Please add a signatures page after the cover page. Visit https://planningdevelopment.elpasoco.com/planning-development-forms/#1584029763943-19bc4c03-3586 for El Paso County standard signature blocks.

TRAFFIC ANALYSIS REPORT

Lewis Palmer Middle School
Monument, CO

Prepared for:

Lewis Palmer District Transportation
99 Santa Fe Ave
Monument, CO 80132

Prepared by:

Felsburg Holt & Ullevig
6400 South Fiddlers Green Circle, Suite 1500
Greenwood Village, CO 80111
303.721.1440

Project Manager: Lyle DeVries, PE, PTOE
Project Engineer: Faith Kelley, EI

FHU Reference No. 122227-01
January 2023

Please add "PCD File No. CDR-23-005"

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I. INTRODUCTION

The Lewis-Palmer School District #38 is proposing to reconfigure an existing parking lot at the Lewis Palmer Middle School (LPMS) in unincorporated El Paso County, Colorado to only serve buses during school peak hours and implement a one-way inbound access to this lot for buses. The new access would be located north of the existing parking lot access on Woodmoor Drive. Woodmoor Drive is an important transportation connector located in Monument, Colorado. The collector roadway serves multiple residential developments and provides access to highway (HWY) 105 and Interstate (I-) 25. The roadway network adjacent to the site can be seen on **Figure 1**.

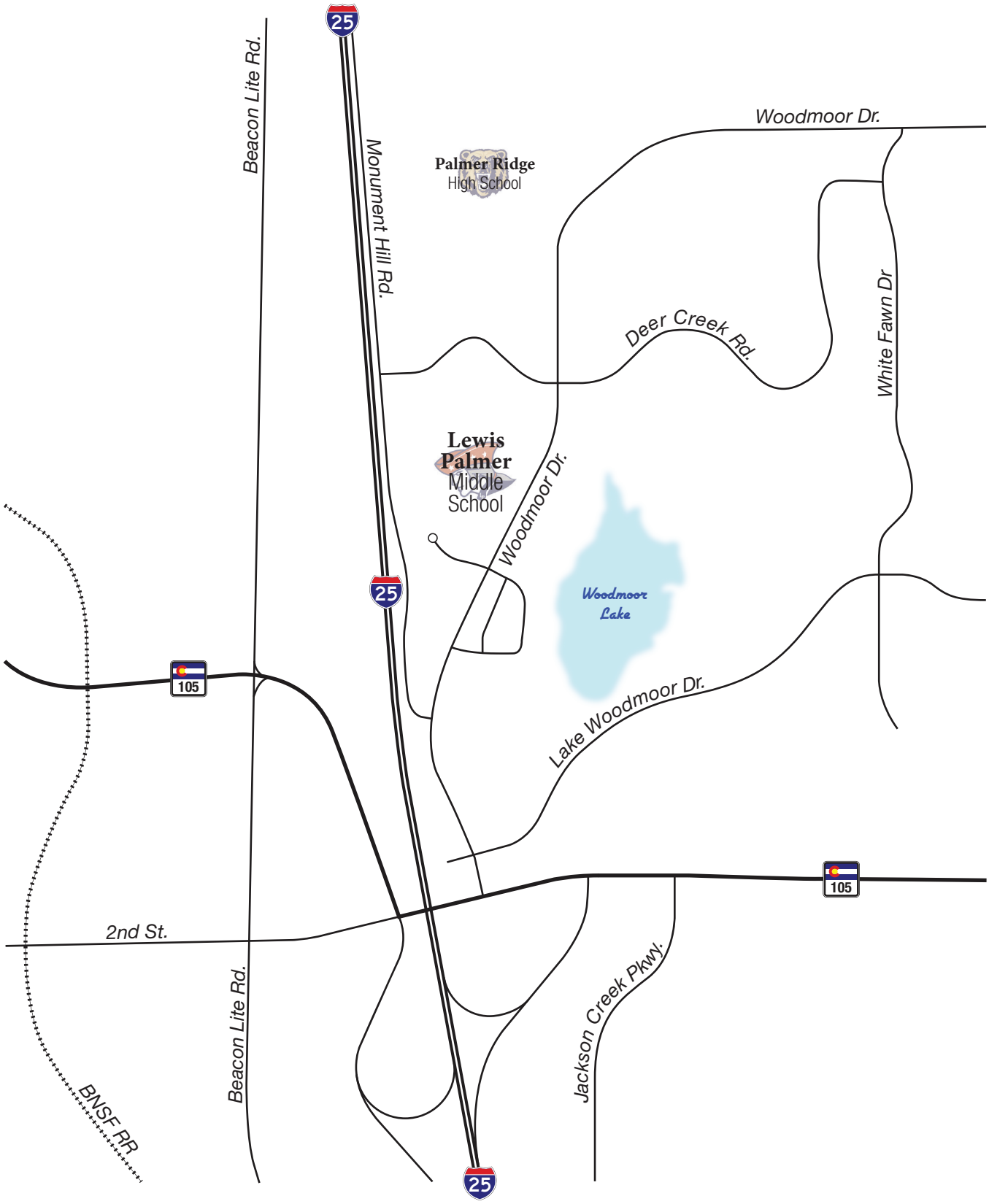
The proposed parking lot/access reconfiguration is intended to improve school traffic circulation and provide exclusive bus access and parking. **Figure 2** shows the layout of the proposed bus access. This access will serve as an inbound only bus access during school peak hours and provide parking for buses. During off peak hours, parents and visitors will be allowed to use this lot for parking purposes outside of normal school hours.

FHU has completed an assessment of current and future (with reconfiguration) transportation conditions along Woodmoor Drive and surrounding the Lewis Palmer Middle School. This assessment provides considerations for future improvements and determines safety and efficiency needs for the proposed new access while serving the needs of multiple user types. The parameters of this analysis have been coordinated with El Paso County Staff. Based on staff input, this report includes information on existing traffic conditions, redistributed traffic with implementation of the bus only parking lot, total traffic volume projections, sight distance needs, multimodal circulation needs, and any recommended roadway improvements.

The following two future scenarios have been analyzed for this report:

- **Short-term Future** – Time period for the completion of the bus only access, currently anticipated as the Year 2023.
- **Long-term Future** – The Long-term Future scenario reflects projected Year 2045 traffic conditions.

Please indicate whether parents/visitors/students etc. will be allowed to use the inbound only entrance during non peak hour



FELSBURG HOLT & ULLEVIG

NOTE: Drawing Not to Scale

FIGURE 1
Vicinity Map
Lewis Palmer Middle School

Lewis Palmer Middle School 122-227-01 1/6/23

FELSBURG HOLT & ULLEVIG

Lewis Palmer Middle School

PARKING LOT A

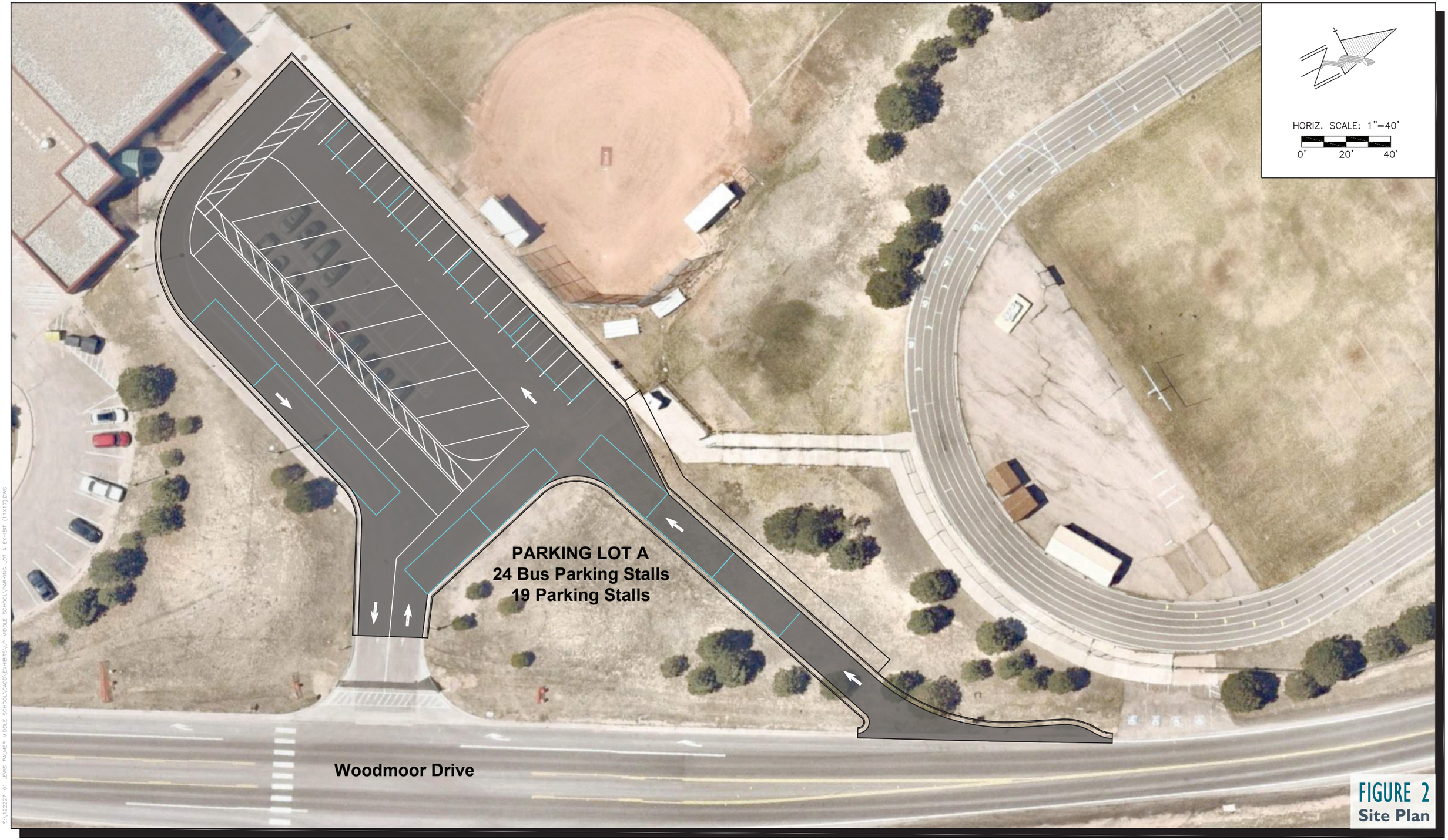


FIGURE 2
Site Plan

S:\122227-01 LEWIS PALMER MIDDLE SCHOOL\CADD\EXHIBITS\LP MIDDLE SCHOOL\PARKING LOT A EXHIBIT (11X17).DWG

II. EXISTING CONDITIONS

II.A. Surrounding Land Use

Much of the area adjacent to the project site has been developed. The land uses surrounding the site are primarily residential with some commercial development north of the Middle School.

II.B. School Traffic Circulation

Currently, there are four parking lots which serve the school, one parking lot north of the school near the track field, two rows of parking along the one-way drive adjacent to the school, and one parking lot south of the school. Each of these lots and their accesses serve multiple users and vehicle types. **Figure 3** shows the current and proposed lots and access locations and current usage is described as follows:

- Lot A: provides 39 spaces, including accessible parking. Provides student drop-off and pickup from the north along Woodmoor Drive. It is accessed via full movement Access 3.
- Lot B: provides 15 spaces. Accessed via full movement Access 1 to Woodmoor Drive.
- Lot C: provides 38 parking spaces, including accessible parking. Parking aisle is one-way southbound during peak periods. During AM school peak, aisle serves bus only traffic. During PM school peak, aisle sequentially serves bus traffic then student pickup. Lot provides general parking during off peak hours.
- Lot D: provides approximately 35 unmarked spaces for faculty and staff. Student drop-off provided from the south via Woodmoor Drive adjacent the Willow Park Way curb line.

II.C. Roadway Network

The existing roadway network adjacent to the vicinity of the site includes Woodmoor Drive and Willow Park Way. The roadway network is as follows:

Woodmoor Drive: Woodmoor Drive is a three-lane collector in the project area serving mainly residential developments and provides connectivity to HWY 105 and I-25. The posted speed limit is 30 miles per hour (mph); however, during school peaks the speed limit is reduced to 20 mph 620 feet north of the parking lot access to 250 feet south of Willow Park Way. Given this study is primarily focused on school hours, this roadway was analyzed with a posted speed of 20 mph.

Willow Park Way: Willow Park Way is a two-lane minor local street which provides access to the Lewis Palmer Middle School as well as a few other commercial developments. There is no posted speed limit, but, for the purpose of this study, the speed limit was assumed to be 20 mph.

NORTH

FIGURE 3

LPMS Parking Lots and Lot Access Locations

Lewis Palmer Middle School 122-227-01 1/27/23

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NOTE: Drawing Not to Scale

II.D. Traffic Volumes

Weekday AM and PM school peak hour turning movement counts (TMCs) were collected on Wednesday, December 14, 2022, at the following intersections:

- Woodmoor Drive & Existing Parking Lot Access
- Woodmoor Drive & Main School Access
- Woodmoor Drive & Willow Park Way
- Willow Park Way & Secondary School Access

The peak hour traffic counts were collected in 15-minute intervals between 6:30 and 8:30 AM and 2:00 to 4:00 PM. The AM peak hour was found to be 7:00 to 8:00 AM, and the PM peak was 2:15 to 3:15 PM. **Appendix A** contains the TMCs. Peak hour traffic volumes are shown on **Figure 4**.

