



July 30, 2019

Mr. Rick Campbell
1556 Investments, LLC
270 St. Paul Street, Suite 200
Denver, CO 80206

Dear Mr. Campbell:

In response to your request, LSC impact analysis for the proposed site is proposing to locate in an existing (SH 30)/E. Centretech Parkwa

REPORT CONTENTS

The report contains the following information for the site including the lane geometry, weekday peak-hour traffic volumes, weekday site-generated traffic volumes, traffic volumes to the area roads, resulting total traffic volumes and recommended circulation plan for routes.

LAND USE AND ACCESS

The site is proposed to include a public charter school with a capacity of 200 students in Phase 1 in the Fall of 2019 and a buildout capacity of 600 students by 2022. Access is provided by the various existing retail shopping center access points. Figure 2 shows the conceptual site plan. The school plans to open in the Fall of 2019 with about 200 students in Kindergarten and 1st and 2nd grades. Phase 1 will only utilize the north drop-off/pick-up area. The school will add a grade or two per year until they reach a student capacity of 600 in grades Kindergarten through 8th Grade in 2022. Approximately 265 students will utilize the north drop-off/pick-up area and about 335 students will utilize the south drop-off/ pick-up area. This split will be adjusted as needed to best accommodate future conditions. The school plans to have a 15-minute stagger between the two drop-off/pick-up locations.

Comments 9.4.19:
1) Include figure showing trip distribution percentages. The project team feels there would be significant operational issues in the study area if parents/guardians were allowed to flow freely in/out of the site. The proposed access and circulation plan requires parents/guardians to follow the routes indicated in Figures 11, 12, and 13. We acknowledge that some parents/guardians will not follow the plan but they will be strongly encouraged to do so.
2) School circulation does not seem realistic with 8 lanes dropping to 2 and then dropping to 1 very quickly. Further evaluation is needed. The queuing areas in Figures 11, 12, and 13 are intended to show the likely maximum amount of queuing available on-site to serve buildout conditions. The school will likely not need all eight lanes initially but wanted to demonstrate the site's ability to queue vehicles. This full capacity will only be utilized if required by future demand.
3) Include signal warrant study for 6th and Jasper. Failing LOS is unacceptable. A review of the volumes at this intersection indicates a full traffic signal warrant analysis would not show a warrant being met due to low side road volumes. The proposed access and circulation plan does not route site trips to any of the poorly operating movements. The intersection could be converted to three-quarter by CDOT or the City but it should not be required based on the school's impact.
4) See comments throughout, including on figures and tables. Comment noted.

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ROADWAY AND TRAFFIC CONDITIONS

Area Roadways

The major roadways in the site’s vicinity are shown on Figure 1 and are described below.

- **E. 6th Avenue (SH 30)** is an east-west, four-lane major arterial roadway north of the site. It is classified R-A (Regional Highway) by CDOT. The intersection with E. Centretech Parkway is signalized with auxiliary turn lanes. The posted speed limit in the vicinity of the site is 40 mph. There are existing bus stops near E. Centretech Parkway.
- **E. Centretech Parkway** is a three-lane collector roadway west and south of the site. The intersection with E. 6th Avenue (SH 30) is signalized with auxiliary turn lanes. It connects E. 6th Avenue (SH 30) southeast to Airport Road. The posted speed limit in the vicinity of the site is 25 mph. There are existing bus stops south of E. 6th Avenue (SH 30).

Existing Traffic Conditions

Figure 3 shows the existing traffic volumes, lane geometries, traffic controls, and posted speed limits in the site’s vicinity on a typical weekday. The weekday peak-hour traffic volumes are from the attached traffic counts conducted by Counter Measures in July, 2019. Figure 3 also shows the lengths of the existing turn lanes in the study area that could be impacted by site traffic.

2022 and 2040 Background Traffic

Figure 4 shows the estimated 2022 background traffic and Figure 5 shows the estimated 2040 background traffic. The background traffic volumes assume an annual growth rate of 0.8 percent on E. 6th Avenue (SH 30) based on CDOT projections.

Existing, 2022 Background, and 2040 Background Levels of Service

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection. Level of service is indicated on a scale from “A” to “F.” LOS A is indicative of little congestion or delay and LOS F is indicative of a high level of congestion or delay. Attached are specific level of service definitions for signalized and unsignalized intersections.

