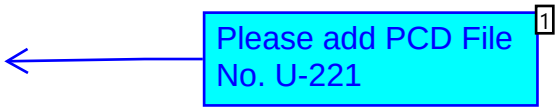
D-49 Transportation Center

Traffic Impact Study

Prepared for:
School District 49
10850 East Woodmen Road
Peyton, Colorado 808031

Contact: Mr. Bruce Brown



OCTOBER 12, 2021

LSC Transportation Consultants
Prepared by: Colleen Guillotte, P.E., PTOE, RSP
Reviewed by: Jeffrey C. Hodsdon, P.E.

LSC #S214340

Summary of Comments on LSC Responses to EPC TIS Redline comments.pdf

Page: 2

Number: 1 Author: lpackman Subject: Callout Date: 2/16/2022 12:50:50 -07'00'

Please add PCD File No. U-221

Author: jchodsdon Subject: Sticky Note Date: 4/20/2022 17:16:41

LSC Response: Added as requested.

LAND USE AND ACCESS

Figure 1 shows the site location relative to the adjacent and nearby streets and roadways. As shown, the site is located southeast of the intersection of US Hwy 24 and Meridian Road. The transportation center will be located between the existing Falcon Elementary School and Patriot High School.

Will all outbound traffic use the Falcon Hwy access? 1

The proposed transportation [illegible]ccess points, as shown in Figure 2. The primary ingress and egress wo[illegible]ne Road. Additionally, an access drive for transportation center traffic is planned. This access drive would connect south to the west access to Falcon Elementary School on Falcon Highway. This southerly access to Falcon Highway will only be for **outbound** traffic. All inbound traffic will use Swingline Road.

There is also the possibility of a future access connection to the northeast as noted in Figure 2. However, there is currently no public right-of-way to/from the northeast (except for US Hwy 24, but no direct access to US Hwy 24 will be allowed by CDOT along the District property frontage). The adjacent properties are private.

The Transportation Center is a unique trip generator because it is planned to eventually store all of the buses for D-49. Every morning and early afternoon, staff will arrive in their private vehicles and pick up the buses. Buses will be dropped off after school pick-up/drop-off is complete and staff will leave the site in their private vehicles. Shift times are discussed in the Trip Generation section of the report.

Table 1 provides short-term and long-term estimates of the number of staff and buses, based on information provided by D-49.

Please explain why there is a discrepancy between number of staff and buses?Also, the letter of intent states 300 bus stalls are being proposed. Are more buses eventually going to be added to the schedule? 2

The discrepancy is because some buses have a driver and a monitor. 300 buses is the eventual number, that will not happen for a projected 40-50 years

3

Table 1: Staff and Buses

Scenario	Staff	Buses
Short-Term	100	80
Long-Term	225	175

ACCESS SIGHT DISTANCE

The sight distance was field measured at the Falcon Elementary School access poi[illegible] Highway. The entering sight-distance measurements at both access points meet *ECM* criteria.

The sight distance to the west is unobstructed to Meridian Road. The sight distance to the east is limited by a vertical curve in the vicinity of the adjacent church access. The sight-distance field measurements for passenger vehicles are 577 feet and 746 feet for the east and west school access points, respectively. The sight distance field measurements for single-unit trucks (and school busses) are 630 feet and 794 feet for the east and west school access points, respectively.

Please provide an exhibit with sight distance lines for both design vehicles. 4

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Number: 1 Author: lpackman Subject: Callout Date: 2/17/2022 17:01:42 -07'00'

Will all outbound traffic use the Falcon Hwy access?

Author: jchodsdon Subject: Sticky Note Date: 5/6/2022 08:32:27

No, outbound traffic will use Falcon Hwy and Swingline. A third outlet to Hwy 24 is part of future planning.

Number: 2 Author: lpackman Subject: Cloud+ Date: 2/22/2022 09:50:16 -07'00'

Please explain why there is a discrepancy between number of staff and buses?Also, the letter of intent states 300 bus stalls are being proposed. Are more buses eventually going to be added to the schedule?

Number: 3 Author: Date: 5/6/2022 08:32:41

The discrepancy is because some buses have a driver and a monitor. 300 buses is the eventual number, that will not happen for a projected 40-50 years

Number: 4 Author: lpackman Subject: Text Box Date: 2/17/2022 15:21:39 -07'00'

Please provide an exhibit with sight distance lines for both design vehicles.

Author: jchodsdon Subject: Sticky Note Date: 5/7/2022 16:33:15

These have been added to the TIS report as requested.

The field-measured sight distances meet the *ECM*-prescribed distances of 450 feet and 585 feet in the *ECM* for passenger vehicles and single-unit trucks (and school busses), respectively (*ECM* Table 2-35; based on the posted speed of 45 mph).