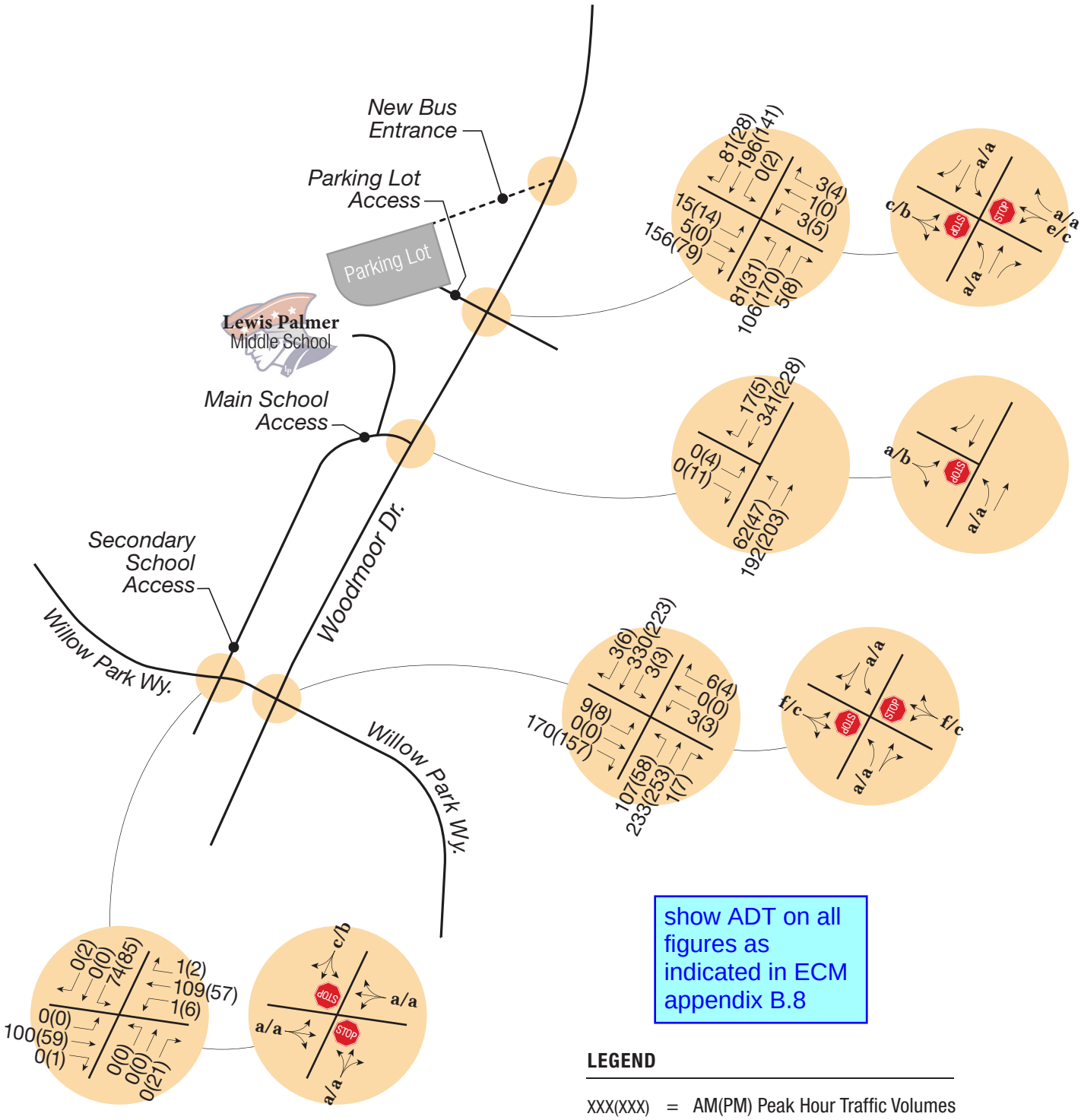
Based on the counts collected, Peak Hour Factors (PHFs) were found to range from 0.33 to 0.92. The majority of heavy vehicle percentages were found to be under 8 percent; however, the southbound volume at the secondary school access as well as the eastbound movements at the intersection of Woodmoor Drive with Willow Park Way were found to be a bit higher, likely reflecting buses leaving the school. In order to reflect school peaking conditions, existing PHFs and heavy vehicle percentages were applied for both existing and future conditions by approach at each study intersection.

II.E. Traffic Operations

Existing operational conditions were analyzed at each study intersection. The analysis is based on procedures documented in the *Highway Capacity Manual (6th Edition)*. This analysis procedure provides a Level of Service (LOS), a qualitative measure of traffic operational conditions, based on intersection capacity and vehicle delay. LOS is described by a letter designation ranging from A to F, LOS A represents almost free-flow conditions, while LOS F represents congested conditions. LOS is calculated for movements which must yield right-of-way for unsignalized intersections.

Figure 4 shows the results of the existing conditions analysis. **Appendix B** contains LOS worksheets. As shown, all stop-controlled movements operate at LOS D or better with the exception of the eastbound and westbound movements at Willow Park Way with Woodmoor Drive during the AM peak hour which currently operate at LOS F.

The parking lot access intersection indicates a LOS of E on the westbound thru/left turn. Revise accordingly.



show ADT on all figures as indicated in ECM appendix B.8

LEGEND

XXX(XXX)	=	AM(PM) Peak Hour Traffic Volumes
x/x	=	AM/PM Peak Hour Unsignalized Intersection Level of Service
STOP	=	Stop Sign

NORTH

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NOTE: Drawing Not to Scale

FIGURE 4
Existing (2022) Traffic Conditions

Lewis Palmer Middle School 122-227-01 1/27/23

III. FUTURE CONDITIONS

III.A. Redistributed Traffic

The new bus access would restrict the north parking lot to bus only during school peak hours, and all buses are anticipated to use the reconfigured lot to the north, which would have one inbound only access (proposed) and the second access would be outbound only for buses. Further, new circulation patterns for buses will cause all buses to arrive and depart from the school traveling southbound, meaning no school buses are anticipated to make a northbound left turn into this lot. **Table 1** outlines the current and proposed users and accesses for each lot.

Table 1. Proposed Reconfigurations to Parking and Access

Parking Lot	Current			Future w/ Reconfiguration		
	Uses	Entrance Access	Exit Access	Use	Entrance Access	Exit Access
A	Student pickup/drop-off	3	3	Bus only during school peaks	3a	3
	Visitors	3	3	Visitors at other times	3	3
B	Faculty and Staff	1	1	Faculty and Staff	1	1
C	Bus Only During School Peaks	1	2	Student pickup/drop-off	1	2
	Student Pickup/Drop-off	1	2	Visitors	1	2
	Visitors	1	2			
D	Faculty and Staff	4, 2	4, 2	Faculty and Staff	4, 2	4, 2

III.B. Future Traffic Conditions

Because the implementation of the new parking lot access will restrict the parking lot to allow only buses during the peak hours, peak hour volumes had to be redistributed so all buses use the parking lot and all passenger cars and heavy vehicles only use the main and secondary school accesses. **Figure 5** shows the redistributed existing volumes and subsequent traffic operations.

Future traffic was estimated for the short-term (2023) and long-term (2045) timeframes and accounts for existing traffic already using the transportation system, plus a general upward factoring of current traffic levels to capture the effects of anticipated future growth in the area. Because the Middle School is not anticipated to increase attendance in the future and the surrounding area is mostly developed, only the northbound and southbound through traffic along Woodmoor Drive was increased to account for growth. The Pikes Peak Area Council of Governments (PPACG) regional model was used to determine an annual growth rate of 0.6% per year along Woodmoor Drive.

Short-term Future Traffic Operations

Year 2023 traffic projections were developed assuming 0.6 percent growth per year for one year, this results in very minimal growth along Woodmoor Drive. It is important to note that the growth factor was applied to only the northbound and southbound through movements on Woodmoor Drive.

Figure 6 depicts short-term future AM and PM peak hour turning movement projections for the study area intersections and **Appendix C** contains the LOS worksheets. Using the existing PHFs and heavy vehicle percentages outlined in **Section II.D**, all unsignalized movements are anticipated to remain at acceptable operations with the exception of the eastbound and westbound movements at Woodmoor

Drive with Willow Park Way in the AM peak hour. The westbound movement is not anticipated to queue longer than 50 feet and the volume to capacity ratio (v/c) is well below 1. However, the eastbound movement is expected to experience a queue length of 375 feet, and the v/c is 1.05. This movement experience a v/c of just under 1 in existing conditions and the current queue length is 300 feet; therefore, the redistribution of traffic is not anticipated to drastically reduce these operations.

Long-term Future Traffic Operations

Figure 7 shows the long-term peak hour turning movement projections for the study area intersections and **Appendix D** contains the LOS worksheets. It is important to note that the growth factor was only applied to northbound and southbound through movements on Woodmoor Drive.

Using the existing PHFs and heavy vehicle percentages outlined in **Section II.D**, all unsignalized movements are projected to remain acceptable with the exception of the eastbound and westbound through movements at the intersection of Woodmoor Drive with Willow Park Way in the AM peak hour. The westbound movement is not anticipated to queue longer than 50 feet and the volume to capacity ratio (v/c) is well below 1. However, the eastbound movement is expected to experience a queue length of 475 feet, and the v/c is 1.2. This movement experiences a v/c of just under 1 in existing conditions and the current queue length is 300 feet; therefore, the redistribution of traffic is not anticipated to drastically worsen these operations.

III.C. Traffic Control Needs

Current traffic control at the study intersections is shown in **Table 2**.

Table 2. Current Traffic Control

Intersection	Traffic Control Type
Woodmoor Drive & Parking Lot Access	Two-Way Stop Control (TWSC) (EB & WB)
Woodmoor Drive & Main School Access	TWSC (EB)
Woodmoor Drive & Willow Park Way	TWSC (EB & WB)
Willow Park Way & Secondary School Access	TWSC (NB & SB)

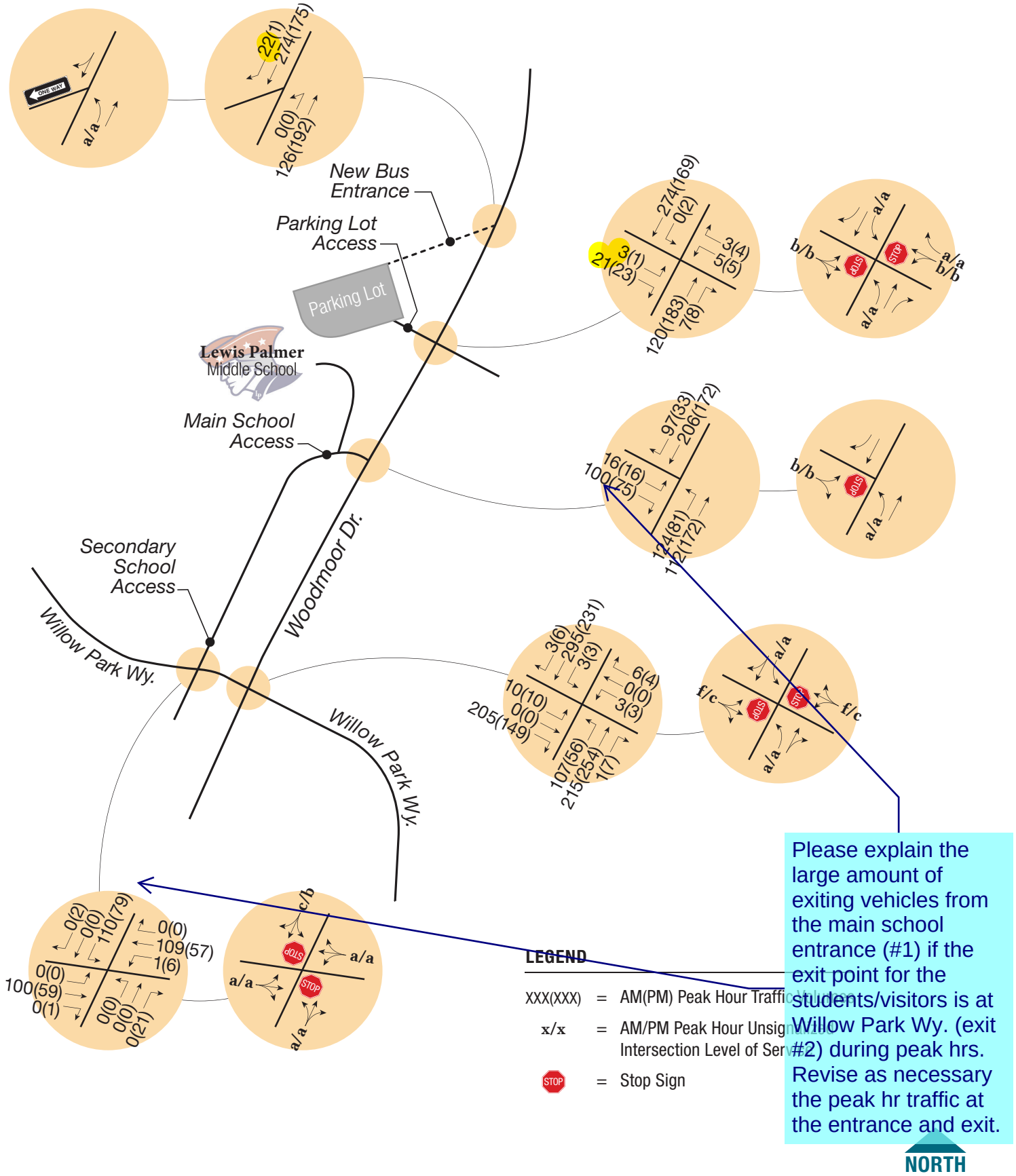
As shown, all of the study intersections are currently unsignalized. The *Manual on Uniform Traffic Control Devices* (MUTCD, 2009 Edition) outlines 9 warrants that may be used to justify installing a traffic signal at an intersection. The warrants are listed as follows:

1. Eight-Hour Vehicular Volume
2. Four-Hour Vehicular Volume
3. Peak Hour
4. Pedestrian Volume
5. School Crossing
6. Coordinated Signal System
7. Crash Experience
8. Roadway Network
9. Intersection Near a Grade Crossing

Of these nine, warrants 1, 2, and 5 are applicable to conditions at the study intersections. Given the failing LOS on the eastbound and westbound approaches, the intersection of Woodmoor Drive with Willow Park Way is the only intersection that may need a signal in order to facilitate acceptable operations. Projected vehicular traffic volumes and pedestrian volumes were compared with warrant criteria to assess this potential. Because the intersection traffic counts only covered peak periods, a scaling factor was used to estimate the fourth and eighth highest hour volumes using information from

the Missouri Department of Transportation (MoDOT). Based on this information, it is estimated that the eighth highest hour comprises approximately 75 percent of the peak recorded hour. Each of the eight highest hours are estimated by scaling in linear fashion.

