

# ENG-CDR20001-R5-TIS Summary\_Markup Summary

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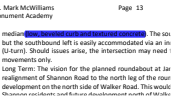
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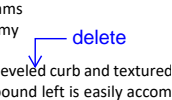
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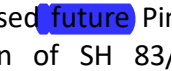
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## Summary of Comments on TIS Redline Comments KDF & JCH.pdf

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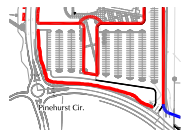


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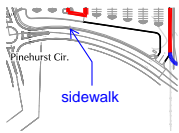
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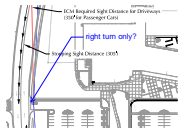




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sidewalk

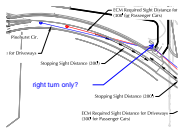
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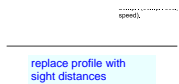
right turn only?

50 (2)



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right turn only?



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replace profile with sight distances

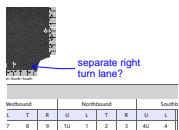
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separate right turn lane?

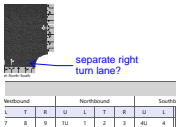
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separate right turn lane?

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separate right turn lane?

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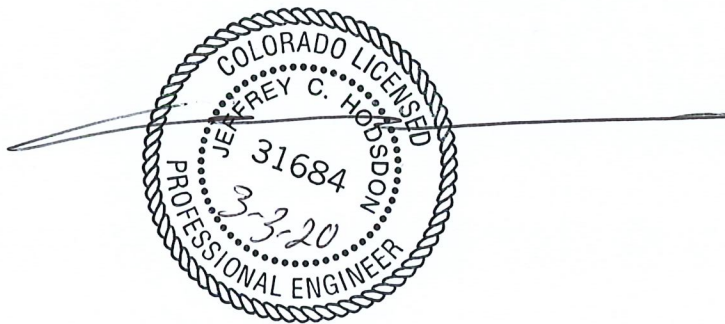


LSC TRANSPORTATION CONSULTANTS, INC.<sup>13Ap</sup>  
545 East Pikes Peak Avenue, Suite 210  
Colorado Springs, CO 80903  
(719) 633-2868  
FAX (719) 633-5430  
E-mail: [lsc@lsctrans.com](mailto:lsc@lsctrans.com)  
Website: <http://www.lsctrans.com>

Monument Academy  
Traffic Impact Analysis  
PCD File No. U192/PPR19009  
(LSC #184820)  
March 2, 2020

Traffic Engineer's Statement

This traffic report and supporting information were prepared under my responsible charge and they conform with the standard of care. So far as is consistent with the standard of care, said report was prepared in general conformance with the criteria established by the County for traffic reports.



Developer's Statement

The Developer, have read and will comply with all commitments made on my behalf within this report.



Walker Road is currently shown as a Four-Lane Minor Arterial on the MTCP 2040 Roadway Plan. As shown on Figure 15 the projected 2025 average weekday traffic volume (ADT) on Walker Road just east of SH 83 is 4,960 vehicles per day. The design ADT for an Urban Four-Lane Minor Arterial is 20,000 vehicles per day. The design ADT for an Urban Residential Collector, which provides one lane in each direction is 10,000 vehicles per day. As the projected volume on Walker Road in the foreseeable future is well below 10,000 vehicles per day, LSC and the applicant are proposing a two-through-lane (one in each direction) facility plus auxiliary turn lanes for Phases 1 and 2, as shown in the attached Lane Exhibits. ROW will be preserved for potential future roadway widening for additional lanes. This will likely need to be evaluated if/when the parcels east and south of the site and/or north of Walker Road are rezoned and developed with more intense land uses than the current RR-5 zoning would allow.

## **PHASING OF TRAFFIC CONTROL**

### **SH 83/Walker Road**

The existing traffic signal plan only provides a permitted phase for the eastbound and westbound traffic. With the addition of the site-generated traffic it will be necessary to also provide a protected phase for the westbound left-turn movement.