The intersections in the study area were analyzed to determine the existing, 2022 background, and 2040 background levels of service using Synchro. The existing traffic signal timing plans were provided by City staff. Table 1 shows the level of service analysis results. The level of service reports are attached.

- **E. 6th Avenue (SH 30)/E. Centretech Parkway/Helena Street:** This signalized intersection currently operates at an overall LOS “B” during both morning and afternoon peak-hours and is expected to do so through 2040.
- **E. Centretech Parkway/5th Place/North Site Access:** All movements at this unsignalized intersection currently operate at LOS “B” or better and are expected to do so through 2040.

Table 1 shows movements with LOS C

Table 1 shows all existing and background scenarios as LOS "B" or better through 2040.

LOS F is unacceptable, conduct signal warrant analysis or recommend other improvements

A review of the volumes at this intersection indicates a full traffic signal warrant analysis would not show a warrant being met due to low side road volumes. The proposed access and circulation plan does not route site trips to any of the poorly operating movements. The intersection could be converted to three-quarter by CDOT or the City but it should not be required based on the school's impact.

- **E. 6th Avenue (SH 30)/Jasper Street:** All currently operate at LOS "C" or better with movement which operates at LOS "F" in the are expected to operate at LOS "D" or better with the exception of the northbound left/through movement which is expected to operate at LOS "F" in both morning and afternoon peak-hours. The southbound approach is expected to operate at LOS "F" in the morning peak-hour. Drivers making these movements have alternative access to E. 6th Avenue (SH 30) at existing traffic signals to the east and/or west.

Only drivers in SB direction have reasonable alternates, not NB

- **E. 6th Avenue (SH 30)/RIRO Site Access:** All movements at this unsignalized right-in/right-out intersection currently operate at LOS "B" or better and are expected to do so through 2022. In 2040, all movements are expected to operate at LOS "C" or better.

Site trips will be directed to only turn right onto E. 6th Avenue during student drop-off/pick-up peaks.

TRIP GENERATION

Table 2 shows the estimated average weekday morning peak-hour trip generation for the proposed land use based on the rates from *Trip Generation, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE).

In Phase 1 in the Fall of 2019, the site is projected to generate about 370 vehicle-trips on the average weekday, with about half entering and half exiting during a 24-hour period. During the morning school peak-hour, which is expected to occur from 7:15 to 8:15 a.m., about 106 vehicles would enter and about 94 vehicles would exit the site. During the afternoon school peak-hour, which is expected to occur from 3:30 to 4:30 p.m., about 61 vehicles would enter and about 72 vehicles would exit.

At buildout in 2022, the site is projected to generate about 1,110 vehicle-trips on the average weekday, with about half entering and half exiting during a 24-hour period. During the morning school peak-hour, which is expected to occur from 7:15 to 8:15 a.m., about 353 vehicles would enter and about 314 vehicles would exit the site. During the afternoon school peak-hour, which is expected to occur from 3:30 to 4:30 p.m., about 180 vehicles would enter and about 211 vehicles would exit.

Table 2 also shows the number of students planned to be dropped off/picked up at the north side (265 students) and south side (335 students) of the building. This split will be adjusted as needed to best accommodate future conditions.

explain how the split was determined. Elementary vs. Middle School?

TRIP ASSIGNMENT

The information was provided by school representatives.

Figure 6 shows the estimated assignment of 2019 site-generated traffic volumes based on 200 students on the north side of the building. Figure 7 shows the estimated traffic based on 600 students utilizing both sides of the building. The proposed access and circulation plan requires parents/guardians to follow the routes indicated in Figures 11, 12, and 13. We acknowledge that some parents/guardians will not follow the plan but they will be strongly encouraged to do so.

The project team feels there would be significant operational issues if the study area if parents/guardians were allowed to flow freely in/out of the site. The proposed access and circulation plan requires parents/guardians to follow the routes indicated in Figures 11, 12, and 13. We acknowledge that some parents/guardians will not follow the plan but they will be strongly encouraged to do so.

Add trip distribution figure

The school's intent is to require all parents/guardians to do so in the interim condition so the expectation is that most will. This is intended to limit impacts to the balance of the uses in the area.