Utilizing the scaling assumptions, the evaluation of traffic-volume based Warrant 1 (eight-hour volume) and 2 (Four-Hour Volume) indicates that traffic volumes do not meet any of the specified conditions. A review of pedestrian volumes at the study intersections revealed a maximum of only 4 pedestrians crossing the intersection of Woodmoor Drive with Willow Park Way during the peak hour. Warrant 5 of the MUTCD specifies a need for at least 20 pedestrians during the peak hour to satisfy this warrant. Therefore, none of the study intersections are anticipated to meet signal warrant criteria.



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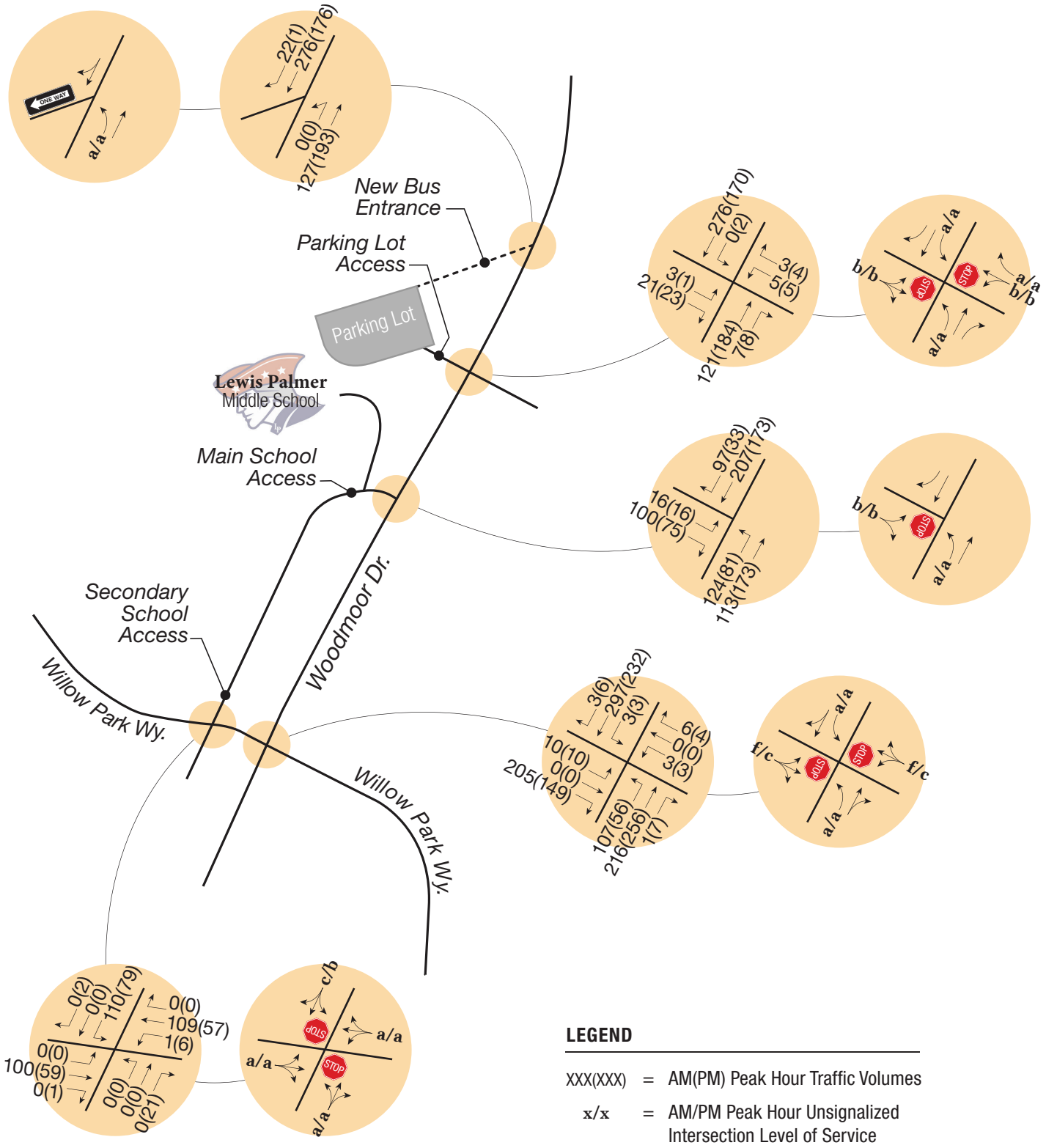
NOTE: Drawing Not to Scale

FIGURE 5

Existing (2022) Redistributed Traffic Conditions

Lewis Palmer Middle School 122-227-01 1/27/23



LEGEND

XXX(XXX)	=	AM(PM) Peak Hour Traffic Volumes
x/x	=	AM/PM Peak Hour Unsignalized Intersection Level of Service
STOP	=	Stop Sign

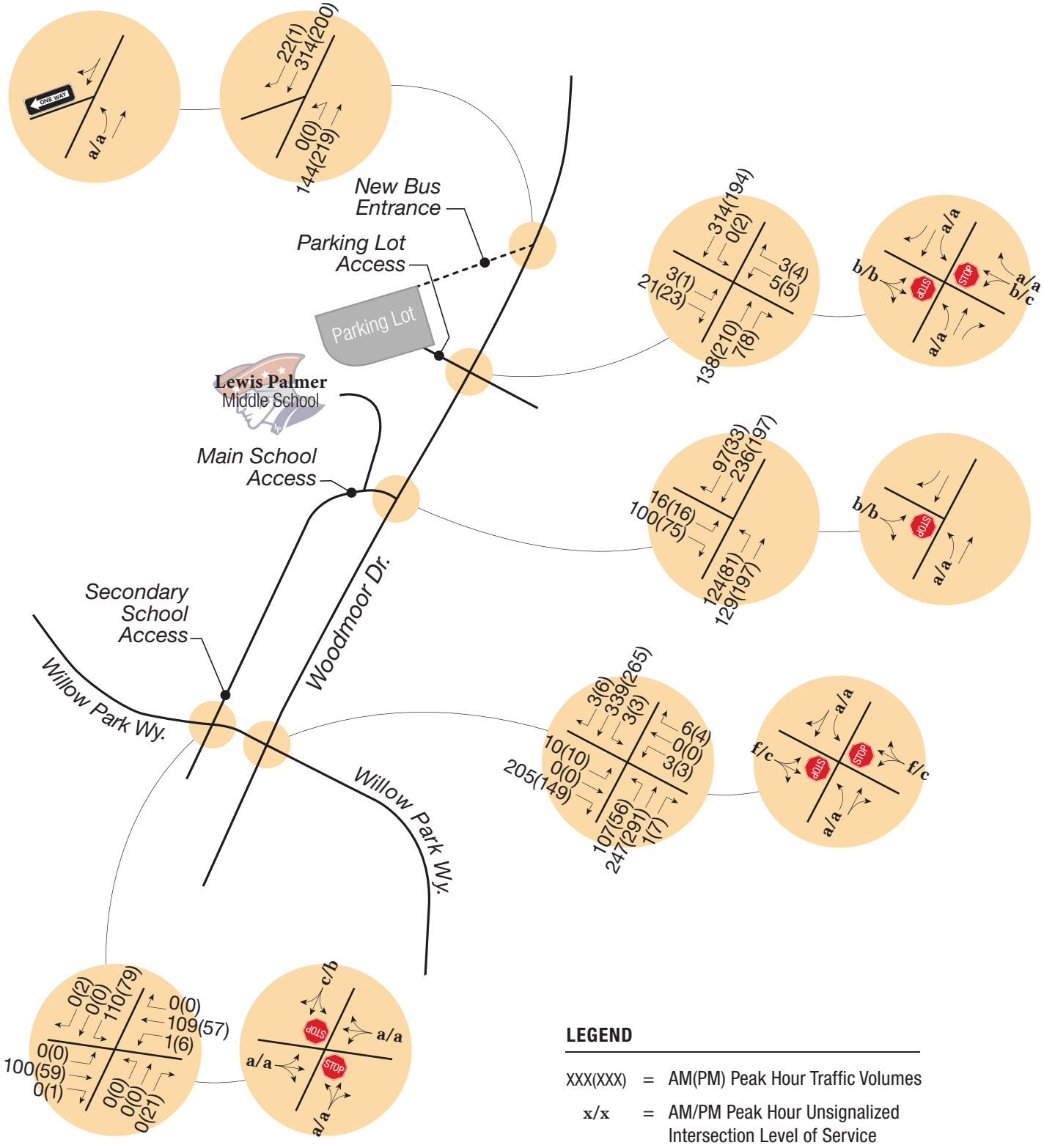
NORTH

FELSBURG HOLT & ULLEVIG

NOTE: Drawing Not to Scale

FIGURE 6
2023 Future Traffic Conditions

Lewis Palmer Middle School 122-227-01 1/27/23



LEGEND

XXX(XXX)	=	AM(PM) Peak Hour Traffic Volumes
x/x	=	AM/PM Peak Hour Unsignalized Intersection Level of Service
STOP	=	Stop Sign

NORTH

FELSBURG HOLT & ULLEVIG

NOTE: Drawing Not to Scale

FIGURE 7
2045 Future Traffic Conditions

Lewis Palmer Middle School 122-227-01 1/27/23

Please address the ECM 2.4 access criteria for the proposed access. If criteria such as access spacing is not met then please submit a deviation request for consideration by the ECM administrator.

staff recommends stating that volume thresholds for a right turn aux. lane are not met at this proposed access

III.D. Access Design Considerations

The proposed bus access would be inbound only meaning sight distance for outbound movements will not be of concern. However, limited spacing between the proposed access and the existing handicap spaces along Woodmoor Drive result is a small auxiliary right turn lane of only 60 feet. The minimal storage space introduces a concern for vehicles coming around the Woodmoor Drive horizontal curve lacking adequate sight distance to see buses slowing at the proposed access. Calculations were completed to determine the distance needed for buses to slow to a reasonable turning speed in order to enter the parking lot. **Table 3** outlines the calculation parameters and results.

provide specs of turn lane to include recommended taper and width

Table 3. Slowing Distance – Woodmoor Drive/New Bus Access

Movement	Planned Storage Length	Slowing Distance for School Buses				
		Posted Speed	Turning Speed	Assumed Deceleration	Slowing Time	Slowing Distance
Southbound Right	60 ft	20 mph	9 mph	-4.49 ft/sec^2	3.59 sec	52.5 ft

As shown above, the planned 60 feet of storage is anticipated to be enough room for buses to slow from the posted speed of 20 mph during school hours to a safe right turning speed of 9 mph. Buses will need just over 50 feet of space to make this adjustment. Therefore, buses will not need to slow down until fully in the storage lane and should not create sight distance safety issues.

Figure 8 shows the turning template for a typical bus. The new bus access configuration is anticipated to acceptably accommodate the turning movements of a typical bus. It should be noted that due to size constraints, bus drivers will likely need to coordinate to ensure all parking lots are filled and emptied during arrival and departure. If not used properly, buses will block entrances and exits which could lead to blockages and queueing onto Woodmoor Drive.

III.E. Pedestrian and Bicyclist Safety

Pedestrian and bicyclist counts were taken at each intersection within the study area. Pedestrian and bicyclist volumes were generally low with no more than 4 crossings at any location during the peak hours. Currently, there are sidewalks along the school property; however, there are no sidewalks along Woodmoor Drive or controlled crossings. Due to the low volume of pedestrians and cyclists in this area, the lack of sidewalks, crosswalks, and bicycle lanes may not be an issue. However, to accommodate transportation safety for students, it is essential to have adequate sidewalks to the school access. It is recommended that a six-foot sidewalk be constructed on the west side of Woodmoor Drive from Willow Park Way to the new bus access.

Please discuss the turn lanes at the main entrance. Are the existing right turn lane and two-way left turn lane sufficient for the additional traffic being added at this access? are any modifications/improvements needed? do they currently meet ECM criteria? please address.

Also discuss/analyze queuing length for school drop off and loading zones. Refer to MSTA guidelines. see link below:https://connect.ncdot.gov/municipalities/School/pages/default.aspx

Identify if signage is recommended for the new configuration proposed.

