Kimley-Horn Responses in RED throughout the document.

Traffic Impact Study

Webster Elementary School Expansion

El Paso County, Colorado

Prepared for:

Widefield School District #3

Kimley»Horn

The PCD file number has been added to the report.

Add PCD File No PPR-22-009

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

Traffic Engineer's Statement

The attached traffic report and supporting information were prepared under my responsible charge and they comport 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.

Jeffrey R. Planck

Jeffrey R. Planck, P.E., PE #53006

January 7, 2022
Date

Developer's Statement

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

Mr. Dave Gish
Widefield School District #3
1820 Main Street
Colorado Springs, CO 80911

Date

Webster Elementary School Expansion

El Paso County, Colorado

Prepared for
Widefield School District #3
1820 Main Street
Colorado Springs, Colorado 80911

Prepared by
Kimley-Horn and Associates, Inc.
4582 South Ulster Street
Suite 1500
Denver, Colorado 80237
(303) 228-2300

January 2022

LIST OF TABLES

LIST OF FIGURES

Include a circulation exhibit that identifies the queue length, drop-off/pick-up zone & stacking length

The requested exhibits will be provided through this traffic study or the development plans.

Include a pedestrian/bicycle circulation plan.

Include an exhibit for sight distance.

Include exhibit for directional distribution of Site-Generate Traffic.

1.0 EXECUTIVE SUMMARY

Webster Elementary School is proposing an expansion to the existing school located on the southwest corner of the Jersey Lane and Quebec Street intersection in El Paso County, Colorado. Webster Elementary School is planning to expand the existing school and re-configure the parking lots along Syracuse Street while increasing the potential enrollment by 332 students for a potential maximum capacity of 850 students. The existing student enrollment is 518 students, and the future capacity accounts for an increase of approximately 64 percent. It should be noted the existing school has a capacity of 600 students, so it is not currently maximizing the potential enrollment for the existing school. For analysis purposes, it was assumed that the Webster Elementary School Expansion will be completed in the next year; therefore, analysis was conducted for the 2022 school year. However, the buildout year is not critical as the studied intersections are in a fully built out area and future traffic growth is not expected along the local n the expansion of the school; therefore, only a buildout scenario was evaluated dy.

A traffic study was performed for the storage facility directly south of Webster Elementary. Since the storage facility was completed and open when the traffic counts were performed, the counts associated with this development are included in the analysis.

his traffic study is to identify project traffic generation characteristics to determine traffic related impacts on the local street system and to develop the necessary ures required for the identified traffic impacts. The following intersections were this traffic study in accordance with El Paso County standards and requirements:

Discuss if any other traffic studies, within the last 5 years, had been performed in the area.

- Jersey Lane and Syracuse Street (Intersection #1)
- Jersey Lane and Bickley Street (#2)
- Jersey Lane and Quebec Street (#3)
- Jersey Lane Faculty Exit (Existing Condition Only) (#4)
- Jersey Lane East Access (Bus Entrance Only) (#5)
- Syracuse Street North Access (Student Drop-off/Pick-up Exit) (#6)
- Syracuse Street South Access (Student Drop-off Pick-up Entrance) (#7)
- Quebec Street Access (Bus Exit Only) (#8)
- Syracuse Street Faculty Entrance (Existing Condition Only) (#9)

Webster Elementary School currently primarily serves the neighborhoods surrounding the school; therefore, limited regional access is currently provided from Interstate 25 (I-25), US-85, and Mesa Ridge Parkway (SH-16). Primary access is provided by Fontaine Boulevard, Fountain Mesa

