-
Westbound Right	-					5'	77'	77'	45	435	273	162	273'
Northbound Left	-					11'	233'	233'	30	250	154	96	235'
Northbound Through+Right	-					0'	38'	-	-	-	-	-	-
Southbound Left	-					170'	69'	170'	30	250	154	96	170'
Southbound Through+Right	-					56'	17'	-	-	-	-	-	-
#103. Jewell Ave at Road 2													
Eastbound Left	-					96'	208'	208'	45	435	273	162	273'
Eastbound Through+Right	-					179'	267'	-	-	-	-	-	-
Westbound Left	-					34'	27'	34'	45	435	273	162	273'
Westbound Through	-					224'	228'	-	-	-	-	-	-
Westbound Right	-					15'	45'	45'	45	435	273	162	273'
Northbound Left	-					12'	52'	52'	30	250	154	96	154'
Northbound Through+Right	-					0'	28'	-	-	-	-	-	-
Southbound Left	-					99'	163'	163'	30	250	154	96	165'
Southbound Through	-					12'	13'	-	-	-	-	-	-
Southbound Right	-					112'	69'	-	-	-	-	-	-
#104. Flatrock Trail at Road 1													
Westbound Left+Right	-					30'	33'	-	-	-	-	-	-
Northbound Through+Right	-					0'	0'	-	-	-	-	-	-
Southbound Left	-					3'	5'	5'	30	250	154	96	154'
Southbound Through	-					0'	0'	-	-	-	-	-	-
#105. Louisiana Pkwy at Road 1													
Eastbound Left+Through+Right	-					13'	13'	-	-	-	-	-	-
Westbound Left+Through+Right	-					18'	15'	-	-	-	-	-	-
Northbound Left+Through+Right	-					0'	3'	-	-	-	-	-	-
Southbound Left+Through+Right	-					0'	3'	-	-	-	-	-	-
#106. Powhatan Rd at Road 3													
Eastbound Left+Through+Right	-					44'	39'	-	-	-	-	-	-
Westbound Left	-					159'	200'	200'	30	250	154	96	205'
Westbound Through+Right	-					64'	129'	-	-	-	-	-	-
Northbound Left	-					16'	36'	36'	45	435	273	162	273'
Northbound Through	-					337'	408'	-	-	-	-	-	-
Northbound Right	-					95'	142'	142'	45	435	273	162	273'
Southbound Left	-					92'	225'	225'	45	435	273	162	273'
Southbound Through	-					48'	225'	-	-	-	-	-	-
Southbound Right	-					0'	33'	33'	45	435	273	162	273'
#107. Road 3 at Road 2													
Eastbound Left+Through	-					25'	25'	-	-	-	-	-	-
Eastbound Right	-					25'	125'	125'	30	250	154	96	154'
Westbound Left+Through	-					25'	100'	-	-	-	-	-	-
Westbound Right	-					25'	25'	25'	30	250	154	96	154'
Northbound Left+Through	-					50'	150'	-	-	-	-	-	-
Northbound Right	-					25'	25'	25'	30	250	154	96	154'
Southbound Left+Through	-					50'	50'	-	-	-	-	-	-
Southbound Right	-					25'	25'	25'	30	250	154	96	154'
#108. Monaghan Rd at Road 3													
Eastbound Left	-					87'	156'	156'	30	250	154	96	160'
Eastbound Right	-					59'	62'	-	-	-	-	-	-
Northbound Left	-					58'	131'	131'	45	435	273	162	273'
Northbound Through	-					46'	61'	-	-	-	-	-	-
Southbound Through+Right	-					114'	84'	-	-	-	-	-	-
#109. Mississippi Ave & Little River St													
Eastbound Left	-					37'	87'	87'	35	310	190	120	190'
Eastbound Through	-					72'	139'	-	-	-	-	-	-
Westbound Through	-					190'	197'	-	-	-	-	-	-
Westbound Right	-					25'	41'	41'	35	310	190	120	190'
Southbound Left	-					172'	128'	-	-	-	-	-	-
Southbound Right	-					57'	52'	172'	25	180	90	90	175'
#110. Mississippi Ave at Road 2													
Eastbound Left	-					170'	271'	271'	35	310	190	120	270'
Eastbound Through	-					103'	108'	-	-	-	-	-	-
Eastbound Right	-					89'	105'	105'	35	310	190	120	190'
Westbound Left	-					41'	27'	41'	35	310	190	120	190'
Westbound Through+Right	-					89'	195'	-	-	-	-	-	-
Northbound Left	-					158'	124'	158'	35	310	190	120	190'
Northbound Through+Right	-					52'	99'	-	-	-	-	-	-
Southbound Left	-					39'	99'	99'	30	250	154	96	154'
Southbound Through+Right	-					183'	274'	-	-	-	-	-	-
#111. S Harvest Rd & Road 4													
Westbound Left	-					195'	194'	195'	30	250	154	96	200'
Westbound Right	-					38'	42'	-	-	-	-	-	-
Northbound Through	-					184'	853'	-	-	-	-	-	-
Northbound Right	-					2'	10'	10'	45	435	273	162	273'
Southbound Left	-					36'	103'	103'	45	435	273	162	273'
Southbound Through	-					412'	360'	-	-	-	-	-	-

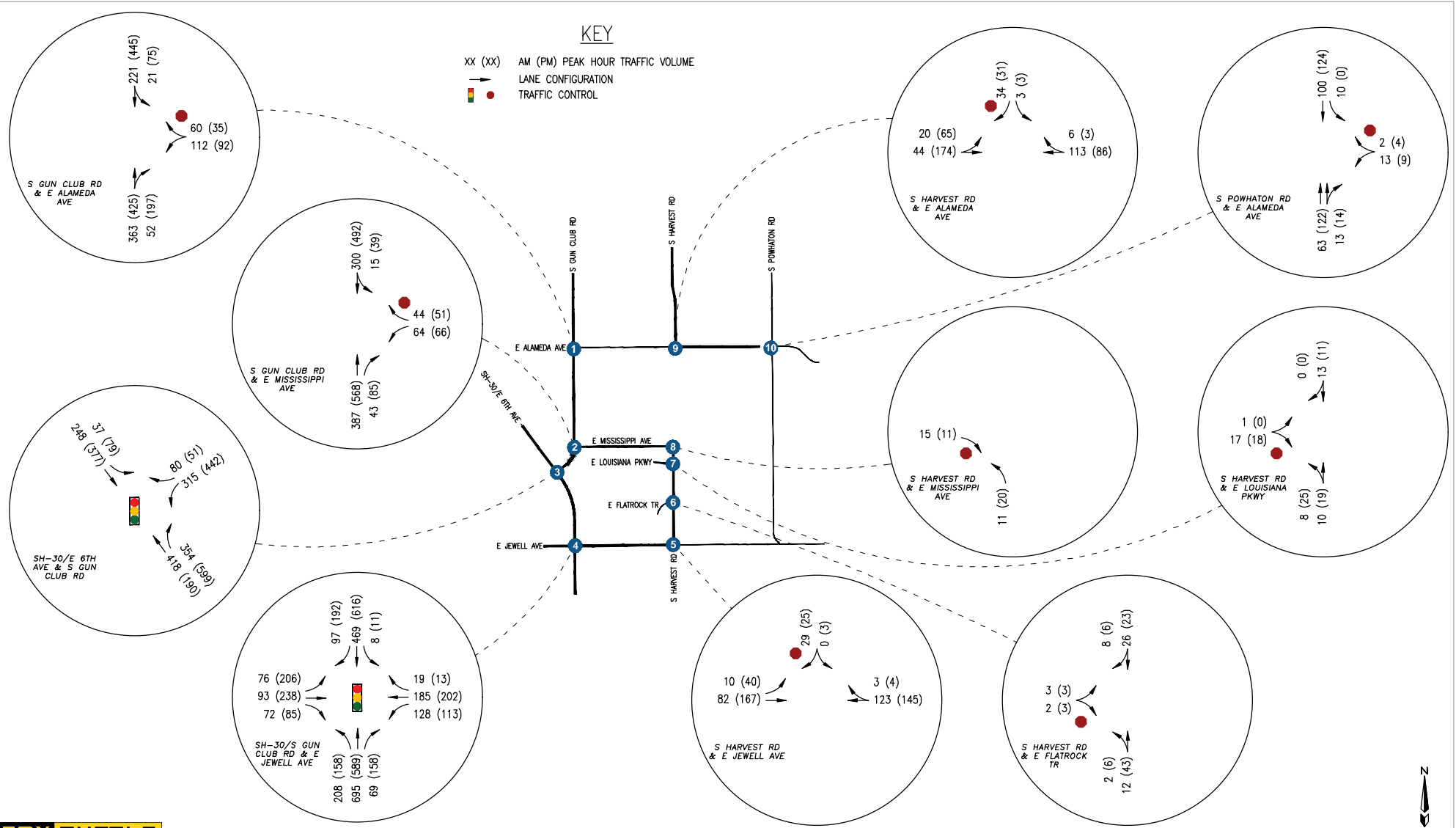
Table 8 - Peak Hour Estimated Queues and Proposed Auxiliary Lanes

Intersection and Lanes Groups	Existing Storage	2021 Existing		2040 Background		2040 Bkgrd + Project		Max. Queue	CDOT SHAC Requirement (NR-B)				Proposed Future Storage
		95th % Q		95th % Q		95th % Q			Speed (mph)	Total (feet)	Storage (feet)	Taper (feet)	
		AM	PM	AM	PM	AM	PM						
#112. Little River St & Road 4													
Eastbound	-					0'	25'	-	-	-	-	-	-
Westbound	-					0'	25'	-	-	-	-	-	-
Northbound	-					25'	25'	-	-	-	-	-	-
Southbound	-					25'	25'	-	-	-	-	-	-
#113. Powhatan Rd & Road 4													
Eastbound Left	-					30'	40'	40'	30	250	154	96	154'
Eastbound Through+Right	-					72'	84'	-	-	-	-	-	-
Westbound Left	-					71'	74'	74'	30	250	154	96	154'
Westbound Through+Right	-					59'	62'	-	-	-	-	-	-
Northbound Left	-					46'	92'	92'	45	435	273	162	273'
Northbound Through+Right	-					197'	284'	-	-	-	-	-	-
Southbound Left	-					36'	92'	92'	45	435	273	162	273'
Southbound Through+Right	-					202'	302'	-	-	-	-	-	-
#114. Road 2 & Road 4													
Eastbound Left+Through+Right	-					60'	160'	-	-	-	-	-	-
Westbound Left+Through+Right	-					23'	53'	-	-	-	-	-	-
Northbound Left+Through+Right	-					5'	3'	-	-	-	-	-	-
Southbound Left+Through+Right	-					3'	3'	-	-	-	-	-	-
#115. Monaghan Rd & Road 4													
Eastbound Left+Through+Right	-					53'	113'	-	-	-	-	-	-
Westbound Left+Through+Right	-					15'	20'	-	-	-	-	-	-
Northbound Left	-					3'	5'	5'	45	435	273	162	273'
Southbound Left	-					0'	0'	0'	45	435	273	162	273'
#116. Jamestown Way & Alameda Ave													
Eastbound Left	-					0'	3'	3'	25	180	90	90	90'
Westbound Left	-					3'	8'	8'	25	180	90	90	90'
Northbound Left+Through+Right	-					23'	30'	-	-	-	-	-	-
Southbound Left+Through+Right	-					13'	8'	-	-	-	-	-	-
#117. Little River St & Alameda Ave													
Eastbound Left	-					3'	5'	5'	25	180	90	90	90'
Westbound Left	-					3'	5'	5'	25	180	90	90	90'
Northbound Left+Through+Right	-					25'	25'	-	-	-	-	-	-
Southbound Left+Through+Right	-					5'	10'	-	-	-	-	-	-
#118. New Castle Way & Alameda Ave													
Eastbound Left	-					0'	3'	3'	25	180	90	90	90'
Westbound Left	-					5'	10'	10'	25	180	90	90	90'
Northbound Left	-					15'	50'	50'	25	180	90	90	90'
Northbound Through+Right	-					8'	20'	-	-	-	-	-	-
Southbound Left+Through+Right	-					13'	8'	-	-	-	-	-	-







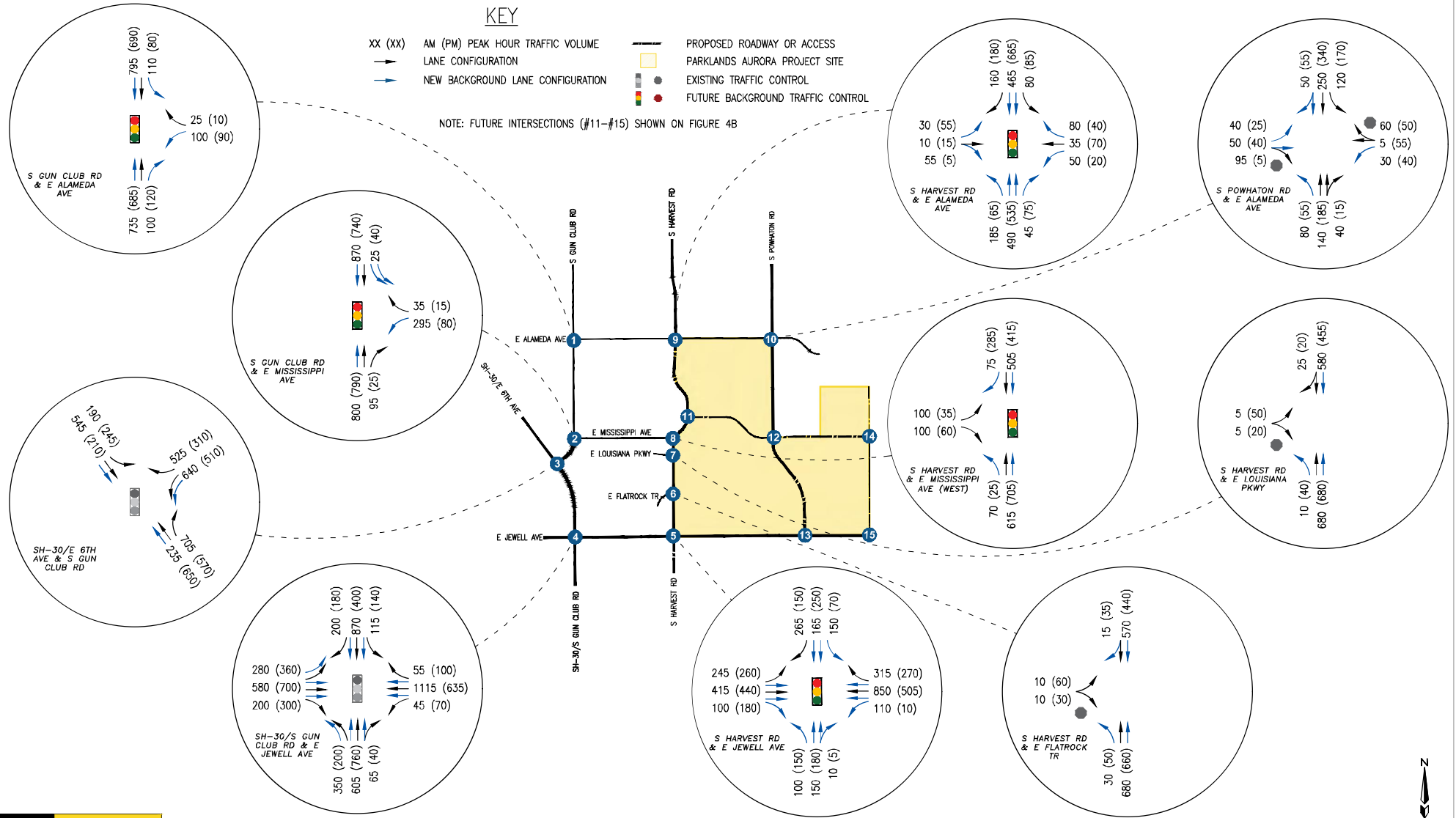


# KEY

XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUME  
 → LANE CONFIGURATION  
 → NEW BACKGROUND LANE CONFIGURATION

PROPOSED ROADWAY OR ACCESS  
 PARKLANDS AURORA PROJECT SITE  
 EXISTING TRAFFIC CONTROL  
 FUTURE BACKGROUND TRAFFIC CONTROL

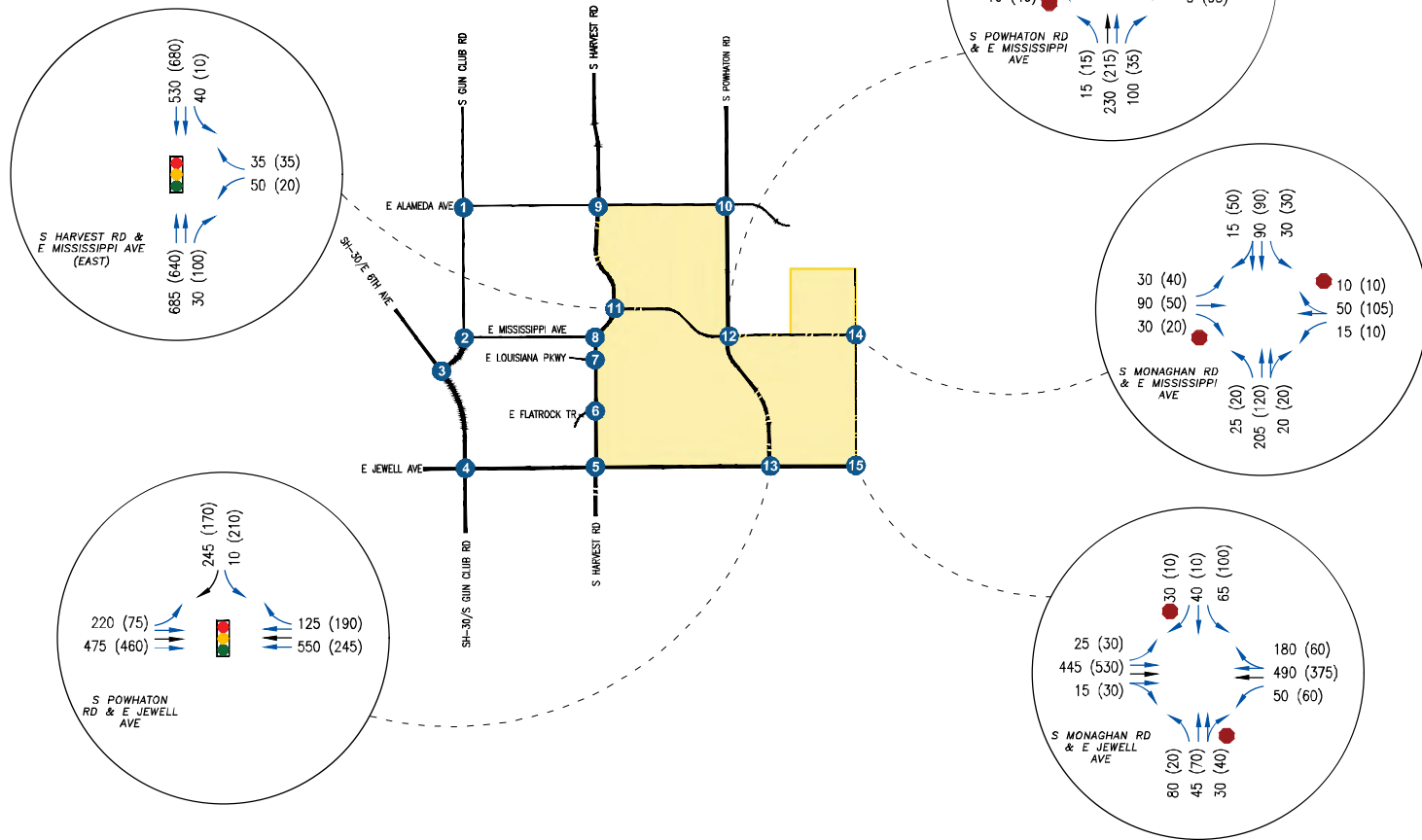
NOTE: FUTURE INTERSECTIONS (#11-#15) SHOWN ON FIGURE 4B

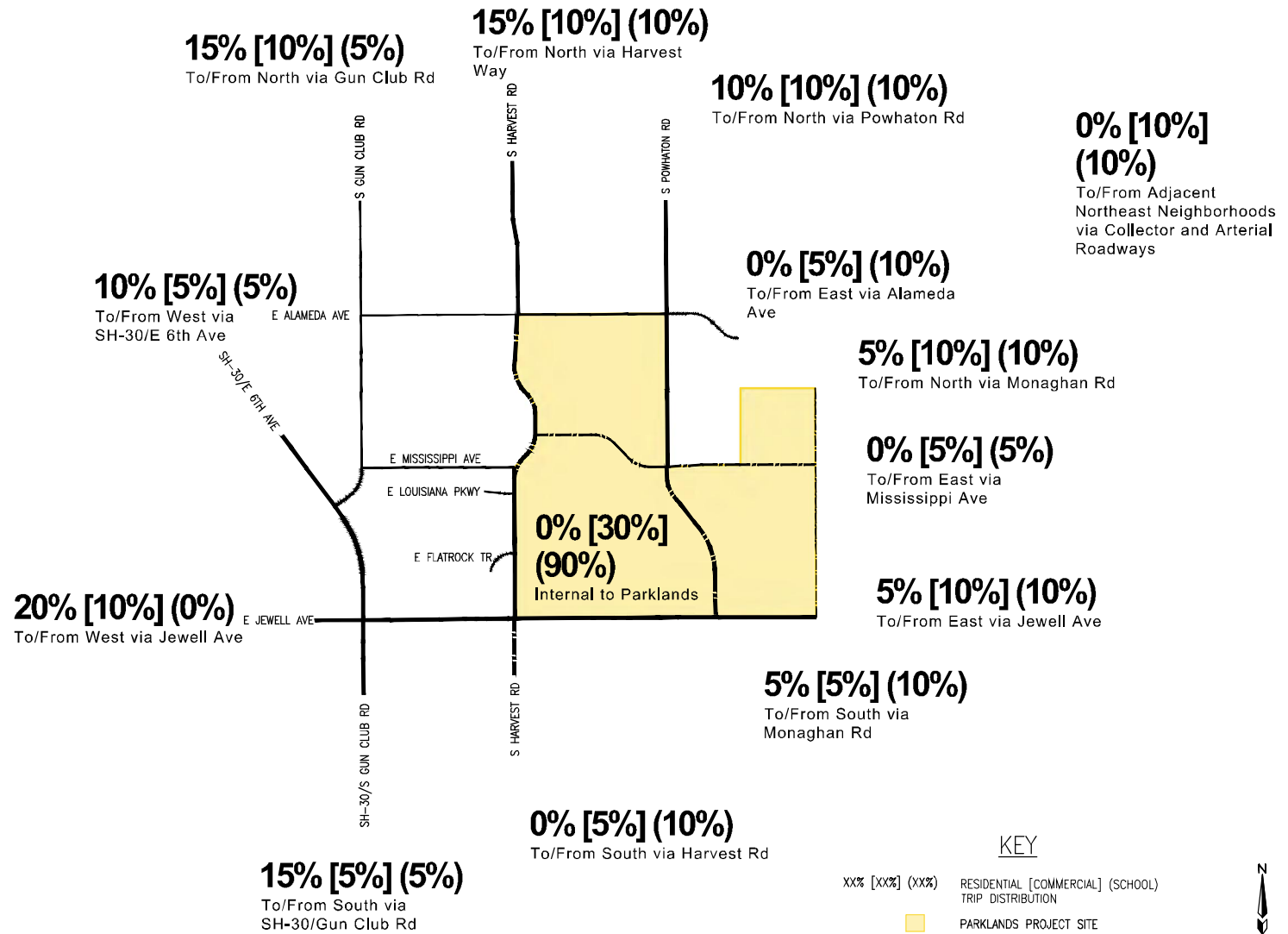


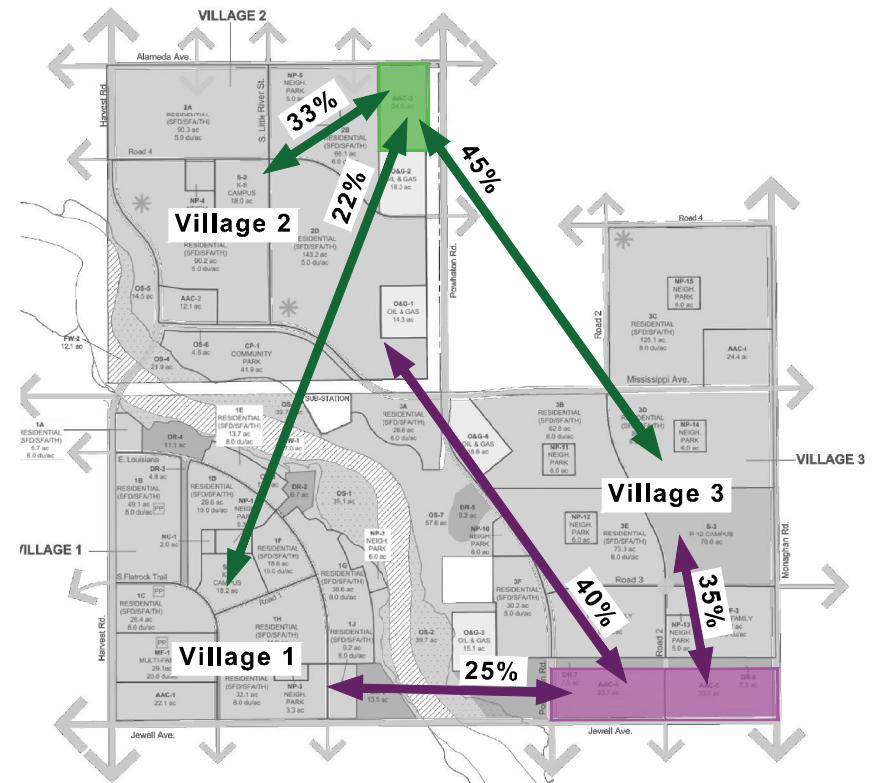
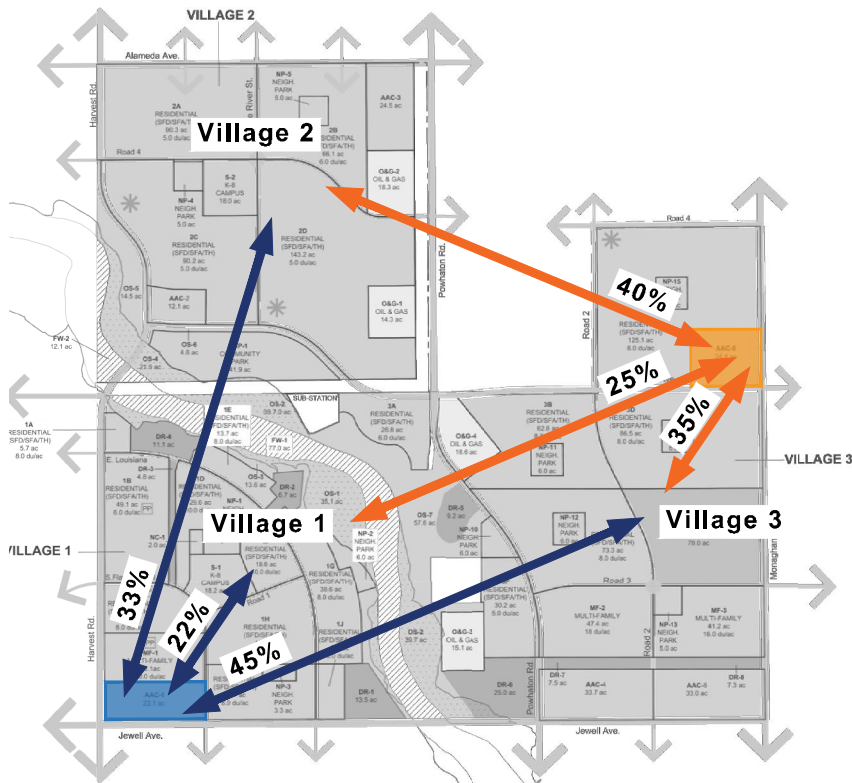
# KEY

- XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUME
- LANE CONFIGURATION
- NEW BACKGROUND LANE CONFIGURATION
- PROPOSED ROADWAY OR ACCESS
- PARKLANDS AURORA PROJECT SITE
- EXISTING TRAFFIC CONTROL
- FUTURE BACKGROUND TRAFFIC CONTROL