### **Jane Lundeen**

The intersection of Jane Lundeen/Walker is planned to be constructed as modern one-lane roundabout. The intersection of Jane Lundeen/Pinehurst is planned to be constructed as a one-lane mini roundabout. The site access points to Jane Lundeen are proposed to be two-way, stop sign-controlled. If the parcels west of Jane Lundeen are rezoned and developed for a more intense use than the current RR-5 zoning allows for alternate traffic control will likely need to be considered for these access points.

## **PHASING AND TRIGGERS FOR WALKER ROAD IMPROVEMENTS**

Table 13 shows a summary of the off-site improvements needed in the vicinity of the site. A modern roundabout will be constructed at the Walker/Jane Lundeen intersection with the initial phase of the school. Please refer to the roundabout design report for details. The addition of eastbound and westbound left-turn lanes on Walker/Highway 105 at SH 83 will be required with the initial development. Also, a northbound right-turn deceleration lane on Highway 83 will be required at the proposed Pinehurst Circle Right-in-only access from SH 83.


## **SHANNON ROAD CONNECTION PHASING**

- Short Term: The roundabout design shows the conversion of Shannon Road/Walker Road intersection to a three-quarter-movement intersection in the short term. The applicant and staff have collaborated on this design as part of the roundabout design. The left-in movement from eastbound Walker would be permitted by constructing a mountable section of raised

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 Number: 1    Author: dsdrice    Subject: Cloud+    Date: 3/20/2020 11:32:26

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 Author: Kirstin    Subject: Sticky Note    Date: 3/31/2020 10:38:34  
The text has been updated as requested

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median<sup>1</sup> ~~low, beveled curb and textured concrete~~<sup>1</sup>. The southbound left would be prohibited, but the southbound left is easily accommodated via an indirect left turn via the roundabout (U-turn). Should issues arise, the intersection may need to be posted for right-in/right-out movements only.

- Long Term: The vision for the planned roundabout at Jane Lundeen/Walker would include realignment of Shannon Road to the north leg of the roundabout in conjunction with future development on the north side of Walker Road. This would result in full movement access for Shannon residents and future development north of Walker Road. The existing Shannon Road connection to Walker would be closed.


## SIGNING AND STRIPING RECOMMENDATIONS

- The striping and signing plan will be included with the construction drawing set, but the following are recommendations for the preparation of the signing & striping plans, particularly with respect to this proposed school area.
- The striping on the approaches and through the roundabout and mini roundabout will be based on the lanage shown in the roundabout design reports. All approaches to the roundabouts will be Yield sign controlled. All established pedestrian crossings within the splitter islands of the Walker Road/Jane Lundeen roundabout and Pinehurst/Jane Ludeen mini roundabouts should be signed with a school pedestrian crossing sign. Initially, it is unlikely that a high number of pedestrians would cross at these roundabouts. However, as the area develops in the future north of Walker, south of Pinehurst, and west of Jane Lundeen, and depending on the number of Monument Academy students using these crossings, the signs may need to be changed to a fluorescent yellow-green color for added emphasis. Also, advance pedestrian warning signs may also need to be added.

**Note:** LSC recommends that the school notify parents **not** to utilize Shannon Drive as a parent-pick up and drop off loop. This would add school pedestrian traffic across the east leg of the roundabout. Fluorescent yellow-green school crossing signs may be needed across this leg of the intersection. LSC recommends that the school review the home addresses of students to identify students who may walk to school and cross at the roundabouts.


- LSC recommends placement of “No Parking or Standing” signs along Jane Lundeen Drive at to discourage and prohibit parent pickup/drop-off along Jane Lundeen. The school should direct parents to utilize an established on-site pick up and drop off plan.
- Jane Lundeen Drive should generally be striped with a center, painted median (two sets of dual yellow pavement stripes. Southbound left-turn lanes should be utilized at each of the two school access points. The lane transition tapers would be in the form of an approximately 100-foot gap in the striping along the southbound lane preceded by a section of dashed yellow/solid striping adjacent to the southbound through lane. For the section just north of the south access, this striping would extend up to the south edge of the north access. For the section between the north access and the roundabout, there should be a section with two sets of solid dual yellow stripes south of the roundabout. The detailed lengths will be depicted on the striping plan for construction.