- To mitigate existing conditions and future enrollment capacity of 850 students, the following improvements may be considered by the school:
  - Provide additional school personnel to direct parents with the student drop-off and pick-up circulation. This would potentially allow for additional vehicles to enter the drop-off/pick-up zone to minimize drivers from using other means of drop-off/pick-up in the public right-of-way (ROW) of the adjacent streets.
  - The school could encourage more pedestrian and bicycle traffic and discourage vehicular traffic to reduce the number of vehicle trips to and from the school. Programs could be developed to incentivize reducing single family vehicle trips such as carpooling, bicycle and pedestrian usage. In addition, providing sufficient, convenient, and safe bicycle storage could encourage more bicycle usage.
  - Provide a student drop-off/pick-up lane along the south side of Jersey Lane. The pavement width along Jersey Lane adjacent to the school is approximately 31 feet wide; therefore, the eastbound and westbound travel lanes could be restriped with 11-foot travel lanes while designating a 9-foot student drop-off and pick-up lane a Jersey Lane. If this student drop-off and pick-up area is designate Jersey Lane, the north curb line of Jersey Lane will need to be des Parking" signs. **Figure 8** conceptually displays the possible signing improvement options as well as the striping for the designated student drop-off and pick-up area.

This recommendation has been removed from the report.

This would County doe or school pa

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

will be

Text has been revised.

3.0 EXISTING AND FUTURE CONDITIONS

3.1 Existing Study Area

The existing site contains Webster Elementary School while single family residential homes are in the immediate surrounding area. A storage facility is located to the south of the site while James Madison Charter Academy is located southwest of the site. Santa Fe Avenue (US-85) is located in the extended area to the west while Mesa Ridge Parkway is located in the extended area to the south.

3.2 Existing and Future Roadway Network

Jersey Lane extends in the east-west direction as a two-lane roadway and has a posted speed limit of 20 miles per hour (mph) near the school.

Syracuse Street, Bickley Street, and Quebec Street extend northbound and southbound and provide one through lane in each direction. The posted speed limits are 20 mph near the school and increases to 25 mph at the posted "End School Zone" signs.

Include discussion of Fay Dr, as new access lines up with this street.

Fay Drive has been included in Section 3.2.

Include a discussion on the queueing length under existing and proposed conditions. Queueing lengths for school should be based on a 15-minute peak. Use North Carolina MSTA School Traffic Calculator for queueing. Based on data generated by spreadsheet, additional factor of safety may need to be used. County will be looking for an extremely realistic analysis.

County suggests setting up a meeting to discuss once the comments have been received.

Copy of spreadsheet can be found here: https://connect.ncdot.gov/municipalities/school/pages.default.aspx

The queues stack within the site and along the ROW of Syracuse Street, Jersey Lane, Quebec Street. Further discussion is included in Section 5.6 Site Circulation Evaluation.

As this is for a school site, traffic analysis needs to be done per North Carolina DOT MSTA School Traffic Calculator (copy of spreadsheet output will be provided at end of redlines.)

3.3 Existing Traffic Volumes

Existing vehicle turning movement coun ere conducted at the study intersections on Thursday, December 2, orning and afternoon peak hours. The counts were conducted durin n peak hours of the school traffic in 15-minute intervals from 7:15 AM 3:15 PM on this count date. The existing intersection vehicle traffic vo with count sheets provided in **Appendix A**. Likewise, existing pedes **ure 4**.

The ITE Trip Generation method of trip calculation provides a higher trip generation for the controlling peak hour generator than the NC DOT trip generation. Therefore, the ITE trip generation was used in this analysis to provide a conservative analysis. However, NCDOT was used for the queue analysis as requested.

State what the start and end t are for the school day, to sho the "peak hour" counts line up the school day.

3.4 Unspecified Development Traffic C

The Webster Elementary School Expans ential increas from 518 students to a capacity of 850 stu ool year. It sh that the future capacity of the school is r first year; however, the full capacity of students was utilized to provide a conservative analysis. Of note, the buildout year is not critical as the studied intersections are in a fully built out area and future traffic growth is not treets other than the expansion of the school; therefore, future volumes s consist of existing plus net increase of school traffic.