NOTE: EXISTING INTERSECTIONS (#1-#10) SHOWN ON FIGURE 4A

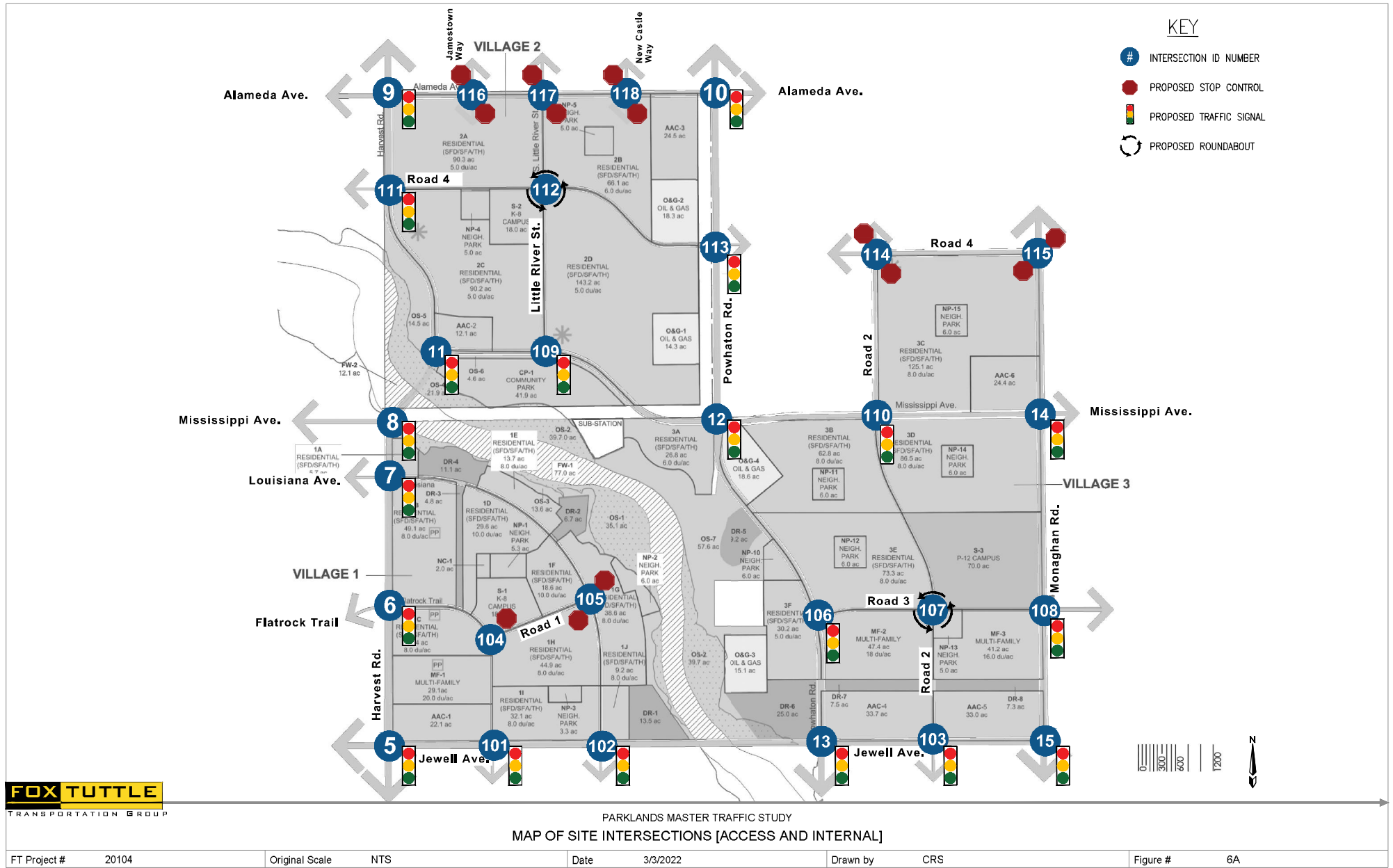


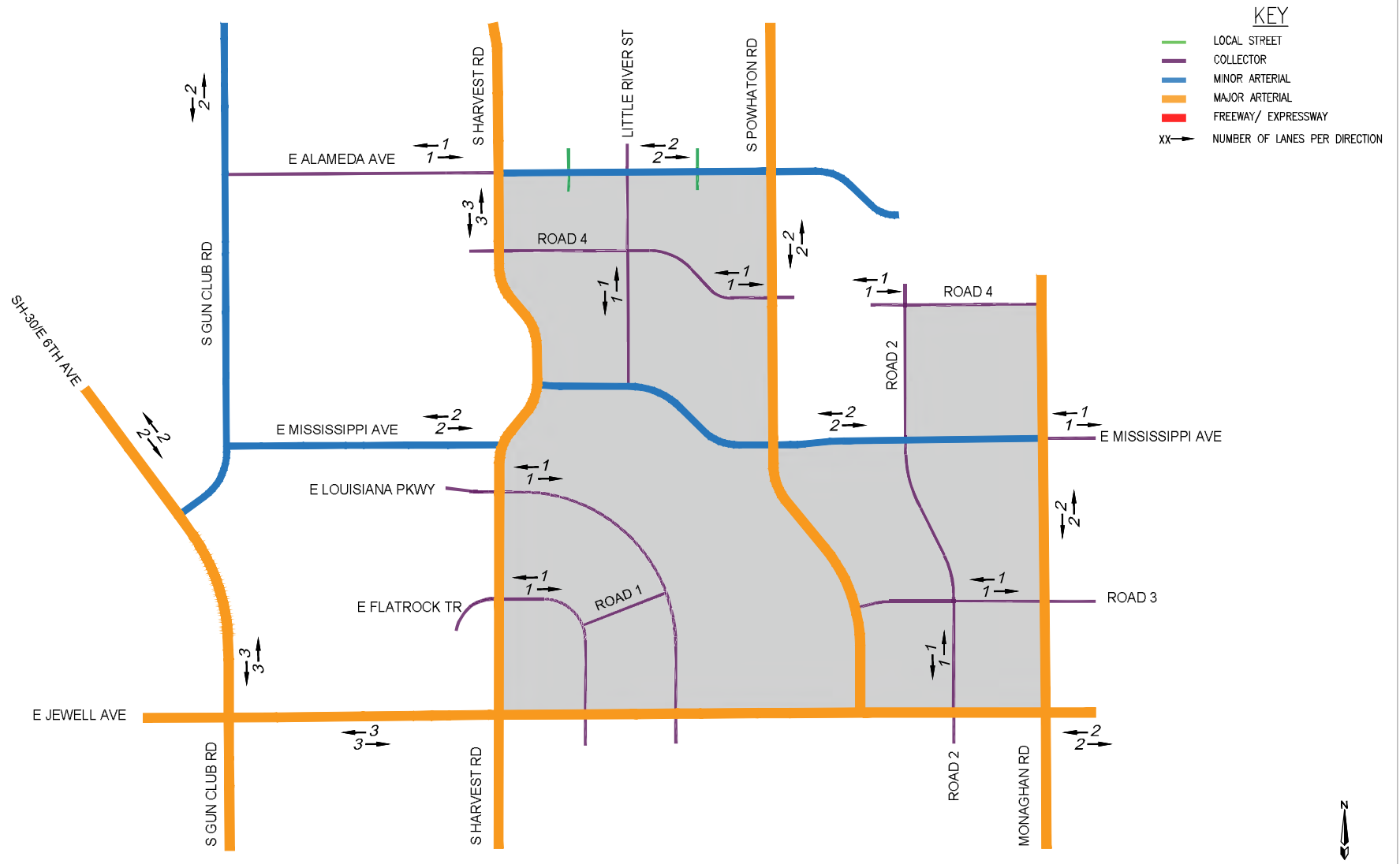










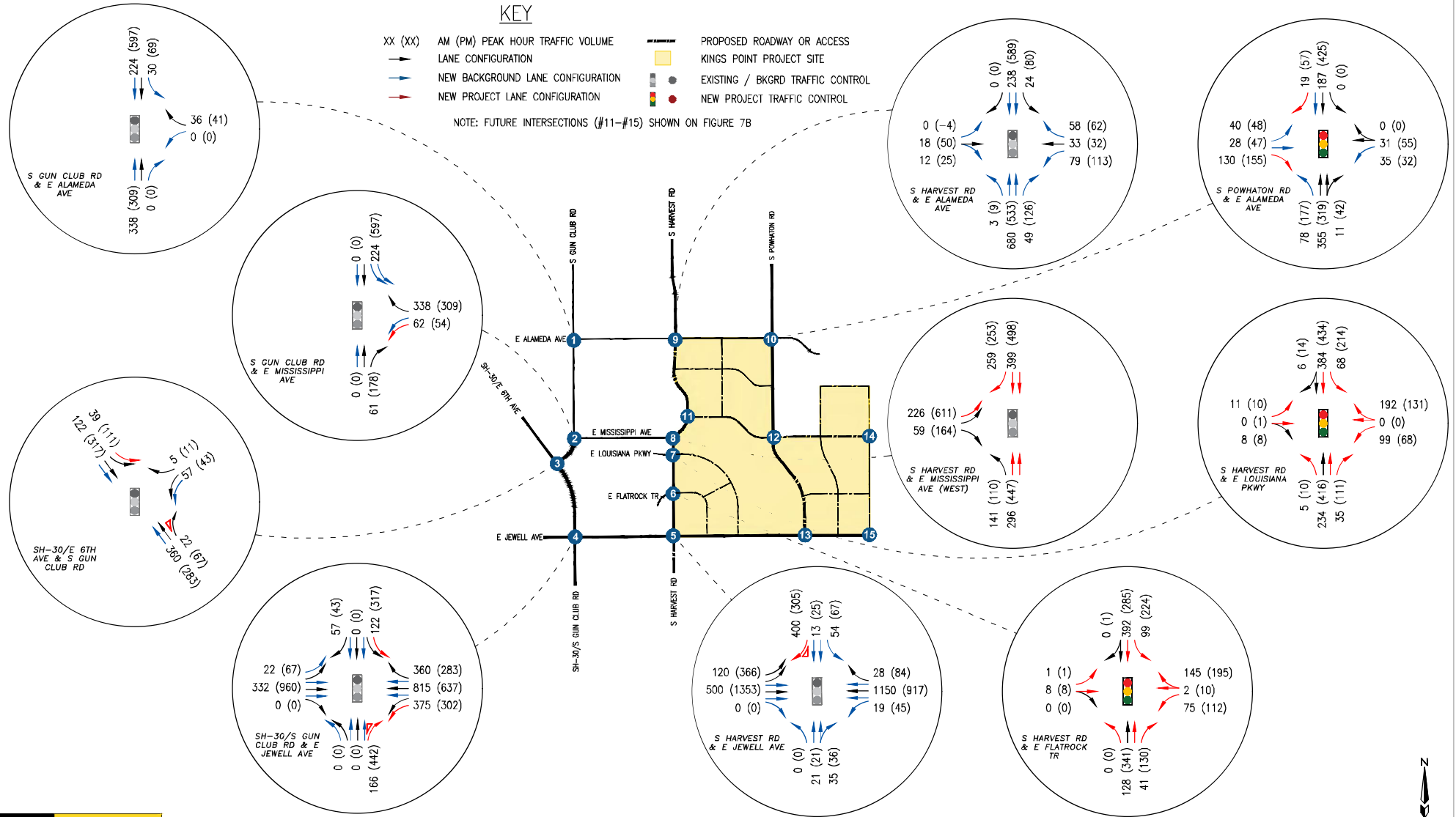


# KEY

XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUME  
 → LANE CONFIGURATION  
 → NEW BACKGROUND LANE CONFIGURATION  
 → NEW PROJECT LANE CONFIGURATION

PROPOSED ROADWAY OR ACCESS  
 KINGS POINT PROJECT SITE  
 EXISTING / BKGRD TRAFFIC CONTROL  
 NEW PROJECT TRAFFIC CONTROL

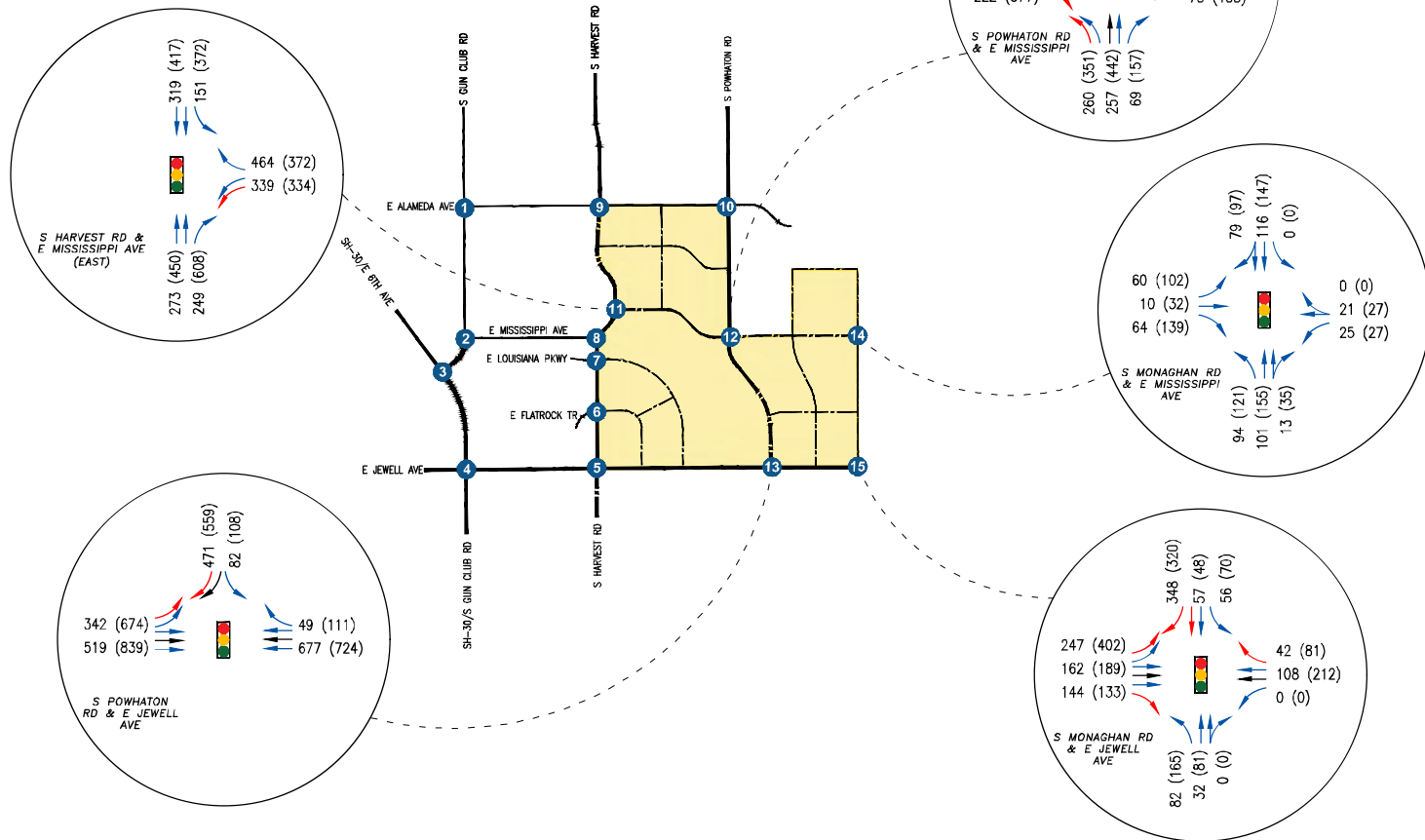
NOTE: FUTURE INTERSECTIONS (#11-#15) SHOWN ON FIGURE 7B

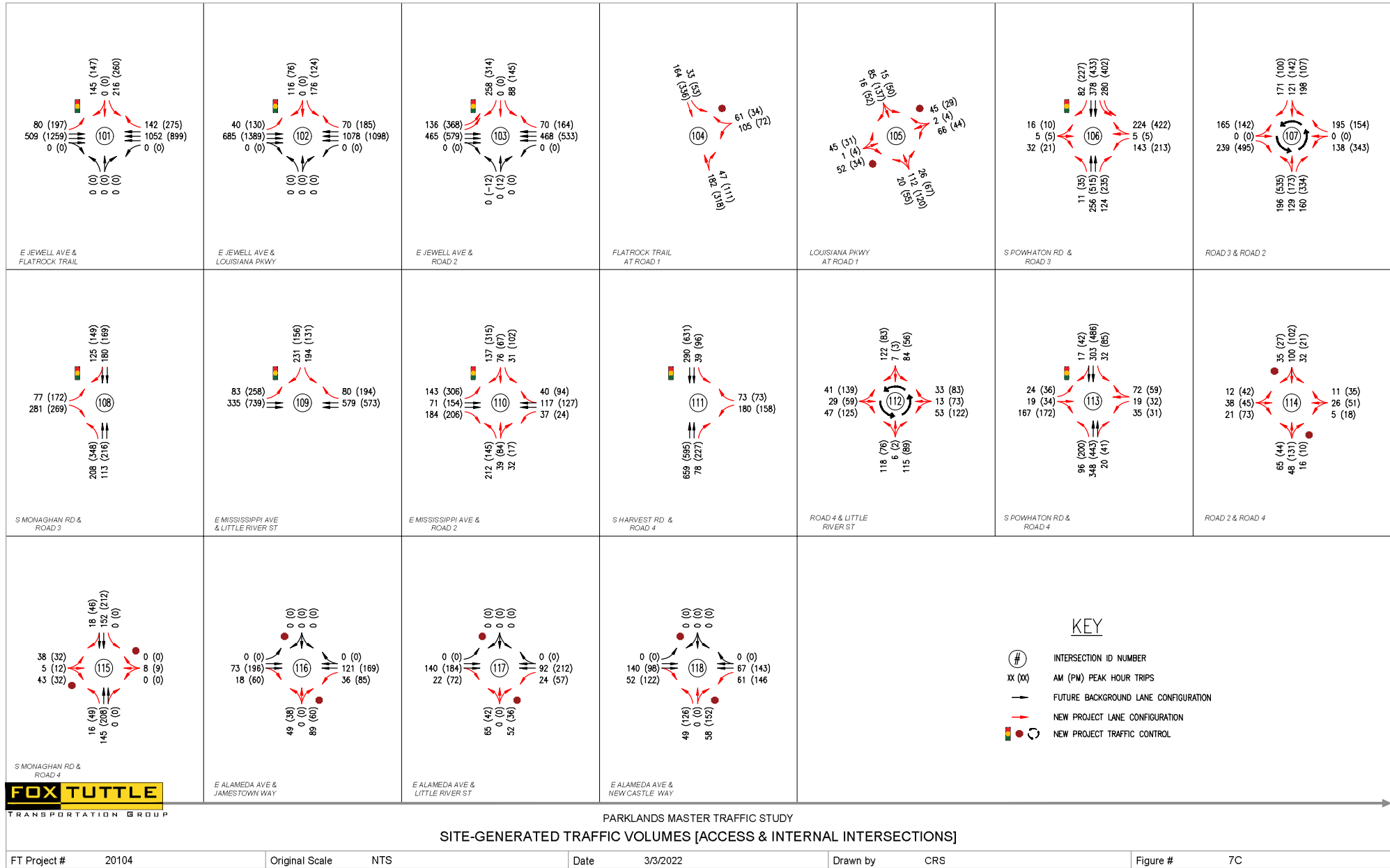


# KEY

- XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUME
- LANE CONFIGURATION
- NEW BACKGROUND LANE CONFIGURATION
- NEW PROJECT LANE CONFIGURATION
- PROPOSED ROADWAY OR ACCESS
- KINGS POINT PROJECT SITE
- EXISTING / BKGRD TRAFFIC CONTROL
- NEW PROJECT TRAFFIC CONTROL

NOTE: EXISTING INTERSECTIONS (#1-#10) SHOWN ON FIGURE 7A





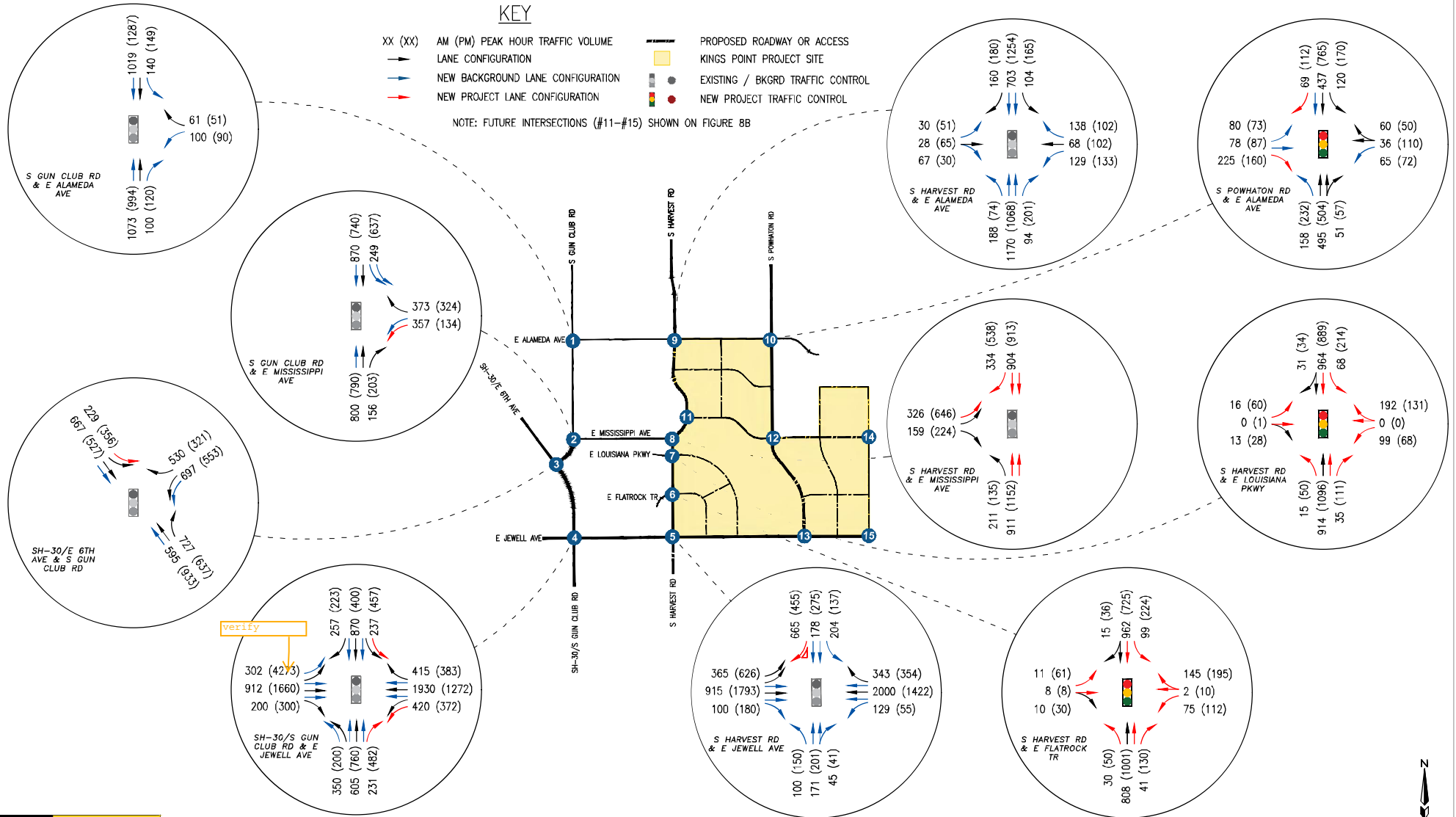


# KEY

XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUME  
 → LANE CONFIGURATION  
 → NEW BACKGROUND LANE CONFIGURATION  
 → NEW PROJECT LANE CONFIGURATION

PROPOSED ROADWAY OR ACCESS  
 KINGS POINT PROJECT SITE  
 EXISTING / BKGRD TRAFFIC CONTROL  
 NEW PROJECT TRAFFIC CONTROL

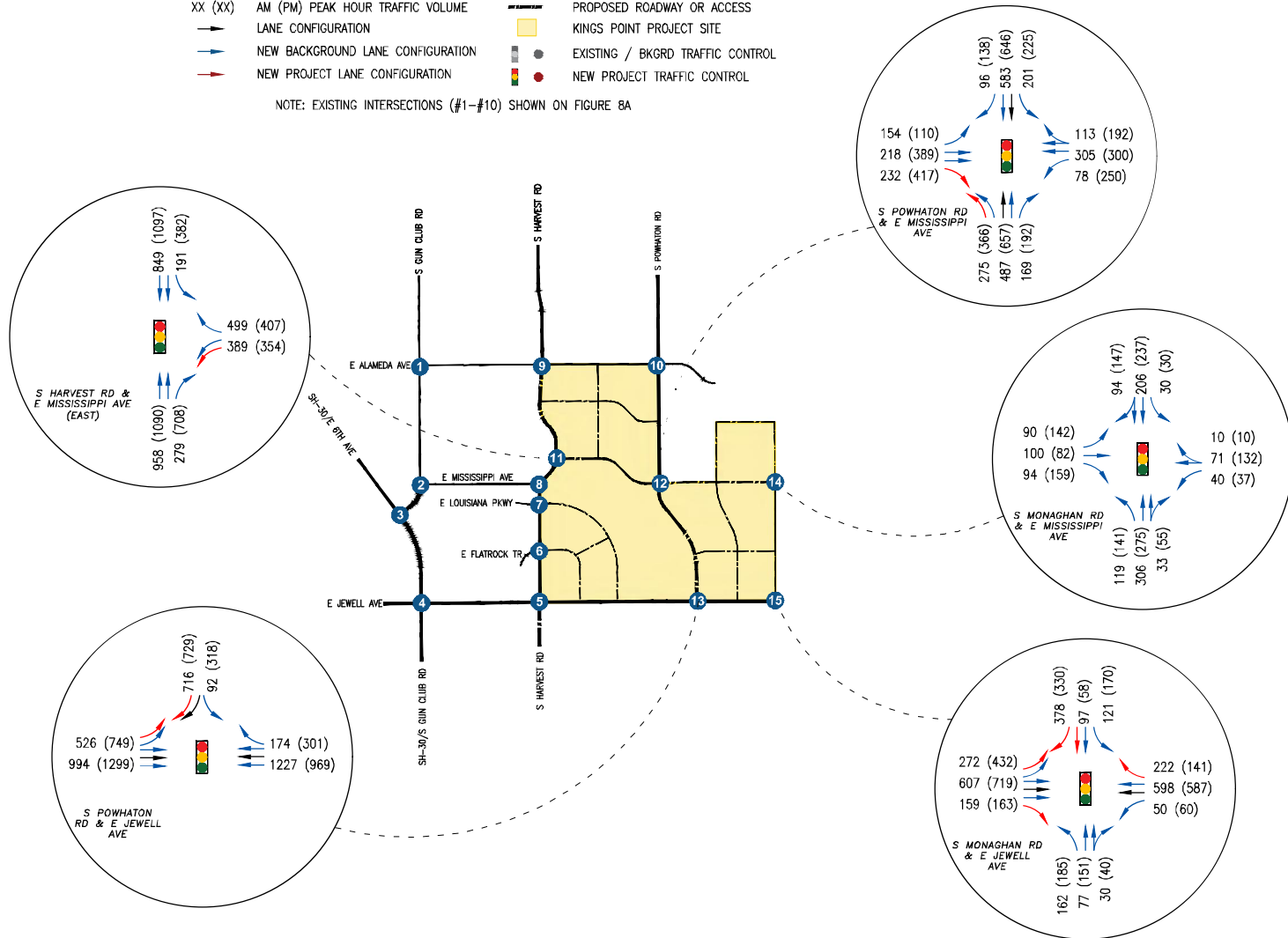
NOTE: FUTURE INTERSECTIONS (#11-#15) SHOWN ON FIGURE 8B

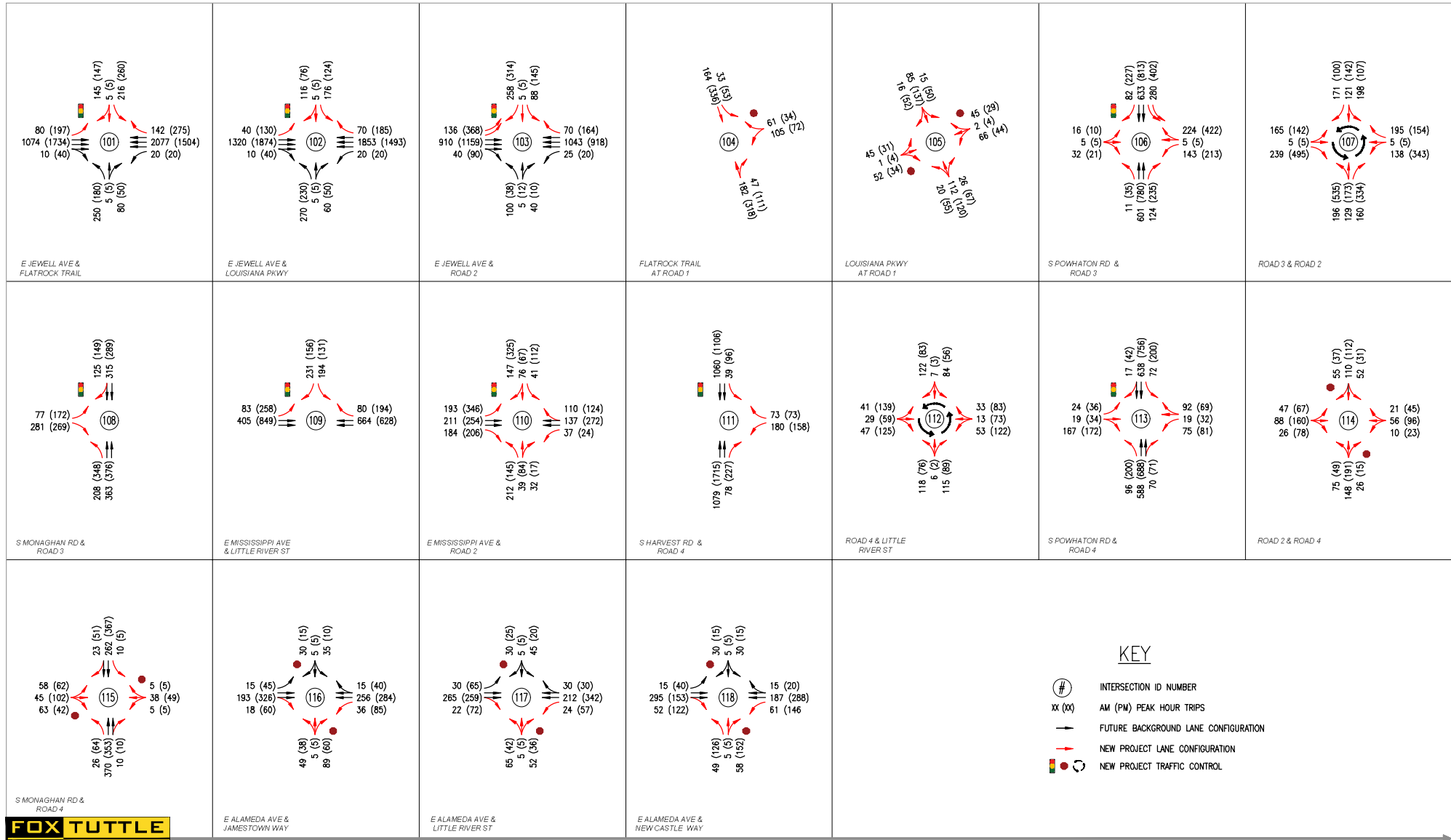


# KEY

- XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUME
- LANE CONFIGURATION
- NEW BACKGROUND LANE CONFIGURATION
- NEW PROJECT LANE CONFIGURATION
- PROPOSED ROADWAY OR ACCESS
- KINGS POINT PROJECT SITE
- EXISTING / BKGRD TRAFFIC CONTROL
- NEW PROJECT TRAFFIC CONTROL