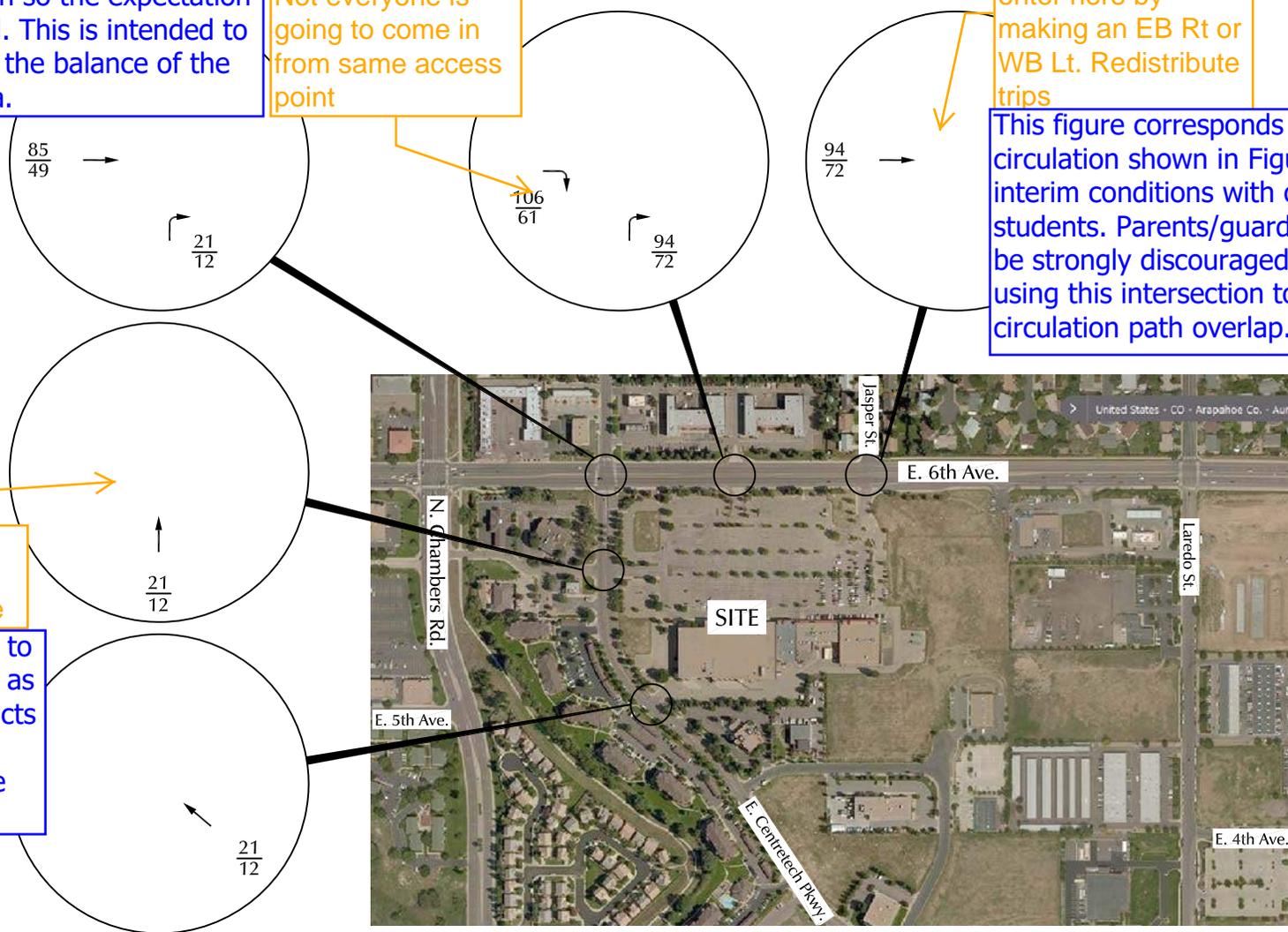
Not everyone is going to come in from same access point

Per circulation plan, some drivers will enter here by making an EB Rt or WB Lt. Redistribute trips

This figure corresponds to the circulation shown in Figure 11 for interim conditions with only 200 students. Parents/guardians will be strongly discouraged from using this intersection to avoid circulation path overlap.