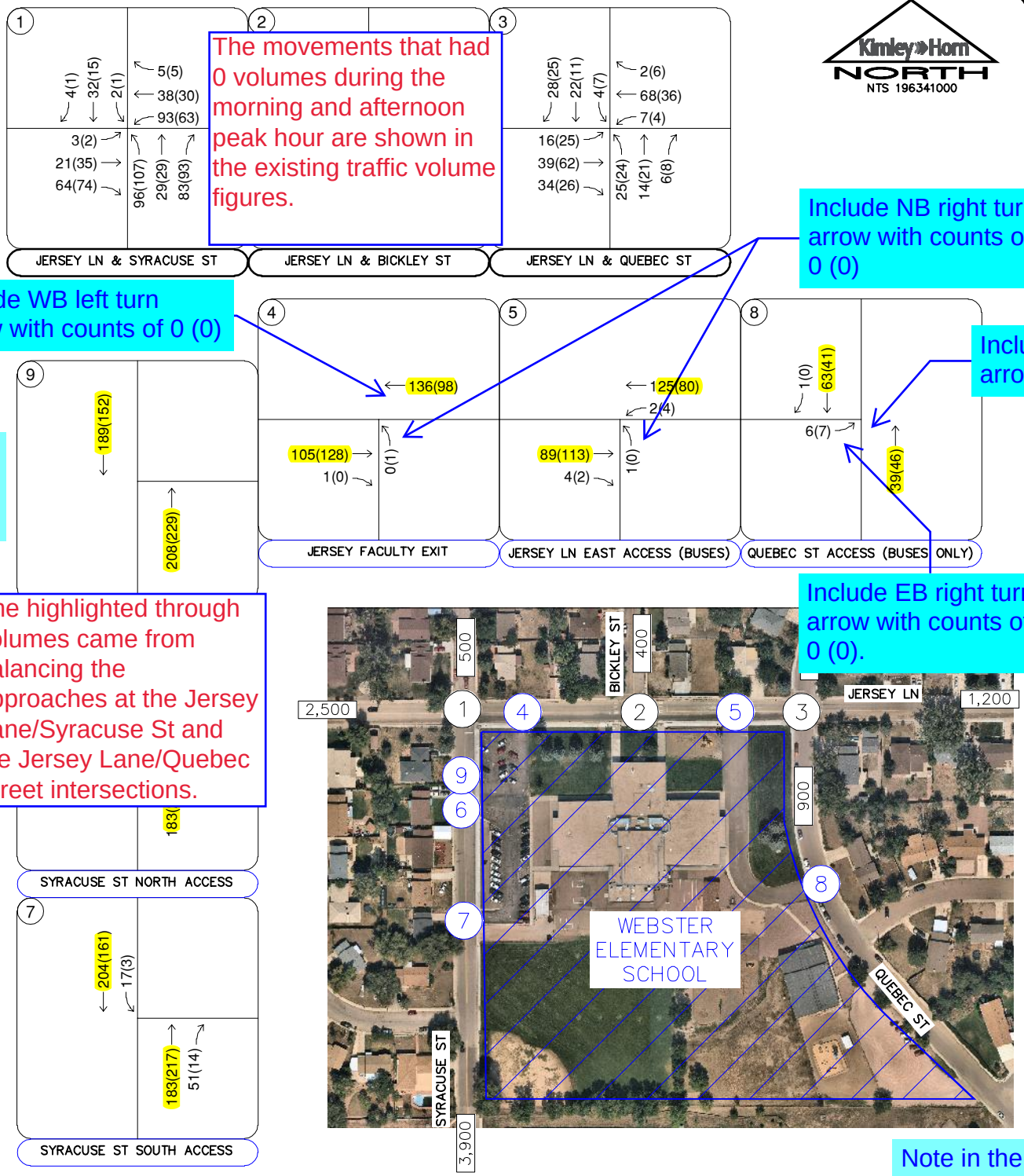
8:00 AM to 2:40 PM

We are not aware of any expansion plans at either of the two schools.

Discuss if there is a potential for either of the 2 other schools in the vicinity (James Madison Charter or Mesa Ridge High School) to expand in the future.

Discuss pedestrian and bicycle access.

The pedestrian and bicycle access discussion was and is included in Section 5.3 Pedestrian and Bicycle Evaluation.



Kimley»Horn
NORTH
NTS 196341000

The movements that had 0 volumes during the morning and afternoon peak hour are shown in the existing traffic volume figures.