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 Number: 1      Author: dsdrice      Subject: Callout      Date: 3/20/2020 11:33:36

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 Number: 2      Author: dsdrice      Date: 3/20/2020 11:33:23  
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 Author: jchodsdon      Subject: Sticky Note      Date: 4/7/2020 13:49:22  
Deleted as requested

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## **ROW Dedication and Preservation**

A portion of Tract B along Hwy 83 will be preserved for future right-of-way to accommodate the potential need for northbound double left-turn lanes and the future expansion of Highway 83 to four lanes. Specific requirements will be identified as part of the access permit and will be shown on the plat for Tract B.


- The MTCP 2040 Roadway Plan currently classifies Walker Road as a Four-Lane Minor Arterial. Walker Road west of Road A to SH 83 is proposed as a two-through-lane facility plus auxiliary turn lanes (as shown in the attached exhibit) with this project, but with right-of-way preservation to accommodate an expansion of the roadway to a four-lane minor arterial plus auxiliary lanes and a roundabout to accommodate potential future development traffic.

## **Recommendations**


- Table 13 shows a summary of the on-site and off-site improvements needed in the vicinity of the site. Table 13 also identifies the time frame each improvement will likely be needed and the party responsible for that improvement.
- The new internal roads will be constructed to public standards, and the roads will be formally dedicated as public during the upcoming subdivision process. There is no need for ROW acquisition for the initial phase of roadway improvements.
- The proposed future Pinehurst Circle connection to SH 83 and any improvements to the intersection of SH 83/Walker/Highway 105 will require a Colorado Department of Transportation (CDOT) Access permit. Any design features or elements needed for these improvements, including those needed to prohibit left turns at the proposed Pinehurst/SH 83 intersection, will be addressed through the access permit process.
- Based on the existing traffic volumes and the criteria contained in the El Paso County Engineering Criteria Manual (ECM) eastbound and westbound left-turn lanes and a westbound right-turn lane are currently required on Walker Road and Highway 105 approaching SH 83. These are existing deficiencies based on the turning volume thresholds requiring turn lanes.

**Note:** The existing northbound left-turn lane on SH 83 approaching Highway 105 is about 670 feet long (lane plus taper length). Based on the criteria contained in the *State of Colorado Highway Access Code*, the classification of SH 83 as a Regional Highway (R-A), the posted speed limit of 55 mph, and existing volumes, this lane is short of meeting criteria. As the proposed right-out component has been removed from the planned Pinehurst intersection, Monument Academy would not add traffic to this turning movement. Based on short-term volumes a lane length of 775 feet would be required (600 feet for deceleration (including the taper) plus 175 feet for queue/storage). This is an existing deficiency. The proposed school is not projected to add additional vehicles to this lane.

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 Number: 1      Author: dsdrice      Date: 3/20/2020 11:45:52  
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 Author: Kirstin      Subject: Sticky Note      Date: 3/31/2020 10:41:58  
The text has been updated as requested