FELSBURG HOLT & ULLEVIG

Lewis Palmer Middle School

PARKING LOT A - AUTOTURN

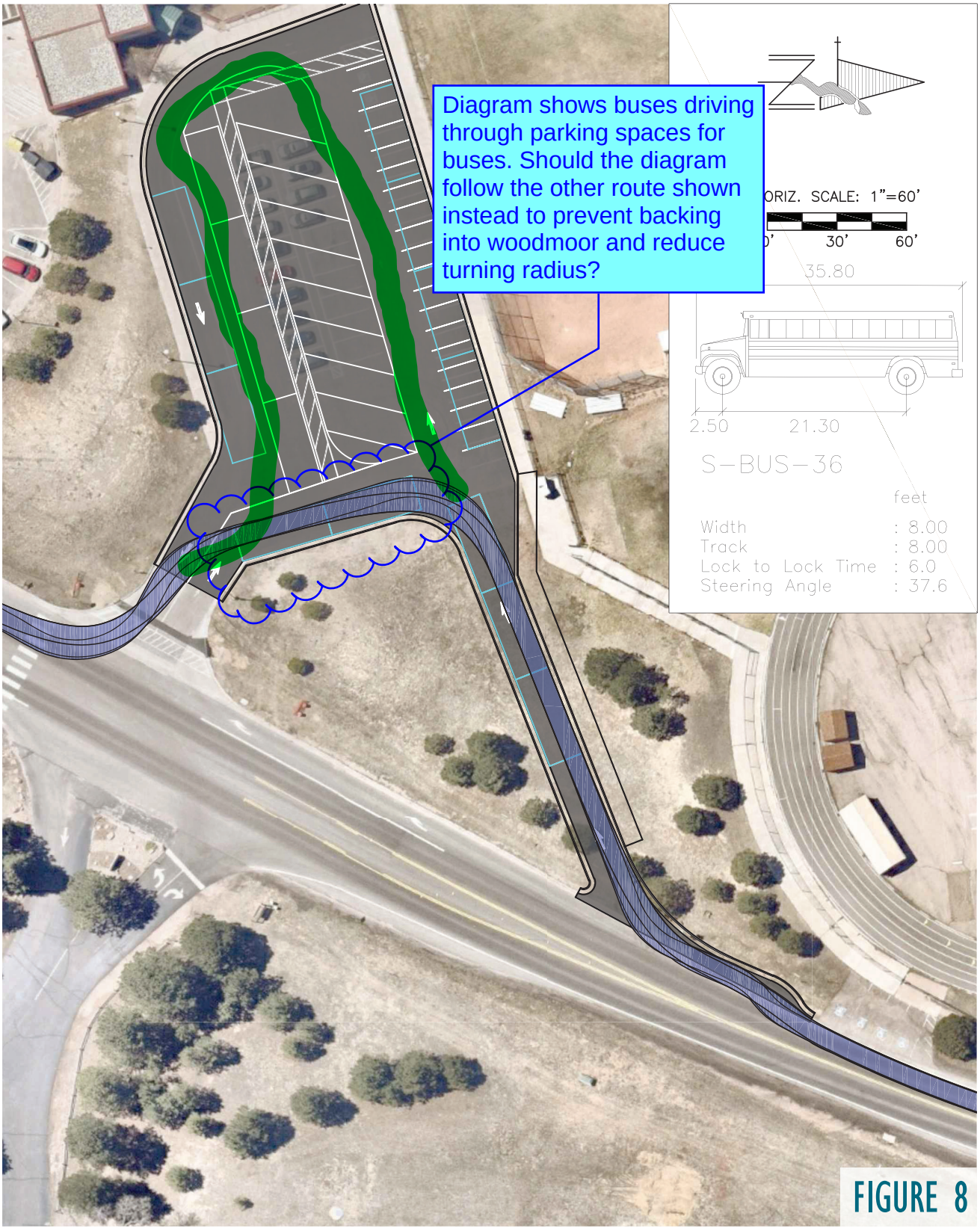


FIGURE 8

IV. SUMMARY AND RECOMMENDATIONS

A new inbound only bus access is proposed for the Lewis Palmer Middle School parking lot to convert to bus only during school peaks. The proposed bus access would be constructed north of the existing parking lot access along Woodmoor Drive in Monument, Colorado. Surrounding areas are primarily residential with some commercial space north of the school.

Two future scenarios were analyzed for this report:

- **Short-term Future** – Time period for the completion of the new access, estimated as the Year 2023.
- **Long-term Future** – The year 2045 was used to assess traffic impacts of the development in the long-term future.

The following is a summary of the findings and recommendations related to the analysis for the development:

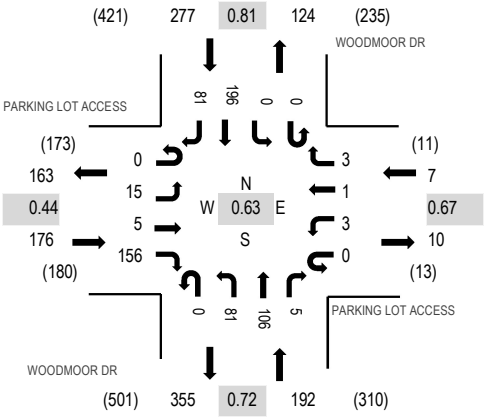
- No geometric or traffic control improvements are anticipated for the existing intersections in the study area based on the redevelopment.
- The planned 60 feet of storage for the southbound right turn lane at the new bus access is anticipated to provide enough space for buses to slow from the posted speed of 20 mph to a safe turning speed of 9 mph without causing sight distance issues for vehicles traveling around the Woodmoor Drive horizontal curve.
- Monitoring of both bus and parent traffic within the study area should occur upon implementation of these changes to determine if adjustments should be made if problems emerge.
    - Access 3 should be monitored to ensure parents and visitors are aware of the new access restriction and do not use this lot during peak hours.
    - Access 3A should be monitored to ensure efficiency entering the parking lot. Woodmoor Drive should not experience blockages due to the new access.
    - Access 2 should be monitored to ensure drivers unfamiliar with this access treat it as outbound only.
    - Access 1 and parking area C should be monitored to ensure that additional student drop-off and pickup activities do not cause concern.
- Lewis Palmer Middle School facilitates the need for pedestrian and bicyclist improvements in the area. A six-foot sidewalk will need to be constructed on the west side of Woodmoor Drive between the new bus access and Willow Park Way.

APPENDIX A. EXISTING TRAFFIC COUNTS

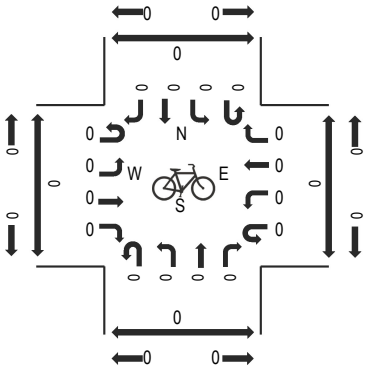
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 1 WOODMOOR DR & PARKING LOT ACCESS AM
Date: Wednesday, December 14, 2022
Peak Hour: 07:00 AM - 08:00 AM
Peak 15-Minutes: 07:15 AM - 07:30 AM

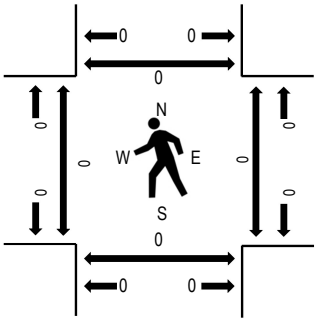
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

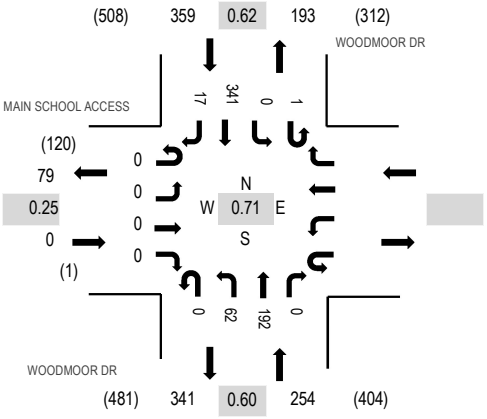
Traffic Counts - Motorized Vehicles

Interval Start Time	PARKING LOT ACCESS Eastbound				PARKING LOT ACCESS Westbound				WOODMOOR DR Northbound				WOODMOOR DR Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
6:30 AM	0	0	0	0	0	2	0	0	0	0	4	1	0	0	21	0	28	559	0	0	0	0
6:45 AM	0	1	0	1	0	1	0	0	0	7	14	0	0	0	34	3	61	612	0	0	0	0
7:00 AM	0	9	2	63	0	2	0	0	0	45	16	0	0	0	34	41	212	652	0	0	0	0
7:15 AM	0	6	3	93	0	0	1	2	0	36	30	1	0	0	46	40	258	540	0	0	0	0
7:30 AM	0	0	0	0	0	1	0	0	0	0	24	0	0	0	56	0	81	363	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	1	0	0	36	4	0	0	60	0	101		0	0	0	0
8:00 AM	0	0	2	0	0	0	0	0	0	0	58	0	0	0	40	0	100		0	0	0	0
8:15 AM	0	0	0	0	0	1	0	0	0	0	34	0	0	0	46	0	81		0	0	0	0
Count Total	0	16	7	157	0	7	1	3	0	88	216	6	0	0	337	84	922		0	0	0	0
Peak Hour	0	15	5	156	0	3	1	3	0	81	106	5	0	0	196	81	652		0	0	0	0

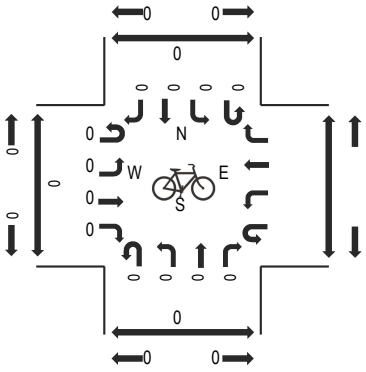
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 2 WOODMOOR DR & MAIN SCHOOL ACCESS AM
Date: Wednesday, December 14, 2022
Peak Hour: 07:00 AM - 08:00 AM
Peak 15-Minutes: 07:15 AM - 07:30 AM

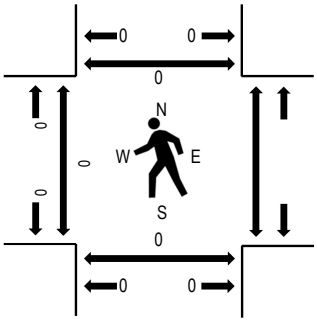
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

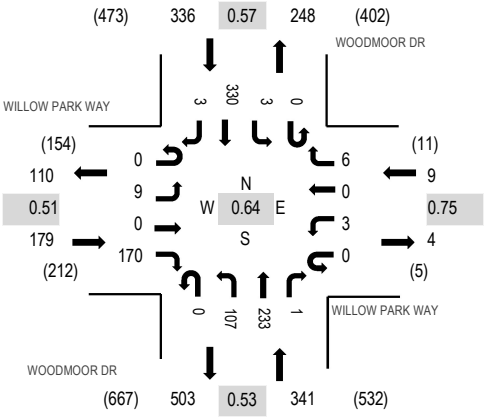
Traffic Counts - Motorized Vehicles

Interval Start Time	MAIN SCHOOL ACCESS Eastbound				MAIN SCHOOL ACCESS Westbound				WOODMOOR DR Northbound				WOODMOOR DR Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
6:30 AM	0	1	0	0					0	5	5	0	0	0	22	1	34	525	0		0	0
6:45 AM	0	0	0	0					0	17	21	0	0	0	28	8	74	579	0		0	0
7:00 AM	0	0	0	0					0	38	67	0	1	0	88	8	202	613	0		0	0
7:15 AM	0	0	0	0					0	11	60	0	0	0	141	3	215	515	0		0	0
7:30 AM	0	0	0	0					0	8	25	0	0	0	52	3	88	388	0		0	0
7:45 AM	0	0	0	0					0	5	40	0	0	0	60	3	108		0		0	0
8:00 AM	0	0	0	0					0	4	59	0	0	0	41	0	104		0		0	0
8:15 AM	0	0	0	0					0	6	33	0	0	0	49	0	88		0		0	0
Count Total	0	1	0	0					0	94	310	0	1	0	481	26	913		0		0	0
Peak Hour	0	0	0	0					0	62	192	0	1	0	341	17	613		0		0	0

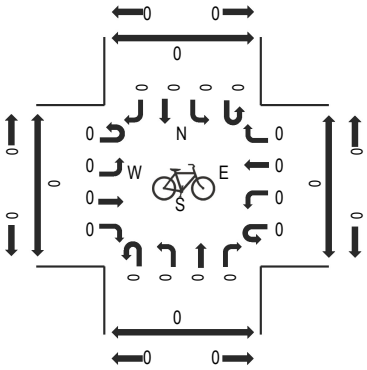
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 3 WOODMOOR DR & WILLOW PARK WAY AM
Date: Wednesday, December 14, 2022
Peak Hour: 07:00 AM - 08:00 AM
Peak 15-Minutes: 07:00 AM - 07:15 AM

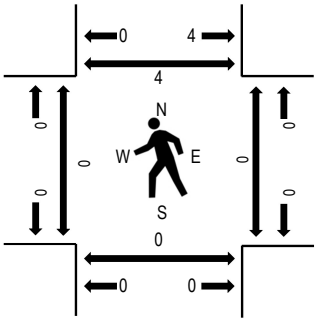
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WILLOW PARK WAY Eastbound				WILLOW PARK WAY Westbound				WOODMOOR DR Northbound				WOODMOOR DR Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
6:30 AM	0	0	0	2	0	0	0	1	0	10	9	0	0	0	23	0	45	794	0	0	0	0
6:45 AM	0	2	0	10	0	0	0	0	0	26	37	1	0	0	27	0	103	853	0	0	0	0
7:00 AM	0	0	0	90	0	1	0	1	0	62	108	0	0	0	75	1	338	865	0	0	0	4
7:15 AM	0	2	0	60	0	1	0	1	0	36	61	0	0	1	145	1	308	642	0	0	0	0
7:30 AM	0	5	0	15	0	1	0	2	0	3	26	0	0	1	50	1	104	434	0	0	0	0
7:45 AM	0	2	0	5	0	0	0	2	0	6	38	1	0	1	60	0	115		0	0	0	0
8:00 AM	0	0	0	7	0	0	0	1	0	3	64	0	0	0	39	1	115		0	0	0	0
8:15 AM	0	4	0	8	0	0	0	0	1	4	36	0	0	0	47	0	100		0	0	0	0
Count Total	0	15	0	197	0	3	0	8	1	150	379	2	0	3	466	4	1,228		0	0	0	4
Peak Hour	0	9	0	170	0	3	0	6	0	107	233	1	0	3	330	3	865		0	0	0	4