Include NB right turn arrow with counts of 0 (0)

Include WB left turn arrow with counts of 0 (0)

Include NB lef arrow with 0 (

tion in the e highlighted erived.

The highlighted through volumes came from balancing the approaches at the Jersey Lane/Syracuse St and the Jersey Lane/Quebec Street intersections.

Include EB right turn arrow with counts of 0 (0).

All Intersection Counts Collected On:
Thursday, December 2, 2021
7:15 to 8:15AM (2:15 to 3:15PM)

LEGEND

(X) Study Area I

(X) School Acce

XXX(XXX) Weekday AM(Peak Hour T

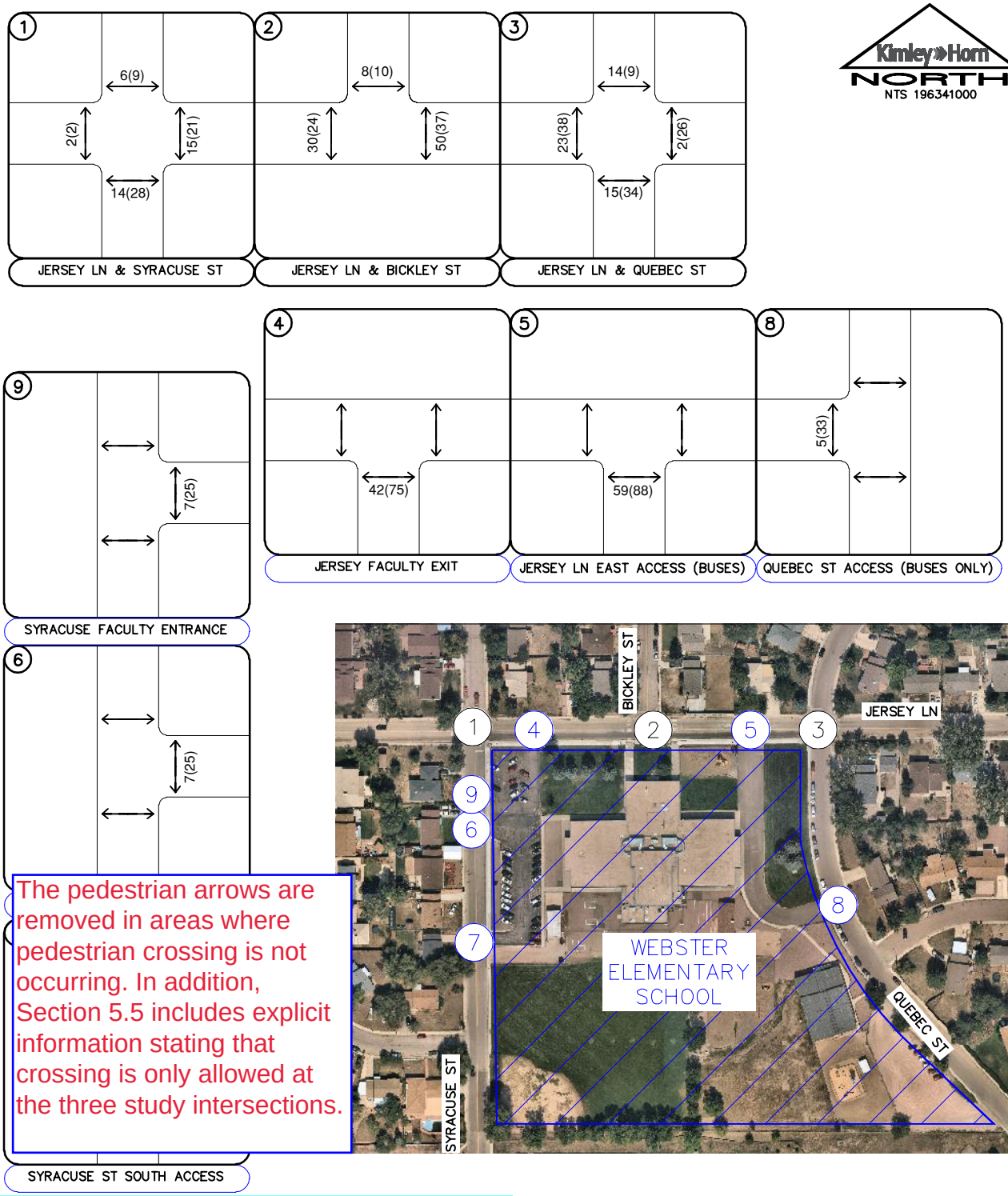
XX,X00 Estimated D

Note in the narrative the estimated daily tr volumes were obtain

The ADT is calculated based on the afternoon peak hour being 10% of the daily traffic volumes. The six movements that contribute to the eastbound & westbound or northbound & southbound are summed and divided by 0.1.

FIGURE 3
WEBSTER ELEMENTARY SCHOOL
EL PASO COUNTY, COLORADO
2021 EXISTING TRAFFIC VOLUMES

Kimley



The pedestrian arrows are removed in areas where pedestrian crossing is not occurring. In addition, Section 5.5 includes explicit information stating that crossing is only allowed at the three study intersections.

Pedestrian counts (arrows) crossing Syracuse, Jersey & Quebec at access points, remove the arrows on the exhibit as it implies there could be crossings here. Include in narrative that pedestrians are not allowed to cross at these locations, only the 3 key intersections.

LEGEND

(X) Study Area Key Intersection

(X) School Accesses

XX(XX) Weekday AM(PM) Peak Hour Pedestrian Volumes

EL PASO COUNTY, COLORADO
2021 EXISTING PEDESTRIAN VOLUMES

Kimley»Horn

4.0 PROJECT TRAFFIC CHARACTERISTICS

4.1 Trip Generation

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Manual*[1] published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. The ITE Trip Generation Report fitted curve equations that applies to Elementary School (ITE Land Use Code 520) was used to determine the increase in trips from the existing 518 students to future capacity of 850 students. For this study, Kimley-Horn used the current conditions at the school driveways to predict future driveway trips associated with the expansion of the elementary school. The existing school has a current enrollment of 518 students and is proposed to increase to a maximum capacity of 850 students. This equates to an increase of approximately 64 percent which was applied to the existing entering and exiting driveway counts to predict future entering and exiting driveway volumes.