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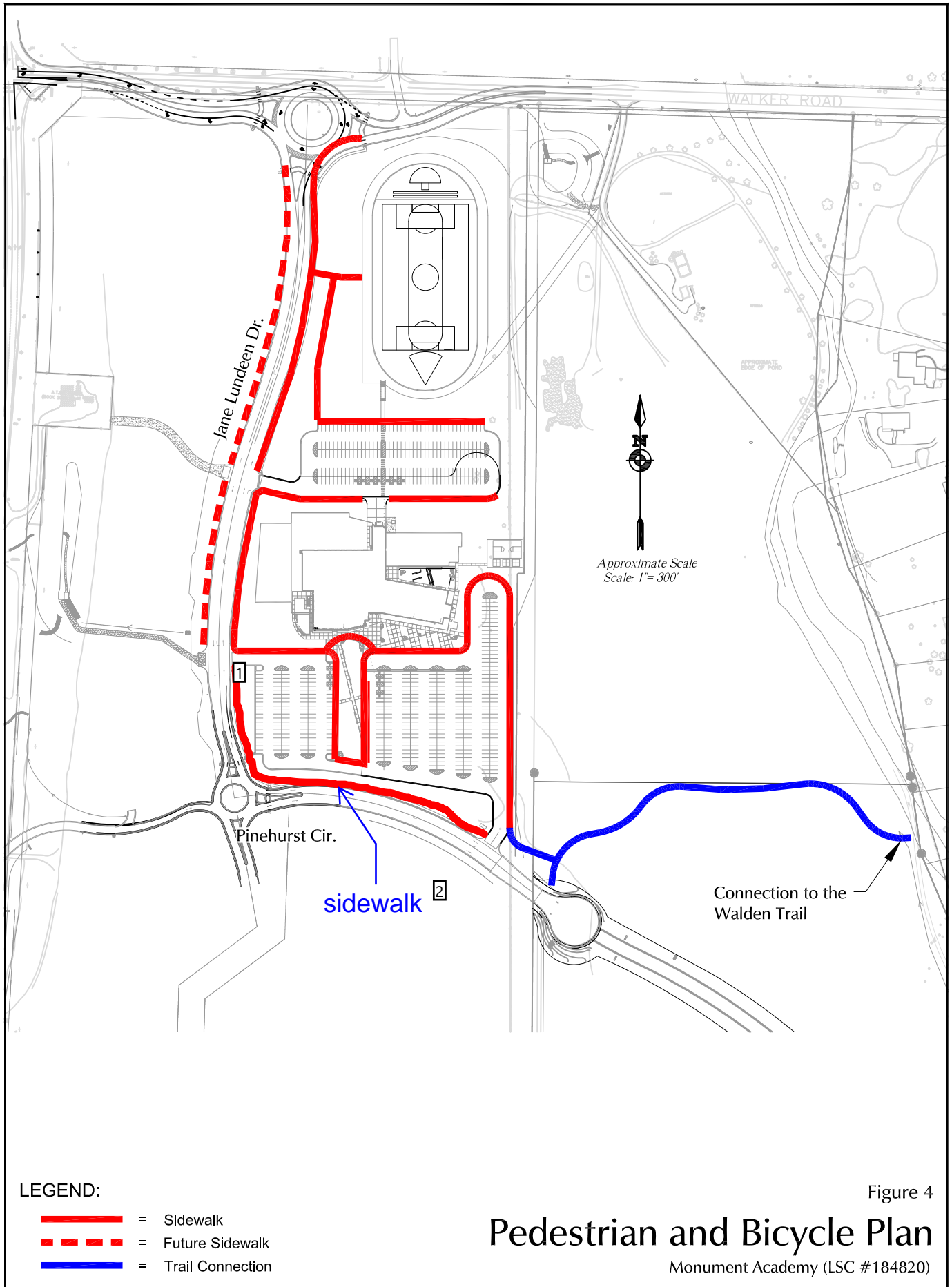



Figure 4


# Pedestrian and Bicycle Plan

Monument Academy (LSC #184820)

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 Number: 2      Author: dsdrice      Subject: Callout      Date: 3/22/2020 19:40:19

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[sidewalk](#)

 Author: jchodsdon      Subject: Sticky Note      Date: 4/7/2020 13:50:26  
The figure has been updated to show sidewalk per the comment.