ALL TRAFFIC DATA SERVICES
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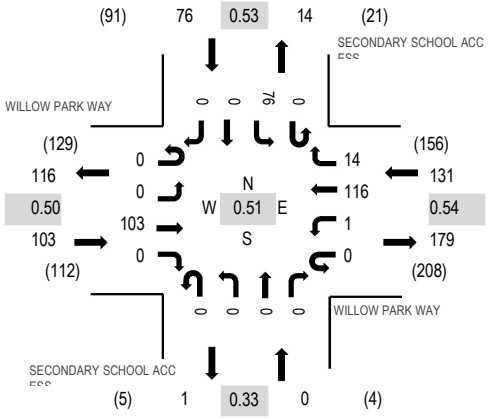
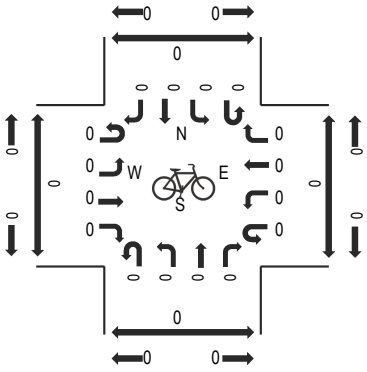
Location: 4 SECONDARY SCHOOL ACCESS & WILLOW PARK WAY AM
Date: Wednesday, December 14, 2022
Peak Hour: 06:45 AM - 07:45 AM
Peak 15-Minutes: 07:00 AM - 07:15 AM

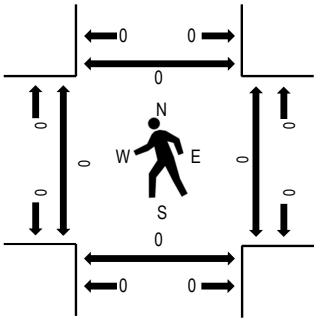
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WILLOW PARK WAY Eastbound				WILLOW PARK WAY Westbound				SECONDARY SCHOOL ACCESS Northbound				SECONDARY SCHOOL ACCESS Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
6:30 AM	0	0	2	0	0	0	3	7	0	0	0	0	0	0	0	0	12	300	0	0	0	0
6:45 AM	0	0	5	0	0	1	12	13	0	0	0	0	0	7	0	0	38	310	0	0	0	0
7:00 AM	0	0	52	0	0	0	62	1	0	0	0	0	0	36	0	0	151	285	0	0	0	0
7:15 AM	0	0	42	0	0	0	38	0	0	0	0	0	0	19	0	0	99	145	0	0	0	0
7:30 AM	0	0	4	0	0	0	4	0	0	0	0	0	0	14	0	0	22	63	0	0	0	0
7:45 AM	0	0	2	0	0	1	5	0	0	0	0	0	0	5	0	0	13		0	0	0	0
8:00 AM	0	0	1	0	0	1	3	0	0	0	0	1	0	5	0	0	11		0	0	0	0
8:15 AM	0	0	4	0	1	2	2	0	0	0	0	3	0	5	0	0	17		0	0	0	0
Count Total	0	0	112	0	1	5	129	21	0	0	0	4	0	91	0	0	363		0	0	0	0
Peak Hour	0	0	103	0	0	1	116	14	0	0	0	0	0	76	0	0	310		0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
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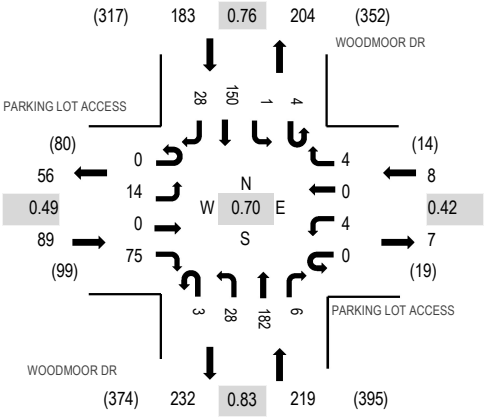
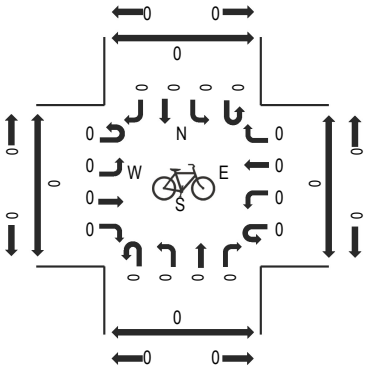
Location: 1 WOODMOOR DR & PARKING LOT ACCESS PM
Date: Wednesday, December 14, 2022
Peak Hour: 02:30 PM - 03:30 PM
Peak 15-Minutes: 02:30 PM - 02:45 PM

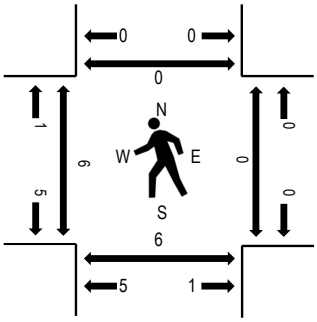
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	PARKING LOT ACCESS Eastbound				PARKING LOT ACCESS Westbound				WOODMOOR DR Northbound				WOODMOOR DR Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
2:00 PM	0	0	1	0	0	1	0	1	0	14	29	2	0	0	29	3	80	485	0	0	0	0
2:15 PM	0	0	0	4	0	1	0	0	2	3	39	3	0	1	28	0	81	491	0	0	0	0
2:30 PM	0	2	0	45	0	2	0	4	2	19	42	3	4	1	32	23	179	499	4	0	4	0
2:45 PM	0	9	0	25	0	1	0	0	1	7	48	1	0	0	49	4	145	400	2	0	2	0
3:00 PM	0	3	0	5	0	1	0	0	0	2	41	1	0	0	32	1	86	340	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	51	1	0	0	37	0	89		0	0	0	0
3:30 PM	0	1	1	0	0	2	0	0	0	1	37	2	0	0	36	0	80		0	0	0	0
3:45 PM	0	0	2	1	0	1	0	0	0	3	41	0	0	0	37	0	85		0	0	1	0
Count Total	0	15	4	80	0	9	0	5	5	49	328	13	4	2	280	31	825		6	0	7	0
Peak Hour	0	14	0	75	0	4	0	4	3	28	182	6	4	1	150	28	499		6	0	6	0

ALL TRAFFIC DATA SERVICES
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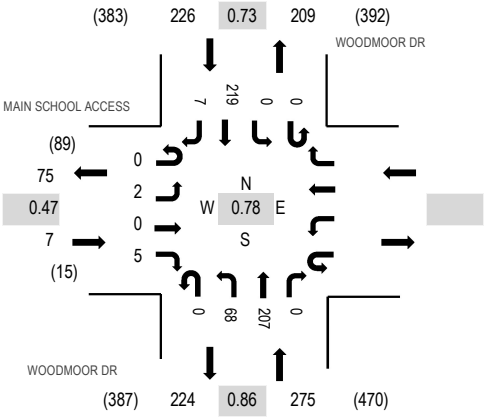
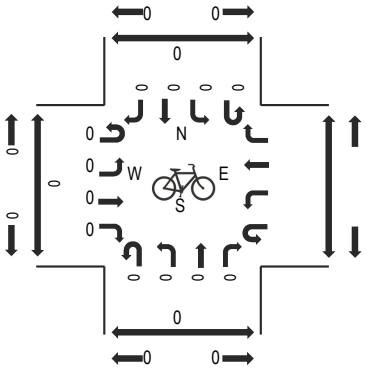
Location: 2 WOODMOOR DR & MAIN SCHOOL ACCESS PM
Date: Wednesday, December 14, 2022
Peak Hour: 02:00 PM - 03:00 PM
Peak 15-Minutes: 02:45 PM - 03:00 PM

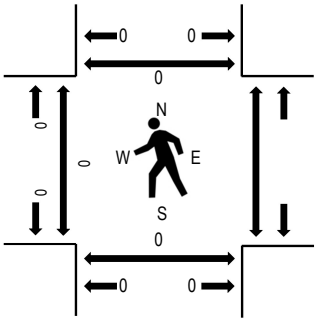
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	MAIN SCHOOL ACCESS Eastbound				Westbound				WOODMOOR DR Northbound				WOODMOOR DR Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
2:00 PM	0	0	0	0					0	25	45	0	0	0	30	2	102	508	0		0	0
2:15 PM	0	1	0	2					0	5	50	0	0	0	31	0	89	498	0		0	0
2:30 PM	0	1	0	1					0	14	56	0	0	0	82	0	154	502	0		0	0
2:45 PM	0	0	0	2					0	24	56	0	0	0	76	5	163	431	0		0	0
3:00 PM	0	2	0	6					0	4	41	0	0	0	39	0	92	360	0		0	0
3:15 PM	0	0	0	0					0	5	51	0	0	0	37	0	93		0		0	0
3:30 PM	0	0	0	0					0	1	42	0	0	0	40	0	83		0		0	0
3:45 PM	0	0	0	0					0	4	47	0	0	0	41	0	92		0		0	0
Count Total	0	4	0	11					0	82	388	0	0	0	376	7	868		0		0	0
Peak Hour	0	2	0	5					0	68	207	0	0	0	219	7	508		0		0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
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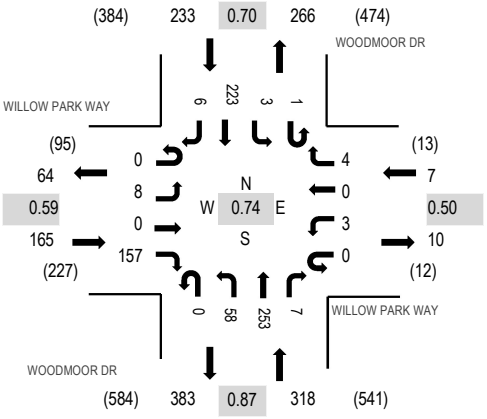
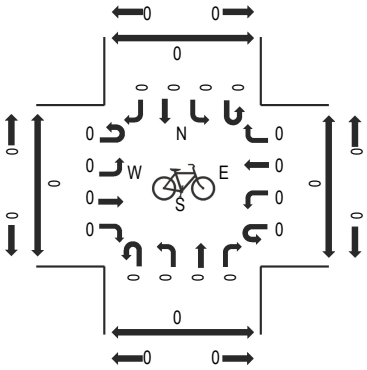
Location: 3 WOODMOOR DR & WILLOW PARK WAY PM
Date: Wednesday, December 14, 2022
Peak Hour: 02:15 PM - 03:15 PM
Peak 15-Minutes: 02:45 PM - 03:00 PM

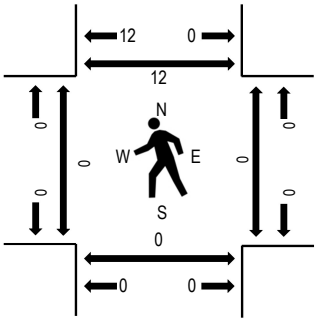
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WILLOW PARK WAY Eastbound				WILLOW PARK WAY Westbound				WOODMOOR DR Northbound				WOODMOOR DR Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
2:00 PM	0	1	0	11	0	1	0	0	0	10	53	0	0	0	30	1	107	716	0	0	0	0
2:15 PM	0	2	0	6	0	0	0	0	0	19	76	0	1	0	30	0	134	723	0	0	0	0
2:30 PM	0	0	0	64	0	2	0	1	0	23	64	5	0	1	70	1	231	701	0	0	0	12
2:45 PM	0	5	0	70	0	1	0	3	0	7	72	1	0	1	80	4	244	591	0	0	0	0
3:00 PM	0	1	0	17	0	0	0	0	0	9	41	1	0	1	43	1	114	449	0	0	0	0
3:15 PM	0	5	0	14	0	0	0	1	0	4	52	0	0	0	36	0	112		0	0	0	0
3:30 PM	0	1	0	23	0	1	0	2	0	11	41	0	0	1	39	2	121		0	0	0	0
3:45 PM	0	3	0	4	0	1	0	0	0	3	49	0	0	1	41	0	102		0	0	0	0
Count Total	0	18	0	209	0	6	0	7	0	86	448	7	1	5	369	9	1,165		0	0	0	12
Peak Hour	0	8	0	157	0	3	0	4	0	58	253	7	1	3	223	6	723		0	0	0	12

ALL TRAFFIC DATA SERVICES
(303) 216-2439
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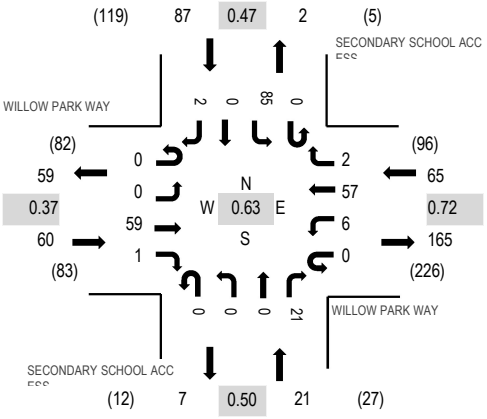
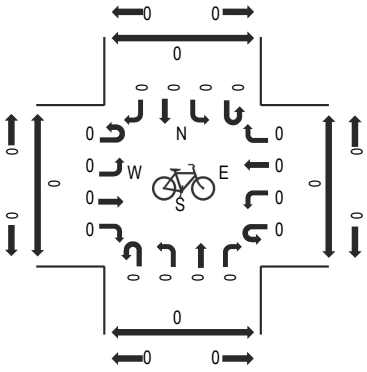
Location: 4 SECONDARY SCHOOL ACCESS & WILLOW PARK WAY PM
Date: Wednesday, December 14, 2022
Peak Hour: 02:15 PM - 03:15 PM
Peak 15-Minutes: 02:30 PM - 02:45 PM