NOTE: EXISTING INTERSECTIONS (#1-#10) SHOWN ON FIGURE 8A





# APPENDIX C

## Trip Generation Worksheets

Project Parklands Village 2 - Phase 1  
 Subject Trip Generation for Single-Family Detached Housing  
 Designed by TJD Date September 26, 2022 Job No. 196480000  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 11th Edition, Fitted Curve Equations

Land Use Code - Single-Family Detached Housing (210)

Independent Variable - Dwelling Units (X)

$$X = 329$$

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (200 Series Page 220)**

$$\begin{aligned} \ln(T) &= 0.91 \ln(X) + 0.12 \\ \ln(T) &= 0.91 * \ln(329) + 0.12 \end{aligned}$$

Directional Distribution: 26% ent. 74% exit.  
 T = 220 Average Vehicle Trip Ends  
 57 entering 163 exiting

$$57 + 163 = 220$$

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (200 Series Page 221)**

$$\begin{aligned} \ln(T) &= 0.94 \ln(X) + 0.27 \\ \ln(T) &= 0.94 * \ln(329) + 0.27 \end{aligned}$$

Directional Distribution: 63% ent. 37% exit.  
 T = 304 Average Vehicle Trip Ends  
 192 entering 112 exiting

$$192 + 112 = 304$$

### **Weekday (200 Series Page 219)**

$$\begin{aligned} \ln(T) &= 0.92 \ln(X) + 2.68 \\ \ln(T) &= 0.92 * \ln(329) + 2.68 \end{aligned}$$

Directional Distribution: 50% entering, 50% exiting  
 T = 3018 Average Vehicle Trip Ends  
 1509 entering 1509 exiting

$$1509 + 1509 = 3018$$

Project Parklands Village 2 - Phase 1  
 Subject Trip Generation for Single-Family Attached Housing  
 Designed by TJD Date September 26, 2022 Job No. 196480000  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 11th Edition, Fitted Curve Equations

Land Use Code - Single-Family Attached Housing (215)

Independent Variable - Dwelling Units (X)

$$X = 90$$

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (200 Series Page 239)**

$(T) = 0.52 (X) - 5.70$	Directional Distribution:	31% ent.	69% exit.
$(T) = 0.52 * (90) - 5.70$	T = 41	Average Vehicle Trip Ends	
	13 entering	28 exiting	
	13 + 28 = 41		

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (200 Series Page 240)**

$(T) = 0.60 (X) - 3.93$	Directional Distribution:	57% ent.	43% exit.
$(T) = 0.60 * (90) - 3.93$	T = 50	Average Vehicle Trip Ends	
	29 entering	21 exiting	
	29 + 21 = 50		

### **Weekday (200 Series Page 238)**

$(T) = 7.62 (X) - 50.48$	Directional Distribution:	50% entering, 50% exiting
$(T) = 7.62 * (90) + 50.48$	T = 636	Average Vehicle Trip Ends
	318 entering	318 exiting
	318 + 318 = 636	



Project Parkland Village 2 - Phase 1  
 Subject Trip Generation - Public Park  
 Designed by TJD Date September 26, 2022 Job No. 196480000  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 11th Edition, Average Rate Equations  
 Land Use Code - Public Park (411)  
 Independent Variable - Acres (X)

Acres 3.6  
 $X = 3.6$   
 T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (400 Series Page 3)**

Directional Distribution: 59% ent. 41% exit.  
 $(T) = 0.02 (X)$   
 $(T) = 0.02 * (3.6)$   
 $T = 0$  Average Vehicle Trip Ends  
 0 entering 0 exiting  
 0 + 0 = 0

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (400 Series Page 4)**

Directional Distribution: 55% ent. 45% exit.  
 $(T) = 0.11 (X)$   
 $(T) = 0.11 * (3.6)$   
 $T = 0$  Average Vehicle Trip Ends  
 0 entering 0 exiting  
 0 + 0 = 0

### **Weekday (400 Series page 2)**

Average Weekday  
 $T = 0.78 * (X)$   
 $T = 0.78 * 3.6$   
 Directional Distribution: 50% entering, 50% exiting  
 $T = 2$  Average Vehicle Trip Ends  
 1 entering 1 exiting  
 1 + 1 = 2

Project Parklands Village 2 - Phase 2  
 Subject Trip Generation for Single-Family Detached Housing  
 Designed by TJD Date September 26, 2022 Job No. 196480000  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 11th Edition, Fitted Curve Equations

Land Use Code - Single-Family Detached Housing (210)

Independent Variable - Dwelling Units (X)

$$X = 984$$

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (200 Series Page 220)**

$$\ln(T) = 0.91 \ln(X) + 0.12$$

$$\ln(T) = 0.91 * \ln(984) + 0.12$$

Directional Distribution: 26% ent. 74% exit.

T = 596 Average Vehicle Trip Ends

155 entering 441 exiting

$$155 + 441 = 596$$

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (200 Series Page 221)**

$$\ln(T) = 0.94 \ln(X) + 0.27$$

$$\ln(T) = 0.94 * \ln(984) + 0.27$$

Directional Distribution: 63% ent. 37% exit.

T = 852 Average Vehicle Trip Ends

537 entering 315 exiting

$$537 + 315 = 852$$

### **Weekday (200 Series Page 219)**

$$\ln(T) = 0.92 \ln(X) + 2.68$$

$$\ln(T) = 0.92 * \ln(984) + 2.68$$

Directional Distribution: 50% entering, 50% exiting

T = 8270 Average Vehicle Trip Ends

4135 entering 4135 exiting

$$4135 + 4135 = 8270$$

Project Parklands Village 2 - Phase 2  
 Subject Trip Generation for Single-Family Attached Housing  
 Designed by TJD Date September 26, 2022 Job No. 196480000  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 11th Edition, Fitted Curve Equations

Land Use Code - Single-Family Attached Housing (215)

Independent Variable - Dwelling Units (X)

$$X = 207$$

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (200 Series Page 239)**

$(T) = 0.52 (X) - 5.70$	Directional Distribution:	31% ent.	69% exit.
$(T) = 0.52 * (207) - 5.70$	T = 102	Average Vehicle Trip Ends	
	32 entering	70 exiting	
	32 + 70 = 102		

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (200 Series Page 240)**

$(T) = 0.60 (X) - 3.93$	Directional Distribution:	57% ent.	43% exit.
$(T) = 0.60 * (207) - 3.93$	T = 120	Average Vehicle Trip Ends	
	68 entering	52 exiting	
	68 + 52 = 120		

### **Weekday (200 Series Page 238)**

$(T) = 7.62 (X) - 50.48$	Directional Distribution:	50% entering, 50% exiting
$(T) = 7.62 * (207) + 50.48$	T = 1528	Average Vehicle Trip Ends
	764 entering	764 exiting
	764 + 764 = 1528	

Project Parklands Village - Phase 2  
 Subject Trip Generation for Multifamily Housing (Mid-Rise)  
 Designed by TJD Date September 26, 2022 Job No. 196480000  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 11th Edition, Average Rate Equations

Land Use Code - Multifamily Housing (Mid-Rise) (221)

Independent Variable - Dwelling Units (X)

$$X = 564$$

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (200 Series Page 275)**

Average Weekday

$$(T) = 0.37 (X)$$

$$(T) = 0.37 * (564.0)$$

Directional Distribution: 23% ent. 77% exit.

T = 209 Average Vehicle Trip Ends

48 entering 161 exiting

$$48 + 161 = 209$$

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (200 Series Page 276)**

Average Weekday

$$(T) = 0.39(X)$$

$$(T) = 0.39 * (564.0)$$

Directional Distribution: 61% ent. 39% exit.

T = 220 Average Vehicle Trip Ends

134 entering 86 exiting

$$134 + 86 = 220$$

### **Weekday (200 Series Page 274)**

Average Weekday

$$(T) = 4.54 (X)$$

$$(T) = 4.54 * (564.0)$$

Directional Distribution: 50% entering, 50% exiting

T = 2562 Average Vehicle Trip Ends

1281 entering 1281 exiting

$$1281 + 1281 = 2562$$

Project Parkland Village 2 - Phase 2  
 Subject Trip Generation - Public Park  
 Designed by TJD Date September 26, 2022 Job No. 196480000  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 11th Edition, Average Rate Equations  
 Land Use Code - Public Park (411)  
 Independent Variable - Acres (X)

Acres 54.7  
 $X = 54.7$   
 T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (400 Series Page 3)**

Directional Distribution: 59% ent. 41% exit.  
 $(T) = 0.02 (X)$   
 $(T) = 0.02 * (54.7)$   
 $T = 1$  Average Vehicle Trip Ends  
 1 entering 0 exiting  
 1 + 0 = 1

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (400 Series Page 4)**

Directional Distribution: 55% ent. 45% exit.  
 $(T) = 0.11 (X)$   
 $(T) = 0.11 * (54.7)$   
 $T = 6$  Average Vehicle Trip Ends  
 3 entering 3 exiting  
 3 + 3 = 6

### **Weekday (400 Series page 2)**

Average Weekday  
 $T = 0.78 * (X)$   
 $T = 0.78 * 54.7$   
 Directional Distribution: 50% entering, 50% exiting  
 $T = 42$  Average Vehicle Trip Ends  
 21 entering 21 exiting  
 21 + 21 = 42

Project Parkland Village 2 - Phase 2  
 Subject Trip Generation for Elementary School  
 Designed by TJD Date September 26, 2022 Job No. 196480000  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 11th Edition, Average Rate Equations

Land Use Code - Elementary School (520)

Independent Variable - Students (X)

$$X = 715$$

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (500 Series Page 327)**

Average Weekday

$$(T) = 0.74 (X)$$

$$(T) = 0.74 * (715.0)$$

Directional Distribution: 54% ent. 46% exit.

T = 529 Average Vehicle Trip Ends

286 entering 243 exiting

$$286 + 243 = 529$$

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (500 Series Page 328)**

Average Weekday

$$(T) = 0.16(X)$$

$$(T) = 0.16 * (715.0)$$

Directional Distribution: 46% ent. 54% exit.

T = 114 Average Vehicle Trip Ends

52 entering 62 exiting

$$52 + 62 = 114$$

### **Weekday (500 Series Page 326)**

Average Weekday

$$(T) = 2.27 (X)$$

$$(T) = 2.27 * (715.0)$$

Directional Distribution: 50% entering, 50% exiting

T = 1624 Average Vehicle Trip Ends

812 entering 812 exiting

$$812 + 812 = 1624$$



Project Parklands Village 2 - Phase 2  
 Subject Trip Generation for Middle School/Junior High School  
 Designed by TJD Date September 26, 2022 Job No. 196480000  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 11th Edition, Average Rate Equations

Land Use Code - Middle School/Junior High School (522)

Independent Variable - Students (X)

$$X = 339$$

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (500 Series Page 342)**

Average Weekday

$$(T) = 0.67 (X)$$

$$(T) = 0.67 * (339.0)$$

Directional Distribution: 54% ent. 46% exit.

T = 227 Average Vehicle Trip Ends

123 entering 104 exiting

$$123 + 104 = 227$$

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (500 Series Page 343)**

Average Weekday

$$(T) = 0.15(X)$$

$$(T) = 0.15 * (339.0)$$

Directional Distribution: 48% ent. 52% exit.

T = 51 Average Vehicle Trip Ends

24 entering 27 exiting

$$24 + 27 = 51$$

### **Weekday (500 Series Page 341)**

Average Weekday

$$(T) = 2.10 (X)$$

$$(T) = 2.10 * (339.0)$$

Directional Distribution: 50% entering, 50% exiting

T = 712 Average Vehicle Trip Ends

356 entering 356 exiting

$$356 + 356 = 712$$

Project Parklands Village 2 - Phase 2  
 Subject Trip Generation for General Office Building  
 Designed by TJD Date September 26, 2022 Job No. 196480000  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. 1 of 1

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 11th Edition, Average Rates

Land Use Code - General Office Building (710)

Independent Variable - 1000 Square Feet (X)

SF = 35,000

X = 35.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 710)**

(T) = 1.52 (X)		Directional Distribution:	88% ent.	12% exit.
(T) = 1.52 *	(35.0)	T = 53	Average Vehicle Trip Ends	
		47 entering	6 exiting	
		47 + 6 = 53		

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 711)**

(T) = 1.44 (X)		Directional Distribution:	17% ent.	83% exit.
(T) = 1.44 *	(35.0)	T = 50	Average Vehicle Trip Ends	
		9 entering	42 exiting	
		9 + 41 = 50		

### **Weekday (700 Series Page 709)**

(T) = 10.84 (X)		Directional Distribution:	50% ent.	50% exit.
(T) = 10.84 *	(35.0)	T = 380	Average Vehicle Trip Ends	
		190 entering	190 exiting	
		190 + 190 = 380		

Project Parklands Village 2 - Phase 2  
 Subject Trip Generation for Shopping Plaza (40-150k) - Supermarket-No  
 Designed by TJD Date September 26, 2022 Job No. 196480000  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 11th Edition, Average Rate Equations

Land Use Code - Shopping Plaza (40-150k) - Supermarket-No (821)

Independent Variable - 1000 Square Feet Gross Leasable Area (X)

Gross Leasable Area = 95,000 Square Feet

X = 95.000

T = Average Vehicle Trip Ends

### Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 213)

Average Weekday	Directional Distribution:	62% ent.	38% exit.
T = 1.73 * (X)	T = 164	Average Vehicle Trip Ends	
T = 1.73 * 95	102 entering	62 exiting	
	102 + 62 = 164		

### Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series page 214)

Average Weekday	Directional Distribution:	49% ent.	51% exit.
T = 5.19 * (X)	T = 493	Average Vehicle Trip Ends	
T = 5.19 * 95	242 entering	251 exiting	
	242 + 251 = 493		

### Weekday (800 Series page 212)

Average Weekday	Directional Distribution:	50% entering, 50% exiting
T = 67.52 * (X)	T = 6414	Average Vehicle Trip Ends
T = 67.52 * 95	3207 entering	3207 exiting
	3207 + 3207 = 6414	

### Non Pass-By Trip Volumes (Between 40 and 150k) (Per ITE Trip Generation Manual, 11th Edition)

AM Peak Hour = 60% Non-Pass By	PM Peak Hour = 60% Non-Pass By
IN Out Total	
AM Peak 61 37 98	PM Peak Hour Rate Applied to AM Peak Hour
PM Peak 145 151 296	
Daily 1924 1924 3848	PM Peak Hour Rate Applied to Daily

### Pass-By Trip Volumes (Between 40 and 150k) (Per ITE Trip Generation Manual, 11th Edition)

AM Peak Hour = 40% Pass By	PM Peak Hour = 40% Pass By
IN Out Total	
AM Peak 41 25 66	PM Peak Hour Rate Applied to AM Peak Hour
PM Peak 97 100 197	
Daily 1283 1283 2566	PM Peak Hour Rate Applied to Daily

Project Parklands Village 2 - Phase 2  
 Subject Trip Generation for Strip Retail Plaza (<40k)  
 Designed by TJD Date September 26, 2022 Job No. 196480000  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 11th Edition, Average Rate Equations

Land Use Code - Strip Retail Plaza (<40k) (822)

Independent Variable - 1000 Square Feet Gross Leasable Area (X)

Gross Leasable Area = 15,000 Square Feet

X = 15.000

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 230)**

Average Weekday	Directional Distribution:	60% ent.	40% exit.
T = 2.36 * (X)	T = 35	Average Vehicle Trip Ends	
T = 2.36 * 15	21 entering	14	exiting
	21 + 14 = 35		

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series page 231)**

Average Weekday	Directional Distribution:	50% ent.	50% exit.
T = 6.59 * (X)	T = 99	Average Vehicle Trip Ends	
T = 6.59 * 15	49 entering	50	exiting
	49 + 50 = 99		

### **Weekday (800 Series page 229)**

Average Weekday	Directional Distribution:	50% entering,	50% exiting
T = 54.45 * (X)	T = 816	Average Vehicle Trip Ends	
T = 54.45 * 15	408 entering	408	exiting
	408 + 408 = 816		

### **Non Pass-By Trip Volumes (Per ITE Trip Generation Manual, 11th Edition)**

AM Peak Hour = 60% Non-Pass By	PM Peak Hour = 60% Non-Pass By
IN Out Total	Pass-By Rates from ITE 821
AM Peak 13 8 21	PM Peak Hour Rate Applied to AM Peak Hour
PM Peak 29 30 60	
Daily 245 245 490	PM Peak Hour Rate Applied to Daily

### **Pass-By Trip Volumes (Per ITE Trip Generation Manual, 11th Edition)**

AM Peak Hour = 40% Pass By	PM Peak Hour = 40% Pass By
IN Out Total	
AM Peak 8 6 14	PM Peak Hour Rate Applied to AM Peak Hour
PM Peak 20 20 40	
Daily 163 163 326	PM Peak Hour Rate Applied to Daily

# APPENDIX D

## Trip Distribution by Intersection Figures

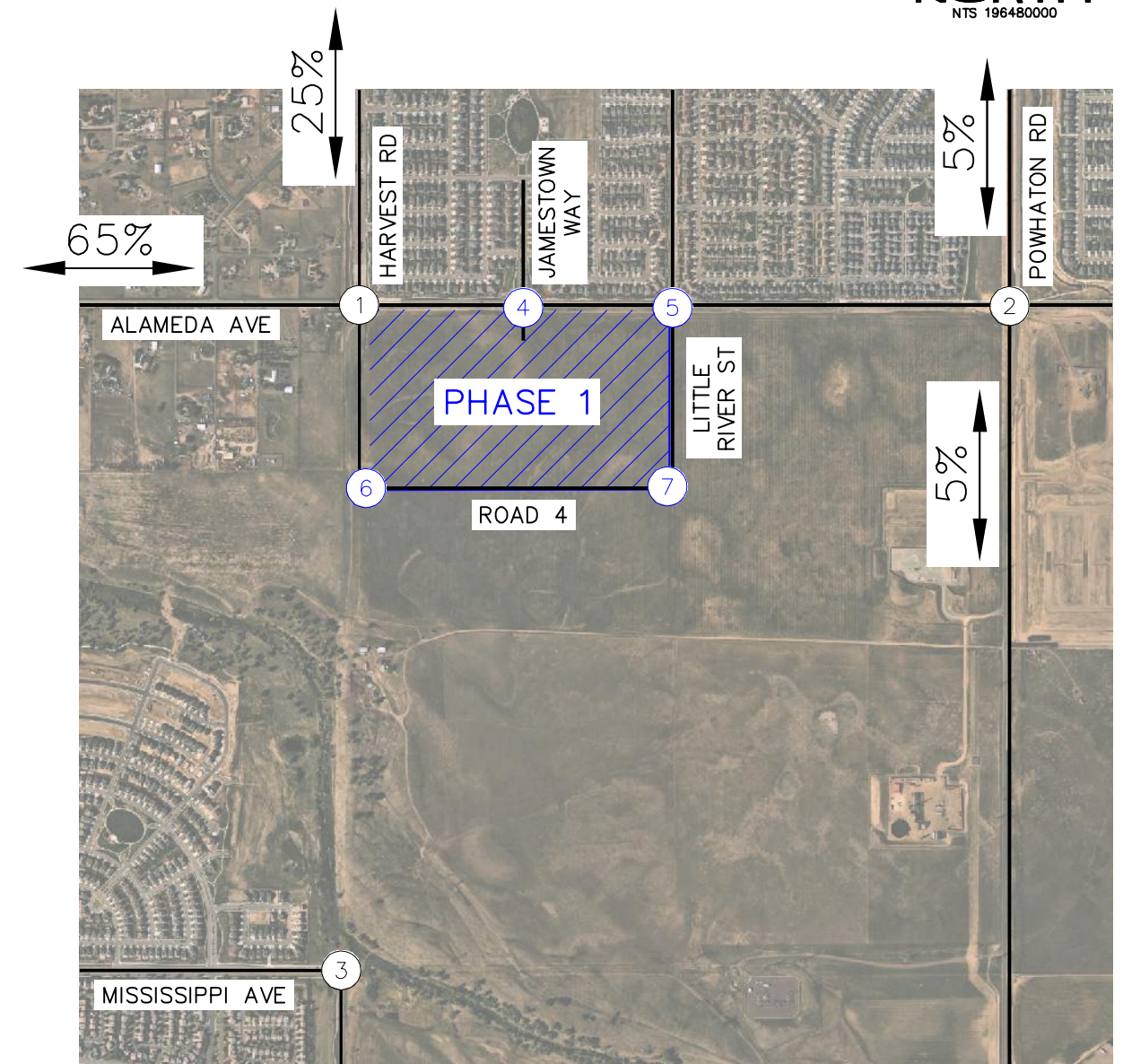
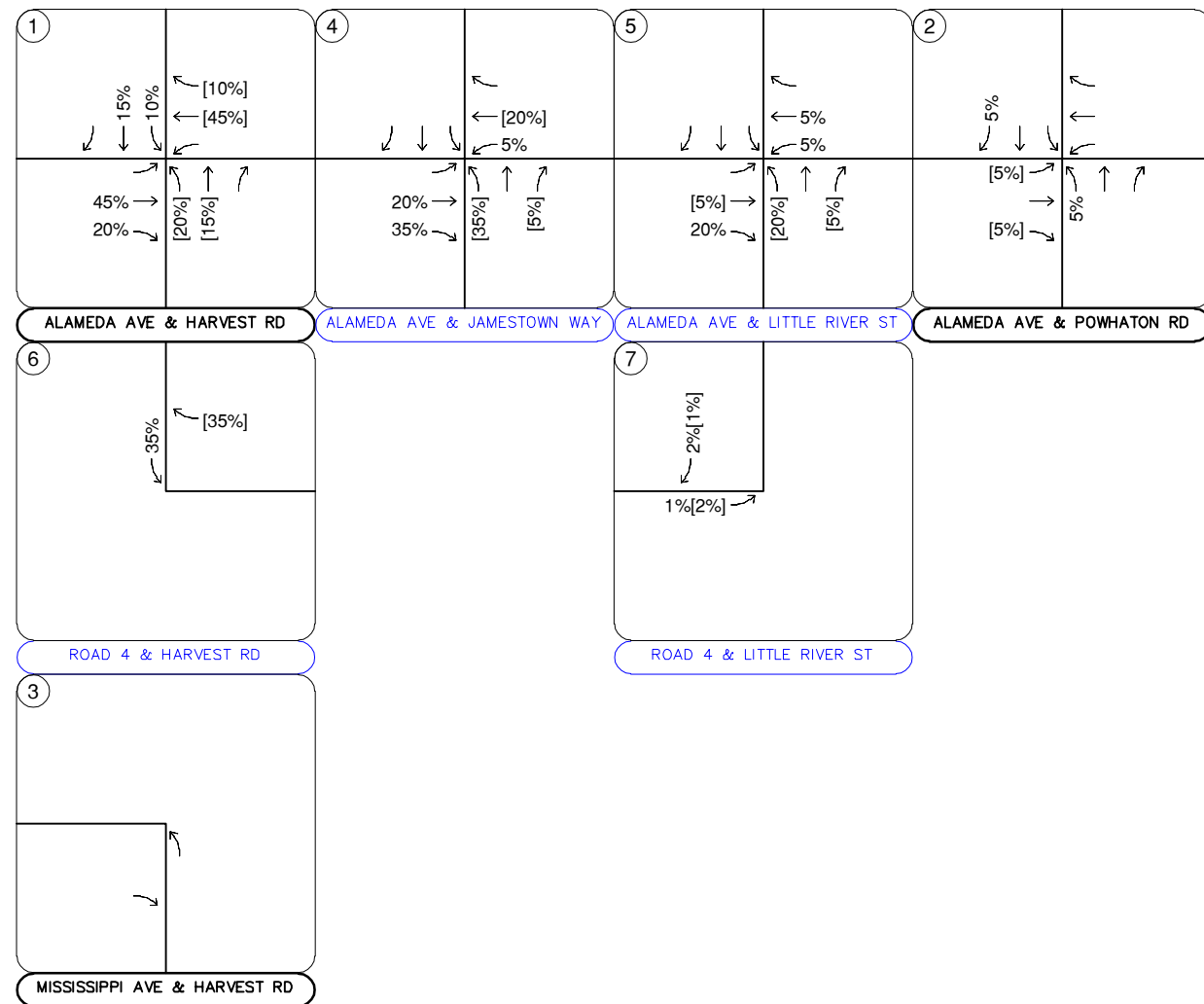
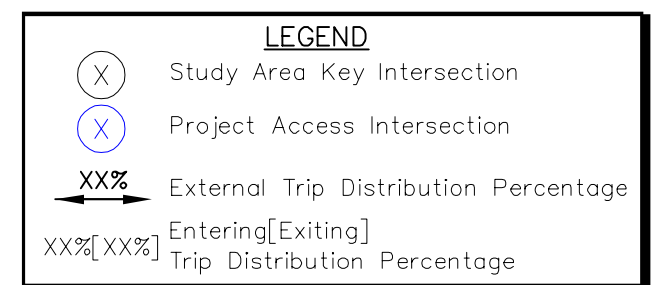