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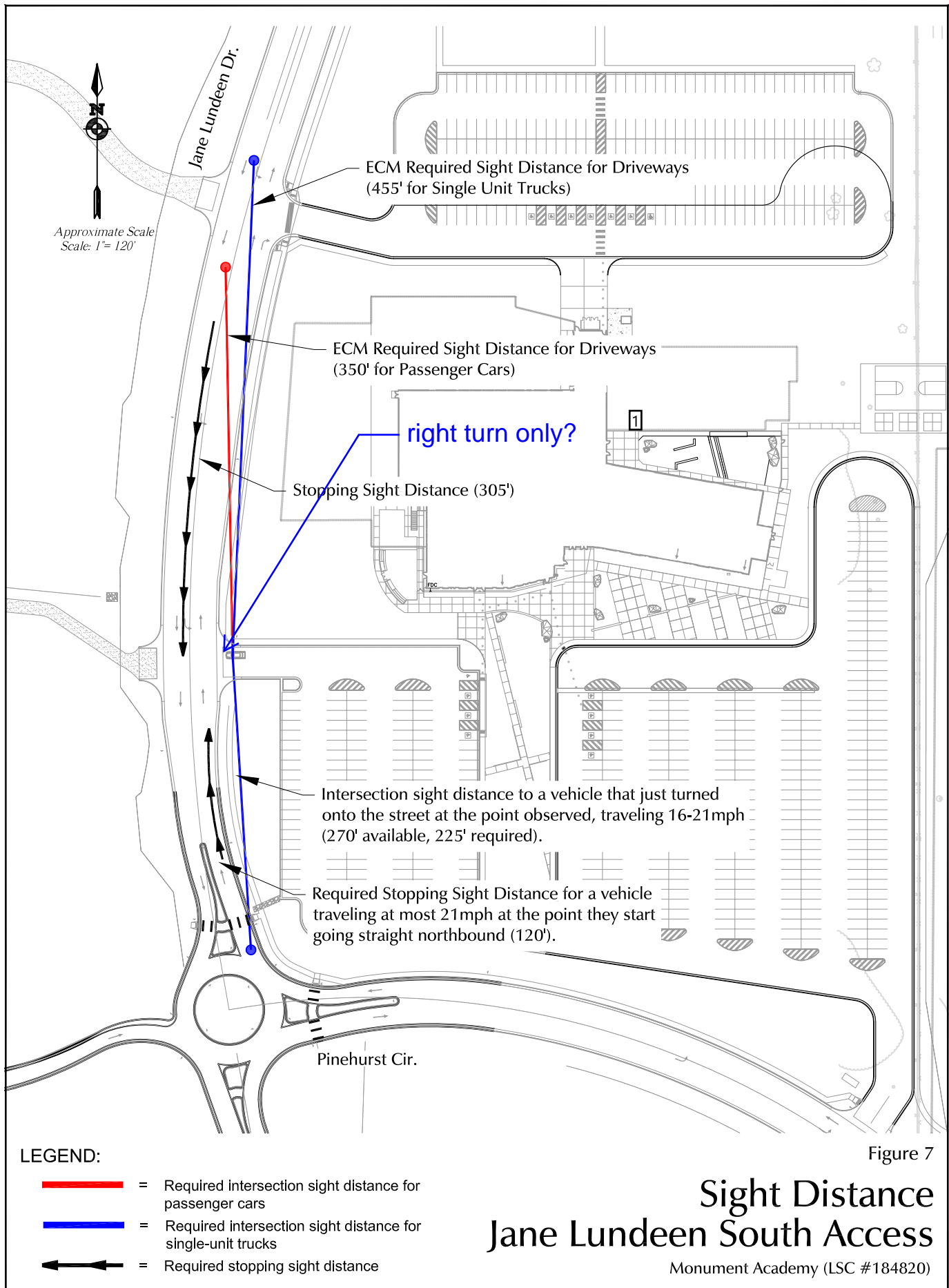



Figure 7

## Sight Distance Jane Lundeen South Access

Monument Academy (LSC #184820)


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right turn only?