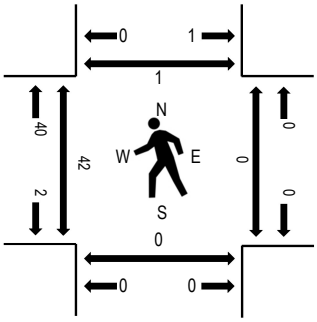
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WILLOW PARK WAY Eastbound				WILLOW PARK WAY Westbound				SECONDARY SCHOOL ACCESS Northbound				SECONDARY SCHOOL ACCESS Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
2:00 PM	0	0	6	0	0	0	10	1	0	0	0	0	0	6	0	0	23	228	0	0	0	0
2:15 PM	0	0	0	0	0	1	20	0	0	0	0	3	0	4	0	0	28	233	1	0	0	0
2:30 PM	0	0	44	1	0	2	21	0	0	0	0	3	0	21	0	0	92	228	38	0	0	1
2:45 PM	0	0	14	0	0	0	11	0	0	0	0	11	0	47	0	2	85	173	1	0	0	0
3:00 PM	0	0	1	0	0	3	5	2	0	0	0	4	0	13	0	0	28	97	2	0	0	0
3:15 PM	0	0	6	0	0	0	4	0	0	0	0	4	0	9	0	0	23		0	0	0	0
3:30 PM	0	0	7	0	0	5	6	2	0	0	0	2	0	15	0	0	37		0	0	0	0
3:45 PM	0	0	4	0	0	0	3	0	0	0	0	0	0	2	0	0	9		0	0	0	0
Count Total	0	0	82	1	0	11	80	5	0	0	0	27	0	117	0	2	325		42	0	0	1
Peak Hour	0	0	59	1	0	6	57	2	0	0	0	21	0	85	0	2	233		42	0	0	1

APPENDIX B. EXISTING LEVEL OF SERVICE WORKSHEETS

Intersection	
Int Delay, s/veh	8.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	5	156	3	1	3	81	106	5	0	196	81
Future Vol, veh/h	15	5	156	3	1	3	81	106	5	0	196	81
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	100	-	100	100	-	125
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	42	42	42	36	36	36	60	60	60	72	72	72
Heavy Vehicles, %	2	2	2	0	0	0	0	0	0	0	0	0
Mvmt Flow	36	12	371	8	3	8	135	177	8	0	272	113

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	729	727	272	967	832	177	385	0	0	185	0	0
Stage 1	272	272	-	447	447	-	-	-	-	-	-	-
Stage 2	457	455	-	520	385	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	338	351	767	236	307	871	1185	-	-	1402	-	-
Stage 1	734	685	-	595	577	-	-	-	-	-	-	-
Stage 2	583	569	-	543	614	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	303	311	767	108	272	871	1185	-	-	1402	-	-
Mov Cap-2 Maneuver	303	311	-	108	272	-	-	-	-	-	-	-
Stage 1	650	685	-	527	511	-	-	-	-	-	-	-
Stage 2	509	504	-	275	614	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.8	24.5	3.6	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1185	-	-	654	127	871	1402	-	-
HCM Lane V/C Ratio	0.114	-	-	0.641	0.087	0.01	-	-	-
HCM Control Delay (s)	8.4	-	-	19.8	36	9.2	0	-	-
HCM Lane LOS	A	-	-	C	E	A	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	4.6	0.3	0	0	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	0	0	62	192	1	341	17
Future Vol, veh/h	0	0	62	192	1	341	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	100	-	-	-	200
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	92	92	64	64	60	60	60
Heavy Vehicles, %	2	2	8	8	1	1	1
Mvmt Flow	0	0	97	300	2	568	28

Major/Minor	Minor2		Major1		Major2		
Conflicting Flow All	1062	568	596	0	-	-	0
Stage 1	568	-	-	-	-	-	-
Stage 2	494	-	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.18	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.272	-	-	-	-
Pot Cap-1 Maneuver	247	522	952	-	-	-	-
Stage 1	567	-	-	-	-	-	-
Stage 2	613	-	-	-	-	-	-
Platoon blocked, %				-		-	-
Mov Cap-1 Maneuver	222	522	952	-	-	-	-
Mov Cap-2 Maneuver	222	-	-	-	-	-	-
Stage 1	509	-	-	-	-	-	-
Stage 2	613	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	2.2	
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	952	-	-	-	-
HCM Lane V/C Ratio	0.102	-	-	-	-
HCM Control Delay (s)	9.2	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-	-

Intersection	
Int Delay, s/veh	18.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↱			↱	
Traffic Vol, veh/h	9	0	170	3	0	6	107	233	1	3	330	3
Future Vol, veh/h	9	0	170	3	0	6	107	233	1	3	330	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	47	47	47	75	75	75	50	50	50	57	57	57
Heavy Vehicles, %	13	13	13	0	0	0	6	6	6	0	0	0
Mvmt Flow	19	0	362	4	0	8	214	466	2	5	579	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1491	1488	582	1668	1489	467	584	0	0	468	0	0
Stage 1	592	592	-	895	895	-	-	-	-	-	-	-
Stage 2	899	896	-	773	594	-	-	-	-	-	-	-
Critical Hdwy	7.23	6.63	6.33	7.1	6.5	6.2	4.16	-	-	4.1	-	-
Critical Hdwy Stg 1	6.23	5.63	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.23	5.63	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.617	4.117	3.417	3.5	4	3.3	2.254	-	-	2.2	-	-
Pot Cap-1 Maneuver	96	117	493	77	125	600	971	-	-	1104	-	-
Stage 1	474	477	-	338	362	-	-	-	-	-	-	-
Stage 2	319	344	-	395	496	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	78	91	493	17	97	600	971	-	-	1104	-	-
Mov Cap-2 Maneuver	78	91	-	17	97	-	-	-	-	-	-	-
Stage 1	370	475	-	264	282	-	-	-	-	-	-	-
Stage 2	245	268	-	105	494	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	73.6	103.4	3.1	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	971	-	-	389	48	1104	-	-
HCM Lane V/C Ratio	0.22	-	-	0.979	0.25	0.005	-	-
HCM Control Delay (s)	9.8	-	-	73.6	103.4	8.3	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.8	-	-	11.5	0.8	0	-	-

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	0	100	0	1	109	1	0	0	0	74	0	0
Future Vol, veh/h	0	100	0	1	109	1	0	0	0	74	0	0
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	48	48	48	44	44	44	92	92	92	51	51	51
Heavy Vehicles, %	1	1	1	1	1	1	2	2	2	28	28	28
Mvmt Flow	0	208	0	2	248	2	0	0	0	145	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	250	0	0	208	0	0	461	462	208	461	461	249
Stage 1	-	-	-	-	-	-	208	208	-	253	253	-
Stage 2	-	-	-	-	-	-	253	254	-	208	208	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.12	6.52	6.22	7.38	6.78	6.48
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.38	5.78	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.38	5.78	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.518	4.018	3.318	3.752	4.252	3.552
Pot Cap-1 Maneuver	1321	-	-	1369	-	-	511	497	832	470	461	730
Stage 1	-	-	-	-	-	-	794	730	-	697	652	-
Stage 2	-	-	-	-	-	-	751	697	-	738	684	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1321	-	-	1369	-	-	510	496	832	469	460	730
Mov Cap-2 Maneuver	-	-	-	-	-	-	510	496	-	469	460	-
Stage 1	-	-	-	-	-	-	794	730	-	697	651	-
Stage 2	-	-	-	-	-	-	749	696	-	738	684	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	0	16.1
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1321	-	-	1369	-	-	469
HCM Lane V/C Ratio	-	-	-	-	0.002	-	-	0.309
HCM Control Delay (s)	0	0	-	-	7.6	0	-	16.1
HCM Lane LOS	A	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	1.3

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	14	0	79	5	0	4	5	31	170	8	4	2	141	28
Future Vol, veh/h	14	0	79	5	0	4	5	31	170	8	4	2	141	28
Conflicting Peds, #/hr	0	0	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	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	0	-	100	-	100	-	100	-	125
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	43	43	43	46	46	46	92	81	81	81	92	65	65	65
Heavy Vehicles, %	0	0	0	0	0	0	2	3	3	3	2	0	0	0
Mvmt Flow	33	0	184	11	0	9	5	38	210	10	4	3	217	43

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	519	537	217	623	570	210	-	260	0	0	-	220	0	0
Stage 1	223	231	-	286	296	-	-	-	-	-	-	-	-	-
Stage 2	296	306	-	337	274	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	-	4.13	-	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	-	2.227	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	471	453	828	401	434	835	-	1299	-	-	-	1361	-	-
Stage 1	784	717	-	726	672	-	-	-	-	-	-	-	-	-
Stage 2	717	665	-	681	687	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	466	453	828	312	434	835	~ -8	~ -8	-	-	~	~	-	-
Mov Cap-2 Maneuver	466	453	-	312	434	-	-	-	-	-	-	-	-	-
Stage 1	784	717	-	726	672	-	-	-	-	-	-	-	-	-
Stage 2	710	665	-	530	687	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.8	13.6		
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	+	-	-	741	312	835	~	-	-
HCM Lane V/C Ratio	-	-	-	0.292	0.035	0.01	~	-	-
HCM Control Delay (s)	-	-	-	11.8	17	9.4	-	-	-
HCM Lane LOS	-	-	-	B	C	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	1.2	0.1	0	~	-	-

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

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	11	47	203	228	5
Future Vol, veh/h	4	11	47	203	228	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	47	47	83	83	69	69
Heavy Vehicles, %	13	13	2	2	0	0
Mvmt Flow	9	23	57	245	330	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	689	330	337	0	-	0
Stage 1	330	-	-	-	-	-
Stage 2	359	-	-	-	-	-
Critical Hdwy	6.53	6.33	4.12	-	-	-
Critical Hdwy Stg 1	5.53	-	-	-	-	-
Critical Hdwy Stg 2	5.53	-	-	-	-	-
Follow-up Hdwy	3.617	3.417	2.218	-	-	-
Pot Cap-1 Maneuver	395	687	1222	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	683	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	376	687	1222	-	-	-
Mov Cap-2 Maneuver	481	-	-	-	-	-
Stage 1	671	-	-	-	-	-
Stage 2	683	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.2	1.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1222	-	617	-	-
HCM Lane V/C Ratio	0.046	-	0.052	-	-
HCM Control Delay (s)	8.1	-	11.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	8	0	157	3	0	4	58	253	7	1	3	223	6
Future Vol, veh/h	8	0	157	3	0	4	58	253	7	1	3	223	6
Conflicting Peds, #/hr	0	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	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-	0	-
Peak Hour Factor	55	55	55	35	35	35	78	78	78	92	69	69	69
Heavy Vehicles, %	13	13	13	0	0	0	9	9	9	2	0	0	0
Mvmt Flow	15	0	285	9	0	11	74	324	9	1	4	323	9

Major/Minor	Minor2			Minor1			Major1			Major2			
Conflicting Flow All	818	819	328	955	819	329	332	0	0	-	333	0	0
Stage 1	336	338	-	477	477	-	-	-	-	-	-	-	-
Stage 2	482	481	-	478	342	-	-	-	-	-	-	-	-
Critical Hdwy	7.23	6.63	6.33	7.1	6.5	6.2	4.19	-	-	-	4.1	-	-
Critical Hdwy Stg 1	6.23	5.63	-	6.1	5.5	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.23	5.63	-	6.1	5.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.617	4.117	3.417	3.5	4	3.3	2.281	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	282	298	689	240	312	717	1189	-	-	-	1238	-	-
Stage 1	656	621	-	573	559	-	-	-	-	-	-	-	-
Stage 2	545	536	-	572	642	-	-	-	-	-	-	-	-
Platoon blocked, %								-	-			-	-
Mov Cap-1 Maneuver	264	280	689	134	293	717	1189	-	-	~ -5	~ -5	-	-
Mov Cap-2 Maneuver	264	280	-	134	293	-	-	-	-	-	-	-	-
Stage 1	615	621	-	537	524	-	-	-	-	-	-	-	-
Stage 2	503	503	-	335	642	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.5	20.6	1.5	
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1189	-	-	639	250	+	-	-
HCM Lane V/C Ratio	0.063	-	-	0.469	0.08	-	-	-
HCM Control Delay (s)	8.2	-	-	15.5	20.6	-	-	-
HCM Lane LOS	A	-	-	C	C	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.5	0.3	-	-	-

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

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	59	1	6	57	2	0	0	21	85	0	2
Future Vol, veh/h	0	59	1	6	57	2	0	0	21	85	0	2
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	33	33	33	65	65	65	48	48	48	45	45	45
Heavy Vehicles, %	0	0	0	3	3	3	0	0	0	25	25	25
Mvmt Flow	0	179	3	9	88	3	0	0	44	189	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	91	0	0	182	0	0	291	290	181	311	290	90
Stage 1	-	-	-	-	-	-	181	181	-	108	108	-
Stage 2	-	-	-	-	-	-	110	109	-	203	182	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	6.5	6.2	7.35	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.35	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.35	5.75	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4	3.3	3.725	4.225	3.525
Pot Cap-1 Maneuver	1517	-	-	1387	-	-	665	624	867	599	584	908
Stage 1	-	-	-	-	-	-	825	754	-	844	763	-
Stage 2	-	-	-	-	-	-	900	809	-	749	708	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1517	-	-	1387	-	-	658	620	867	565	580	908
Mov Cap-2 Maneuver	-	-	-	-	-	-	658	620	-	565	580	-
Stage 1	-	-	-	-	-	-	825	754	-	844	758	-
Stage 2	-	-	-	-	-	-	889	803	-	711	708	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.7	9.4	14.5
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	867	1517	-	-	1387	-	-	570
HCM Lane V/C Ratio	0.05	-	-	-	0.007	-	-	0.339
HCM Control Delay (s)	9.4	0	-	-	7.6	0	-	14.5
HCM Lane LOS	A	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	1.5