Include discussion on where traffic is being generated from. Is the majority of the students within a 2-mile radius, indicating that there will be more daily traffic, or is there a large percentage of students outside of the 2-mile radius and being bused in?

When the traffic counts were collected, observations and video footage showed parents dropping-off and picking-up students in the right-of-way of Syracuse Street, Jersey Lane, Bickley Street and Quebec Street. Of note, Quebec Street does not provide acc network, and it is believed the majority of traffic volumes on the south Quebec Street intersection are vehicles parking in the public ROW for student pick-up and drop off. The existing traffic volumes along Quebec Street (south of Jersey Lane) were also increased by 64 percent to account for future student drop-off and pick-up volumes in the ROW of Quebec Street. Therefore, the remaining school traffic (beyond driveway volumes and Quebec Street ROW) is still using the ROW of Syracuse Street, Jersey Lane, and Bickley Street. As such, traffic volumes were also added to the surrounding street network and area based on a proportionate share of the increase of enrollment to 850 students from the existing 518 students.

Understood. The zoning map for Webster Elementary is included in Section 4.2 Trip Distribution.

[1] Institute of Transportation Engineers, *Trip Generation Manual*, Eleventh Edition, Washington DC, 2021.

The Webster Elementary School expansion is expected to generate a net increase of approximately 754 weekday daily trips, with 249 of these trips occurring during the school's morning peak hour and 150 of these trips occurring during the school's afternoon peak hour. Calculations were based on the procedure and information provided in the ITE *Trip Generation Manual, 11th Edition – Volume 1: User's Guide and Handbook*, 2021. **Table 1** summarizes the estimated trip generation for the Webster Elementary School Expansion. The trip generation worksheets are included in **Appendix B**.