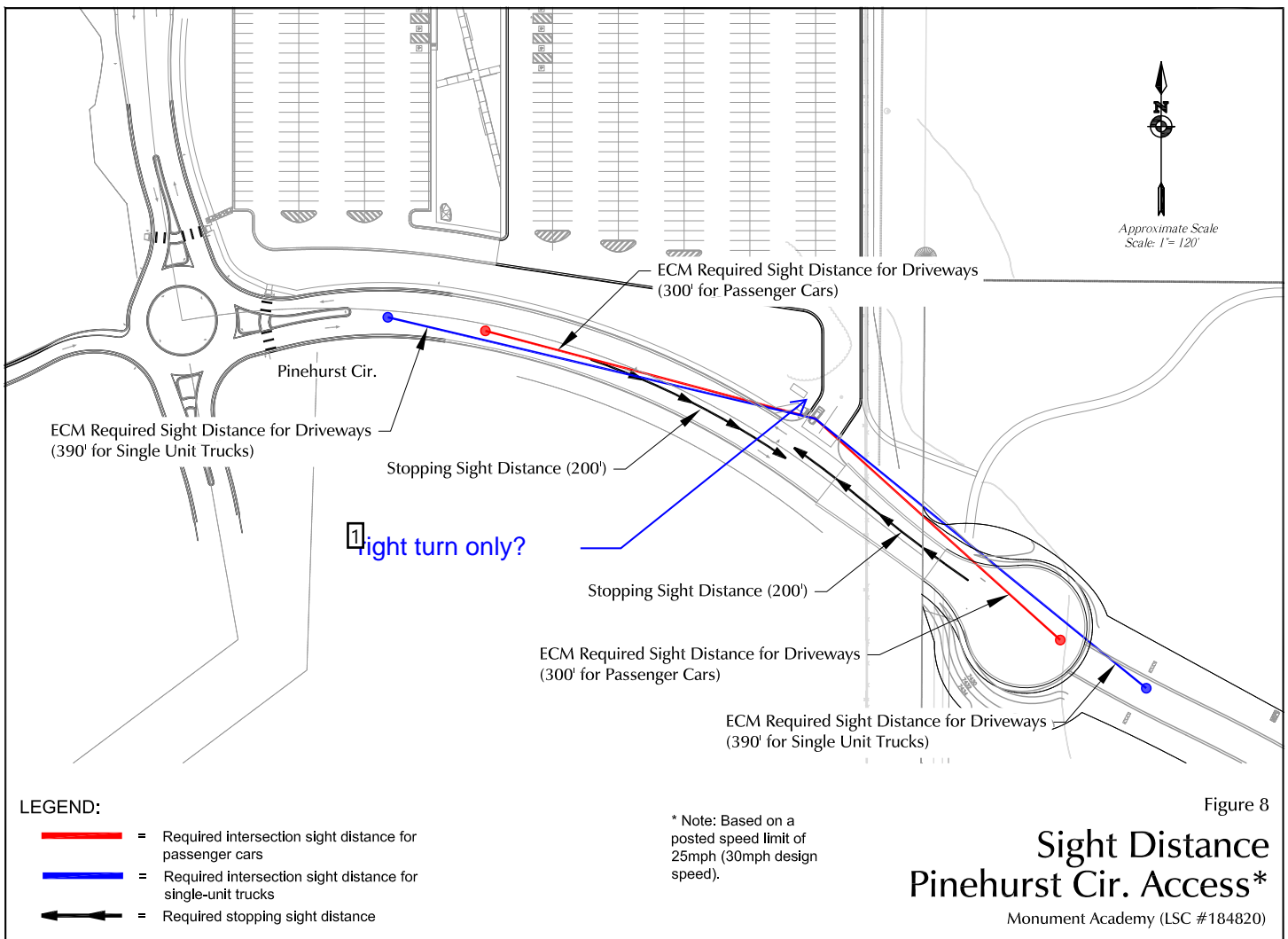
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 Author: Kirstin      Subject: Sticky Note      Date: 4/7/2020 14:02:08

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This access is generally planned to be a full-movement intersection. Clarification has been added to the updated TIS with language regarding the addition of a "wayfinding" sign(s) and potential turn restriction during parent drop off/pick up times (depending on the selected final carpool plan).






2. replace profile with sight distances

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 Number: 1      Author: dsdrice      Subject: Callout      Date: 3/22/2020 19:57:20


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right turn only?

 Author: Kirstin      Subject: Sticky Note      Date: 4/8/2020 11:49:33


The access will be restricted using striping and signing and potentially cones or other devices during pickup/dropoff times. As exiting motorists may make exiting left-turns at this access anyway, the sight distance evaluation has been included.