APPENDIX C. SHORT-TERM FUTURE LEVEL OF SERVICE WORKSHEETS

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	21	5	0	3	0	121	7	0	276	0
Future Vol, veh/h	3	0	21	5	0	3	0	121	7	0	276	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	100	-	-	100	-	125
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	42	42	42	36	36	36	60	60	60	72	72	72
Heavy Vehicles, %	2	2	2	0	0	0	0	0	0	0	0	0
Mvmt Flow	7	0	50	14	0	8	0	202	12	0	383	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	595	597	383	610	585	202	383	0	0	214	0	0
Stage 1	383	383	-	202	202	-	-	-	-	-	-	-
Stage 2	212	214	-	408	383	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	416	416	664	409	426	844	1187	-	-	1368	-	-
Stage 1	640	612	-	805	738	-	-	-	-	-	-	-
Stage 2	790	725	-	624	616	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	412	416	664	378	426	844	1187	-	-	1368	-	-
Mov Cap-2 Maneuver	412	416	-	378	426	-	-	-	-	-	-	-
Stage 1	640	612	-	805	738	-	-	-	-	-	-	-
Stage 2	782	725	-	577	616	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	12.8	0	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1187	-	-	617	378	844	1368	-	-
HCM Lane V/C Ratio	-	-	-	0.093	0.037	0.01	-	-	-
HCM Control Delay (s)	0	-	-	11.4	14.9	9.3	0	-	-
HCM Lane LOS	A	-	-	B	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	100	124	113	207	97
Future Vol, veh/h	16	100	124	113	207	97
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	64	64	60	60
Heavy Vehicles, %	2	2	8	8	1	1
Mvmt Flow	17	109	194	177	345	162

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	910	345	507	0	-	0
Stage 1	345	-	-	-	-	-
Stage 2	565	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.18	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.272	-	-	-
Pot Cap-1 Maneuver	305	698	1028	-	-	-
Stage 1	717	-	-	-	-	-
Stage 2	569	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	247	698	1028	-	-	-
Mov Cap-2 Maneuver	375	-	-	-	-	-
Stage 1	581	-	-	-	-	-
Stage 2	569	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.2	4.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1028	-	624	-	-
HCM Lane V/C Ratio	0.188	-	0.202	-	-
HCM Control Delay (s)	9.3	-	12.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.7	-	0.8	-	-

Intersection	
Int Delay, s/veh	26.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	205	3	0	6	107	216	1	3	297	3
Future Vol, veh/h	10	0	205	3	0	6	107	216	1	3	297	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	47	47	47	75	75	75	50	50	50	57	57	57
Heavy Vehicles, %	13	13	13	0	0	0	6	6	6	0	0	0
Mvmt Flow	21	0	436	4	0	8	214	432	2	5	521	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1399	1396	524	1613	1397	433	526	0	0	434	0	0
Stage 1	534	534	-	861	861	-	-	-	-	-	-	-
Stage 2	865	862	-	752	536	-	-	-	-	-	-	-
Critical Hdwy	7.23	6.63	6.33	7.1	6.5	6.2	4.16	-	-	4.1	-	-
Critical Hdwy Stg 1	6.23	5.63	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.23	5.63	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.617	4.117	3.417	3.5	4	3.3	2.254	-	-	2.2	-	-
Pot Cap-1 Maneuver	112	134	532	85	142	627	1021	-	-	1136	-	-
Stage 1	510	507	-	353	375	-	-	-	-	-	-	-
Stage 2	333	357	-	405	527	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	92	105	532	13	112	627	1021	-	-	1136	-	-
Mov Cap-2 Maneuver	92	105	-	13	112	-	-	-	-	-	-	-
Stage 1	403	505	-	279	296	-	-	-	-	-	-	-
Stage 2	260	282	-	73	525	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	88.5	143.4	3.1	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1021	-	-	435	37	1136	-	-
HCM Lane V/C Ratio	0.21	-	-	1.052	0.324	0.005	-	-
HCM Control Delay (s)	9.5	-	-	88.5	143.4	8.2	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.8	-	-	14.6	1.1	0	-	-

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	100	0	1	109	0	0	0	0	110	0	0
Future Vol, veh/h	0	100	0	1	109	0	0	0	0	110	0	0
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	48	48	48	44	44	44	92	92	92	51	51	51
Heavy Vehicles, %	1	1	1	1	1	1	2	2	2	28	28	28
Mvmt Flow	0	208	0	2	248	0	0	0	0	216	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	248	0	0	208	0	0	460	460	208	460	460	248
Stage 1	-	-	-	-	-	-	208	208	-	252	252	-
Stage 2	-	-	-	-	-	-	252	252	-	208	208	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.12	6.52	6.22	7.38	6.78	6.48
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.38	5.78	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.38	5.78	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.518	4.018	3.318	3.752	4.252	3.552
Pot Cap-1 Maneuver	1324	-	-	1369	-	-	512	498	832	470	461	731
Stage 1	-	-	-	-	-	-	794	730	-	698	653	-
Stage 2	-	-	-	-	-	-	752	698	-	738	684	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1324	-	-	1369	-	-	511	497	832	469	460	731
Mov Cap-2 Maneuver	-	-	-	-	-	-	511	497	-	469	460	-
Stage 1	-	-	-	-	-	-	794	730	-	698	652	-
Stage 2	-	-	-	-	-	-	750	697	-	738	684	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	0	19
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1324	-	-	1369	-	-	469
HCM Lane V/C Ratio	-	-	-	-	0.002	-	-	0.46
HCM Control Delay (s)	0	0	-	-	7.6	0	-	19
HCM Lane LOS	A	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	2.4

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	23	5	0	4	0	184	8	2	170	0
Future Vol, veh/h	1	0	23	5	0	4	0	184	8	2	170	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	100	-	-	100	-	125
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	43	43	43	46	46	46	81	81	81	65	65	65
Heavy Vehicles, %	0	0	0	0	0	0	3	3	3	0	0	0
Mvmt Flow	2	0	53	11	0	9	0	227	10	3	262	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	505	505	262	522	495	227	262	0	0	237	0	0
Stage 1	268	268	-	227	227	-	-	-	-	-	-	-
Stage 2	237	237	-	295	268	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.13	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	481	473	782	468	479	817	1296	-	-	1342	-	-
Stage 1	742	691	-	780	720	-	-	-	-	-	-	-
Stage 2	771	713	-	718	691	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	475	472	782	435	478	817	1296	-	-	1342	-	-
Mov Cap-2 Maneuver	475	472	-	435	478	-	-	-	-	-	-	-
Stage 1	742	690	-	780	720	-	-	-	-	-	-	-
Stage 2	763	713	-	667	690	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.1	11.7	0	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1296	-	-	761	435	817	1342	-	-
HCM Lane V/C Ratio	-	-	-	0.073	0.025	0.011	0.002	-	-
HCM Control Delay (s)	0	-	-	10.1	13.5	9.5	7.7	-	-
HCM Lane LOS	A	-	-	B	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	75	81	173	173	33
Future Vol, veh/h	16	75	81	173	173	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	47	47	83	83	69	69
Heavy Vehicles, %	13	13	2	2	0	0
Mvmt Flow	34	160	98	208	251	48

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	655	251	299	0	-	0
Stage 1	251	-	-	-	-	-
Stage 2	404	-	-	-	-	-
Critical Hdwy	6.53	6.33	4.12	-	-	-
Critical Hdwy Stg 1	5.53	-	-	-	-	-
Critical Hdwy Stg 2	5.53	-	-	-	-	-
Follow-up Hdwy	3.617	3.417	2.218	-	-	-
Pot Cap-1 Maneuver	414	762	1262	-	-	-
Stage 1	766	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	382	762	1262	-	-	-
Mov Cap-2 Maneuver	483	-	-	-	-	-
Stage 1	706	-	-	-	-	-
Stage 2	651	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.2	2.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1262	-	692	-	-
HCM Lane V/C Ratio	0.077	-	0.28	-	-
HCM Control Delay (s)	8.1	-	12.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1.1	-	-

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	149	3	0	4	56	256	7	3	232	6
Future Vol, veh/h	10	0	149	3	0	4	56	256	7	3	232	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	55	55	55	35	35	35	78	78	78	69	69	69
Heavy Vehicles, %	13	13	13	0	0	0	9	9	9	0	0	0
Mvmt Flow	18	0	271	9	0	11	72	328	9	4	336	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	831	830	341	961	830	333	345	0	0	337	0	0
Stage 1	349	349	-	477	477	-	-	-	-	-	-	-
Stage 2	482	481	-	484	353	-	-	-	-	-	-	-
Critical Hdwy	7.23	6.63	6.33	7.1	6.5	6.2	4.19	-	-	4.1	-	-
Critical Hdwy Stg 1	6.23	5.63	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.23	5.63	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.617	4.117	3.417	3.5	4	3.3	2.281	-	-	2.2	-	-
Pot Cap-1 Maneuver	277	294	677	238	308	713	1176	-	-	1234	-	-
Stage 1	645	614	-	573	559	-	-	-	-	-	-	-
Stage 2	545	536	-	568	634	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	259	275	677	136	288	713	1176	-	-	1234	-	-
Mov Cap-2 Maneuver	259	275	-	136	288	-	-	-	-	-	-	-
Stage 1	606	612	-	538	525	-	-	-	-	-	-	-
Stage 2	503	503	-	340	632	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.9	20.4	1.5	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1176	-	-	615	253	1234	-	-
HCM Lane V/C Ratio	0.061	-	-	0.47	0.079	0.004	-	-
HCM Control Delay (s)	8.3	-	-	15.9	20.4	7.9	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.5	0.3	0	-	-

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	59	1	6	57	0	0	0	21	79	0	2
Future Vol, veh/h	0	59	1	6	57	0	0	0	21	79	0	2
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	33	33	33	65	65	65	48	48	48	45	45	45
Heavy Vehicles, %	0	0	0	3	3	3	0	0	0	25	25	25
Mvmt Flow	0	179	3	9	88	0	0	0	44	176	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	88	0	0	182	0	0	289	287	181	309	288	88
Stage 1	-	-	-	-	-	-	181	181	-	106	106	-
Stage 2	-	-	-	-	-	-	108	106	-	203	182	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	6.5	6.2	7.35	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.35	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.35	5.75	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4	3.3	3.725	4.225	3.525
Pot Cap-1 Maneuver	1520	-	-	1387	-	-	667	626	867	601	585	910
Stage 1	-	-	-	-	-	-	825	754	-	846	765	-
Stage 2	-	-	-	-	-	-	902	811	-	749	708	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1520	-	-	1387	-	-	660	622	867	567	581	910
Mov Cap-2 Maneuver	-	-	-	-	-	-	660	622	-	567	581	-
Stage 1	-	-	-	-	-	-	825	754	-	846	760	-
Stage 2	-	-	-	-	-	-	891	805	-	711	708	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.7	9.4	14.2
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	867	1520	-	-	1387	-	-	572
HCM Lane V/C Ratio	0.05	-	-	-	0.007	-	-	0.315
HCM Control Delay (s)	9.4	0	-	-	7.6	0	-	14.2
HCM Lane LOS	A	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	1.3

APPENDIX D. LONG-TERM FUTURE LEVEL OF SERVICE WORKSHEETS

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	21	5	0	3	0	138	7	0	314	0
Future Vol, veh/h	3	0	21	5	0	3	0	138	7	0	314	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	100	-	-	100	-	125
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	42	42	42	36	36	36	60	60	60	72	72	72
Heavy Vehicles, %	2	2	2	0	0	0	0	0	0	0	0	0
Mvmt Flow	7	0	50	14	0	8	0	230	12	0	436	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	676	678	436	691	666	230	436	0	0	242	0	0
Stage 1	436	436	-	230	230	-	-	-	-	-	-	-
Stage 2	240	242	-	461	436	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	367	374	620	362	383	814	1134	-	-	1336	-	-
Stage 1	599	580	-	777	718	-	-	-	-	-	-	-
Stage 2	763	705	-	584	583	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	363	374	620	333	383	814	1134	-	-	1336	-	-
Mov Cap-2 Maneuver	363	374	-	333	383	-	-	-	-	-	-	-
Stage 1	599	580	-	777	718	-	-	-	-	-	-	-
Stage 2	755	705	-	537	583	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12	13.8	0	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1134	-	-	570	333	814	1336	-	-
HCM Lane V/C Ratio	-	-	-	0.1	0.042	0.01	-	-	-
HCM Control Delay (s)	0	-	-	12	16.3	9.5	0	-	-
HCM Lane LOS	A	-	-	B	C	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	100	124	129	236	97
Future Vol, veh/h	16	100	124	129	236	97
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	64	64	60	60
Heavy Vehicles, %	2	2	8	8	1	1
Mvmt Flow	17	109	194	202	393	162

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	983	393	555	0	-	0
Stage 1	393	-	-	-	-	-
Stage 2	590	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.18	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.272	-	-	-
Pot Cap-1 Maneuver	276	656	986	-	-	-
Stage 1	682	-	-	-	-	-
Stage 2	554	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	222	656	986	-	-	-
Mov Cap-2 Maneuver	353	-	-	-	-	-
Stage 1	548	-	-	-	-	-
Stage 2	554	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.8	4.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	986	-	587	-	-
HCM Lane V/C Ratio	0.197	-	0.215	-	-
HCM Control Delay (s)	9.5	-	12.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.7	-	0.8	-	-