FIGURE D1  
PARKLANDS VILLAGE 2  
AURORA, COLORADO  
2025 PROJECT TRIP DISTRIBUTION





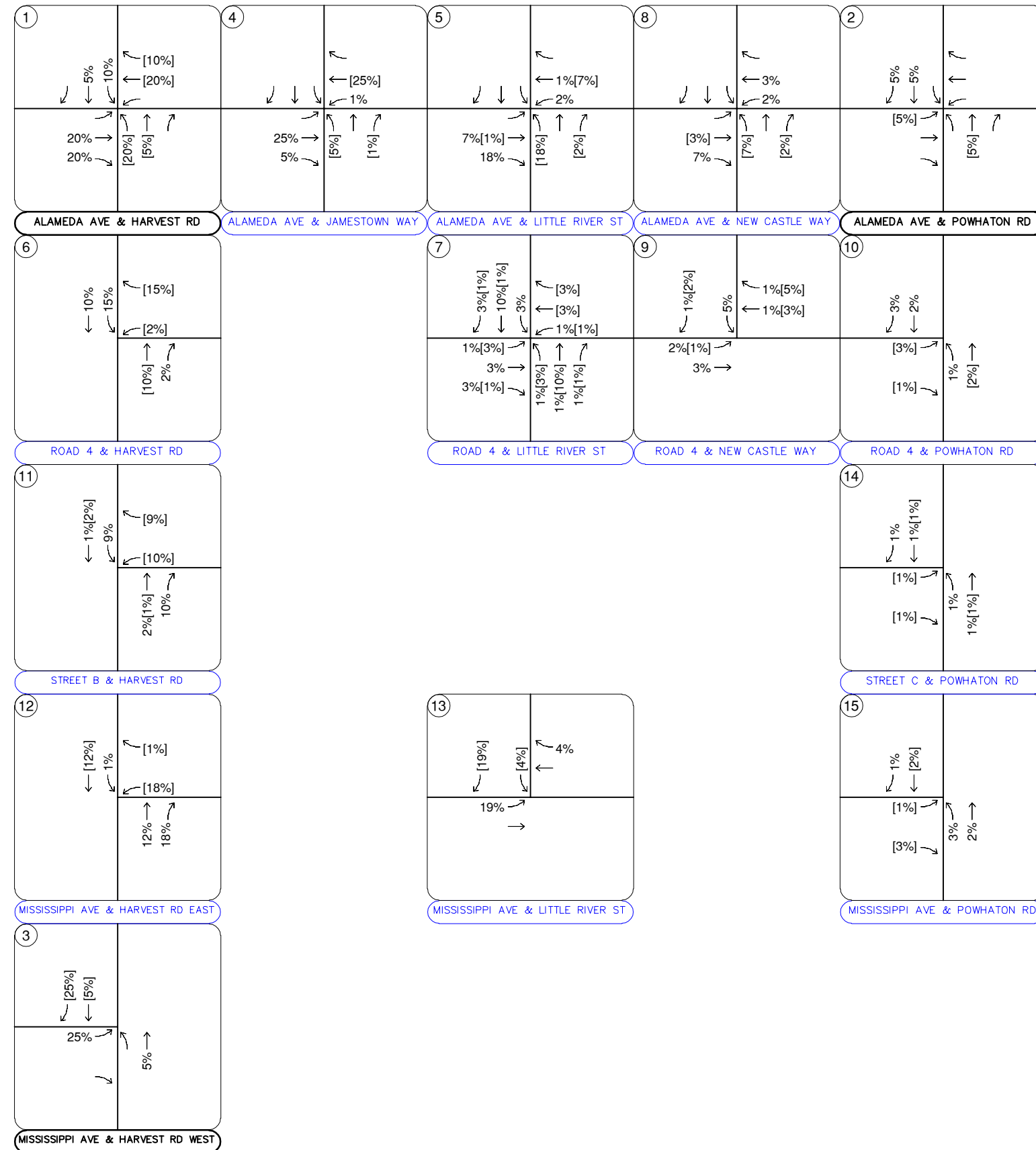
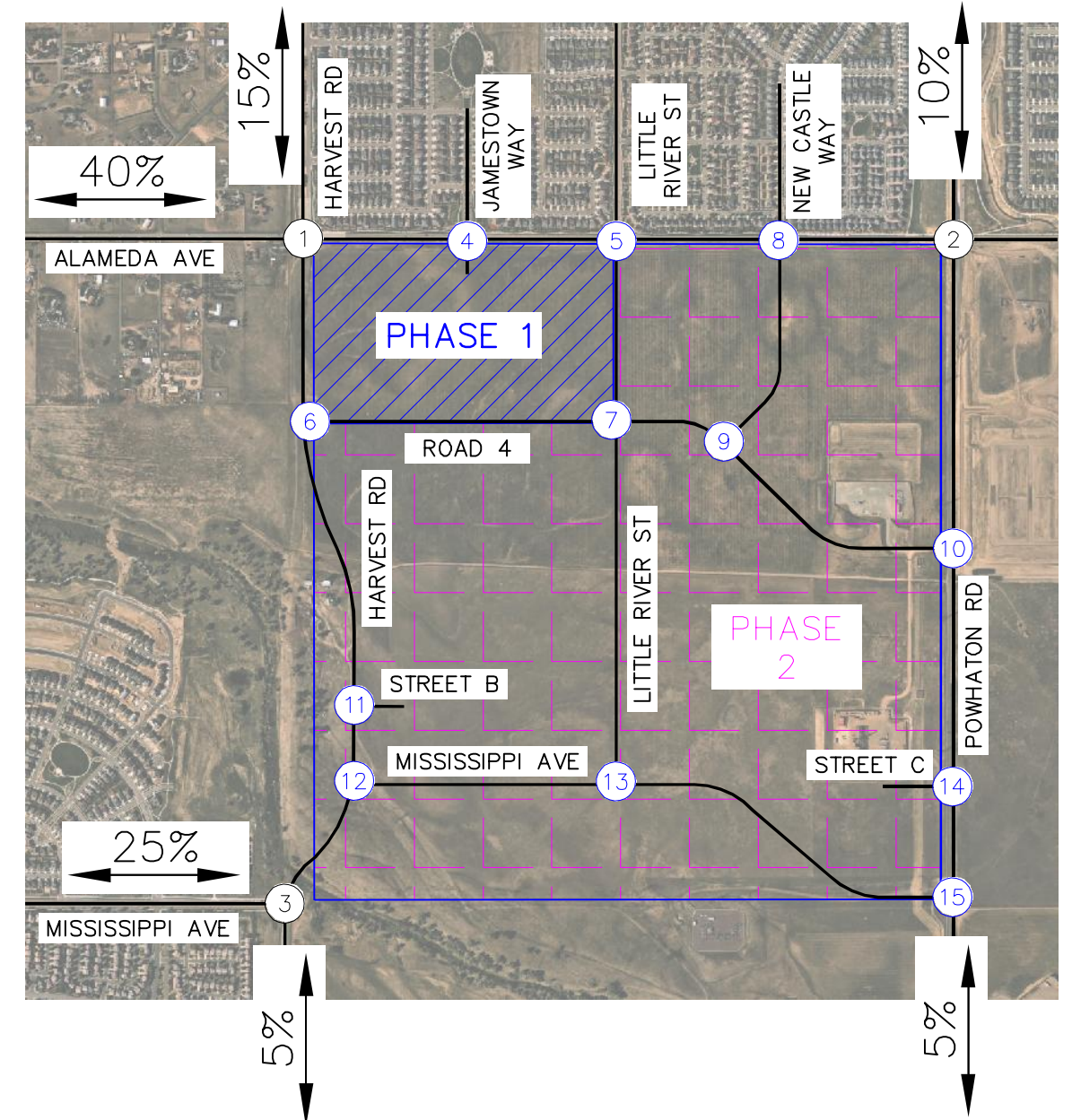


FIGURE D2  
PARKLANDS VILLAGE 2  
AURORA, COLORADO  
2030 EXTERNAL PROJECT TRIP DISTRIBUTION – RESIDENTIAL



Note:  
15% of total project residential trips are assumed to be internal to Parklands. The external trip distributions shown in this figure are applied to External Project Residential Trips only—85% of the total project residential trips.

LEGEND	
(X)	Study Area Key Intersection
(X)	Project Access Intersection
XX%	External Trip Distribution Percentage
XX%[XX%]	Entering[Exiting] Trip Distribution Percentage



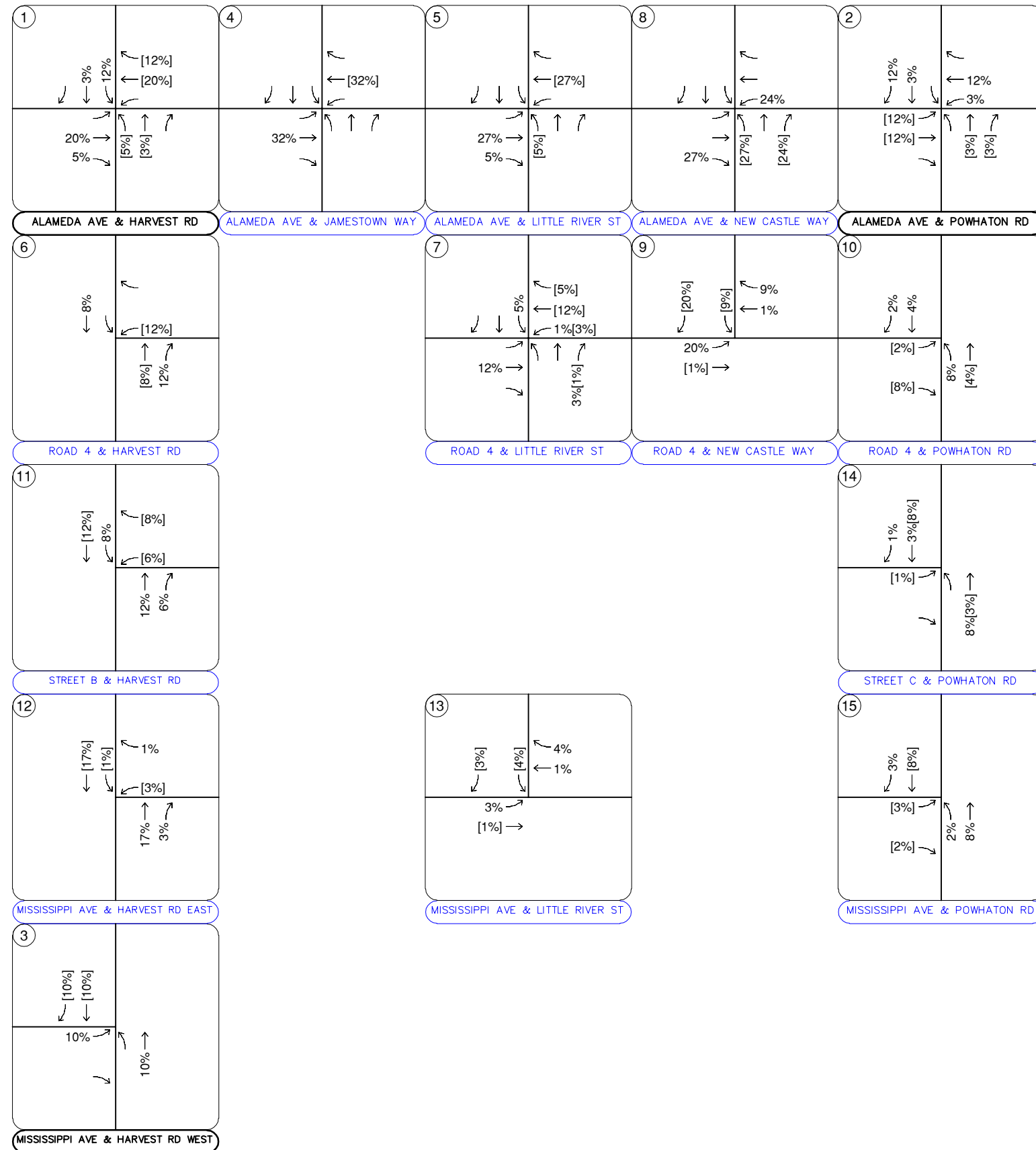
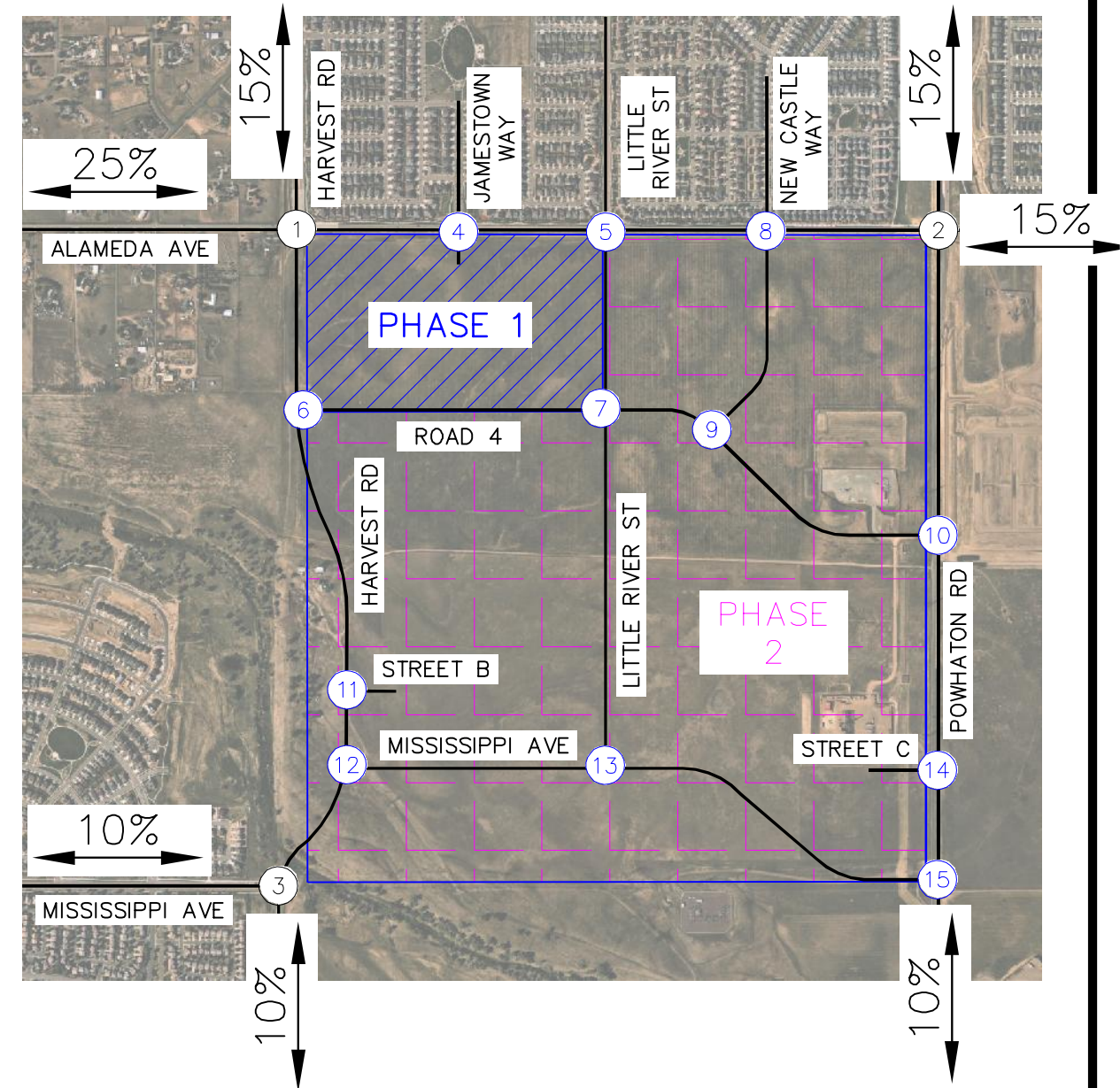


FIGURE D3  
PARKLANDS VILLAGE 2  
AURORA, COLORADO  
2030 EXTERNAL PROJECT TRIP DISTRIBUTION – COMMERCIAL



Note:

30% of total project commercial trips are assumed to be internal to Parklands. The external trip distributions shown in this figure are applied to External Project Commercial Trips only—70% of the total project commercial trips.

LEGEND

- (X) Study Area Key Intersection
- (X) Project Access Intersection
- XX% External Trip Distribution Percentage
- XX%[XX%] Entering[Exiting] Trip Distribution Percentage

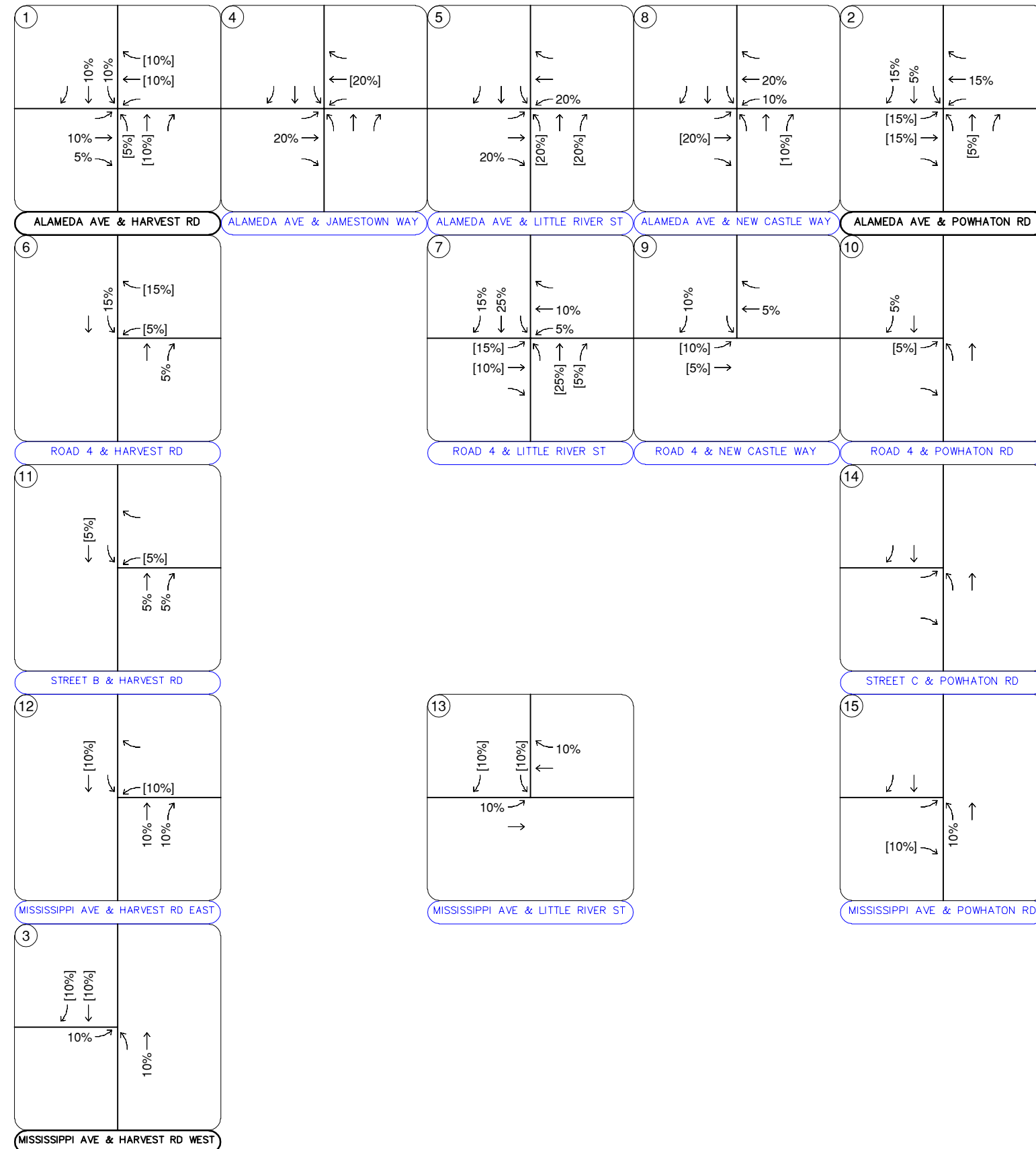
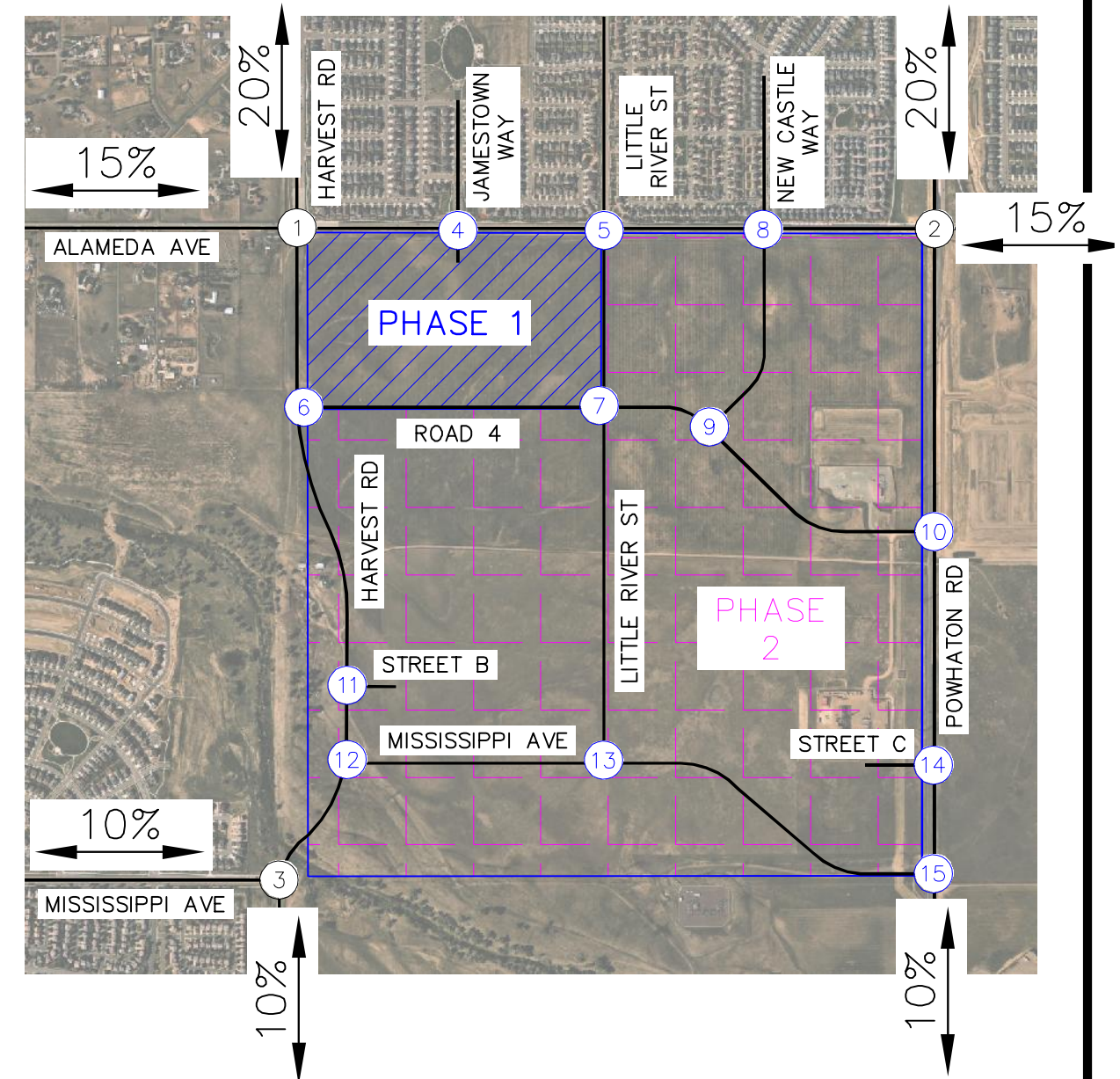


FIGURE D4  
PARKLANDS VILLAGE 2  
AURORA, COLORADO  
2030 EXTERNAL PROJECT TRIP DISTRIBUTION – SCHOOL



#### Note:





75% of total project school trips are assumed to be internal to Parklands. The external trip distributions shown in this figure are applied to External Project School Trips only—25% of the total project school trips.

#### LEGEND

- X Study Area Key Intersection
- X Project Access Intersection
- XX% External Trip Distribution Percentage
- XX%[XX%] Entering[Exiting] Trip Distribution Percentage

# APPENDIX E





## Intersection Analysis Worksheets

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	55	135	6	13	35
Future Vol, veh/h	20	55	135	6	13	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	300	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	8	8	7	7	5	5
Mvmt Flow	23	64	157	7	15	41
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	164	0	-	0	271	161
Stage 1	-	-	-	-	161	-
Stage 2	-	-	-	-	110	-
Critical Hdwy	4.18	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.272	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1379	-	-	-	712	876
Stage 1	-	-	-	-	861	-
Stage 2	-	-	-	-	907	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1379	-	-	-	700	876
Mov Cap-2 Maneuver	-	-	-	-	700	-
Stage 1	-	-	-	-	846	-
Stage 2	-	-	-	-	907	-
Approach	EB	WB		SB		
HCM Control Delay, s	2	0		9.6		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1379	-	-	-	700	876
HCM Lane V/C Ratio	0.017	-	-	-	0.022	0.046
HCM Control Delay (s)	7.7	0	-	-	10.3	9.3
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0.1



Intersection





Int Delay, s/veh 2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	66	197	98	3	18	32
Future Vol, veh/h	66	197	98	3	18	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	300	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	71	212	105	3	19	34

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	108	0	0 461 107
Stage 1	-	-	- 107 -
Stage 2	-	-	- 354 -
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	1483	-	- 559 947
Stage 1	-	-	- 917 -
Stage 2	-	-	- 710 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1483	-	- 529 947
Mov Cap-2 Maneuver	-	-	- 529 -
Stage 1	-	-	- 867 -
Stage 2	-	-	- 710 -

Approach	EB	WB	SB
HCM Control Delay, s	1.9	0	10.1
HCM LOS			B





Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1483	-	-	-	529	947
HCM Lane V/C Ratio	0.048	-	-	-	0.037	0.036
HCM Control Delay (s)	7.5	0	-	-	12.1	8.9
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.1	0.1

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	21	58	143	6	14	37
Future Vol, veh/h	21	58	143	6	14	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	300	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	8	8	7	7	5	5
Mvmt Flow	24	67	166	7	16	43
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	173	0	-	0	285	170
Stage 1	-	-	-	-	170	-
Stage 2	-	-	-	-	115	-
Critical Hdwy	4.18	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.272	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1368	-	-	-	699	866
Stage 1	-	-	-	-	853	-
Stage 2	-	-	-	-	902	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1368	-	-	-	686	866
Mov Cap-2 Maneuver	-	-	-	-	686	-
Stage 1	-	-	-	-	838	-
Stage 2	-	-	-	-	902	-
Approach	EB	WB		SB		
HCM Control Delay, s	2	0		9.7		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1368	-	-	-	686	866
HCM Lane V/C Ratio	0.018	-	-	-	0.024	0.05
HCM Control Delay (s)	7.7	0	-	-	10.4	9.4
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0.2



Intersection

Int Delay, s/veh 2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	74	221	109	3	19	36
Future Vol, veh/h	74	221	109	3	19	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	300	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	80	238	117	3	20	39

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	120	0	0 517 119
Stage 1	-	-	- 119 -
Stage 2	-	-	- 398 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1468	-	- 518 933
Stage 1	-	-	- 906 -
Stage 2	-	-	- 678 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1468	-	- 485 933
Mov Cap-2 Maneuver	-	-	- 485 -
Stage 1	-	-	- 849 -
Stage 2	-	-	- 678 -

Approach	EB	WB	SB
HCM Control Delay, s	1.9	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1468	-	-	-	485	933
HCM Lane V/C Ratio	0.054	-	-	-	0.042	0.041
HCM Control Delay (s)	7.6	0	-	-	12.7	9
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.1	0.1

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	↕
Traffic Vol, veh/h	23	86	13	5	236	25	38	28	5	15	10	39
Future Vol, veh/h	23	86	13	5	236	25	38	28	5	15	10	39
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	-	-	-	-	-	-	-	-	-	300	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	8	8	2	2	7	7	2	2	2	5	2	5
Mvmt Flow	27	100	15	6	274	29	44	33	6	17	12	45
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	303	0	0	115	0	0	491	477	108	482	470	289
Stage 1	-	-	-	-	-	-	162	162	-	301	301	-
Stage 2	-	-	-	-	-	-	329	315	-	181	169	-
Critical Hdwy	4.18	-	-	4.12	-	-	7.12	6.52	6.22	7.15	6.52	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.15	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.15	5.52	-
Follow-up Hdwy	2.272	-	-	2.218	-	-	3.518	4.018	3.318	3.545	4.018	3.345
Pot Cap-1 Maneuver	1225	-	-	1474	-	-	488	487	946	490	492	743
Stage 1	-	-	-	-	-	-	840	764	-	702	665	-
Stage 2	-	-	-	-	-	-	684	656	-	814	759	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1225	-	-	1474	-	-	440	473	946	451	478	743
Mov Cap-2 Maneuver	-	-	-	-	-	-	440	473	-	451	478	-
Stage 1	-	-	-	-	-	-	820	746	-	685	662	-
Stage 2	-	-	-	-	-	-	628	653	-	755	741	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.5			0.1			14.3			11.3		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3		
Capacity (veh/h)	471	1225	-	-	1474	-	-	451	478	743		
HCM Lane V/C Ratio	0.175	0.022	-	-	0.004	-	-	0.039	0.024	0.061		
HCM Control Delay (s)	14.3	8	0	-	7.5	0	-	13.3	12.7	10.2		
HCM Lane LOS	B	A	A	-	A	A	-	B	B	B		
HCM 95th %tile Q(veh)	0.6	0.1	-	-	0	-	-	0.1	0.1	0.2		

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	↕
Traffic Vol, veh/h	74	320	44	5	163	16	26	20	5	33	33	36
Future Vol, veh/h	74	320	44	5	163	16	26	20	5	33	33	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	-	-	-	-	-	-	-	-	-	300	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	80	344	47	5	175	17	28	22	5	35	35	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	192	0	0	391	0	0	759	730	368	735	745	184
Stage 1	-	-	-	-	-	-	528	528	-	194	194	-
Stage 2	-	-	-	-	-	-	231	202	-	541	551	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1381	-	-	1168	-	-	323	349	677	335	342	858
Stage 1	-	-	-	-	-	-	534	528	-	808	740	-
Stage 2	-	-	-	-	-	-	772	734	-	525	515	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1381	-	-	1168	-	-	265	321	677	296	315	858
Mov Cap-2 Maneuver	-	-	-	-	-	-	265	321	-	296	315	-
Stage 1	-	-	-	-	-	-	494	488	-	747	736	-
Stage 2	-	-	-	-	-	-	698	730	-	461	476	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	0.2	19.4	15.2
HCM LOS			C	C























Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	304	1381	-	-	1168	-	-	296	315	858
HCM Lane V/C Ratio	0.18	0.058	-	-	0.005	-	-	0.12	0.113	0.045
HCM Control Delay (s)	19.4	7.8	0	-	8.1	0	-	18.8	17.9	9.4
HCM Lane LOS	C	A	A	-	A	A	-	C	C	A
HCM 95th %tile Q(veh)	0.6	0.2	-	-	0	-	-	0.4	0.4	0.1

# Timings

## 1: Alameda Ave & Harvest Rd

2030 Background AM

10/13/2022

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	23	89	81	18	196	94	286	367	124	266	129
Future Volume (vph)	23	89	81	18	196	94	286	367	124	266	129
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		4			8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	4	4	4	8	8	8	5	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	9.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	14.0	27.5	10.0	23.5	23.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	37.5%	23.3%	45.8%	16.7%	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	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effect Green (s)	12.5	12.5	12.5	12.5	12.5	12.5	37.4	29.3	31.1	24.5	24.5
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21	0.21	0.62	0.49	0.52	0.41	0.41
v/c Ratio	0.13	0.26	0.22	0.08	0.57	0.25	0.47	0.51	0.25	0.39	0.20
Control Delay	18.8	20.2	4.5	23.3	32.5	10.3	8.3	15.0	7.1	16.3	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.8	20.2	4.5	23.3	32.5	10.3	8.3	15.0	7.1	16.3	4.1
LOS	B	C	A	C	C	B	A	B	A	B	A
Approach Delay		13.5			25.2			12.2		11.1	
Approach LOS		B			C			B		B	

### Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 14.4

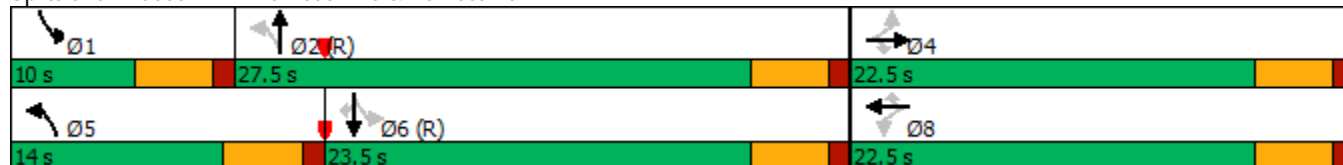
Intersection LOS: B

Intersection Capacity Utilization 59.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Alameda Ave & Harvest Rd



























# HCM 6th Signalized Intersection Summary

2030 Background AM

## 1: Alameda Ave & Harvest Rd

10/13/2022























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	89	81	18	196	94	286	367	43	124	266	129
Future Volume (veh/h)	23	89	81	18	196	94	286	367	43	124	266	129
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	1781	1781	1781	1796	1796	1796	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	25	97	88	20	213	102	311	399	47	135	289	140
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	8	8	7	7	7	5	5	5	5	5	5
Cap, veh/h	186	314	266	281	317	268	735	840	99	587	869	737
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.12	0.52	0.52	0.07	0.48	0.48
Sat Flow, veh/h	1014	1781	1510	1247	1796	1522	1739	1603	189	1739	1826	1547
Grp Volume(v), veh/h	25	97	88	20	213	102	311	0	446	135	289	140
Grp Sat Flow(s),veh/h/ln	1014	1781	1510	1247	1796	1522	1739	0	1792	1739	1826	1547
Q Serve(g_s), s	1.4	2.8	3.1	0.9	6.6	3.5	5.2	0.0	9.5	2.3	5.9	3.1
Cycle Q Clear(g_c), s	8.1	2.8	3.1	3.7	6.6	3.5	5.2	0.0	9.5	2.3	5.9	3.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	186	314	266	281	317	268	735	0	939	587	869	737
V/C Ratio(X)	0.13	0.31	0.33	0.07	0.67	0.38	0.42	0.00	0.47	0.23	0.33	0.19
Avail Cap(c_a), veh/h	312	534	453	435	539	457	797	0	939	617	869	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	0.93	0.93	0.93	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.9	21.5	21.6	23.1	23.1	21.8	6.2	0.0	9.0	7.0	9.8	9.1
Incr Delay (d2), s/veh	0.3	0.6	0.7	0.1	2.3	0.8	0.4	0.0	1.7	0.2	1.0	0.6
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(50%),veh/ln	0.3	1.2	1.1	0.2	2.8	1.2	1.5	0.0	3.4	0.6	2.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.2	22.1	22.3	23.2	25.4	22.6	6.6	0.0	10.8	7.2	10.8	9.6
LnGrp LOS	C	C	C	C	C	C	A	A	B	A	B	A
Approach Vol, veh/h	210			335			757			564		
Approach Delay, s/veh	22.8			24.4			9.0			9.7		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.0	35.9		15.1	11.9	33.1		15.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	23.0		18.0	9.5	19.0		18.0				
Max Q Clear Time (g_c+I1), s	4.3	11.5		10.1	7.2	7.9		8.6				
Green Ext Time (p_c), s	0.0	2.2		0.5	0.2	1.5		1.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	13.5											
HCM 6th LOS	B											

# Timings

2030 Background PM

## 1: Alameda Ave & Harvest Rd

10/13/2022

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	77	269	122	20	158	106	319	410	179	358	103
Future Volume (vph)	77	269	122	20	158	106	319	410	179	358	103
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		4			8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	4	4	4	8	8	8	5	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	9.5	22.5	9.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	14.8	27.1	10.4	22.7	22.7
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	37.5%	24.7%	45.2%	17.3%	37.8%	37.8%
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	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effect Green (s)	14.6	14.6	14.6	14.6	14.6	14.6	35.2	25.2	28.7	21.9	21.9
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.24	0.24	0.59	0.42	0.48	0.36	0.36
v/c Ratio	0.29	0.65	0.27	0.12	0.38	0.24	0.62	0.64	0.44	0.57	0.17
Control Delay	20.0	26.8	5.2	18.7	21.4	8.3	12.2	19.5	10.5	21.2	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	26.8	5.2	18.7	21.4	8.3	12.2	19.5	10.5	21.2	4.7
LOS	B	C	A	B	C	A	B	B	B	C	A
Approach Delay		20.0			16.4			16.5		15.5	
Approach LOS		C			B			B		B	

### Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 17.0

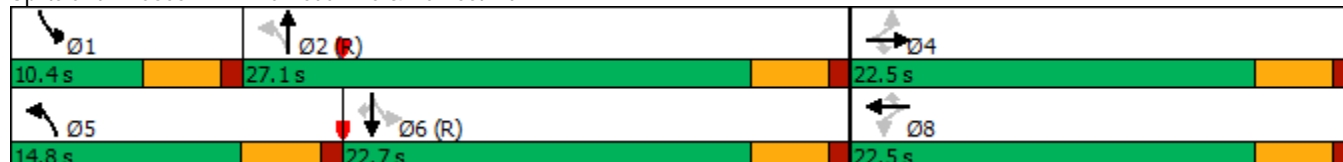
Intersection LOS: B

Intersection Capacity Utilization 69.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Alameda Ave & Harvest Rd




























# HCM 6th Signalized Intersection Summary

2030 Background PM

## 1: Alameda Ave & Harvest Rd





















10/13/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	269	122	20	158	106	319	410	48	179	358	103
Future Volume (veh/h)	77	269	122	20	158	106	319	410	48	179	358	103
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	84	292	133	22	172	115	347	446	52	195	389	112
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	265	398	337	185	398	337	613	776	91	528	788	668
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.14	0.47	0.47	0.09	0.42	0.42
Sat Flow, veh/h	1092	1870	1585	962	1870	1585	1781	1644	192	1781	1870	1585
Grp Volume(v), veh/h	84	292	133	22	172	115	347	0	498	195	389	112
Grp Sat Flow(s),veh/h/ln	1092	1870	1585	962	1870	1585	1781	0	1836	1781	1870	1585
Q Serve(g_s), s	4.3	8.7	4.3	1.3	4.8	3.7	6.2	0.0	11.8	3.6	9.1	2.6
Cycle Q Clear(g_c), s	9.1	8.7	4.3	10.0	4.8	3.7	6.2	0.0	11.8	3.6	9.1	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	265	398	337	185	398	337	613	0	867	528	788	668
V/C Ratio(X)	0.32	0.73	0.39	0.12	0.43	0.34	0.57	0.00	0.57	0.37	0.49	0.17
Avail Cap(c_a), veh/h	361	561	476	269	561	476	668	0	867	543	788	668
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	0.88	0.88	0.88	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.4	22.0	20.3	26.7	20.5	20.0	8.1	0.0	11.5	8.9	12.7	10.8
Incr Delay (d2), s/veh	0.7	3.0	0.7	0.3	0.7	0.5	0.9	0.0	2.8	0.4	2.2	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(50%),veh/ln	1.1	3.9	1.6	0.3	2.0	1.3	2.0	0.0	4.7	1.1	3.5	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.1	25.1	21.0	27.0	21.1	20.6	9.1	0.0	14.2	9.3	14.9	11.3
LnGrp LOS	C	C	C	C	C	C	A	A	B	A	B	B
Approach Vol, veh/h		509			309			845			696	
Approach Delay, s/veh		24.0			21.3			12.1			12.7	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.9	32.8		17.3	12.9	29.8		17.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.9	22.6		18.0	10.3	18.2		18.0				
Max Q Clear Time (g_c+I1), s	5.6	13.8		11.1	8.2	11.1		12.0				
Green Ext Time (p_c), s	0.0	2.1		1.5	0.3	1.5		0.7				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				16.1								
HCM 6th LOS				B								

# Timings

## 1: Harvest Rd & Alameda Ave

2030 Total AM  
10/13/2022









										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	25	195	150	55	420	190	445	440	175	305
Future Volume (vph)	25	195	150	55	420	190	445	440	175	305
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	pm+pt	NA
Protected Phases	7	4	5	3	8		5	2	1	6
Permitted Phases	4		4	8		8			6	
Detector Phase	7	4	5	3	8	8	5	2	1	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)	9.5	22.5	9.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.6	50.0	30.0	9.6	50.0	50.0	30.0	41.8	18.6	30.4
Total Split (%)	8.0%	41.7%	25.0%	8.0%	41.7%	41.7%	25.0%	34.8%	15.5%	25.3%
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	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)	39.2	35.2	61.5	40.1	37.1	37.1	21.8	52.0	53.5	41.8
Actuated g/C Ratio	0.33	0.29	0.51	0.33	0.31	0.31	0.18	0.43	0.45	0.35
v/c Ratio	0.17	0.41	0.18	0.17	0.83	0.37	0.78	0.35	0.42	0.39
Control Delay	22.9	35.1	1.9	24.7	53.3	13.6	57.8	29.3	19.4	30.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	35.1	1.9	24.7	53.3	13.6	57.8	29.3	19.4	30.7
LOS	C	D	A	C	D	B	E	C	B	C
Approach Delay		20.8			39.6			42.9		27.5
Approach LOS		C			D			D		C

### 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: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 35.2  
 Intersection Capacity Utilization 66.6%  
 Analysis Period (min) 15

Intersection LOS: D  
 ICU Level of Service C

### Splits and Phases: 1: Harvest Rd & Alameda Ave
























 Ø1	 Ø2 (R)	 Ø3	 Ø4
18.6 s	41.8 s	9.6 s	50 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
30 s	30.4 s	9.6 s	50 s

# HCM 6th Signalized Intersection Summary

2030 Total AM

## 1: Harvest Rd & Alameda Ave





















10/13/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	195	150	55	420	190	445	440	45	175	305	130
Future Volume (veh/h)	25	195	150	55	420	190	445	440	45	175	305	130
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	1781	1781	1870	1870	1796	1796	1870	1870	1870	1826	1870	1826
Adj Flow Rate, veh/h	27	212	163	60	457	207	484	478	49	190	332	141
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	8	2	2	7	7	2	2	2	5	2	5
Cap, veh/h	134	490	694	303	515	436	561	1479	151	514	920	383
Arrive On Green	0.02	0.28	0.28	0.04	0.29	0.29	0.16	0.45	0.45	0.08	0.38	0.38
Sat Flow, veh/h	1697	1781	1585	1781	1796	1522	3456	3255	332	1739	2445	1019
Grp Volume(v), veh/h	27	212	163	60	457	207	484	260	267	190	240	233
Grp Sat Flow(s),veh/h/ln	1697	1781	1585	1781	1796	1522	1728	1777	1811	1739	1777	1687
Q Serve(g_s), s	1.4	11.7	7.7	2.9	29.2	13.5	16.4	11.2	11.3	7.9	11.7	12.0
Cycle Q Clear(g_c), s	1.4	11.7	7.7	2.9	29.2	13.5	16.4	11.2	11.3	7.9	11.7	12.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.18	1.00		0.60
Lane Grp Cap(c), veh/h	134	490	694	303	515	436	561	808	823	514	669	635
V/C Ratio(X)	0.20	0.43	0.24	0.20	0.89	0.47	0.86	0.32	0.32	0.37	0.36	0.37
Avail Cap(c_a), veh/h	164	675	858	314	681	577	734	808	823	572	669	635
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	33.2	35.8	21.2	30.1	41.0	35.3	49.0	20.9	20.9	19.6	27.0	27.1
Incr Delay (d2), s/veh	0.7	0.6	0.2	0.3	11.0	0.8	8.3	1.1	1.0	0.4	1.5	1.6
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(50%),veh/ln	0.6	5.2	2.9	1.3	14.4	5.1	7.7	4.9	5.0	3.1	5.0	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.0	36.4	21.3	30.4	52.0	36.1	57.3	22.0	22.0	20.1	28.5	28.7
LnGrp LOS	C	D	C	C	D	D	E	C	C	C	C	C
Approach Vol, veh/h	402			724			1011			663		
Approach Delay, s/veh	30.1			45.6			38.9			26.1		
Approach LOS	C			D			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.6	59.0	8.8	37.5	24.0	49.7	7.5	38.9				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	14.1	37.3	5.1	45.5	25.5	25.9	5.1	45.5				
Max Q Clear Time (g_c+I1), s	9.9	13.3	4.9	13.7	18.4	14.0	3.4	31.2				
Green Ext Time (p_c), s	0.2	3.3	0.0	1.9	1.1	2.0	0.0	3.2				
Intersection Summary												
HCM 6th Ctrl Delay	36.4											
HCM 6th LOS	D											

# Timings

## 1: Harvest Rd & Alameda Ave

2030 Total PM  
10/13/2022

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	80	540	305	45	345	190	440	460	295	435
Future Volume (vph)	80	540	305	45	345	190	440	460	295	435
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	pm+pt	NA
Protected Phases	7	4	5	3	8		5	2	1	6
Permitted Phases	4		4	8		8			6	
Detector Phase	7	4	5	3	8	8	5	2	1	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)	9.5	22.5	9.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	10.3	52.0	26.0	9.6	51.3	51.3	26.0	30.4	28.0	32.4
Total Split (%)	8.6%	43.3%	21.7%	8.0%	42.8%	42.8%	21.7%	25.3%	23.3%	27.0%
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	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)	47.2	42.5	67.5	45.0	39.9	39.9	20.4	36.4	55.7	35.8
Actuated g/C Ratio	0.39	0.35	0.56	0.38	0.33	0.33	0.17	0.30	0.46	0.30
v/c Ratio	0.31	0.89	0.35	0.35	0.61	0.35	0.82	0.52	0.70	0.56
Control Delay	22.1	52.7	7.8	26.0	37.8	17.1	62.9	41.5	28.7	38.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.1	52.7	7.8	26.0	37.8	17.1	62.9	41.5	28.7	38.8
LOS	C	D	A	C	D	B	E	D	C	D
Approach Delay		35.3			30.1			51.4		35.2
Approach LOS		D			C			D		D

### 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: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 39.0









Intersection LOS: D

Intersection Capacity Utilization 78.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 1: Harvest Rd & Alameda Ave

























			
Ø1	Ø2 (R)	Ø3	Ø4
28 s	30.4 s	9.6 s	52 s
			
Ø5	Ø6 (R)	Ø7	Ø8
26 s	32.4 s	10.3 s	51.3 s

# HCM 6th Signalized Intersection Summary

2030 Total PM

## 1: Harvest Rd & Alameda Ave

10/13/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	540	305	45	345	190	440	460	50	295	435	105
Future Volume (veh/h)	80	540	305	45	345	190	440	460	50	295	435	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	87	587	332	49	375	207	478	500	54	321	473	114
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	280	647	797	159	624	529	543	1066	115	488	891	213
Arrive On Green	0.05	0.35	0.35	0.03	0.33	0.33	0.16	0.33	0.33	0.14	0.31	0.31
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	3456	3236	348	1781	2844	681
Grp Volume(v), veh/h	87	587	332	49	375	207	478	274	280	321	294	293
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1728	1777	1808	1781	1777	1748
Q Serve(g_s), s	3.8	35.9	15.8	2.1	20.1	12.0	16.2	14.7	14.8	14.4	16.4	16.6
Cycle Q Clear(g_c), s	3.8	35.9	15.8	2.1	20.1	12.0	16.2	14.7	14.8	14.4	16.4	16.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.19	1.00		0.39
Lane Grp Cap(c), veh/h	280	647	797	159	624	529	543	585	595	488	557	548
V/C Ratio(X)	0.31	0.91	0.42	0.31	0.60	0.39	0.88	0.47	0.47	0.66	0.53	0.53
Avail Cap(c_a), veh/h	285	740	876	175	729	618	619	585	595	585	557	548
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	26.2	37.4	18.7	30.0	33.3	30.6	49.5	31.9	31.9	22.9	33.9	34.0
Incr Delay (d2), s/veh	0.6	13.8	0.3	1.1	1.0	0.5	12.7	2.7	2.7	2.1	3.6	3.7
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(50%),veh/ln	1.7	18.7	5.8	1.0	9.2	4.7	7.9	6.7	6.9	6.0	7.4	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.8	51.2	19.1	31.0	34.3	31.1	62.2	34.6	34.6	24.9	37.5	37.7
LnGrp LOS	C	D	B	C	C	C	E	C	C	C	D	D
Approach Vol, veh/h	1006			631			1032			908		
Approach Delay, s/veh	38.5			33.0			47.4			33.1		
Approach LOS	D			C			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.4	44.0	8.5	46.0	23.4	42.1	10.0	44.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	23.5	25.9	5.1	47.5	21.5	27.9	5.8	46.8				
Max Q Clear Time (g_c+l1), s	16.4	16.8	4.1	37.9	18.2	18.6	5.8	22.1				
Green Ext Time (p_c), s	0.6	2.3	0.0	3.6	0.6	2.2	0.0	3.1				
Intersection Summary												
HCM 6th Ctrl Delay	38.7											
HCM 6th LOS	D											

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	10	20	10	13	25	2	10	64	13	15	102	10
Future Vol, veh/h	10	20	10	13	25	2	10	64	13	15	102	10
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	-	-	-	-	-	-	150	-	200	225	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	7	7	7	7	7	7	4	4	4	6	6	6
Mvmt Flow	11	21	11	14	26	2	11	67	14	16	107	11

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	214	248	59	192	246	41	118	0	0	81	0	0
Stage 1	145	145	-	96	96	-	-	-	-	-	-	-
Stage 2	69	103	-	96	150	-	-	-	-	-	-	-
Critical Hdwy	7.64	6.64	7.04	7.64	6.64	7.04	4.18	-	-	4.22	-	-
Critical Hdwy Stg 1	6.64	5.64	-	6.64	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.64	5.64	-	6.64	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.57	4.07	3.37	3.57	4.07	3.37	2.24	-	-	2.26	-	-
Pot Cap-1 Maneuver	711	642	978	737	644	1005	1453	-	-	1486	-	-
Stage 1	829	764	-	886	803	-	-	-	-	-	-	-
Stage 2	919	797	-	886	760	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	678	630	978	701	632	1005	1453	-	-	1486	-	-
Mov Cap-2 Maneuver	693	637	-	709	637	-	-	-	-	-	-	-
Stage 1	822	756	-	879	797	-	-	-	-	-	-	-
Stage 2	880	791	-	843	752	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.4		10.7		0.9		0.9	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1453	-	-	714	671	1486	-
HCM Lane V/C Ratio	0.007	-	-	0.059	0.063	0.011	-
HCM Control Delay (s)	7.5	-	-	10.4	10.7	7.4	-
HCM Lane LOS	A	-	-	B	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0	-



Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	15	25	15	9	15	4	10	124	14	10	126	15
Future Vol, veh/h	15	25	15	9	15	4	10	124	14	10	126	15
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	-	-	-	-	-	-	150	-	200	225	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	8	8	8	8	8	8	2	2	2	6	6	6
Mvmt Flow	16	26	16	9	16	4	10	129	15	10	131	16

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	252	323	74	256	324	72	147	0	0	144	0	0
Stage 1	159	159	-	157	157	-	-	-	-	-	-	-
Stage 2	93	164	-	99	167	-	-	-	-	-	-	-
Critical Hdwy	7.66	6.66	7.06	7.66	6.66	7.06	4.14	-	-	4.22	-	-
Critical Hdwy Stg 1	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Follow-up Hdwy	3.58	4.08	3.38	3.58	4.08	3.38	2.22	-	-	2.26	-	-
Pot Cap-1 Maneuver	665	580	954	661	579	956	1432	-	-	1407	-	-
Stage 1	810	751	-	812	753	-	-	-	-	-	-	-
Stage 2	886	747	-	879	745	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	642	572	954	622	571	956	1432	-	-	1407	-	-
Mov Cap-2 Maneuver	669	598	-	654	598	-	-	-	-	-	-	-
Stage 1	804	746	-	806	748	-	-	-	-	-	-	-
Stage 2	858	742	-	828	740	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.7		10.8		0.5		0.5	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1432	-	-	688	651	1407	-
HCM Lane V/C Ratio	0.007	-	-	0.083	0.045	0.007	-
HCM Control Delay (s)	7.5	-	-	10.7	10.8	7.6	-
HCM Lane LOS	A	-	-	B	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0	-

Intersection												
Int Delay, s/veh	5.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	11	72	11	14	64	2	11	68	14	16	108	11
Future Vol, veh/h	11	72	11	14	64	2	11	68	14	16	108	11
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	-	-	-	-	-	-	150	-	200	225	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	7	7	7	7	7	7	4	4	4	6	6	6
Mvmt Flow	12	76	12	15	67	2	12	72	15	17	114	12
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	248	265	63	233	264	44	126	0	0	87	0	0
Stage 1	154	154	-	104	104	-	-	-	-	-	-	-
Stage 2	94	111	-	129	160	-	-	-	-	-	-	-
Critical Hdwy	7.64	6.64	7.04	7.64	6.64	7.04	4.18	-	-	4.22	-	-
Critical Hdwy Stg 1	6.64	5.64	-	6.64	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.64	5.64	-	6.64	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.57	4.07	3.37	3.57	4.07	3.37	2.24	-	-	2.26	-	-
Pot Cap-1 Maneuver	672	628	973	689	629	1001	1444	-	-	1478	-	-
Stage 1	818	757	-	876	797	-	-	-	-	-	-	-
Stage 2	888	791	-	847	753	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	606	615	973	608	616	1001	1444	-	-	1478	-	-
Mov Cap-2 Maneuver	641	626	-	631	626	-	-	-	-	-	-	-
Stage 1	811	748	-	869	791	-	-	-	-	-	-	-
Stage 2	804	785	-	743	744	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	11.5		11.6		0.9		0.9					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1444	-	-	655	633	1478	-	-				
HCM Lane V/C Ratio	0.008	-	-	0.151	0.133	0.011	-	-				
HCM Control Delay (s)	7.5	-	-	11.5	11.6	7.5	-	-				
HCM Lane LOS	A	-	-	B	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.5	0.5	0	-	-				

Intersection												
Int Delay, s/veh	6.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	16	148	16	10	102	4	11	132	15	11	134	16
Future Vol, veh/h	16	148	16	10	102	4	11	132	15	11	134	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	-	-	-	-	-	-	150	-	200	225	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	8	8	8	8	8	8	2	2	2	6	6	6
Mvmt Flow	17	154	17	10	106	4	11	138	16	11	140	17
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	315	347	79	337	347	77	157	0	0	154	0	0
Stage 1	171	171	-	168	168	-	-	-	-	-	-	-
Stage 2	144	176	-	169	179	-	-	-	-	-	-	-
Critical Hdwy	7.66	6.66	7.06	7.66	6.66	7.06	4.14	-	-	4.22	-	-
Critical Hdwy Stg 1	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Follow-up Hdwy	3.58	4.08	3.38	3.58	4.08	3.38	2.22	-	-	2.26	-	-
Pot Cap-1 Maneuver	599	562	946	578	562	949	1420	-	-	1395	-	-
Stage 1	797	742	-	800	744	-	-	-	-	-	-	-
Stage 2	827	738	-	799	736	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	507	553	946	447	553	949	1420	-	-	1395	-	-
Mov Cap-2 Maneuver	564	585	-	507	585	-	-	-	-	-	-	-
Stage 1	791	736	-	794	738	-	-	-	-	-	-	-
Stage 2	699	732	-	616	730	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	13.6		12.7		0.5		0.5					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1420	-	-	603	585	1395	-	-				
HCM Lane V/C Ratio	0.008	-	-	0.311	0.207	0.008	-	-				
HCM Control Delay (s)	7.6	-	-	13.6	12.7	7.6	-	-				
HCM Lane LOS	A	-	-	B	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	1.3	0.8	0	-	-				

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	14	5	14	15	21	2	14	72	15	12	115	8
Future Vol, veh/h	14	5	14	15	21	2	14	72	15	12	115	8
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	-	-	-	-	-	-	150	-	200	225	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	7	7	7	7	7	7	4	4	4	6	6	6
Mvmt Flow	15	5	15	16	22	2	15	76	16	13	121	8
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	230	273	65	203	269	46	129	0	0	92	0	0
Stage 1	151	151	-	114	114	-	-	-	-	-	-	-
Stage 2	79	122	-	89	155	-	-	-	-	-	-	-
Critical Hdwy	7.64	6.64	7.04	7.64	6.64	7.04	4.18	-	-	4.22	-	-
Critical Hdwy Stg 1	6.64	5.64	-	6.64	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.64	5.64	-	6.64	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.57	4.07	3.37	3.57	4.07	3.37	2.24	-	-	2.26	-	-
Pot Cap-1 Maneuver	692	621	970	724	625	998	1440	-	-	1472	-	-
Stage 1	822	759	-	864	789	-	-	-	-	-	-	-
Stage 2	906	782	-	894	756	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	662	609	970	698	613	998	1440	-	-	1472	-	-
Mov Cap-2 Maneuver	682	623	-	708	624	-	-	-	-	-	-	-
Stage 1	814	752	-	855	781	-	-	-	-	-	-	-
Stage 2	869	774	-	867	749	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	9.9		10.7		1		0.7					
HCM LOS	A		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1440	-	-	768	668	1472	-	-				
HCM Lane V/C Ratio	0.01	-	-	0.045	0.06	0.009	-	-				
HCM Control Delay (s)	7.5	-	-	9.9	10.7	7.5	-	-				
HCM Lane LOS	A	-	-	A	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-				

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	12	21	12	11	5	4	22	140	16	5	142	22
Future Vol, veh/h	12	21	12	11	5	4	22	140	16	5	142	22
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	-	-	-	-	-	-	150	-	200	225	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	8	8	8	8	8	8	2	2	2	6	6	6
Mvmt Flow	13	22	13	11	5	4	23	146	17	5	148	23

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	292	379	86	296	382	82	171	0	0	163	0	0
Stage 1	170	170	-	201	201	-	-	-	-	-	-	-
Stage 2	122	209	-	95	181	-	-	-	-	-	-	-
Critical Hdwy	7.66	6.66	7.06	7.66	6.66	7.06	4.14	-	-	4.22	-	-
Critical Hdwy Stg 1	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Follow-up Hdwy	3.58	4.08	3.38	3.58	4.08	3.38	2.22	-	-	2.26	-	-
Pot Cap-1 Maneuver	622	538	937	618	536	942	1404	-	-	1384	-	-
Stage 1	798	743	-	765	719	-	-	-	-	-	-	-
Stage 2	852	713	-	884	734	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	606	527	937	583	525	942	1404	-	-	1384	-	-
Mov Cap-2 Maneuver	643	567	-	623	563	-	-	-	-	-	-	-
Stage 1	785	740	-	753	707	-	-	-	-	-	-	-
Stage 2	828	702	-	843	731	-	-	-	-	-	-	-

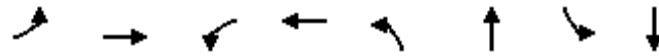
Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.9		10.7		0.9		0.2	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1404	-	-	657 650	1384	-	-
HCM Lane V/C Ratio	0.016	-	-	0.071 0.032	0.004	-	-
HCM Control Delay (s)	7.6	-	-	10.9 10.7	7.6	-	-
HCM Lane LOS	A	-	-	B B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2 0.1	0	-	-

# Timings 2: Powhaton Rd & Alameda Ave

2030 Background AM

10/13/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	36	80	40	70	184	635	86	707
Future Volume (vph)	36	80	40	70	184	635	86	707
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	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	9.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	13.0	27.3	10.2	24.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	21.7%	45.5%	17.0%	40.8%
Yellow Time (s)	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
Lost Time Adjust (s)	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
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)	9.3	9.3	9.3	9.3	39.6	32.5	35.6	28.9
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.66	0.54	0.59	0.48
v/c Ratio	0.20	0.59	0.31	0.28	0.42	0.45	0.20	0.51
Control Delay	23.2	19.5	27.1	23.1	6.7	10.5	5.4	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	19.5	27.1	23.1	6.7	10.5	5.4	13.3
LOS	C	B	C	C	A	B	A	B
Approach Delay		20.1		24.5		9.8		12.6
Approach LOS		C		C		A		B

## Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 12.7

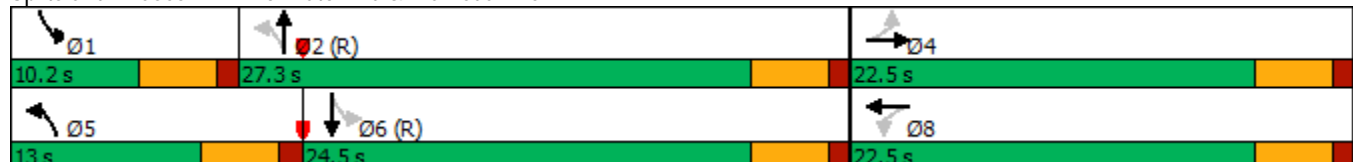
Intersection LOS: B

Intersection Capacity Utilization 61.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 2: Powhaton Rd & Alameda Ave
