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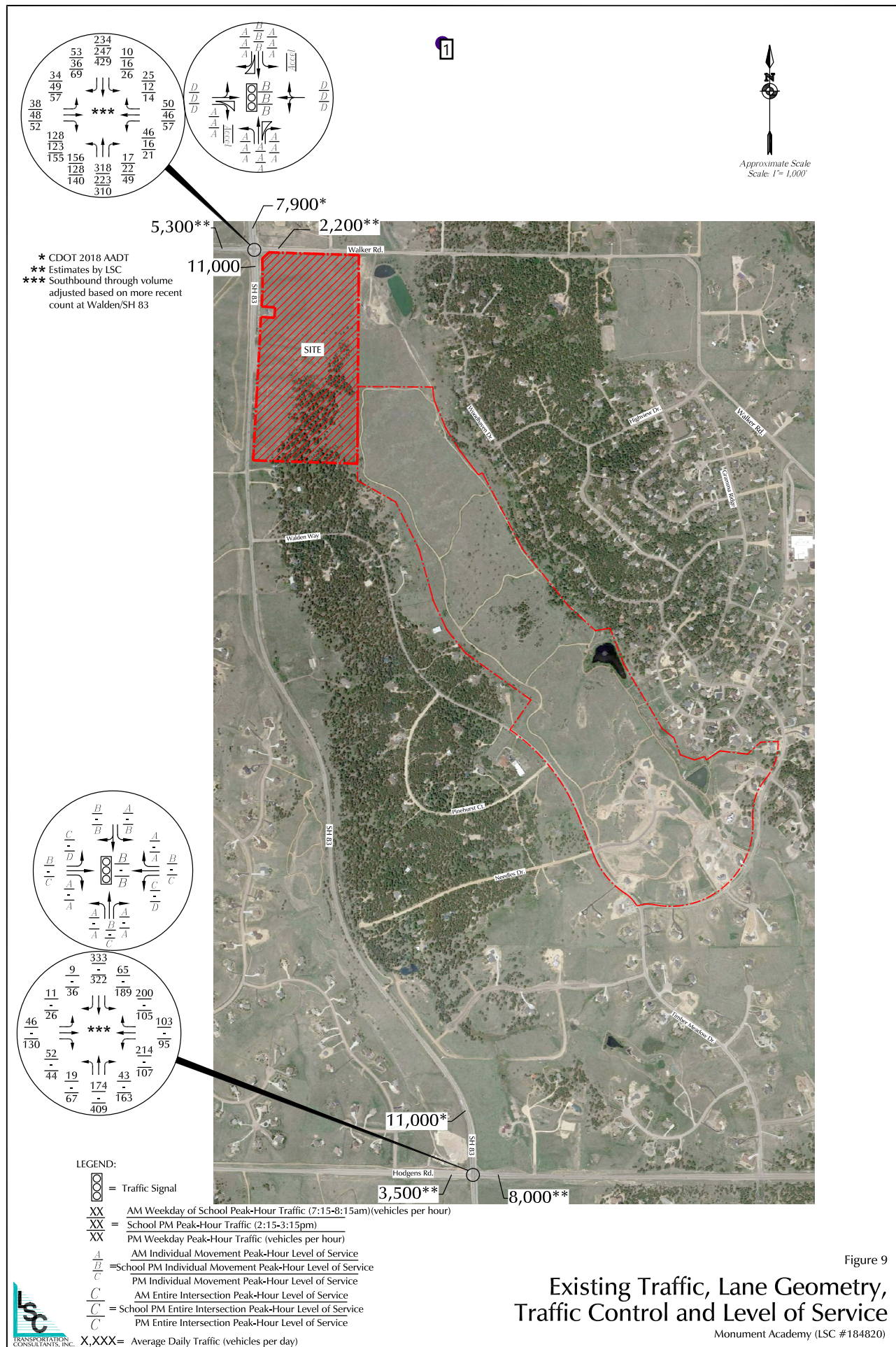
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replace profile with sight distances

 Author: jchodsdon      Subject: Sticky Note      Date: 4/7/2020 14:03:29

Completed as requested. Please refer to Figure 8.