Intersection	
Int Delay, s/veh	41.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↱		↰	↱	
Traffic Vol, veh/h	10	0	205	3	0	6	107	247	1	3	339	3
Future Vol, veh/h	10	0	205	3	0	6	107	247	1	3	339	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	47	47	47	75	75	75	50	50	50	57	57	57
Heavy Vehicles, %	13	13	13	0	0	0	6	6	6	0	0	0
Mvmt Flow	21	0	436	4	0	8	214	494	2	5	595	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1535	1532	598	1749	1533	495	600	0	0	496	0	0
Stage 1	608	608	-	923	923	-	-	-	-	-	-	-
Stage 2	927	924	-	826	610	-	-	-	-	-	-	-
Critical Hdwy	7.23	6.63	6.33	7.1	6.5	6.2	4.16	-	-	4.1	-	-
Critical Hdwy Stg 1	6.23	5.63	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.23	5.63	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.617	4.117	3.417	3.5	4	3.3	2.254	-	-	2.2	-	-
Pot Cap-1 Maneuver	89	110	482	68	118	579	958	-	-	1078	-	-
Stage 1	464	469	-	326	351	-	-	-	-	-	-	-
Stage 2	308	334	-	369	488	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	72	85	482	5	91	579	958	-	-	1078	-	-
Mov Cap-2 Maneuver	72	85	-	5	91	-	-	-	-	-	-	-
Stage 1	361	467	-	253	273	-	-	-	-	-	-	-
Stage 2	236	260	-	35	486	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	144.1	$ 497.4	3	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	958	-	-	381	15	1078	-	-
HCM Lane V/C Ratio	0.223	-	-	1.201	0.8	0.005	-	-
HCM Control Delay (s)	9.8	-	-	144.1	$ 497.4	8.4	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.9	-	-	18.7	1.9	0	-	-

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

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	100	0	1	109	0	0	0	0	110	0	0
Future Vol, veh/h	0	100	0	1	109	0	0	0	0	110	0	0
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	48	48	48	44	44	44	92	92	92	51	51	51
Heavy Vehicles, %	1	1	1	1	1	1	2	2	2	28	28	28
Mvmt Flow	0	208	0	2	248	0	0	0	0	216	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	248	0	0	208	0	0	460	460	208	460	460	248
Stage 1	-	-	-	-	-	-	208	208	-	252	252	-
Stage 2	-	-	-	-	-	-	252	252	-	208	208	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.12	6.52	6.22	7.38	6.78	6.48
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.38	5.78	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.38	5.78	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.518	4.018	3.318	3.752	4.252	3.552
Pot Cap-1 Maneuver	1324	-	-	1369	-	-	512	498	832	470	461	731
Stage 1	-	-	-	-	-	-	794	730	-	698	653	-
Stage 2	-	-	-	-	-	-	752	698	-	738	684	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1324	-	-	1369	-	-	511	497	832	469	460	731
Mov Cap-2 Maneuver	-	-	-	-	-	-	511	497	-	469	460	-
Stage 1	-	-	-	-	-	-	794	730	-	698	652	-
Stage 2	-	-	-	-	-	-	750	697	-	738	684	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	0	19
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1324	-	-	1369	-	-	469
HCM Lane V/C Ratio	-	-	-	-	0.002	-	-	0.46
HCM Control Delay (s)	0	0	-	-	7.6	0	-	19
HCM Lane LOS	A	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	2.4

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	1	0	23	5	0	4	0	210	8	4	2	194	0
Future Vol, veh/h	1	0	23	5	0	4	0	210	8	4	2	194	0
Conflicting Peds, #/hr	0	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	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	0	100	-	-	-	100	-	125
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-	0	-
Peak Hour Factor	43	43	43	46	46	46	81	81	81	92	65	65	65
Heavy Vehicles, %	0	0	0	0	0	0	3	3	3	2	0	0	0
Mvmt Flow	2	0	53	11	0	9	0	259	10	4	3	298	0

Major/Minor	Minor2			Minor1			Major1			Major2			
Conflicting Flow All	573	581	298	590	571	259	298	0	0	-	269	0	0
Stage 1	304	312	-	259	259	-	-	-	-	-	-	-	-
Stage 2	269	269	-	331	312	-	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.13	-	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.227	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	433	428	746	422	434	785	1258	-	-	-	1306	-	-
Stage 1	710	661	-	750	697	-	-	-	-	-	-	-	-
Stage 2	741	690	-	687	661	-	-	-	-	-	-	-	-
Platoon blocked, %								-	-			-	-
Mov Cap-1 Maneuver	428	428	746	392	434	785	1258	-	-	~	~	-	-
Mov Cap-2 Maneuver	428	428	-	392	434	-	-	-	-	-	-	-	-
Stage 1	710	661	-	750	697	-	-	-	-	-	-	-	-
Stage 2	733	690	-	638	661	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.4	12.3	0	
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1258	-	-	724	392	785	~	-	-
HCM Lane V/C Ratio	-	-	-	0.077	0.028	0.011	~	-	-
HCM Control Delay (s)	0	-	-	10.4	14.4	9.6	-	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	~	-	-

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

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	75	81	197	197	33
Future Vol, veh/h	16	75	81	197	197	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	47	47	83	83	69	69
Heavy Vehicles, %	13	13	2	2	0	0
Mvmt Flow	34	160	98	237	286	48

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	719	286	334	0	-	0
Stage 1	286	-	-	-	-	-
Stage 2	433	-	-	-	-	-
Critical Hdwy	6.53	6.33	4.12	-	-	-
Critical Hdwy Stg 1	5.53	-	-	-	-	-
Critical Hdwy Stg 2	5.53	-	-	-	-	-
Follow-up Hdwy	3.617	3.417	2.218	-	-	-
Pot Cap-1 Maneuver	379	728	1225	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	631	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	349	728	1225	-	-	-
Mov Cap-2 Maneuver	457	-	-	-	-	-
Stage 1	679	-	-	-	-	-
Stage 2	631	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	2.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1225	-	659	-	-
HCM Lane V/C Ratio	0.08	-	0.294	-	-
HCM Control Delay (s)	8.2	-	12.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1.2	-	-

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	149	3	0	4	56	291	7	3	265	6
Future Vol, veh/h	10	0	149	3	0	4	56	291	7	3	265	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	55	55	55	35	35	35	78	78	78	69	69	69
Heavy Vehicles, %	13	13	13	0	0	0	9	9	9	0	0	0
Mvmt Flow	18	0	271	9	0	11	72	373	9	4	384	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	924	923	389	1054	923	378	393	0	0	382	0	0
Stage 1	397	397	-	522	522	-	-	-	-	-	-	-
Stage 2	527	526	-	532	401	-	-	-	-	-	-	-
Critical Hdwy	7.23	6.63	6.33	7.1	6.5	6.2	4.19	-	-	4.1	-	-
Critical Hdwy Stg 1	6.23	5.63	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.23	5.63	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.617	4.117	3.417	3.5	4	3.3	2.281	-	-	2.2	-	-
Pot Cap-1 Maneuver	239	259	636	206	272	673	1128	-	-	1188	-	-
Stage 1	607	585	-	542	534	-	-	-	-	-	-	-
Stage 2	515	511	-	535	604	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	223	242	636	112	254	673	1128	-	-	1188	-	-
Mov Cap-2 Maneuver	223	242	-	112	254	-	-	-	-	-	-	-
Stage 1	568	583	-	507	500	-	-	-	-	-	-	-
Stage 2	474	478	-	306	602	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.6	23.5	1.3	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1128	-	-	570	214	1188	-	-
HCM Lane V/C Ratio	0.064	-	-	0.507	0.093	0.004	-	-
HCM Control Delay (s)	8.4	-	-	17.6	23.5	8	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.9	0.3	0	-	-

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	59	1	6	57	0	0	0	21	79	0	2
Future Vol, veh/h	0	59	1	6	57	0	0	0	21	79	0	2
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	33	33	33	65	65	65	48	48	48	45	45	45
Heavy Vehicles, %	0	0	0	3	3	3	0	0	0	25	25	25
Mvmt Flow	0	179	3	9	88	0	0	0	44	176	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	88	0	0	182	0	0	289	287	181	309	288	88
Stage 1	-	-	-	-	-	-	181	181	-	106	106	-
Stage 2	-	-	-	-	-	-	108	106	-	203	182	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	6.5	6.2	7.35	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.35	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.35	5.75	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4	3.3	3.725	4.225	3.525
Pot Cap-1 Maneuver	1520	-	-	1387	-	-	667	626	867	601	585	910
Stage 1	-	-	-	-	-	-	825	754	-	846	765	-
Stage 2	-	-	-	-	-	-	902	811	-	749	708	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1520	-	-	1387	-	-	660	622	867	567	581	910
Mov Cap-2 Maneuver	-	-	-	-	-	-	660	622	-	567	581	-
Stage 1	-	-	-	-	-	-	825	754	-	846	760	-
Stage 2	-	-	-	-	-	-	891	805	-	711	708	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.7	9.4	14.2
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	867	1520	-	-	1387	-	-	572
HCM Lane V/C Ratio	0.05	-	-	-	0.007	-	-	0.315
HCM Control Delay (s)	9.4	0	-	-	7.6	0	-	14.2
HCM Lane LOS	A	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	1.3

V1_Traffic Impact Study Redlines.pdf Markup Summary

Carlos (4)

Subject: Text Box
Page Label: 1
Author: Carlos
Date: 3/14/2023 2:21:59 PM
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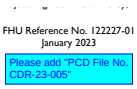
Area: 0
Volume: 0

Please add a signatures page after the cover page. Visit https://planningdevelopment.elpasoco.com/planning-development-forms/#1584029763943-19bc4c03-3586 for El Paso County standard signature blocks.



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Author: Carlos
Date: 3/9/2023 2:03:47 PM
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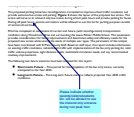
Please add "PCD File No. CDR-23-005"

Subject: Cloud+
Page Label: 18
Author: Carlos
Date: 3/21/2023 4:52:07 PM
Length: 0
Area: 0
Volume: 0

Diagram shows buses driving through parking spaces for buses. Should the diagram follow the other route shown instead to prevent backing into woodmoor and reduce turning radius?

Subject: Highlight
Page Label: 18
Author: Carlos
Date: 3/16/2023 5:10:44 PM
Length: 0
Area: 0
Volume: 0

Daniel Torres (13)



Subject: Callout
Page Label: 4
Author: Daniel Torres
Date: 3/21/2023 3:20:56 PM
Length: 0
Area: 0
Volume: 0

Please indicate whether parents/visitors/students etc. will be allowed to use the inbound only entrance during non peak hour

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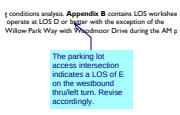
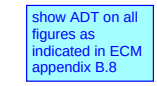


Subject: Callout
Page Label: 9
Author: Daniel Torres
Date: 3/21/2023 2:18:51 PM
Length: 0
Area: 0
Volume: 0

The parking lot access intersection indicates a LOS of E on the westbound thru/left turn. Revise accordingly.



Subject: Text Box
Page Label: 10
Author: Daniel Torres
Date: 3/21/2023 4:11:55 PM
Length: 0
Area: 0
Volume: 0

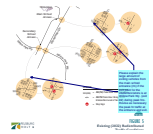
show ADT on all figures as indicated in ECM appendix B.8

Subject: Callout
Page Label: 12
Author: Daniel Torres
Date: 3/21/2023 4:30:41 PM
Length: 0
Area: 0
Volume: 0

Please identify possible solutions to the deficient turn movements.

Subject: Callout
Page Label: 13
Author: Daniel Torres
Date: 3/21/2023 3:52:31 PM
Length: 0
Area: 0
Volume: 0

identify what the scaling factor is that is used

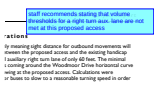


Subject: Callout
Page Label: 14
Author: Daniel Torres
Date: 3/21/2023 4:10:19 PM
Length: 0
Area: 0
Volume: 0

Please explain the large amount of exiting vehicles from the main school entrance (#1) if the exit point for the students/visitors is at Willow Park Wy. (exit #2) during peak hrs. Revise as necessary the peak hr traffic at the entrance and exit.

Subject: Highlight
Page Label: 14
Author: Daniel Torres
Date: 3/21/2023 4:08:51 PM
Length: 0
Area: 0
Volume: 0

Subject: Highlight
Page Label: 14
Author: Daniel Torres
Date: 3/21/2023 4:08:54 PM
Length: 0
Area: 0
Volume: 0



Subject: Text Box
Page Label: 17
Author: Daniel Torres
Date: 3/21/2023 4:38:16 PM
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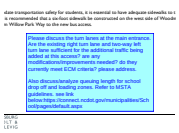
Area: 0
Volume: 0

staff recommends stating that volume thresholds for a right turn aux. lane are not met at this proposed access



Subject: Text Box
Page Label: 17
Author: Daniel Torres
Date: 3/21/2023 4:18:34 PM
Length: 0
Area: 0
Volume: 0

Please discuss the turn lanes at the main entrance. Are the existing right turn lane and two-way left turn lane sufficient for the additional traffic being added at this access? are any modifications/improvements needed? do they currently meet ECM criteria? please address.

Also discuss/analyze queuing length for school drop off and loading zones. Refer to MSTA guidelines. see link below:https://connect.ncdot.gov/municipalities/School/pages/default.aspx

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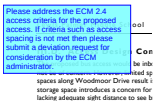
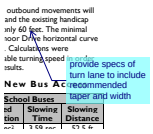


Subject: Text Box
Page Label: 17
Author: Daniel Torres
Date: 3/21/2023 4:13:21 PM
Length: 0
Area: 0
Volume: 0

Please address the ECM 2.4 access criteria for the proposed access. If criteria such as access spacing is not met then please submit a deviation request for consideration by the ECM administrator.



Subject: Callout
Page Label: 17
Author: Daniel Torres
Date: 3/21/2023 4:53:26 PM
Length: 0
Area: 0
Volume: 0

provide specs of turn lane to include recommended taper and width

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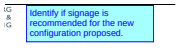

Subject: Text Box
Page Label: 17
Author: Daniel Torres
Date: 3/21/2023 4:49:55 PM
Length: 0
Area: 0
Volume: 0

Identify if signage is recommended for the new configuration proposed.