Table 1 – Webster Elementary School Expansion Traffic Generation

Land Use and Size	Weekday Vehicle Trip						
	Daily	School AM Peak Hour			Sch		
		In	Out	Total	In		
ITE Trip Generation							
(ITE 520) –	1,176	210	179	389			
(ITE 520) –	1,930	345	293	638			
ps	754	135	114	249			
Site Specific Data – Existing 518 Students							
veway Counts		76	64	140	23	32	55
(E) Existing ROW Counts along Quebec St		57	41	98	37	48	85
School Expansion – 850 Students							
(F) Future Driveway Volumes *(F = D*1.64)*		125	105	230	38	52	90
(G) Future Quebec ROW Volumes *(G = E*1.64)*		93	67	160	60	79	139

The 1.64 factor came from the trip generation comparison between the existing 518 student enrollment and the future 850 student enrollment (850/518 = 1.64). The 850 student enrollment produces 64 percent (1.64) more trips than the 518-student trips.

The Quebec Street ROW counts were derived from the in/out movements along Quebec Street from Jersey Lane. It was assumed 90% of those volumes were associated with pick-up/drop-off to the school.

State count

r

4.2 Total (Background Plus Project) Traffic

The remaining site generated traffic volumes associated with the Webster Elementary School expansion were added to the existing traffic volumes to represent estimated traffic conditions for a maximum enrollment of 850 students. These total vehicle traffic volumes for the study area are illustrated for the opening 2022 year in **Figures 5** while the total pedestrian volumes accounting for the school expansion are shown in **Fi**

A stated previously in the report text, driveway volumes were increased by 64% to account for the school expansion. Likewise, future pedestrian traffic was also increased by 64%.

Include discussion on how driveway volumes were distributed to each drive.

Include discussion on how future pedestrian traffic was determined.

Intersection	Movement	Control	2021 Existing		2022 Total	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
			LOS (Delay)	LOS (Delay)	LOS (Delay	LOS (Delay
Syracuse Street South Access (#7) (Student drop-off/pick-up entrance) – Proposed to align with Fay Drive	**Northbound Left**		Associated with School Expansion in 2022		8.1 A	7.9 A
	Eastbound Approach	STOP			11.3 B	10.6 B
	Southbound Left				8.3 A	8.1 A
Quebec Street Access (#8) – (Outbound Bus Access)	**Eastbound Approach**	STOP	9.7 A	9.5 A	10.6 B	10.3 B
Syracuse Street Faculty Entrance (#9)	**Southbound Left**		No Observed Vehicles		Removed with School Expansion	

Green = LOS A-C, Yellow = LOS D (Not Experienced), Orange = LOS E (Not Experienced), Red = LOS F (Not Experienced)

As shown in **Table 3**, the movements at all of the studied intersections and accesses currently operate acceptably and are expected to continue to operate acceptably with LOS B or better during the peak hours Corrected l expansion.

Faculty

As shown in the table, the Faulty Accesses (Intersections #4 and #9) will be removed when the school is expanded and the parking lot along Syracuse Street is re-configured. In addition, the south entrance along Syracuse Street is proposed to align with Fay Drive when the drop-off/pick-up parking lot expands to the south.

Therefore, no modifications to the existing lane configurations and control are recommended at the study area key intersections. The existing street network is expected to be able to accommodate the increase in school traffic. However, to further identify the exiting only accesses and to restrict entering movements, R5-1 “Do Not Enter” signs could be installed at the approaches of the Syracuse Street North Access (#6) and the access along Quebec Street (#8). Likewise, to further identify the entrance only accesses and to restrict exiting movements, R6-1 “One Way” signs could be installed at the entering approaches of the Jersey Lane East Access (#5) and the relocated Syracuse Street South Access (#7). Lastly, R1-1 “Stop” signs could be installed on the exiting approaches of the Syracuse Street North Access (#6) and the Quebec Street Access (#8).