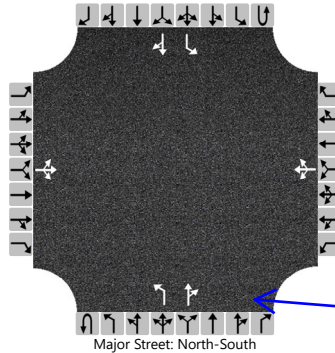


# HCS7 Two-Way Stop-Control Report

## General Information

Analyst	KDF	Intersection	Jane Lundeen/North School
Agency/Co.		Jurisdiction	El Paso County
Date Performed	2/24/2020	East/West Street	North Site Access
Analysis Year	2040	North/South Street	Jane Lundeen Dr
Time Analyzed	School AM Peak Hour	Peak Hour Factor	1.00
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Monument Academy		

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	1	0	0	1	1	0
Configuration			LTR				LTR			L		TR		L		TR
Volume (veh/h)		98	0	1		0	0	0		32	700	26		46	467	95
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type   Storage	Undivided															


## Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

## Delay, Queue Length, and Level of Service


Flow Rate, v (veh/h)			99				0			32				46		
Capacity, c (veh/h)			85							838				728		
v/c Ratio			1.17							0.04				0.06		
95% Queue Length, Q <sub>95</sub> (veh)			7.1							0.1				0.2		
Control Delay (s/veh)			239.7							9.5				10.3		
Level of Service (LOS)			F							A				B		
Approach Delay (s/veh)	239.7								0.4				0.8			
Approach LOS	F															

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 Number: 1      Author: dsdrice      Subject: Callout      Date: 3/22/2020 20:10:31

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separate right turn lane?

 Author: Kirstin      Subject: Sticky Note      Date: 3/31/2020 11:00:17  
The pedestrian level of service analysis has been updated to include a northbound right-turn lane

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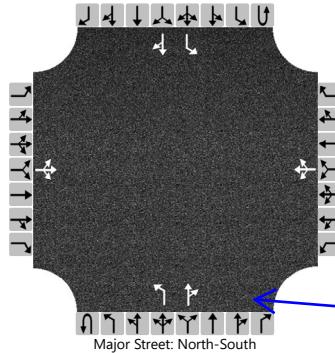


# HCS7 Two-Way Stop-Control Report

## General Information

Analyst	KDF	Intersection	Jane Lundeen/North School
Agency/Co.		Jurisdiction	El Paso County
Date Performed	2/24/2020	East/West Street	North Site Access
Analysis Year	2040	North/South Street	Jane Lundeen Dr
Time Analyzed	School Miday PM Peak Hour	Peak Hour Factor	1.00
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Monument Academy		

## Lanes



separate right turn lane?

## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	1	0	0	1	1	0
Configuration			LTR				LTR			L		TR		L		TR
Volume (veh/h)		132	0	2		1	0	28		32	477	0		0	332	102
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type   Storage	Undivided															


## Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

## Delay, Queue Length, and Level of Service


Flow Rate, v (veh/h)			134				29			32				0		
Capacity, c (veh/h)			170				434			935				902		
v/c Ratio			0.79				0.07			0.03				0.00		
95% Queue Length, Q <sub>95</sub> (veh)			5.2				0.2			0.1				0.0		
Control Delay (s/veh)			77.1				13.9			9.0				9.0		
Level of Service (LOS)			F				B			A				A		
Approach Delay (s/veh)	77.1				13.9				0.6				0.0			
Approach LOS	F				B											

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 Number: 1      Author: dsdrice      Subject: Callout      Date: 3/22/2020 20:20:03

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separate right turn lane?

 Author: Kirstin      Subject: Sticky Note      Date: 3/31/2020 11:00:24  
The pedestrian level of service analysis has been updated to include a northbound right-turn lane

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