# HCM 6th Signalized Intersection Summary

## 2: Powhaton Rd & Alameda Ave

2030 Background AM

10/13/2022

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	80	107	40	70	2	184	635	128	86	707	57
Future Volume (veh/h)	36	80	107	40	70	2	184	635	128	86	707	57
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	1796	1796	1796	1796	1796	1796	1841	1841	1841	1811	1811	1811
Adj Flow Rate, veh/h	39	87	116	43	76	2	200	690	139	93	768	62
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	7	7	7	7	7	7	4	4	4	6	6	6
Cap, veh/h	313	132	176	203	329	9	494	1509	304	471	1612	130
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.09	0.52	0.52	0.07	0.50	0.50
Sat Flow, veh/h	1269	698	931	1132	1742	46	1753	2900	584	1725	3225	260
Grp Volume(v), veh/h	39	0	203	43	0	78	200	416	413	93	410	420
Grp Sat Flow(s),veh/h/ln	1269	0	1629	1132	0	1788	1753	1749	1736	1725	1721	1764
Q Serve(g_s), s	1.6	0.0	6.9	2.2	0.0	2.2	3.2	9.0	9.0	1.5	9.4	9.4
Cycle Q Clear(g_c), s	3.8	0.0	6.9	9.1	0.0	2.2	3.2	9.0	9.0	1.5	9.4	9.4
Prop In Lane	1.00		0.57	1.00		0.03	1.00		0.34	1.00		0.15
Lane Grp Cap(c), veh/h	313	0	308	203	0	338	494	910	903	471	860	882
V/C Ratio(X)	0.12	0.00	0.66	0.21	0.00	0.23	0.40	0.46	0.46	0.20	0.48	0.48
Avail Cap(c_a), veh/h	454	0	489	329	0	536	592	910	903	521	860	882
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)	0.98	0.00	0.98	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.3	0.0	22.5	26.8	0.0	20.6	6.9	9.1	9.1	6.6	9.8	9.9
Incr Delay (d2), s/veh	0.2	0.0	2.4	0.5	0.0	0.3	0.5	1.7	1.7	0.2	1.9	1.8
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(50%),veh/ln	0.5	0.0	2.7	0.6	0.0	0.9	0.9	3.0	2.9	0.4	3.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.4	0.0	24.9	27.3	0.0	21.0	7.4	10.7	10.7	6.8	11.7	11.7
LnGrp LOS	C	A	C	C	A	C	A	B	B	A	B	B
Approach Vol, veh/h	242			121			1029			923		
Approach Delay, s/veh	24.5			23.2			10.1			11.2		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.4	35.7		15.8	9.7	34.5		15.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.7	22.8		18.0	8.5	20.0		18.0				
Max Q Clear Time (g_c+I1), s	3.5	11.0		8.9	5.2	11.4		11.1				
Green Ext Time (p_c), s	0.0	3.9		0.8	0.2	3.2		0.2				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	12.7											
HCM 6th LOS	B											



# Timings 2: Powhaton Rd & Alameda Ave

2030 Background PM

10/13/2022

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	40	163	49	112	174	776	53	863
Future Volume (vph)	40	163	49	112	174	776	53	863
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	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	9.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	11.3	28.0	9.5	26.2
Total Split (%)	37.5%	37.5%	37.5%	37.5%	18.8%	46.7%	15.8%	43.7%
Yellow Time (s)	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
Lost Time Adjust (s)	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
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)	14.4	14.4	14.4	14.4	35.1	30.7	30.6	25.1
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.58	0.51	0.51	0.42
v/c Ratio	0.15	0.75	0.40	0.30	0.57	0.54	0.17	0.72
Control Delay	14.4	22.2	26.9	18.7	16.3	13.1	7.5	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.4	22.2	26.9	18.7	16.3	13.1	7.5	19.7
LOS	B	C	C	B	B	B	A	B
Approach Delay		21.3		21.1		13.6		19.0
Approach LOS		C		C		B		B

## Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 17.2

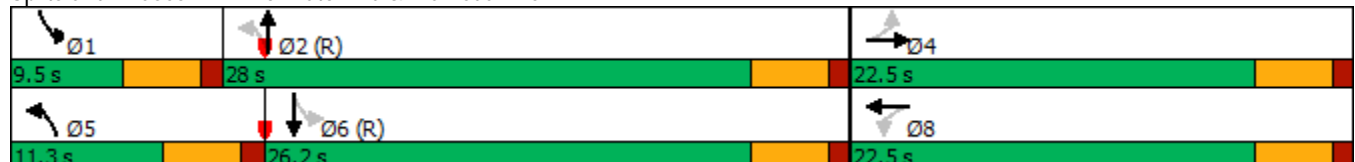
Intersection LOS: B

Intersection Capacity Utilization 73.0%

ICU Level of Service C

Analysis Period (min) 15

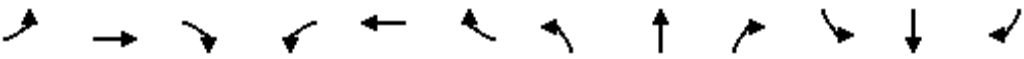








Splits and Phases: 2: Powhaton Rd & Alameda Ave



# HCM 6th Signalized Intersection Summary 2: Powhaton Rd & Alameda Ave

2030 Background PM





















10/13/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	163	150	49	112	5	174	776	106	53	863	80
Future Volume (veh/h)	40	163	150	49	112	5	174	776	106	53	863	80
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	1781	1781	1781	1781	1781	1781	1870	1870	1870	1811	1811	1811
Adj Flow Rate, veh/h	43	177	163	53	122	5	189	843	115	58	938	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	8	8	8	8	8	2	2	2	6	6	6
Cap, veh/h	385	236	217	206	469	19	369	1405	192	348	1302	121
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.09	0.45	0.45	0.05	0.41	0.41
Sat Flow, veh/h	1204	854	786	991	1699	70	1781	3142	429	1725	3183	295
Grp Volume(v), veh/h	43	0	340	53	0	127	189	477	481	58	507	518
Grp Sat Flow(s),veh/h/ln	1204	0	1640	991	0	1769	1781	1777	1793	1725	1721	1758
Q Serve(g_s), s	1.7	0.0	11.4	3.1	0.0	3.4	3.6	12.2	12.2	1.1	14.8	14.8
Cycle Q Clear(g_c), s	5.1	0.0	11.4	14.5	0.0	3.4	3.6	12.2	12.2	1.1	14.8	14.8
Prop In Lane	1.00		0.48	1.00		0.04	1.00		0.24	1.00		0.17
Lane Grp Cap(c), veh/h	385	0	453	206	0	489	369	794	802	348	704	719
V/C Ratio(X)	0.11	0.00	0.75	0.26	0.00	0.26	0.51	0.60	0.60	0.17	0.72	0.72
Avail Cap(c_a), veh/h	414	0	492	230	0	531	411	794	802	402	704	719
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)	0.80	0.00	0.80	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.9	0.0	19.8	26.4	0.0	16.9	11.2	12.5	12.5	9.9	14.9	14.9
Incr Delay (d2), s/veh	0.1	0.0	4.7	0.7	0.0	0.3	1.1	3.3	3.3	0.2	6.3	6.2
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(50%),veh/ln	0.5	0.0	4.5	0.7	0.0	1.3	1.2	4.6	4.6	0.4	5.9	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.0	0.0	24.6	27.1	0.0	17.2	12.3	15.9	15.8	10.2	21.1	21.0
LnGrp LOS	B	A	C	C	A	B	B	B	B	B	C	C
Approach Vol, veh/h	383			180			1147			1083		
Approach Delay, s/veh	23.9			20.1			15.3			20.5		
Approach LOS	C			C			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	31.3		21.1	9.9	29.0		21.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	23.5		18.0	6.8	21.7		18.0				
Max Q Clear Time (g_c+I1), s	3.1	14.2		13.4	5.6	16.8		16.5				
Green Ext Time (p_c), s	0.0	3.9		0.9	0.1	2.6		0.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	18.8											
HCM 6th LOS	B											

# Timings 2: Powhaton Rd & Alameda Ave

2030 Total AM

10/14/2022

										
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	95	75	120	45	120	140	325	20	305	55
Future Volume (vph)	95	75	120	45	120	140	325	20	305	55
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	7	4	4	3	8	5	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
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	9.5	22.5	9.5	22.5	22.5
Total Split (s)	21.0	42.0	42.0	15.0	36.0	26.0	50.0	13.0	37.0	37.0
Total Split (%)	17.5%	35.0%	35.0%	12.5%	30.0%	21.7%	41.7%	10.8%	30.8%	30.8%
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	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effect Green (s)	32.0	21.9	21.9	24.4	16.3	78.2	71.8	70.3	64.2	64.2
Actuated g/C Ratio	0.27	0.18	0.18	0.20	0.14	0.65	0.60	0.59	0.54	0.54
v/c Ratio	0.39	0.25	0.34	0.17	0.69	0.23	0.20	0.04	0.18	0.07
Control Delay	36.1	43.8	9.3	31.4	59.9	10.2	12.9	10.2	16.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	43.8	9.3	31.4	59.9	10.2	12.9	10.2	16.6	0.1
LOS	D	D	A	C	E	B	B	B	B	A
Approach Delay		27.0			53.5		12.2		13.9	
Approach LOS		C			D		B		B	

## 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: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 21.7

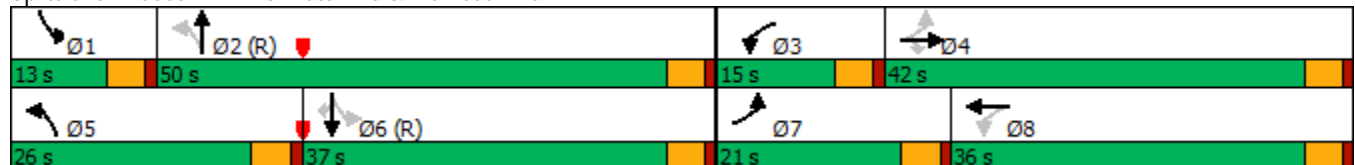
Intersection LOS: C

Intersection Capacity Utilization 44.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Powhaton Rd & Alameda Ave

























# HCM 6th Signalized Intersection Summary

2030 Total AM

## 2: Powhaton Rd & Alameda Ave





















10/14/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	75	120	45	120	35	140	325	55	20	305	55
Future Volume (veh/h)	95	75	120	45	120	35	140	325	55	20	305	55
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	1796	1796	1796	1796	1796	1796	1841	1841	1841	1811	1811	1811
Adj Flow Rate, veh/h	103	82	130	49	130	38	152	353	60	22	332	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	7	7	7	7	7	7	4	4	4	6	6	6
Cap, veh/h	202	273	231	243	158	46	708	1925	324	658	2114	943
Arrive On Green	0.07	0.15	0.15	0.03	0.12	0.12	0.05	0.64	0.64	0.02	0.61	0.61
Sat Flow, veh/h	1711	1796	1522	1711	1336	390	1753	2995	504	1725	3441	1535
Grp Volume(v), veh/h	103	82	130	49	0	168	152	205	208	22	332	60
Grp Sat Flow(s),veh/h/ln	1711	1796	1522	1711	0	1726	1753	1749	1750	1725	1721	1535
Q Serve(g_s), s	6.2	4.9	9.5	3.0	0.0	11.4	3.7	5.7	5.8	0.6	4.9	1.9
Cycle Q Clear(g_c), s	6.2	4.9	9.5	3.0	0.0	11.4	3.7	5.7	5.8	0.6	4.9	1.9
Prop In Lane	1.00		1.00	1.00		0.23	1.00		0.29	1.00		1.00
Lane Grp Cap(c), veh/h	202	273	231	243	0	205	708	1124	1125	658	2114	943
V/C Ratio(X)	0.51	0.30	0.56	0.20	0.00	0.82	0.21	0.18	0.19	0.03	0.16	0.06
Avail Cap(c_a), veh/h	323	561	476	335	0	453	934	1124	1125	742	2114	943
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.8	45.2	47.2	44.4	0.0	51.6	7.2	8.7	8.7	8.1	9.9	9.3
Incr Delay (d2), s/veh	2.0	0.6	2.1	0.4	0.0	7.9	0.2	0.4	0.4	0.0	0.2	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(50%),veh/ln	2.7	2.2	3.7	1.3	0.0	5.4	1.3	2.1	2.1	0.2	1.8	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.8	45.9	49.3	44.8	0.0	59.6	7.4	9.0	9.0	8.1	10.0	9.4
LnGrp LOS	D	D	D	D	A	E	A	A	A	A	B	A
Approach Vol, veh/h	315			217			565			414		
Approach Delay, s/veh	46.6			56.3			8.6			9.8		
Approach LOS	D			E			A			A		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.1	81.6	8.5	22.7	10.5	78.2	12.5	18.7				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	8.5	45.5	10.5	37.5	21.5	32.5	16.5	31.5				
Max Q Clear Time (g_c+I1), s	2.6	7.8	5.0	11.5	5.7	6.9	8.2	13.4				
Green Ext Time (p_c), s	0.0	2.4	0.0	0.9	0.3	2.2	0.1	0.8				
Intersection Summary												
HCM 6th Ctrl Delay	23.7											
HCM 6th LOS	C											

# Timings 2: Powhaton Rd & Alameda Ave

2030 Total PM

10/14/2022

										
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	100	175	160	55	130	155	400	140	495	90
Future Volume (vph)	100	175	160	55	130	155	400	140	495	90
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	7	4	4	3	8	5	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
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	9.5	22.5	9.5	22.5	22.5
Total Split (s)	18.0	37.0	37.0	14.0	33.0	23.0	46.0	23.0	46.0	46.0
Total Split (%)	15.0%	30.8%	30.8%	11.7%	27.5%	19.2%	38.3%	19.2%	38.3%	38.3%
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	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effect Green (s)	31.6	22.0	22.0	25.2	16.9	74.2	64.0	73.6	63.7	63.7
Actuated g/C Ratio	0.26	0.18	0.18	0.21	0.14	0.62	0.53	0.61	0.53	0.53
v/c Ratio	0.42	0.59	0.42	0.24	0.70	0.30	0.28	0.28	0.30	0.11
Control Delay	33.4	47.8	7.7	33.1	60.9	10.8	16.8	10.7	17.9	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.4	47.8	7.7	33.1	60.9	10.8	16.8	10.7	17.9	4.2
LOS	C	D	A	C	E	B	B	B	B	A
Approach Delay		29.7			53.8		15.3		14.8	
Approach LOS		C			D		B		B	

## 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: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 22.4

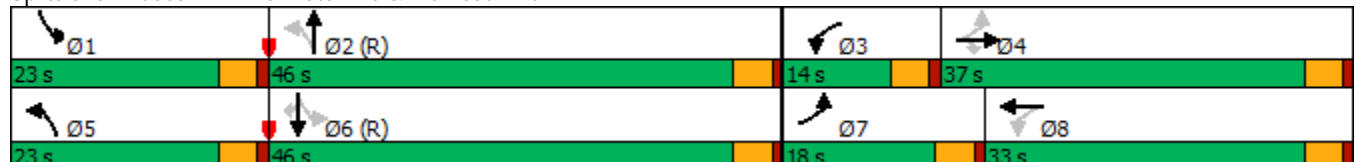
Intersection LOS: C

Intersection Capacity Utilization 51.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Powhaton Rd & Alameda Ave

























# HCM 6th Signalized Intersection Summary

2030 Total PM

## 2: Powhaton Rd & Alameda Ave

10/14/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	175	160	55	130	30	155	400	70	140	495	90
Future Volume (veh/h)	100	175	160	55	130	30	155	400	70	140	495	90
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	1781	1781	1781	1781	1781	1781	1870	1870	1870	1811	1811	1811
Adj Flow Rate, veh/h	109	190	174	60	141	33	168	435	76	152	538	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	8	8	8	8	8	2	2	2	6	6	6
Cap, veh/h	206	269	228	178	170	40	577	1834	318	614	2075	926
Arrive On Green	0.07	0.15	0.15	0.04	0.12	0.12	0.05	0.61	0.61	0.05	0.60	0.60
Sat Flow, veh/h	1697	1781	1510	1697	1396	327	1781	3027	525	1725	3441	1535
Grp Volume(v), veh/h	109	190	174	60	0	174	168	254	257	152	538	98
Grp Sat Flow(s),veh/h/ln	1697	1781	1510	1697	0	1723	1781	1777	1776	1725	1721	1535
Q Serve(g_s), s	6.6	12.2	13.3	3.7	0.0	11.8	4.3	7.9	8.0	4.0	8.8	3.2
Cycle Q Clear(g_c), s	6.6	12.2	13.3	3.7	0.0	11.8	4.3	7.9	8.0	4.0	8.8	3.2
Prop In Lane	1.00		1.00	1.00		0.19	1.00		0.30	1.00		1.00
Lane Grp Cap(c), veh/h	206	269	228	178	0	210	577	1076	1076	614	2075	926
V/C Ratio(X)	0.53	0.71	0.76	0.34	0.00	0.83	0.29	0.24	0.24	0.25	0.26	0.11
Avail Cap(c_a), veh/h	277	482	409	242	0	409	754	1076	1076	790	2075	926
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.7	48.4	48.9	43.9	0.0	51.5	8.2	10.9	10.9	8.1	11.2	10.1
Incr Delay (d2), s/veh	2.1	3.4	5.2	1.1	0.0	8.2	0.3	0.5	0.5	0.2	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(50%),veh/ln	2.9	5.7	5.3	1.6	0.0	5.6	1.5	3.1	3.1	1.4	3.2	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.8	51.8	54.1	45.0	0.0	59.7	8.4	11.4	11.4	8.3	11.5	10.3
LnGrp LOS	D	D	D	D	A	E	A	B	B	A	B	B
Approach Vol, veh/h	473			234			679			788		
Approach Delay, s/veh	50.8			55.9			10.7			10.8		
Approach LOS	D			E			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.7	77.2	9.4	22.6	11.1	76.9	13.0	19.1				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	18.5	41.5	9.5	32.5	18.5	41.5	13.5	28.5				
Max Q Clear Time (g_c+I1), s	6.0	10.0	5.7	15.3	6.3	10.8	8.6	13.8				
Green Ext Time (p_c), s	0.3	3.0	0.0	1.5	0.3	4.0	0.1	0.8				
Intersection Summary												
HCM 6th Ctrl Delay	24.3											
HCM 6th LOS	C											

# Timings 3: Harvest Rd & Mississippi Ave

2030 Background AM

10/13/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	99	330	304	597	175	190
Future Volume (vph)	99	330	304	597	175	190
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4	2			6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	13.0	37.5	24.5	24.5
Total Split (%)	37.5%	37.5%	21.7%	62.5%	40.8%	40.8%
Yellow Time (s)	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
Lost Time Adjust (s)	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
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	10.9	10.9	40.1	40.1	24.4	24.4
Actuated g/C Ratio	0.18	0.18	0.67	0.67	0.41	0.41
v/c Ratio	0.46	0.71	0.59	0.76	0.36	0.37
Control Delay	26.8	11.3	12.5	17.1	16.9	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.8	11.3	12.5	17.1	16.9	4.8
LOS	C	B	B	B	B	A
Approach Delay	14.9			15.6	10.6	
Approach LOS	B			B	B	

## Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 14.3

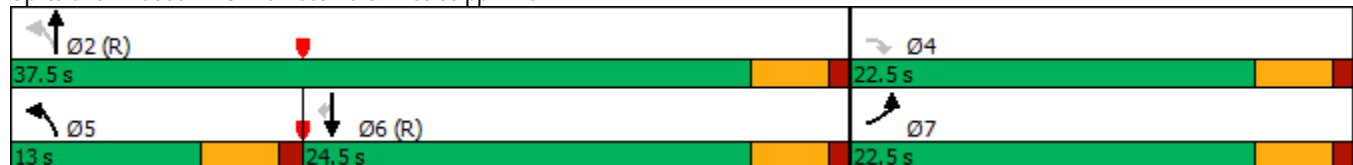
Intersection LOS: B

Intersection Capacity Utilization 44.4%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Harvest Rd & Mississippi Ave











# HCM 6th Signalized Intersection Summary 3: Harvest Rd & Mississippi Ave

2030 Background AM

10/13/2022



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	99	330	304	597	175	190
Future Volume (veh/h)	99	330	304	597	175	190
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	1307	1307	1189	1189	1189	1189
Adj Flow Rate, veh/h	108	196	330	649	190	207
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	40	40	48	48	48	48
Cap, veh/h	262	233	477	760	503	426
Arrive On Green	0.21	0.21	0.14	0.64	0.42	0.42
Sat Flow, veh/h	1245	1108	1132	1189	1189	1007
Grp Volume(v), veh/h	108	196	330	649	190	207
Grp Sat Flow(s),veh/h/ln	1245	1108	1132	1189	1189	1007
Q Serve(g_s), s	4.5	10.2	8.5	26.0	6.6	9.0
Cycle Q Clear(g_c), s	4.5	10.2	8.5	26.0	6.6	9.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	262	233	477	760	503	426
V/C Ratio(X)	0.41	0.84	0.69	0.85	0.38	0.49
Avail Cap(c_a), veh/h	373	332	477	760	503	426
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	20.5	22.7	9.3	8.6	11.9	12.6
Incr Delay (d2), s/veh	1.0	12.4	4.3	11.7	2.2	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	6.6	2.0	6.0	1.8	5.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.5	35.1	13.5	20.3	14.1	16.5
LnGrp LOS	C	D	B	C	B	B
Approach Vol, veh/h	304			979	397	
Approach Delay, s/veh	30.3			18.0	15.3	
Approach LOS	C			B	B	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	42.9			17.1	13.0	29.9
Change Period (Y+Rc), s	4.5			4.5	4.5	4.5
Max Green Setting (Gmax), s	33.0			18.0	8.5	20.0
Max Q Clear Time (g_c+l1), s	28.0			12.2	10.5	11.0
Green Ext Time (p_c), s	1.8			0.5	0.0	1.3
Intersection Summary						
HCM 6th Ctrl Delay			19.6			
HCM 6th LOS			B			

# Timings 3: Harvest Rd & Mississippi Ave

2030 Background PM

10/13/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	110	409	340	667	268	232
Future Volume (vph)	110	409	340	667	268	232
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4	2			6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	14.1	37.5	23.4	23.4
Total Split (%)	37.5%	37.5%	23.5%	62.5%	39.0%	39.0%
Yellow Time (s)	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
Lost Time Adjust (s)	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
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	11.0	10.9	40.1	40.1	25.6	25.6
Actuated g/C Ratio	0.18	0.18	0.67	0.67	0.43	0.43
v/c Ratio	0.46	0.75	0.53	0.60	0.38	0.32
Control Delay	26.3	11.0	8.5	9.5	15.6	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.3	11.0	8.5	9.5	15.6	3.7
LOS	C	B	A	A	B	A
Approach Delay	14.3			9.1	10.1	
Approach LOS	B			A	B	

## Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 10.7

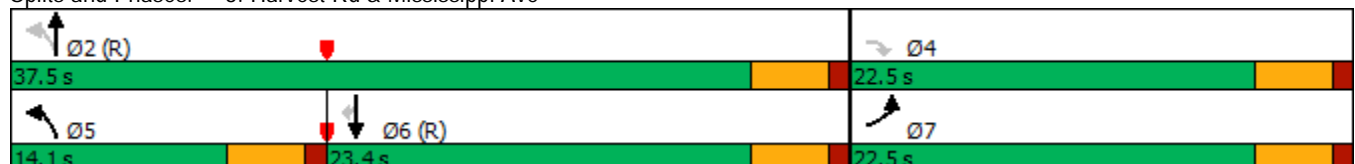
Intersection LOS: B

Intersection Capacity Utilization 50.3%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Harvest Rd & Mississippi Ave









# HCM 6th Signalized Intersection Summary 3: Harvest Rd & Mississippi Ave

2030 Background PM

10/13/2022



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	409	340	667	268	232
Future Volume (veh/h)	110	409	340	667	268	232
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	1500	1500	1826	1826	1826	1826
Adj Flow Rate, veh/h	120	282	370	725	291	252
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	27	27	5	5	5	5
Cap, veh/h	363	323	596	1089	670	568
Arrive On Green	0.25	0.25	0.15	0.60	0.37	0.37
Sat Flow, veh/h	1428	1271	1739	1826	1826	1547
Grp Volume(v), veh/h	120	282	370	725	291	252
Grp Sat Flow(s),veh/h/ln	1428	1271	1739	1826	1826	1547
Q Serve(g_s), s	4.1	12.8	7.2	16.0	7.2	7.4
Cycle Q Clear(g_c), s	4.1	12.8	7.2	16.0	7.2	7.4
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	363	323	596	1089	670	568
V/C Ratio(X)	0.33	0.87	0.62	0.67	0.43	0.44
Avail Cap(c_a), veh/h	429	381	606	1089	670	568
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	18.2	21.5	8.8	8.1	14.3	14.4
Incr Delay (d2), s/veh	0.5	17.5	1.9	3.2	2.0	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	9.8	2.1	4.8	3.0	7.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.8	39.0	10.7	11.3	16.4	16.9
LnGrp LOS	B	D	B	B	B	B
Approach Vol, veh/h	402			1095	543	
Approach Delay, s/veh	32.9			11.1	16.6	
Approach LOS	C			B	B	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	40.3			19.7	13.8	26.5
Change Period (Y+Rc), s	4.5			4.5	4.5	4.5
Max Green Setting (Gmax), s	33.0			18.0	9.6	18.9
Max Q Clear Time (g_c+I1), s	18.0			14.8	9.2	9.4
Green Ext Time (p_c), s	4.1			0.5	0.1	1.9
Intersection Summary						
HCM 6th Ctrl Delay			16.9			
HCM 6th LOS			B			

# Timings

## 3: Mississippi Ave & Harvest Rd

2030 Total AM

10/12/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	175	330	305	630	220	350
Future Volume (vph)	175	330	305	630	220	350
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	40.0	40.0	32.0	80.0	48.0	48.0
Total Split (%)	33.3%	33.3%	26.7%	66.7%	40.0%	40.0%
Yellow Time (s)	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
Lost Time Adjust (s)	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
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	18.4	18.4	92.6	92.6	75.8	75.8
Actuated g/C Ratio	0.15	0.15	0.77	0.77	0.63	0.63
v/c Ratio	0.70	0.66	0.38	0.25	0.20	0.33
Control Delay	61.4	10.4	5.7	4.6	14.5	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.4	10.4	5.7	4.6	14.5	6.6
LOS	E	B	A	A	B	A
Approach Delay	28.1			4.9	9.7	
Approach LOS	C			A	A	

### 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

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 12.1

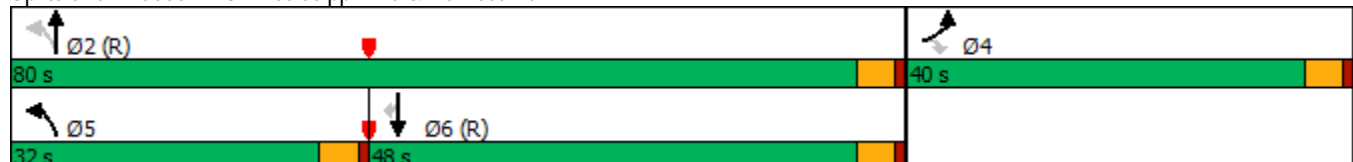
Intersection LOS: B

Intersection Capacity Utilization 49.4%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Mississippi Ave & Harvest Rd









# HCM 6th Signalized Intersection Summary

## 3: Mississippi Ave & Harvest Rd

2030 Total AM  
10/12/2022



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	175	330	305	630	220	350
Future Volume (veh/h)	175	330	305	630	220	350
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	190	359	332	685	239	380
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	440	392	621	2409	1006	852
Arrive On Green	0.25	0.25	0.10	0.68	0.54	0.54
Sat Flow, veh/h	1781	1585	1781	3647	1870	1585
Grp Volume(v), veh/h	190	359	332	685	239	380
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1870	1585
Q Serve(g_s), s	10.8	26.5	9.4	9.2	8.1	17.5
Cycle Q Clear(g_c), s	10.8	26.5	9.4	9.2	8.1	17.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	440	392	621	2409	1006	852
V/C Ratio(X)	0.43	0.92	0.53	0.28	0.24	0.45
Avail Cap(c_a), veh/h	527	469	846	2409	1006	852
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	44.0	9.4	7.7	14.7	16.9
Incr Delay (d2), s/veh	0.7	20.7	0.7	0.3	0.6	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	23.2	3.6	3.4	3.6	6.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	38.8	64.6	10.1	8.0	15.3	18.6
LnGrp LOS	D	E	B	A	B	B
Approach Vol, veh/h	549			1017	619	
Approach Delay, s/veh	55.7			8.7	17.3	
Approach LOS	E			A	B	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	85.9			34.1	16.8	69.0
Change Period (Y+Rc), s	4.5			4.5	4.5	4.5
Max Green Setting (Gmax), s	75.5			35.5	27.5	43.5
Max Q Clear Time (g_c+l1), s	11.2			28.5	11.4	19.5
Green Ext Time (p_c), s	5.7			1.2	0.9	2.8
Intersection Summary						
HCM 6th Ctrl Delay			22.9			
HCM 6th LOS			C			

# Timings

## 3: Mississippi Ave & Harvest Rd

2030 Total PM

10/12/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	295	410	340	725	315	355
Future Volume (vph)	295	410	340	725	315	355
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	42.0	42.0	33.0	78.0	45.0	45.0
Total Split (%)	35.0%	35.0%	27.5%	65.0%	37.5%	37.5%
Yellow Time (s)	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
Lost Time Adjust (s)	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
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	27.7	27.7	83.3	83.3	63.0	63.0
Actuated g/C Ratio	0.23	0.23	0.69	0.69	0.52	0.52
v/c Ratio	0.79	0.63	0.53	0.32	0.35	0.39
Control Delay	56.8	7.4	11.0	8.4	22.6	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.8	7.4	11.0	8.4	22.6	8.7
LOS	E	A	B	A	C	A
Approach Delay	28.0			9.2	15.2	
Approach LOS	C			A	B	