5.3 Internal Roadway Classifications and Turn Lanes

The studied roadways all meet the characteristics of as urban local roadway with exception of the Syracuse Street south of Jersey Lane. The average daily traffic (ADT) among the studied roadways is expected to be less than 3,000 vehicles per day (vpd) with the exception of Syracuse Street south of Jersey Lane. The south leg of Jersey Lane and Syracuse Street has a projected ADT of 4,100 vpd which matches the classification of an urban residential collector roadway. **Figure 7** illustrates the street classification map for the surrounding area. In addition, exclusive left turn lanes are warranted for ingress turning volumes of 25 vehicles p whereas exclusive right turn lanes are warranted for ingress turning volumes of 50 vph or greater along "Minor Arterial and Lower Classification". Of note, the surrounding roadway network primarily consists of local streets without the implementation of any designated left and right turn lanes; therefore, auxiliary turn lanes are not recommended at the studied intersections. Further, all studied intersections are expected to operate at LOS B or better during the peak hours.

Intersection spacing is included in Section 5.4.

Discuss if al requirement

5.4 Sight Distance Evaluation

It is recommended that sight triangles be provided at all site access points to give drivers exiting the site a clear view of oncoming traffic. Landscaping and objects within sight triangles must not obstruct drivers' views of the adjacent travel lanes. ECM design intersection sight distances for left turn from stop at all the study intersection is recommended to provide an intersection sight distance of 280 feet. Of note, because the intersections are between two local roadways or a local and an access, the distance from the driver's eye to the edge of pavement can be reduced to 10 feet and the sight distance can b f the road. It is believed that all existing intersections provide the

Exhibit for sight distance will be provided with the development plans.

Discuss if all the intersections and accesses can meet this requirement. Include an exhibit in the appendix.

Make note of where this reduction came from.

This reduction came from the ECM Table 2-21 footnote 2.

Include discussion that no ROW dedication or preservation is needed on any of the existing roadways.

This has been included in Section 5.6 Site Circulation.

5.5 Site Circulation Evaluation

There are existing sidewalks located along both sides of Jersey Lane, Syracuse Street, Bickley Street, and Quebec Street. In addition, east-west crosswalk pavement markings are provided along Syracuse Street and Quebec Street intersecting with Jersey Lane. North-south crosswalk pavement markings are also provided along Jersey Lane at Bickley Street.

Based on the videos and counts at the study intersections, the Syracuse Street North Access and South Access are for student drop-off/pick-up on the west side of the school. Vehicles enter the south access, circulate counterclockwise and drop off or pick up the student, and then exit from the north access along Syracuse Street. With this circulation pattern for student drop-offs and pick-ups, the passenger side of vehicles is appropriately located on the side of the school to minimize vehicles doors opening on the side with circulating traffic. Two vehicles were observed extending beyond the student drop-off area and to the south along Syracuse Street during the arrival morning peak hour. Likewise, approximately 10 vehicles were observed extending beyond the student pick-off area and to the south along Syracuse Street during the dismissal afternoon peak hour.

The existing parking lot to the north of the designated student drop-off and pick-up area is intended for faculty and generated negligible volumes during the school's peak morning and afternoon hours. Typically, faculty and staff arrive prior to student drop-off and depart after student pick-up. Faculty enter from the Syracuse Street Faculty Entrance and circulate counterclockwise while exiting from the Jersey Lane Faculty Exit. Of note, vehicle traffic was not observed entering the north access along Syracuse Street during the peak hours of the school traffic, and this portion of the parking lot will be removed with the expansion of the school.

With the expansion of the school, the drop-off and pick-up parking lot along Syracuse Street will expand to the north and the south while the faculty parking lot located on the southeast corner of the Jersey Lane and Syracuse Street intersection will be removed. The expansion of the drop-off and pick-up parking lot will provide additional parking for the fa
increase in drop-off/pick-up with the proposed increase in student
lot is proposed to be moved and align with Fay Drive. The circula
vehicles entering at the south access through the parking lot and exit to the north.

This has been included in Section 5.6 Site Circulation.

State whether routing plan has been coordinated with law enforcement and school officials.

The east access along Jersey Street is designated for school buses entering the bus drop-off/pick-up zone and the access along Quebec Street is designated for buses exiting the school site. Six (6) school buses accommodated the existing school enrollment of 518 students.