Some parents won't follow rules and may exit here

The school's intent is to prevent this as much as possible to limit impacts to other uses in the area - particularly the Maverick C-Store.



LEGEND:

- $\frac{26}{35}$ = AM Peak Hour Traffic
- $\frac{35}{35}$ = PM Peak Hour Traffic
- 2,500 = Average Daily Traffic

Add note that assumption is drop if north side of building only

A note can be added to an updated study.

Assignment of 2019 Site-Generated Traffic Based on 200 Students

Aurora Community School (LSC #190680)

Figure 6



Approximate Scale
Scale: 1"=600'

Note: Assumes 265 elementary students and 335 middle school students for the purposes of drop-off/pick-up.

Figure 7

Assignment of Buildout Site-Generated Traffic Based on 600 Students

Aurora Community School (LSC #190680)

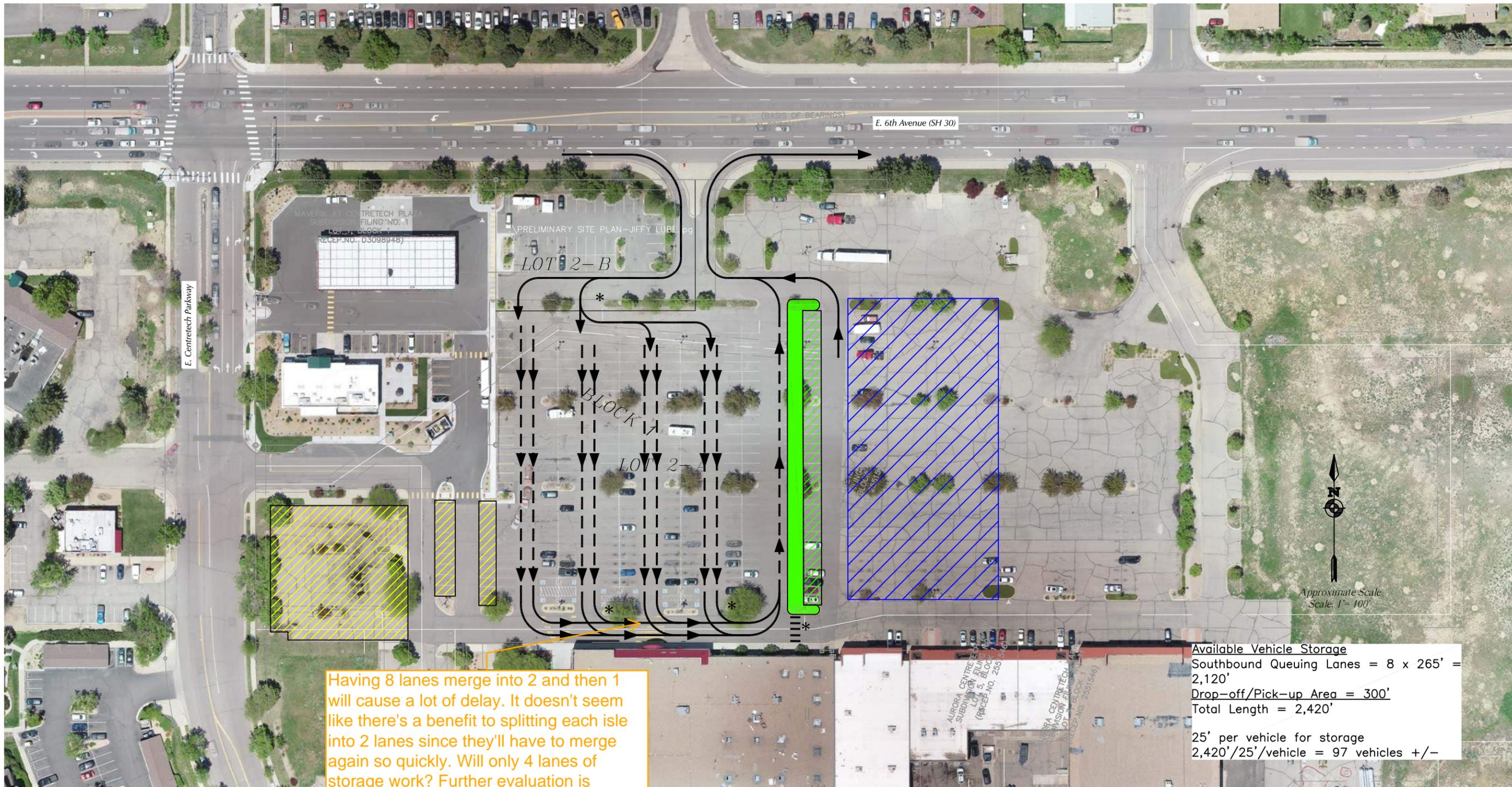
LEGEND:

$\frac{26}{35}$ = AM Peak Hour Traffic
 = PM Peak Hour Traffic
 2,500 = Average Daily Traffic

* The WB LT entering movement may need to be eliminated if the movement frequently spills back and blocks westbound through traffic. The existing left-turn lane could be lengthened from about 250 feet to about 450 feet with median construction.

What is 95th percentile queue in 2022? Does median need to be modified?

The capacity analysis reports suggest the queue lengths are minimal and will fit in the existing turn lane length.



Having 8 lanes merge into 2 and then 1 will cause a lot of delay. It doesn't seem like there's a benefit to splitting each isle into 2 lanes since they'll have to merge again so quickly. Will only 4 lanes of storage work? Further evaluation is needed. At a minimum, additional staff may be needed. It is also highly unlikely that parents won't drop off children in front of school. More work is needed on this.

Available Vehicle Storage
 Southbound Queuing Lanes = 8 x 265' = 2,120'
 Drop-off/Pick-up Area = 300'
 Total Length = 2,420'
 25' per vehicle for storage
 2,420'/25'/vehicle = 97 vehicles +/-

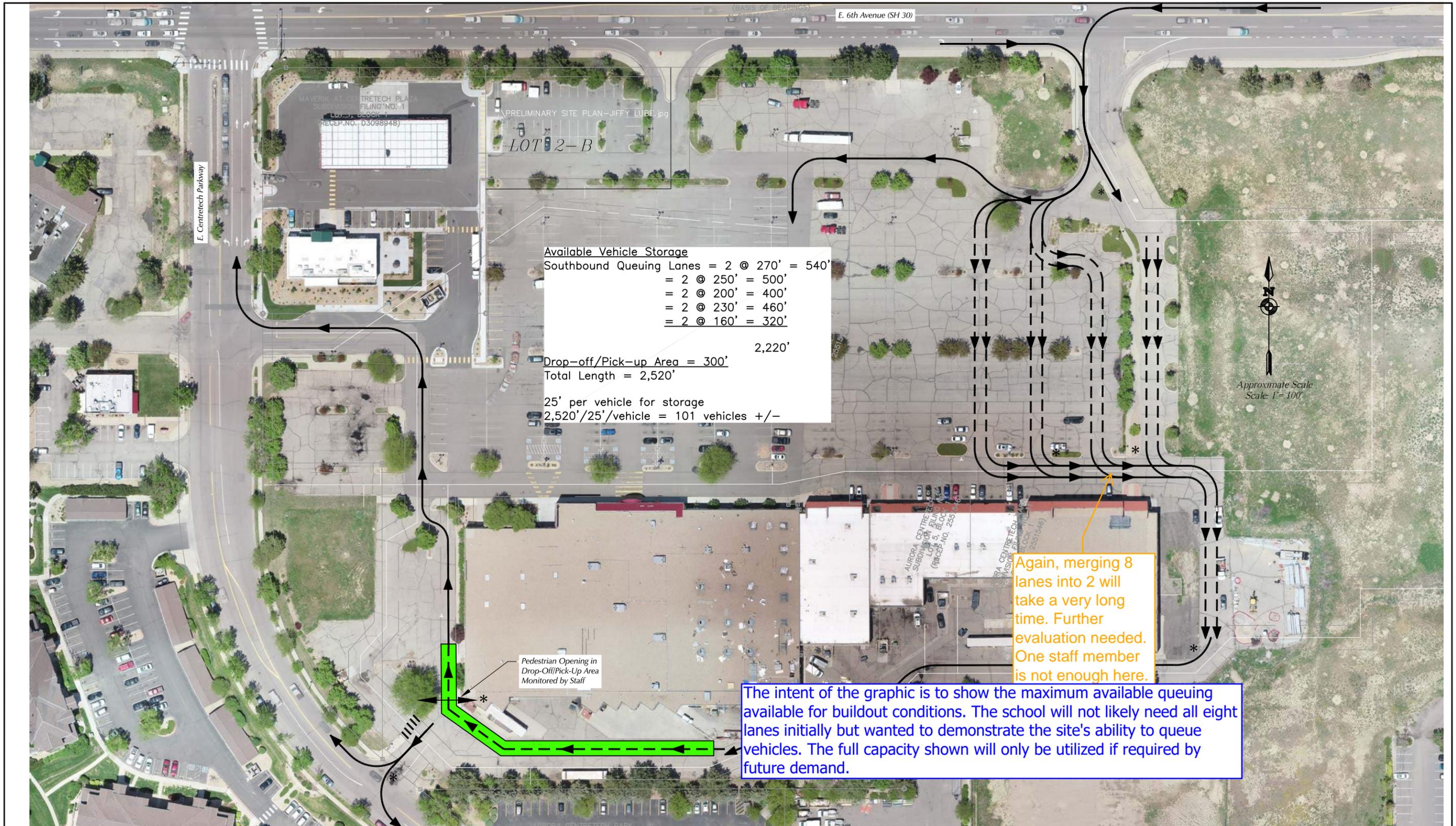
- LEGEND:
- = Circulation Route - No Stop
 - = Queuing Area
 - = Raised Median/Island for Drop-Off/Pick-Up (300 feet long)
 - = Staff/Teacher Parking (+/- 30 spaces)
 - = Parking for businesses to the west of the school (+/- 62 spaces)
 - = Parking for businesses to the east of the school (+/- 150 spaces)
 - = Potential Location of Staff/Volunteer