### 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

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 16.3

Intersection LOS: B

Intersection Capacity Utilization 63.0%

ICU Level of Service B

Analysis Period (min) 15

### Splits and Phases: 3: Mississippi Ave & Harvest Rd



# HCM 6th Signalized Intersection Summary

## 3: Mississippi Ave & Harvest Rd

2030 Total PM  
10/12/2022



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱	↰	↕	↕	↱
Traffic Volume (veh/h)	295	410	340	725	315	355
Future Volume (veh/h)	295	410	340	725	315	355
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	321	446	370	788	342	386
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	531	473	642	2227	862	731
Arrive On Green	0.30	0.30	0.13	0.63	0.46	0.46
Sat Flow, veh/h	1781	1585	1781	3647	1870	1585
Grp Volume(v), veh/h	321	446	370	788	342	386
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1870	1585
Q Serve(g_s), s	18.5	33.0	12.4	12.8	14.5	20.8
Cycle Q Clear(g_c), s	18.5	33.0	12.4	12.8	14.5	20.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	531	473	642	2227	862	731
V/C Ratio(X)	0.60	0.94	0.58	0.35	0.40	0.53
Avail Cap(c_a), veh/h	557	495	837	2227	862	731
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.0	41.1	13.5	10.7	21.3	23.0
Incr Delay (d2), s/veh	1.7	26.3	0.8	0.4	1.4	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	28.7	4.9	5.0	6.6	8.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	37.8	67.5	14.3	11.2	22.7	25.8
LnGrp LOS	D	E	B	B	C	C
Approach Vol, veh/h	767			1158	728	
Approach Delay, s/veh	55.0			12.2	24.3	
Approach LOS	E			B	C	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	79.7			40.3	19.9	59.8
Change Period (Y+Rc), s	4.5			4.5	4.5	4.5
Max Green Setting (Gmax), s	73.5			37.5	28.5	40.5
Max Q Clear Time (g_c+l1), s	14.8			35.0	14.4	22.8
Green Ext Time (p_c), s	6.8			0.8	1.0	3.3
Intersection Summary						
HCM 6th Ctrl Delay			27.9			
HCM 6th LOS			C			



HCM 6th TWSC  
4: Jamestown Way & Alameda Ave

2025 Total AM  
10/14/2022

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕			↕			↕	
Traffic Vol, veh/h	17	51	23	3	150	17	66	5	9	12	5	46
Future Vol, veh/h	17	51	23	3	150	17	66	5	9	12	5	46
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	-	-	150	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	55	25	3	163	18	72	5	10	13	5	50
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	181	0	0	80	0	0	297	278	55	289	294	172
Stage 1	-	-	-	-	-	-	91	91	-	178	178	-
Stage 2	-	-	-	-	-	-	206	187	-	111	116	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1394	-	-	1518	-	-	655	630	1012	663	617	872
Stage 1	-	-	-	-	-	-	916	820	-	824	752	-
Stage 2	-	-	-	-	-	-	796	745	-	894	800	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1394	-	-	1518	-	-	606	620	1012	644	607	872
Mov Cap-2 Maneuver	-	-	-	-	-	-	606	620	-	644	607	-
Stage 1	-	-	-	-	-	-	903	809	-	812	750	-
Stage 2	-	-	-	-	-	-	743	744	-	867	789	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.4			0.1			11.6			10		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	636	1394	-	-	1518	-	-	791				
HCM Lane V/C Ratio	0.137	0.013	-	-	0.002	-	-	0.087				
HCM Control Delay (s)	11.6	7.6	0	-	7.4	0	-	10				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.3				








HCM 6th TWSC  
4: Jamestown Way & Alameda Ave

2025 Total PM  
10/14/2022

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕			↕			↕	
Traffic Vol, veh/h	67	199	77	11	99	12	46	5	7	17	5	34
Future Vol, veh/h	67	199	77	11	99	12	46	5	7	17	5	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	-	-	150	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	73	216	84	12	108	13	50	5	8	18	5	37
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	121	0	0	300	0	0	522	507	216	550	585	115
Stage 1	-	-	-	-	-	-	362	362	-	139	139	-
Stage 2	-	-	-	-	-	-	160	145	-	411	446	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1467	-	-	1261	-	-	465	468	824	446	423	937
Stage 1	-	-	-	-	-	-	657	625	-	864	782	-
Stage 2	-	-	-	-	-	-	842	777	-	618	574	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1467	-	-	1261	-	-	419	436	824	414	394	937
Mov Cap-2 Maneuver	-	-	-	-	-	-	419	436	-	414	394	-
Stage 1	-	-	-	-	-	-	618	588	-	812	774	-
Stage 2	-	-	-	-	-	-	795	769	-	570	540	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.5			0.7			14.4			11.4		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	447	1467	-	-	1261	-	-	622				
HCM Lane V/C Ratio	0.141	0.05	-	-	0.009	-	-	0.098				
HCM Control Delay (s)	14.4	7.6	0	-	7.9	0	-	11.4				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.5	0.2	-	-	0	-	-	0.3				

HCM 6th TWSC  
4: Jamestown Way & Alameda Ave

2030 Total AM  
10/12/2022

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	265	35	10	455	20	100	5	20	40	5	45
Future Vol, veh/h	25	265	35	10	455	20	100	5	20	40	5	45
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	150	-	150	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	288	38	11	495	22	109	5	22	43	5	49

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	517	0	0	326	0	0	897	881	288	903	908	506
Stage 1	-	-	-	-	-	-	342	342	-	528	528	-
Stage 2	-	-	-	-	-	-	555	539	-	375	380	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1049	-	-	1263	-	-	263	281	*868	260	268	566
Stage 1	-	-	-	-	-	-	768	681	-	534	528	-
Stage 2	-	-	-	-	-	-	516	522	-	730	649	-
Platoon blocked, %	-	-	-	1	-	-	1	1	1	1	1	-
Mov Cap-1 Maneuver	1049	-	-	1263	-	-	232	271	*868	244	259	566
Mov Cap-2 Maneuver	-	-	-	-	-	-	345	376	-	377	376	-
Stage 1	-	-	-	-	-	-	748	663	-	520	523	-
Stage 2	-	-	-	-	-	-	462	517	-	688	632	-








Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.2	19.5	15.2
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	383	1049	-	-	1263	-	-	452
HCM Lane V/C Ratio	0.355	0.026	-	-	0.009	-	-	0.216
HCM Control Delay (s)	19.5	8.5	-	-	7.9	-	-	15.2
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1.6	0.1	-	-	0	-	-	0.8

Notes												
-: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon												

HCM 6th TWSC  
4: Jamestown Way & Alameda Ave

2030 Total PM  
10/12/2022






Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	590	110	20	425	30	70	5	15	20	5	25
Future Vol, veh/h	40	590	110	20	425	30	70	5	15	20	5	25
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	150	-	150	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	43	641	120	22	462	33	76	5	16	22	5	27






Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	495	0	0	761	0	0	1266	1266	641	1321	1370	479
Stage 1	-	-	-	-	-	-	727	727	-	523	523	-
Stage 2	-	-	-	-	-	-	539	539	-	798	847	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1069	-	-	786	-	-	108	120	*581	92	92	587
Stage 1	-	-	-	-	-	-	511	454	-	537	530	-
Stage 2	-	-	-	-	-	-	527	522	-	435	363	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	1069	-	-	786	-	-	96	112	*581	83	86	587
Mov Cap-2 Maneuver	-	-	-	-	-	-	255	256	-	236	219	-
Stage 1	-	-	-	-	-	-	491	436	-	516	515	-
Stage 2	-	-	-	-	-	-	483	507	-	400	349	-










Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.4			24.5			17.9		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	281	1069	-	-	786	-	-	333
HCM Lane V/C Ratio	0.348	0.041	-	-	0.028	-	-	0.163
HCM Control Delay (s)	24.5	8.5	-	-	9.7	-	-	17.9
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1.5	0.1	-	-	0.1	-	-	0.6

Notes												
-: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon												

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	42	13	3	115	17	38	5	9	12	5	46
Future Vol, veh/h	17	42	13	3	115	17	38	5	9	12	5	46
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	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	46	14	3	125	18	41	5	10	13	5	50
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	143	0	0	60	0	0	257	238	53	228	227	125
Stage 1	-	-	-	-	-	-	89	89	-	131	131	-
Stage 2	-	-	-	-	-	-	168	149	-	97	96	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1440	-	-	1544	-	-	696	663	1014	727	672	926
Stage 1	-	-	-	-	-	-	918	821	-	873	788	-
Stage 2	-	-	-	-	-	-	834	774	-	910	815	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1440	-	-	1544	-	-	647	653	1014	707	662	926
Mov Cap-2 Maneuver	-	-	-	-	-	-	647	653	-	707	662	-
Stage 1	-	-	-	-	-	-	906	810	-	862	786	-
Stage 2	-	-	-	-	-	-	782	772	-	884	804	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.8			0.2			10.7			9.6		
HCM LOS							B			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	691	1440	-	-	1544	-	-	849				
HCM Lane V/C Ratio	0.082	0.013	-	-	0.002	-	-	0.081				
HCM Control Delay (s)	10.7	7.5	0	-	7.3	0	-	9.6				
HCM Lane LOS	B	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.3				

Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	67	112	44	11	84	12	26	5	7	17	5	34
Future Vol, veh/h	67	112	44	11	84	12	26	5	7	17	5	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	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	73	122	48	12	91	13	28	5	8	18	5	37
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	104	0	0	170	0	0	435	420	146	414	431	91
Stage 1	-	-	-	-	-	-	292	292	-	115	115	-
Stage 2	-	-	-	-	-	-	143	128	-	299	316	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1488	-	-	1407	-	-	531	525	901	549	517	967
Stage 1	-	-	-	-	-	-	716	671	-	890	800	-
Stage 2	-	-	-	-	-	-	860	790	-	710	655	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1488	-	-	1407	-	-	482	492	901	514	484	967
Mov Cap-2 Maneuver	-	-	-	-	-	-	482	492	-	514	484	-
Stage 1	-	-	-	-	-	-	677	635	-	842	793	-
Stage 2	-	-	-	-	-	-	814	783	-	660	620	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	2.3			0.8			12.4			10.5		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	529	1488	-	-	1407	-	-	713				
HCM Lane V/C Ratio	0.078	0.049	-	-	0.008	-	-	0.085				
HCM Control Delay (s)	12.4	7.5	0	-	7.6	0	-	10.5				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.3	0.2	-	-	0	-	-	0.3				










Intersection												
Int Delay, s/veh	6.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	210	80	30	280	20	165	5	40	40	5	45
Future Vol, veh/h	20	210	80	30	280	20	165	5	40	40	5	45
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	150	-	150	150	-	150	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	228	87	33	304	22	179	5	43	43	5	49

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	326	0	0	315	0	0	680	664	228	710	729	304
Stage 1	-	-	-	-	-	-	272	272	-	370	370	-
Stage 2	-	-	-	-	-	-	408	392	-	340	359	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1263	-	-	1263	-	-	417	412	919	392	368	862
Stage 1	-	-	-	-	-	-	814	722	-	736	657	-
Stage 2	-	-	-	-	-	-	694	640	-	738	653	-
Platoon blocked, %	1	-	-	1	-	-	1	1	1	1	1	1
Mov Cap-1 Maneuver	1263	-	-	1263	-	-	376	394	919	358	352	862
Mov Cap-2 Maneuver	-	-	-	-	-	-	376	394	-	358	352	-
Stage 1	-	-	-	-	-	-	800	710	-	723	640	-
Stage 2	-	-	-	-	-	-	632	624	-	686	642	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.7			20.2			13.8		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	376	800	1263	-	-	1263	-	-	505
HCM Lane V/C Ratio	0.477	0.061	0.017	-	-	0.026	-	-	0.194
HCM Control Delay (s)	23	9.8	7.9	-	-	7.9	-	-	13.8
HCM Lane LOS	C	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	2.5	0.2	0.1	-	-	0.1	-	-	0.7









Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	405	175	30	335	40	115	5	20	25	5	25
Future Vol, veh/h	45	405	175	30	335	40	115	5	20	25	5	25
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	150	-	150	150	-	150	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	440	190	33	364	43	125	5	22	27	5	27







Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	407	0	0	630	0	0	1006	1011	440	1077	1158	364
Stage 1	-	-	-	-	-	-	538	538	-	430	430	-
Stage 2	-	-	-	-	-	-	468	473	-	647	728	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1174	-	-	917	-	-	214	222	*737	183	167	*816
Stage 1	-	-	-	-	-	-	627	561	-	701	625	-
Stage 2	-	-	-	-	-	-	658	591	-	516	424	-
Platoon blocked, %	1	-	-	1	-	-	1	1	1	1	1	1
Mov Cap-1 Maneuver	1174	-	-	917	-	-	192	205	*737	165	155	*816
Mov Cap-2 Maneuver	-	-	-	-	-	-	352	335	-	314	275	-
Stage 1	-	-	-	-	-	-	601	537	-	671	602	-
Stage 2	-	-	-	-	-	-	608	569	-	475	406	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0.7	19.1	14.8
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	352	594	1174	-	-	917	-	-	428
HCM Lane V/C Ratio	0.355	0.046	0.042	-	-	0.036	-	-	0.14
HCM Control Delay (s)	20.8	11.4	8.2	-	-	9.1	-	-	14.8
HCM Lane LOS	C	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.6	0.1	0.1	-	-	0.1	-	-	0.5

Notes												
-: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon												

Intersection						
Int Delay, s/veh	1.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	170	760	25	70	395
Future Vol, veh/h	25	170	760	25	70	395
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	-	150	150	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	185	826	27	76	429
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1193	413	0	0	853	0
Stage 1	826	-	-	-	-	-
Stage 2	367	-	-	-	-	-
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	*565	*763	-	-	*1141	-
Stage 1	*720	-	-	-	-	-
Stage 2	*867	-	-	-	-	-
Platoon blocked, %	1	1	-	-	1	-
Mov Cap-1 Maneuver	*527	*763	-	-	*1141	-
Mov Cap-2 Maneuver	*586	-	-	-	-	-
Stage 1	*720	-	-	-	-	-
Stage 2	*809	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.2	0		1.3		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	586	763	* 1141	-
HCM Lane V/C Ratio	-	-	0.046	0.242	0.067	-
HCM Control Delay (s)	-	-	11.4	11.2	8.4	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.9	0.2	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Intersection						
Int Delay, s/veh	1.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	110	835	40	175	580
Future Vol, veh/h	40	110	835	40	175	580
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	-	150	150	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	120	908	43	190	630

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1603	454	0
Stage 1	908	-	-
Stage 2	695	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	*466	*737	-
Stage 1	*695	-	-
Stage 2	*766	-	-
Platoon blocked, %	1	1	-
Mov Cap-1 Maneuver	*386	*737	-
Mov Cap-2 Maneuver	*478	-	-
Stage 1	*695	-	-
Stage 2	*635	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.5	0	2.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	-	478	737 * 1102
HCM Lane V/C Ratio	-	-	0.091	0.162 0.173
HCM Control Delay (s)	-	-	13.3	10.8 8.9
HCM Lane LOS	-	-	B	B A
HCM 95th %tile Q(veh)	-	-	0.3	0.6 0.6








Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection				
Intersection Delay, s/veh	5.6			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	238	234	331	158
Demand Flow Rate, veh/h	243	239	338	161
Vehicles Circulating, veh/h	221	293	160	321
Vehicles Exiting, veh/h	261	205	304	211
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.4	5.9	5.8	5.2
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	243	239	338	161
Cap Entry Lane, veh/h	1101	1023	1172	995
Entry HV Adj Factor	0.980	0.978	0.980	0.981
Flow Entry, veh/h	238	234	331	158
Cap Entry, veh/h	1079	1001	1149	976
V/C Ratio	0.221	0.234	0.288	0.162
Control Delay, s/veh	5.4	5.9	5.8	5.2
LOS	A	A	A	A
95th %tile Queue, veh	1	1	1	1

Intersection				
Intersection Delay, s/veh	5.0			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	190	201	223	196
Demand Flow Rate, veh/h	194	206	228	200
Vehicles Circulating, veh/h	239	184	178	228
Vehicles Exiting, veh/h	189	222	255	162
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.0	4.8	5.0	5.0
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	194	206	228	200
Cap Entry Lane, veh/h	1081	1144	1151	1094
Entry HV Adj Factor	0.980	0.977	0.979	0.979
Flow Entry, veh/h	190	201	223	196
Cap Entry, veh/h	1060	1117	1127	1071
V/C Ratio	0.179	0.180	0.198	0.183
Control Delay, s/veh	5.0	4.8	5.0	5.0
LOS	A	A	A	A
95th %tile Queue, veh	1	1	1	1

HCM 6th TWSC  
8: New Castle Way & Alameda Ave

2030 Total AM  
10/12/2022

Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	185	50	45	210	25	55	5	35	40	5	45
Future Vol, veh/h	20	185	50	45	210	25	55	5	35	40	5	45
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	150	-	150	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	201	54	49	228	27	60	5	38	43	5	49








Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	255	0	0	255	0	0	612	598	201	634	639	242
Stage 1	-	-	-	-	-	-	245	245	-	340	340	-
Stage 2	-	-	-	-	-	-	367	353	-	294	299	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1340	-	-	1310	-	-	438	435	840	421	409	900
Stage 1	-	-	-	-	-	-	759	703	-	738	667	-
Stage 2	-	-	-	-	-	-	710	657	-	714	666	-
Platoon blocked, %	1	-	-	-	-	-	1	1	-	1	1	1
Mov Cap-1 Maneuver	1340	-	-	1310	-	-	394	413	840	382	388	900
Mov Cap-2 Maneuver	-	-	-	-	-	-	485	483	-	476	461	-
Stage 1	-	-	-	-	-	-	747	692	-	727	642	-
Stage 2	-	-	-	-	-	-	641	633	-	665	655	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			1.3			12.6			11.9		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	574	1340	-	-	1310	-	-	621
HCM Lane V/C Ratio	0.18	0.016	-	-	0.037	-	-	0.158
HCM Control Delay (s)	12.6	7.7	-	-	7.9	-	-	11.9
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.7	0	-	-	0.1	-	-	0.6

HCM 6th TWSC  
8: New Castle Way & Alameda Ave




2030 Total PM  
10/12/2022

Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	270	105	65	255	30	95	5	70	20	5	25
Future Vol, veh/h	40	270	105	65	255	30	95	5	70	20	5	25
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	150	-	150	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	43	293	114	71	277	33	103	5	76	22	5	27
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	310	0	0	407	0	0	831	831	293	913	929	294
Stage 1	-	-	-	-	-	-	379	379	-	436	436	-
Stage 2	-	-	-	-	-	-	452	452	-	477	493	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1285	-	-	1152	-	-	299	305	746	255	259	*868
Stage 1	-	-	-	-	-	-	643	615	-	665	606	-
Stage 2	-	-	-	-	-	-	649	594	-	569	547	-
Platoon blocked, %	1	-	-	-	-	-	1	1	-	1	1	1
Mov Cap-1 Maneuver	1285	-	-	1152	-	-	266	277	746	211	235	*868
Mov Cap-2 Maneuver	-	-	-	-	-	-	385	377	-	320	336	-
Stage 1	-	-	-	-	-	-	622	595	-	643	568	-
Stage 2	-	-	-	-	-	-	585	557	-	489	529	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.8			1.5			17.1			13.6		
HCM LOS							C			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	480	1285	-	-	1152	-	-	471				
HCM Lane V/C Ratio	0.385	0.034	-	-	0.061	-	-	0.115				
HCM Control Delay (s)	17.1	7.9	-	-	8.3	-	-	13.6				
HCM Lane LOS	C	A	-	-	A	-	-	B				
HCM 95th %tile Q(veh)	1.8	0.1	-	-	0.2	-	-	0.4				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined					*: All major volume in platoon			



Intersection




Int Delay, s/veh 4.5









Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	95	80	105	55	30	95
Future Vol, veh/h	95	80	105	55	30	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	103	87	114	60	33	103

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	174	0	437
Stage 1	-	-	144
Stage 2	-	-	293
Critical Hdwy	4.12	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.218	-	3.518
Pot Cap-1 Maneuver	1403	-	577
Stage 1	-	-	883
Stage 2	-	-	757
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1403	-	533
Mov Cap-2 Maneuver	-	-	533
Stage 1	-	-	815
Stage 2	-	-	757

Approach	EB	WB	SB
HCM Control Delay, s	4.2	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1403	-	-	-	774
HCM Lane V/C Ratio	0.074	-	-	-	0.176
HCM Control Delay (s)	7.8	0	-	-	10.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.6

Intersection						
Int Delay, s/veh	6.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	120	65	60	65	75	120
Future Vol, veh/h	120	65	60	65	75	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	130	71	65	71	82	130
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	136	0	-	0	432	101
Stage 1	-	-	-	-	101	-
Stage 2	-	-	-	-	331	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1448	-	-	-	581	954
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	728	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1448	-	-	-	527	954
Mov Cap-2 Maneuver	-	-	-	-	527	-
Stage 1	-	-	-	-	837	-
Stage 2	-	-	-	-	728	-
Approach	EB	WB		SB		
HCM Control Delay, s	5	0		12		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1448	-	-	-	727	
HCM Lane V/C Ratio	0.09	-	-	-	0.292	
HCM Control Delay (s)	7.7	0	-	-	12	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.3	-	-	-	1.2	









Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	20	15	40	20	20	15	465	50	40	400	15
Future Vol, veh/h	25	20	15	40	20	20	15	465	50	40	400	15
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	150	-	-	150	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	22	16	43	22	22	16	505	54	43	435	16

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	825	1120	226	879	1101	280	451	0	0	559	0	0
Stage 1	529	529	-	564	564	-	-	-	-	-	-	-
Stage 2	296	591	-	315	537	-	-	-	-	-	-	-
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	419	271	*924	*378	279	717	1368	-	-	1008	-	-
Stage 1	759	689	-	*478	507	-	-	-	-	-	-	-
Stage 2	688	493	-	*871	683	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	-	-	-	-	-	-
Mov Cap-1 Maneuver	373	257	*924	*340	264	717	1368	-	-	1008	-	-
Mov Cap-2 Maneuver	465	351	-	*403	373	-	-	-	-	-	-	-
Stage 1	750	659	-	*472	501	-	-	-	-	-	-	-
Stage 2	631	487	-	*793	653	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	13.2		14		0.2		0.8	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1368	-	-	465	478	403	491	1008	-	-
HCM Lane V/C Ratio	0.012	-	-	0.058	0.08	0.108	0.089	0.043	-	-
HCM Control Delay (s)	7.7	-	-	13.2	13.2	15	13	8.7	-	-
HCM Lane LOS	A	-	-	B	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0.4	0.3	0.1	-	-

Notes												
-: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						







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	20	35	25	50	35	10	25	580	30	115	560	25
Future Vol, veh/h	20	35	25	50	35	10	25	580	30	115	560	25
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	150	-	-	150	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	38	27	54	38	11	27	630	33	125	609	27







Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1261	1590	318	1275	1587	332	636	0	0	663	0	0
Stage 1	873	873	-	701	701	-	-	-	-	-	-	-
Stage 2	388	717	-	574	886	-	-	-	-	-	-	-
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	211	139	*867	*205	140	664	1247	-	-	922	-	-
Stage 1	516	509	-	*395	439	-	-	-	-	-	-	-
Stage 2	607	432	-	*817	500	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	-	-	-	-	-	-
Mov Cap-1 Maneuver	161	118	*867	*152	118	664	1247	-	-	922	-	-
Mov Cap-2 Maneuver	278	213	-	*279	244	-	-	-	-	-	-	-
Stage 1	505	440	-	*386	429	-	-	-	-	-	-	-
Stage 2	532	422	-	*625	432	-	-	-	-	-	-	-







Approach	EB		WB		NB		SB	
HCM Control Delay, s	19.5		20.7		0.3		1.6	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1247	-	-	278	311	279	284	922	-	-
HCM Lane V/C Ratio	0.022	-	-	0.078	0.21	0.195	0.172	0.136	-	-
HCM Control Delay (s)	8	-	-	19	19.6	21	20.3	9.5	-	-
HCM Lane LOS	A	-	-	C	C	C	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.8	0.7	0.6	0.5	-	-







Notes												
-: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon				

Intersection						
Int Delay, s/veh	1.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	65	60	725	35	30	390
Future Vol, veh/h	65	60	725	35	30	390
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	0	-	150	150	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	71	65	788	38	33	424
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1066	394	0	0	826	0
Stage 1	788	-	-	-	-	-
Stage 2	278	-	-	-	-	-
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	*366	*789	-	-	1166	-
Stage 1	*744	-	-	-	-	-
Stage 2	*867	-	-	-	-	-
Platoon blocked, %	1	1	-	-	1	-
Mov Cap-1 Maneuver	*356	*789	-	-	1166	-
Mov Cap-2 Maneuver	*610	-	-	-	-	-
Stage 1	*744	-	-	-	-	-
Stage 2	*843	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.9	0		0.6		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	610	789	1166	-
HCM Lane V/C Ratio	-	-	0.116	0.083	0.028	-
HCM Control Delay (s)	-	-	11.7	10	8.2	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0.3	0.1	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Intersection						
Int Delay, s/veh	1.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	55	55	820	80	75	545
Future Vol, veh/h	55	55	820	80	75	545
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	0	-	150	150	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	60	60	891	87	82	592
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1351	446	0	0	978	0
Stage 1	891	-	-	-	-	-
Stage 2	460	-	-	-	-	-
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	*248	*737	-	-	1078	-
Stage 1	*695	-	-	-	-	-
Stage 2	*818	-	-	-	-	-
Platoon blocked, %	1	1	-	-	1	-
Mov Cap-1 Maneuver	*229	*737	-	-	1078	-
Mov Cap-2 Maneuver	*530	-	-	-	-	-
Stage 1	*695	-	-	-	-	-
Stage 2	*756	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.5	0		1		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	530	737	1078	-
HCM Lane V/C Ratio	-	-	0.113	0.081	0.076	-
HCM Control Delay (s)	-	-	12.7	10.3	8.6	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0.3	0.2	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon





Intersection						
Int Delay, s/veh	1.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	115	25	750	50	20	455
Future Vol, veh/h	115	25	750	50	20	455
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	0	-	150	150	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	125	27	815	54	22	495
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1107	408	0	0	869	0
Stage 1	815	-	-	-	-	-
Stage 2	292	-	-	-	-	-
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	*763	-	-	*1141	-
Stage 1	*720	-	-	-	-	-
Stage 2	*843	-	-	-	-	-
Platoon blocked, %	1	1	-	-	1	-
Mov Cap-1 Maneuver	*530	*763	-	-	*1141	-
Mov Cap-2 Maneuver	*647	-	-	-	-	-
Stage 1	*720	-	-	-	-	-
Stage 2	*827	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.5	0		0.3		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	647	763	* 1141	-
HCM Lane V/C Ratio	-	-	0.193	0.036	0.019	-
HCM Control Delay (s)	-	-	11.9	9.9	8.2	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.7	0.1	0.1	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon



Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	80	20	895	125	30	590
Future Vol, veh/h	80	20	895	125	30	590
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	0	-	150	150	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	87	22	973	136	33	641
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1360	487	0	0	1109	0
Stage 1	973	-	-	-	-	-
Stage 2	387	-	-	-	-	-
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	*442	*711	-	-	963	-
Stage 1	*671	-	-	-	-	-
Stage 2	*794	-	-	-	-	-
Platoon blocked, %	1	1	-	-	1	-
Mov Cap-1 Maneuver	*427	*711	-	-	963	-
Mov Cap-2 Maneuver	*583	-	-	-	-	-
Stage 1	*671	-	-	-	-	-
Stage 2	*767	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.9	0		0.4		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	583	711	963	-
HCM Lane V/C Ratio	-	-	0.149	0.031	0.034	-
HCM Control Delay (s)	-	-	12.3	10.2	8.9	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.5	0.1	0.1	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Intersection





Int Delay, s/veh 6.4






Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	55	25	25	25	35	120
Future Vol, veh/h	55	25	25	25	35	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	60	27	27	27	38	130





Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	54	0	0 188 41
Stage 1	-	-	- 41 -
Stage 2	-	-	- 147 -
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	1551	-	- 801 1030
Stage 1	-	-	- 981 -
Stage 2	-	-	- 880 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1551	-	- 770 1030
Mov Cap-2 Maneuver	-	-	- 770 -
Stage 1	-	-	- 943 -
Stage 2	-	-	- 880 -

Approach	EB	WB	SB
HCM Control Delay, s	5.1	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1551	-	-	-	770	1030
HCM Lane V/C Ratio	0.039	-	-	-	0.049	0.127
HCM Control Delay (s)	7.4	0	-	-	9.9	9
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	0.4

Intersection						
Int Delay, s/veh	6.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	130	30	20	35	30	85
Future Vol, veh/h	130	30	20	35	30	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	141	33	22	38	33	92
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	60	0	-	0	356	41
Stage 1	-	-	-	-	41	-
Stage 2	-	-	-	-	315	-
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	1544	-	-	-	642	1030
Stage 1	-	-	-	-	981	-
Stage 2	-	-	-	-	740	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1544	-	-	-	582	1030
Mov Cap-2 Maneuver	-	-	-	-	582	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	740	-
Approach	EB	WB		SB		
HCM Control Delay, s	6.1	0		9.5		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1544	-	-	-	582	1030
HCM Lane V/C Ratio	0.092	-	-	-	0.056	0.09
HCM Control Delay (s)	7.6	0	-	-	11.6	8.8
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.3	-	-	-	0.2	0.3

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	15	10	525	450	10
Future Vol, veh/h	15	15	10	525	450	10
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	-	150	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	16	11	571	489	11
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	803	250	500	0	-	0
Stage 1	495	-	-	-	-	-
Stage 2	308	-	-	-	-	-
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	*513	*899	*1345	-	-	-
Stage 1	*848	-	-	-	-	-
Stage 2	*719	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	*509	*899	*1345	-	-	-
Mov Cap-2 Maneuver	*582	-	-	-	-	-
Stage 1	*841	-	-	-	-	-
Stage 2	*719	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	10.3		0.1		0	
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	* 1345	-	707	-	-	
HCM Lane V/C Ratio	0.008	-	0.046	-	-	
HCM Control Delay (s)	7.7	-	10.3	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon






Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	10	15	630	625	15
Future Vol, veh/h	10	10	15	630	625	15
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	-	150	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	11	16	685	679	16

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1062	348	695	0	-	0
Stage 1	687	-	-	-	-	-
Stage 2	375	-	-	-	-	-
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	386	*841	1226	-	-	-
Stage 1	775	-	-	-	-	-
Stage 2	665	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	381	*841	1226	-	-	-
Mov Cap-2 Maneuver	497	-	-	-	-	-
Stage 1	765	-	-	-	-	-
Stage 2	665	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1226	-	625	-	-
HCM Lane V/C Ratio	0.013	-	0.035	-	-
HCM Control Delay (s)	8	-	11	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	30	20	520	450	10
Future Vol, veh/h	10	30	20	520	450	10
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	-	150	-	-	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	33	22	565	489	11

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	822	250	500	0	-	0
Stage 1	495	-	-	-	-	-
Stage 2	327	-	-	-	-	-
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	*496	*899	*1345	-	-	-
Stage 1	*848	-	-	-	-	-
Stage 2	*703	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	*488	*899	*1345	-	-	-
Mov Cap-2 Maneuver	*628	-	-	-	-	-
Stage 1	*835	-	-	-	-	-
Stage 2	*703	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 1345	-	811	-	-
HCM Lane V/C Ratio	0.016	-	0.054	-	-
HCM Control Delay (s)	7.7	-	9.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-





Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th TWSC  
15: Powhaton Rd & Mississippi Ave

2030 Total PM  
10/14/2022

Intersection

Int Delay, s/veh 2.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	20	380	625	615	15
Future Vol, veh/h	15	20	380	625	615	15
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	-	150	-	-	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	22	413	679	668	16

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1842	342	684
Stage 1	676	-	-
Stage 2	1166	-	-
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	86	*841	1241
Stage 1	787	-	-
Stage 2	259	-	-
Platoon blocked, %	1	1	1
Mov Cap-1 Maneuver	57	*841	1241
Mov Cap-2 Maneuver	224	-	-
Stage 1	525	-	-
Stage 2	259	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.3	3.5	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1241	-	386	-	-
HCM Lane V/C Ratio	0.333	-	0.099	-	-
HCM Control Delay (s)	9.3	-	15.3	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	1.5	-	0.3	-	-

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon



# APPENDIX F

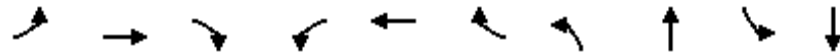
## Queue Analysis Worksheets

## Queues

2030 Total AM

## 1: Harvest Rd &amp; Alameda Ave

10/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	27	212	163	60	457	207	484	527	190	473
v/c Ratio	0.17	0.41	0.18	0.17	0.83	0.37	0.78	0.35	0.42	0.39
Control Delay	22.9	35.1	1.9	24.7	53.3	13.6	57.8	29.3	19.4	30.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	35.1	1.9	24.7	53.3	13.6	57.8	29.3	19.4	30.7
Queue Length 50th (ft)	13	127	0	28	311	38	189	154	75	137
Queue Length 95th (ft)	29	178	25	52	396	95	241	225	137	215
Internal Link Dist (ft)		1136			1208			727		968
Turn Bay Length (ft)	150		150	150		10	150		300	
Base Capacity (vph)	163	666	933	345	673	656	729	1517	491	1200
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.32	0.17	0.17	0.68	0.32	0.66	0.35	0.39	0.39

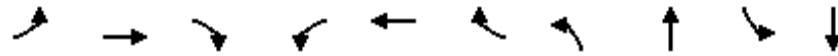
## Intersection Summary

## Queues

2030 Total PM

## 1: Harvest Rd &amp; Alameda Ave

10/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	87	587	332	49	375	207	478	554	321	587
v/c Ratio	0.31	0.89	0.35	0.35	0.61	0.35	0.82	0.52	0.70	0.56
Control Delay	22.1	52.7	7.8	26.0	37.8	17.1	62.9	41.5	28.7	38.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.1	52.7	7.8	26.0	37.8	17.1	62.9	41.5	28.7	38.8
Queue Length 50th (ft)	38	416	62	21	220	57	188	176	155	208
Queue Length 95th (ft)	67	548	109	m44	301	116	249	269	240	279
Internal Link Dist (ft)		1136			1208			727		968
Turn Bay Length (ft)	150		150	150		10	150		300	
Base Capacity (vph)	284	737	969	139	726	675	622	1063	512	1042
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.80	0.34	0.35	0.52	0.31	0.77	0.52	0.63	0.56

## Intersection Summary

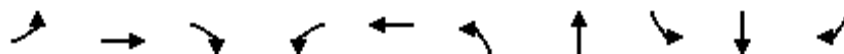
m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2030 Total AM

## 2: Powhaton Rd &amp; Alameda Ave

10/14/2022



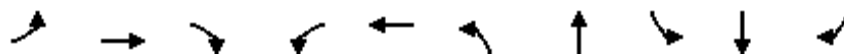
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	103	82	130	49	168	152	413	22	332	60
v/c Ratio	0.39	0.25	0.34	0.17	0.69	0.23	0.20	0.04	0.18	0.07
Control Delay	36.1	43.8	9.3	31.4	59.9	10.2	12.9	10.2	16.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	43.8	9.3	31.4	59.9	10.2	12.9	10.2	16.6	0.1
Queue Length 50th (ft)	56	58	6	29	117	41	75	6	66	0
Queue Length 95th (ft)	91	102	48	53	182	88	129	19	121	0
Internal Link Dist (ft)	1359				792	722		1032		
Turn Bay Length (ft)	150	150		150	150		150		150	
Base Capacity (vph)	310	555	565	317	459	746	2039	609	1821	897
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.15	0.23	0.15	0.37	0.20	0.20	0.04	0.18	0.07
Intersection Summary										

## Queues

2030 Total PM

## 2: Powhaton Rd &amp; Alameda Ave

10/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	109	190	174	60	174	168	511	152	538	98
v/c Ratio	0.42	0.59	0.42	0.24	0.70	0.30	0.28	0.28	0.30	0.11
Control Delay	33.4	47.8	7.7	33.1	60.9	10.8	16.8	10.7	17.9	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.4	47.8	7.7	33.1	60.9	10.8	16.8	10.7	17.9	4.2
Queue Length 50th (ft)	56	135	10	35	123	46	105	42	117	0
Queue Length 95th (ft)	m81	m183	m34	64	189	93	175	85	192	32
Internal Link Dist (ft)		1359			792		722		1032	
Turn Bay Length (ft)	150		150	150		150		150		150
Base Capacity (vph)	281	476	531	264	412	648	1853	642	1807	854
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.40	0.33	0.23	0.42	0.26	0.28	0.24	0.30	0.11

## Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

## Queues

2030 Total AM

## 3: Mississippi Ave &amp; Harvest Rd

10/13/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	190	359	332	685	239	380
v/c Ratio	0.70	0.66	0.38	0.25	0.20	0.33
Control Delay	61.4	10.4	5.7	4.6	12.9	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.4	10.4	5.7	4.6	12.9	4.9
Queue Length 50th (ft)	142	0	61	66	104	71
Queue Length 95th (ft)	207	82	118	113	183	135
Internal Link Dist (ft)	586			50	880	
Turn Bay Length (ft)			150			150
Base Capacity (vph)	523	721	970	2730	1176	1139
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.50	0.34	0.25	0.20	0.33
Intersection Summary						

## Queues

2030 Total PM

## 3: Mississippi Ave &amp; Harvest Rd

10/13/2022

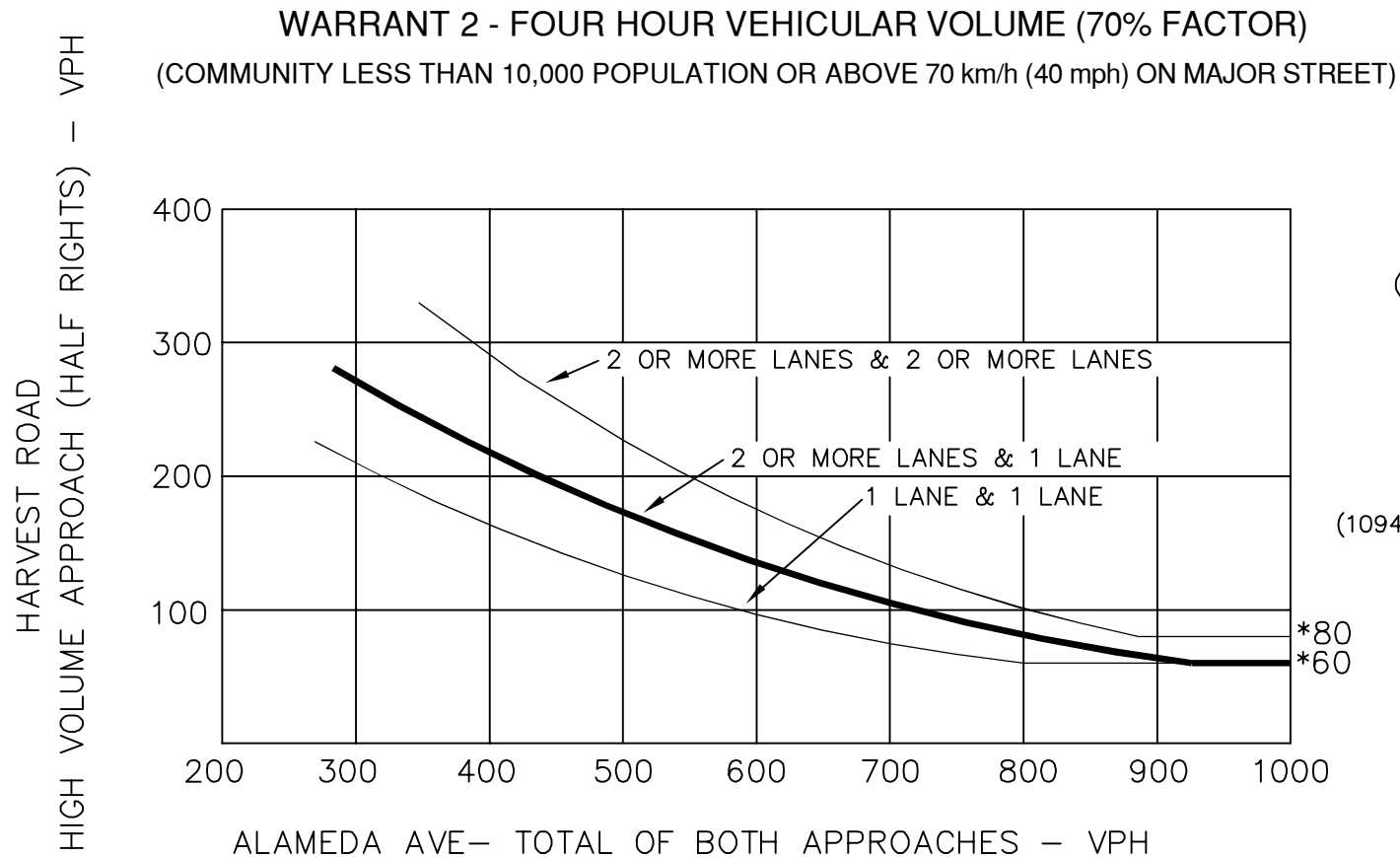


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	321	446	370	788	342	386
v/c Ratio	0.79	0.63	0.53	0.32	0.35	0.39
Control Delay	56.8	7.4	11.0	8.4	22.2	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.8	7.4	11.0	8.4	22.2	8.0
Queue Length 50th (ft)	234	0	101	114	185	92
Queue Length 95th (ft)	309	77	186	184	330	151
Internal Link Dist (ft)	586			50	880	
Turn Bay Length (ft)			150			150
Base Capacity (vph)	553	801	799	2457	977	1000
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.56	0.46	0.32	0.35	0.39
Intersection Summary						



# APPENDIX G

## Signal Warrant Analysis Worksheets



SIGNAL WARRANT ANALYSIS  
ALAMEDA AVE & HARVEST RD  
FOUR HOUR VOLUME WARRANT

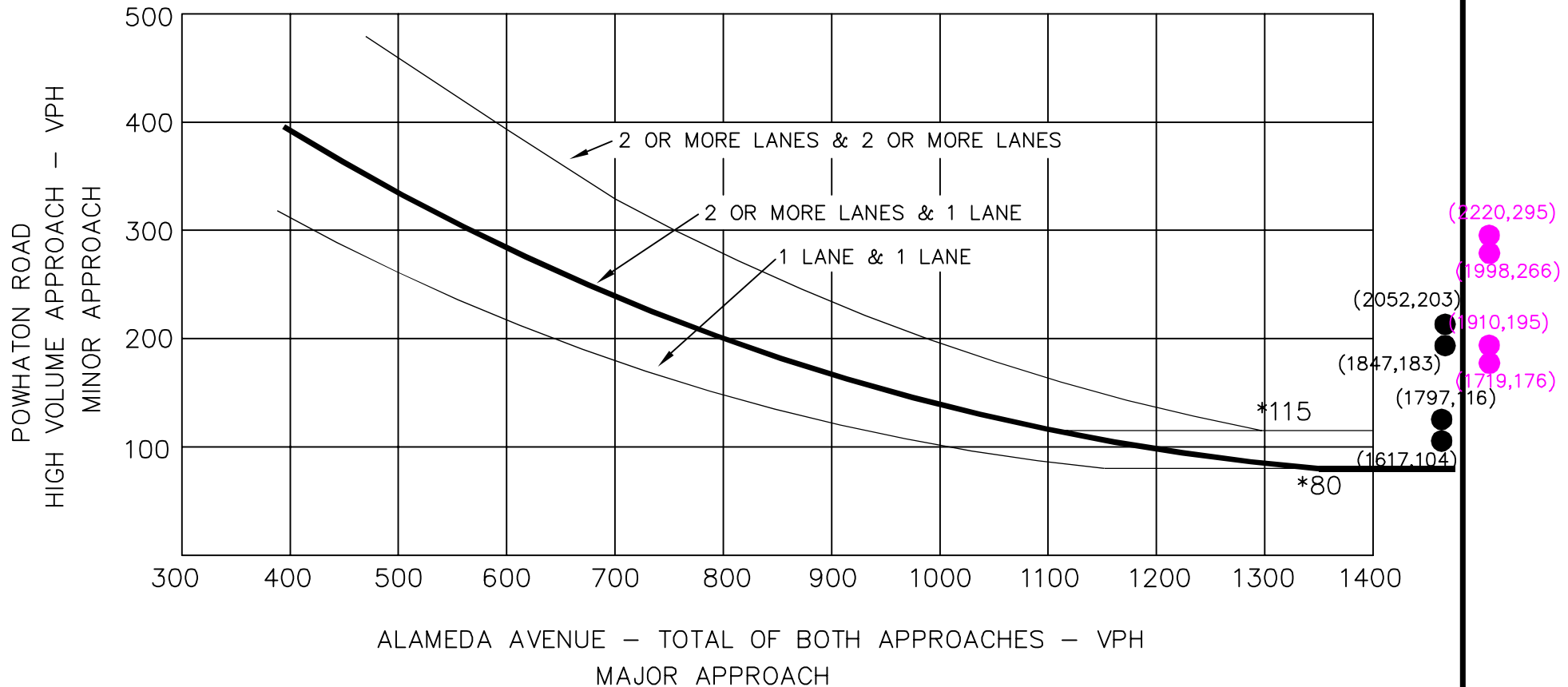
\* NOTE: 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 60 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

- 2030 BACKGROUND TRAFFIC DATA POINT
- 2030 TOTAL TRAFFIC DATA POINT

Source: Manual of Uniform Traffic Control Devices 2009

FIGURE A

## WARRANT 2 - FOUR HOUR VEHICULAR VOLUME



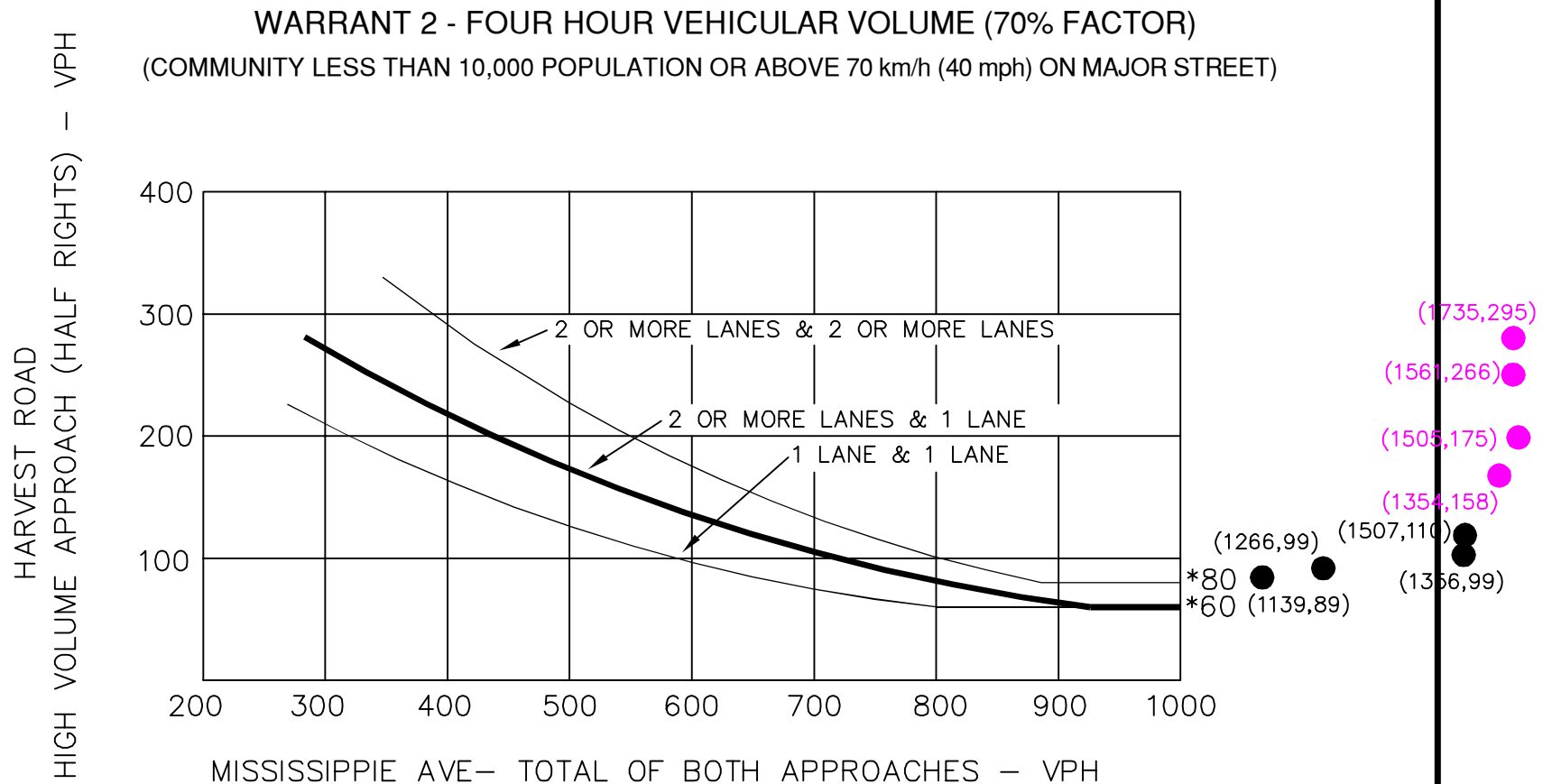
\* NOTE: 115 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SIGNAL WARRANT ANALYSIS  
ALAMEDA AVE & POWHATON RD  
FOUR HOUR VOLUME WARRANT

- 2030 BACKGROUND TRAFFIC DATA POINT
- 2030 TOTAL TRAFFIC DATA POINT

FIGURE B

Source: Manual of Uniform Traffic Control Devices 2009



\* NOTE: 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 60 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SIGNAL WARRANT ANALYSIS  
MISSISSIPPI AVE & HARVEST RD  
FOUR HOUR VOLUME WARRANT

● 2030 BACKGROUND TRAFFIC DATA POINT  
● 2030 TOTAL TRAFFIC DATA POINT

Source: Manual of Uniform Traffic Control Devices 2009

FIGURE C

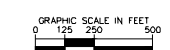
# APPENDIX H

## Conceptual Site Plan



ROADWAY:

- HARVEST ROAD FROM E. ALAMEDA AVENUE TO INTERSECTION WITH ROAD 4 AS A FOUR-LANE ARTERIAL.
- THIS PROJECT IS RESPONSIBLE FOR THE EAST HALF OF E. ALAMEDA AVENUE FROM HARVEST ROAD TO S. LITTLE RIVER STREET AS A FOUR-LANE ARTERIAL. THE NORTHERN TWO LANES ARE EXISTING AND WERE CONSTRUCTED AS PART OF AN ADJACENT PROJECT IN THE 1970S (IN THE NEIGHBORHOOD). THE REMAINING SOUTHERN TWO LANES, LANDSCAPE, AND SIDEWALK IMPROVEMENTS ARE TRIGGERED BY THE REVENUE FROM THE PROJECT, OR AS DETERMINED BY A FUTURE PIFA. IMPROVEMENTS WILL BE COMPLETED CONCURRENTLY WITH FINAL SITE PLAN AND DESIGN OF THE AREA.
- S. LITTLE RIVER STREET FROM E. ALAMEDA AVENUE TO ROUNDABOUT AT INTERSECTION WITH ROAD 4 AS A TWO-LANE COLLECTOR OR ALTERNATIVE TWO-LANE COLLECTOR.
- ROAD 4 FROM HARVEST ROAD TO S. LITTLE RIVER STREET AS A TWO-LANE COLLECTOR OR ALTERNATIVE TWO-LANE COLLECTOR.
- ROADWAY IMPROVEMENTS INTERNAL TO PLANNING AREA 2A
- ROUNDABOUT AT ROAD 4 AND S. LITTLE RIVER STREET.
- TRAFFIC SIGNALS WHEN WARRANTED AT:
  - HARVEST ROAD AND HARVEST ROAD
  - HARVEST ROAD AND ROAD 4



PARKLANDS VILLAGE 2, FILING NO. 1  
OVERALL SITE PLAN  
EASTERN HILLS  
ALBUQUERQUE, NM

**Kimley»Horn**  
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4582 SOUTH ULSTER STREET, SUITE 1500  
DENVER, CO 80237 (303) 228-2300

DESIGNED KH TEAM	DRAWN KH TEAM	CHECKED TLC
SCALE (H): 1" = 250'		
SCALE (V): N/A		
DATE: 8/23/2022		SHEET NO.  2
PROJECT NO. 196480000		
DWG. NAME SP-OVERALL-480000.dwg		

CHECKED	
LC	
ET NO.	
2	
#	

LAND USE TABLE								
# OF LOTS	% OF TOTAL	UNIT TYPE	LOT TYPE	LOT SIZE	MIN LOT AREA (SQ FT)	MIN FRONT SETBACK (FT)	MIN SIDE SETBACK (FT)	MIN REAR SETBACK (FT)
41	10%	SINGLE-FAMILY DETACHED, STANDARD	FRONT LOADED	60' x 110'	4,500	20	5	15
112	27%	SINGLE-FAMILY DETACHED, STANDARD	FRONT LOADED	50' x 110'	4,500	20	5	15
140	33%	SINGLE-FAMILY DETACHED, STANDARD	FRONT LOADED	45' x 110'	4,500	20	5	15
36	9%	MOTOR COURT	ALT LOADED	41' x 62'	2,600	10	5	10
34	8%	DUPLEX	ALT LOADED	26' x 80'	1,250	10	5-END UNIT 0-INTERIOR	6
56	13%	TOWNHOME	ALT LOADED	20' x 70'	1,380-END 1,200-INTERIOR	10	5-END UNIT 0-INTERIOR	6

<b>Site Data Table</b>	
SFD (60' x 110'):	171 units (11%, to be 10%)
Front Setback:	20'
Side Setback:	5'
Rear Setback:	15'
Corner Setback:	+10'

SFD (50' x 110'):	467 units (29%, to be 30%)
Front Setback:	20'
Side Setback:	5'
Rear Setback:	15'
Corner Setback:	+10'

SFD (45' x 110'):	549 units (35%, to be 35%)
Front Setback:	20'
Side Setback:	5'
Rear Setback:	15'
Corner Setback:	+10'

Motor Court (41' x 62'):	126 units (8%, to be 7%)
Front Setback:	10'
Side Setback:	5'
Rear Setback:	15'
Corner Setback:	+7'

Duplex (26' x 80'):	126 units (8%, to be 8%)
Front Setback:	10'
Side Setback:	0/5'
Rear Setback:	6'
Corner Setback:	+10'

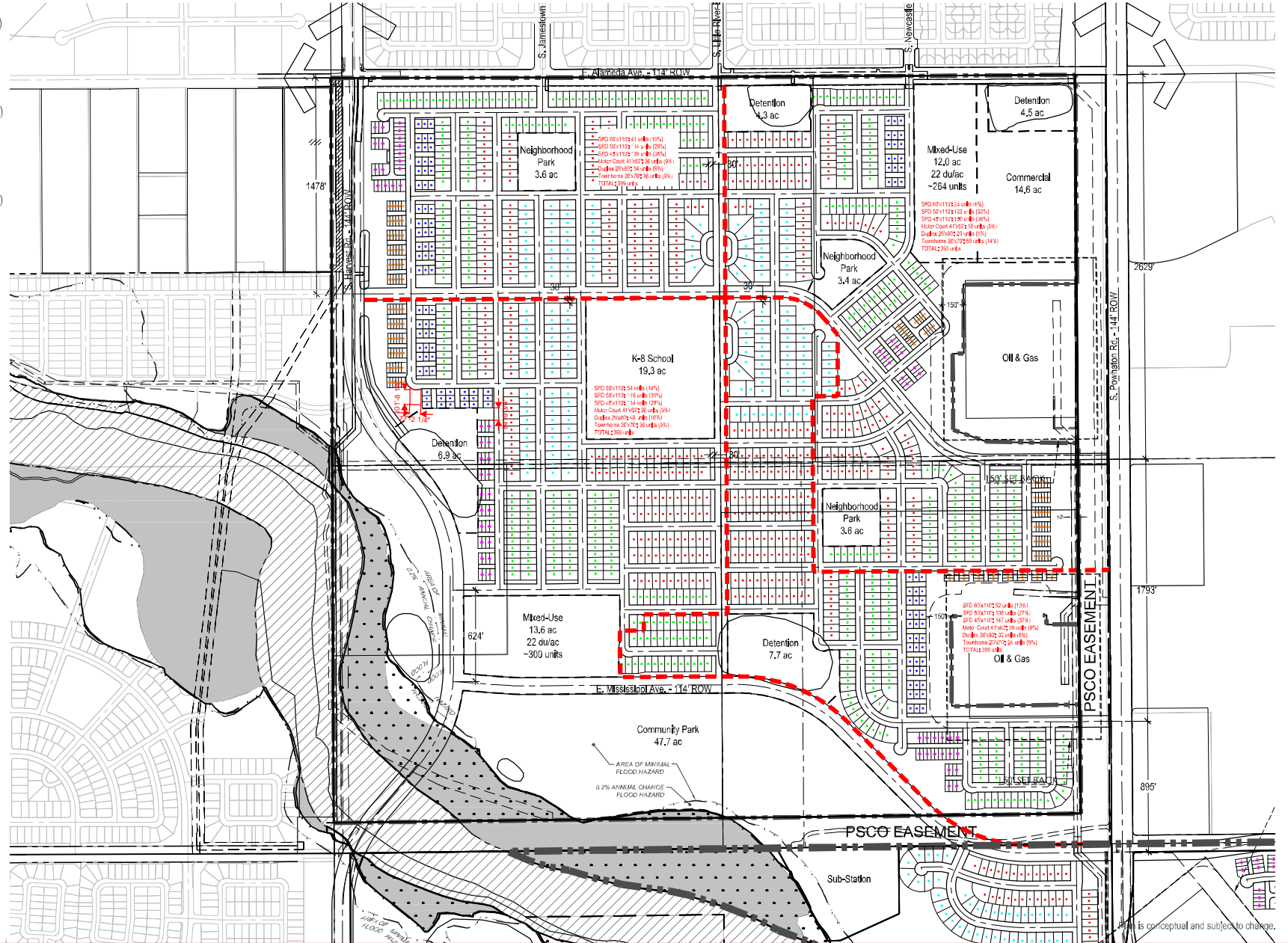
Townhome (20' x 70'):	151 units (9%, to be 10%)
Front Setback:	10'
Side Setback:	0'
Rear Setback:	6'
Corner Setback:	+10'

Major Arterial Width:	144'
Minor Arterial Width:	114'
Maj./Min. Collector Wldth:	80'
Local ROW Width:	64'
Alley Width:	30'

<b>Summary</b>	
SFD 60'x110':	171 units (11%)
SFD 50'x110':	467 units (29%)
SFD 45'x110':	549 units (35%)
Motor Court 41'x62':	126 units (8%)
Duplex 26'x80':	126 units (8%)
Townhome 20'x70':	151 units (9%)
Total Single-Family:	1,590 units

Northeast Mixed-Use:	~264 units
Southwest Mixed-Use:	~300 units
Total Mixed-Use:	564 units

<b>GRAND TOTAL:</b>	2,154 units
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THE PARKLANDS | VILLAGE 2 CONCEPTUAL LOTTING

7/7/22