Discuss if there will be an in number of buses due to the enrollment, which could imp drop-off/pick-up zones and

Of note, many drop-offs/pick-ups are occurring along the public street right- surrounding the elementary school. As discussed above, minimal student drop-off and pick-ups occur along Syracuse Street. However, it was observed that parents par Jersey Lane while the south side of Jersey Lane is restricted with traffic c were observed queuing on Bickley Street for student pick-ups. Quebec utilized for student pick-up and drop-offs while several faculty members s on Quebec Street. The following recommendations are intended to im circulation at the school:

This has been included in Section 5.6 Site Circulation. The 850 student enrollment will increase the bus count from 5 to 6. The existing one (1) day care bus will continue to use the bus loop at the middle school. The bus zone provides 370 feet of stacking for the buses. With a bus length of 35 feet, the area can stack up to 10 buses. Likewise, seven large school buses of 45 feet long would be accommodated in this 370-foot distance. Therefore, the 7 buses using the bus route will remain on-site.

- To mitigate existing conditions and future enrollment capacity of 850 improvements may be considered by the school:
  - Provide additional school personnel to direct parents with the stu up circulation. This would potentially allow for additional vehicles to up zone to minimize drivers from using other means of drop-off/pic of-way (ROW) of the adjacent streets.
  - The school could encourage more pedestrian and bicycle traffic an traffic to reduce the number of vehicle trips to and from the scho developed to incentivize reducing single family vehicle trips such as carpooling, bicycle and pedestrian usage. In addition, providing sufficient, convenient, and safe bicycle storage could encourage more bicycle usage.
  - Provide a student drop-off/pick-up lane along the south side of Jersey Lane. The pavement width along Jersey Lane adjacent to the school is approximately 33 feet wide; therefore, the eastbound and westbound travel lanes could be striped with 11-foot travel lanes while designating a 11-foot student drop-off and pick-up lane along the south side of Jersey Lane. If this student drop-off and pick-up area is designated on the south side th curb line of Jersey Lane will need to be designated with R7-1 **gure 8** conceptually displays the possible signing improvement options as well as the striping for the designated student drop-off and pick-up area.

This has been included in Section 5.7 Safety Analysis.

Include discussion on safety analysis, any crash data within project area.

5.6 Road Impact Fees

Road impact fees were evaluated based on the El Paso County Road Impact Fee Schedule. Based on these fee schedule guidelines, the fee per thousand square feet is $3,372. Therefore, the road impact fee for the proposed 18,500 square feet of elementary school expansion is expected to be $62,382. Road impact fee calculations are shown in Table 4. We will determine payment methods with the final plat.

Understood, the fees will be determined now.

Fees will need to be determined now, as there will not be a final plat.

Table 4 – Road Impact Fees

Use	Square Feet	Fee / KSF	Total Fee
Elementary School Expansion	18,500	$3,372	$62,382

Discuss if there are any anticipated deviations.

The needed deviations are included in Section 6 Conclusions and Recommendations.

APPENDICES

Include an hourly distribution table at 15-minute intervals. (Example is located at end of redlines.)

An hourly distribution is included in Appendix C.

Table 3
Hourly Distribution

	Middle School (Grades 6-8)		High School (Grades 9-12)	
Time	**IN**	**OUT**	**IN**	**OUT**
7:15 AM	40%	40%	0%	0%
7:30 AM	60%	60%	10%	0%
7:45 AM	0%	0%	45%	40%
8:00 AM	0%	0%	45%	60%
1:45 PM	0%	0%	0%	0%
2:00 PM	25%	0%	0%	0%
2:15 PM	50%	5%	5%	0%
2:30 PM	20%	60%	10%	0%
2:45 PM	5%	30%	45%	20%
3:00 PM	0%	5%	35%	60%
3:15 PM	0%	0%	5%	15%
3:30 PM	0%	0%	0%	5%
2:15-3:15 PM	Percentage			
	75%	100%	95%	80%
	Vehicles Per Hour			
	107	168	200	247

Source:LSC Transportation Consultants, Inc.