Notes:
 1. The morning peak hour is expected to have 156 vehicles enter the site and 139 vehicles exit the site. The roughly 97 queuing spaces in the north drop-off/pick-up area will be sufficient because the drop-off operation does not need to store all vehicles at one time because some students arrive and their parent/guardian departs the

The intent of the graphic is to show the maximum available queuing available for buildout conditions. The school will not likely need all eight lanes initially but wanted to demonstrate the site's ability to queue vehicles. The full capacity shown will only be utilized if required by future demand.

Figure 11
Circulation Plan
 for North Drop-Off/Pick-Up Area
 Aurora Community School (LSC #190680)





Available Vehicle Storage
 Southbound Queuing Lanes = 2 @ 270' = 540'
 = 2 @ 250' = 500'
 = 2 @ 200' = 400'
 = 2 @ 230' = 460'
 = 2 @ 160' = 320'
 2,220'

Drop-off/Pick-up Area = 300'
 Total Length = 2,520'

25' per vehicle for storage
 2,520'/25'/vehicle = 101 vehicles +/-

Again, merging 8 lanes into 2 will take a very long time. Further evaluation needed. One staff member is not enough here.

The intent of the graphic is to show the maximum available queuing available for buildout conditions. The school will not likely need all eight lanes initially but wanted to demonstrate the site's ability to queue vehicles. The full capacity shown will only be utilized if required by future demand.

- LEGEND:**
- ▶— = Circulation Route – No Stopping or Parking
 - - -▶ - - - = Queuing Area
 - █ = 18' Wide (300' +/-) Drop-Off/Pick-Up Area (10' Lane + 8' Pedestrian Walking Area) – located north of existing fire lane
 - * = Potential Location of Staff/Volunteer

Notes:

1. The morning peak hour is expected to have 197 vehicles enter the site and 175 vehicles exit the site. The roughly 101 queuing spaces in the south drop-off/pick-up area will be sufficient because the drop-off operation does not need to store all vehicles at one time because some students arrive and their parent/guardian departs the site before other vehicles arrive in the queue.
2. The afternoon peak hour is expected to have 100 vehicles enter the site and 118 vehicles exit the site. These 100 vehicles can be stored in the south drop-off/pick-up area.



Figure 12
Circulation Plan
 for South Drop-Off/Pick-Up Area
 Aurora Community School (LSC #190680)



LEGEND:

- ➔ = Pedestrian Route
- * = Potential Location of Staff/Volunteer to Assist Pedestrians



Figure 14

Pedestrian Routes to/from School

Aurora Community School (LSC #190680)