Technical notes: The sight distance for single-unit trucks (and school busses) was measured from a drivers'-eye height of 7 1/3 feet high. The standard 3 1/2-foot-high drivers'-eye height was used for the passenger-vehicle sight-distance measurement. Note that the sight distance for school busses is met based on the 45-mph posted limit on Falcon highway, but also school speed-limit flashers operate on Falcon Highway for the beginning and ending of the school day. Therefore, the approach speed limit on Falcon Highway is significantly lower during times when loaded school busses (with children from Falcon Elementary) enter the roadway. Busses from this transportation facility would be unloaded when entering the roadway.

EXISTING ROAD AND TRAFFIC CONDITIONS

Figure 1 shows the streets adjacent to and in the vicinity of the site. Adjacent streets serving the site are identified below, followed by a brief description of each:

- **Woodmen Road** is a four-lane east/west Expressway that extends from west of Interstate 25 (I-25) to the east where it ends at the intersection with US Hwy 24. The intersections of Woodmen Road with Meridian Road, McLaughlin Road, and US Hwy 24 are all signalized.

- **US Highway 24** is a two-lane, category EX - Expressway/Major Bypass adjacent to the site that runs northeast/southwest with a 55-mile-per-hour (mph) posted speed limit. The corridor was studied in-depth in the *US Hwy 24 Planning and Environmental Linkages Study*. Two alternatives were carried forward in this study for the segment of US Hwy 24 adjacent to the site:
    - US Hwy 24 as a six-lane corridor
    - US Hwy 24 as a four-lane corridor with a peak-period shoulder lane in each direction

  Because both scenarios result in US Hwy 24 operating a six-lane road during peak hours, this has been assumed for the 2040 analysis.

- **Old Meridian Road** is a two-lane north/south Collector. The intersection with US Hwy 24 has recently been converted to a right-in/right-out intersection.

- **New Meridian Road** is a four-lane north/south Principal Arterial. The US Hwy 24 connection has recently been opened and the US Hwy 24/Old Meridian Road intersection has been converted to a right-in/right-out intersection.

When is Meridian Road expected to be built out? 1

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Number: 1 Author: lpackman Subject: Callout Date: 2/22/2022 12:56:33 -07'00'

When is Meridian Road expected to be built out?

Author: jchodsdon Subject: Sticky Note Date: 5/5/2022 19:57:04

Meridian Road has since been completed. This bullet has been revised.

- **Swingline Road** is a two-lane urban-type street. The existing roadway extends approximately 1,140 feet east of Old Meridian Road, where it ends as a cul-de-sac. An extension of Swingline Road is currently under construction between New Meridian Road and Old Meridian Road. The intersection with Old Meridian Road is currently being reconstructed as a one-lane roundabout.

  Swingline Road was platted and built with the Falcon Vista subdivision. The original PUD document does not appear to specify a classification. The *El Paso County Road System – 2019* publication identifies an Urban Area Local functional classification (FC) for this street. The street does not appear on the MTCP plan. The ROW is 80 feet and 40-foot width, which was the Collector standard circa 2000 (prior to the *ECM*). The roadway also has no direct lot residential driveways, which is also consistent with a Collector roadway. The street was constructed with vertical-type curb & gutter, similar to the current Collector standards. The sidewalks are attached, which **may** have been the Collector standard prior to the *ECM*.

- **Falcon Highway** is a two-lane east/west Major Collector that extends from US Hwy 24 to Soap Weed Road. The intersection with US Hwy 24 is signalized. The roadway has a posted speed limit of 45 mph. In the *El Paso County 2016 Major Transportation Corridors Plan*, the roadway is shown to be planned to be upgraded to an improved Minor Arterial.

Pedestrian, Bicycle, and Public Transit Access

Sidewalks currently exist on both sides of Swingline Road. In addition, sidewalks are planned to be installed along New Meridian Road with the construction and around the proposed Park-and-Ride that is being constructed north of Falcon Highway between the Old Meridian Road and New Meridian Road.

Mountain Metropolitan Transit does not have any routes in the vicinity of the study area.

The Rock Island Regional Trail is located along the north side of US Hwy 24. Likely, future connectivity to this trail and US Hwy 24 pedestrian crossings would be at the signalized intersections of (new) Meridian Road & Woodmen Road.

Existing Traffic Volumes

Figure 3 shows the results of peak-hour traffic-volume counts conducted in spring and summer 2021 at the intersections of Meridian Road/Falcon Highway, Old Meridian Road/Swingline Road, Falcon Highway/Falcon Elementary Access, US Hwy 24/Woodmen Road, and US Hwy 24/New Meridian Road. Newer counts were not collected at the intersection of US Hwy 24/Old Meridian Road because construction was still ongoing at the time. It should be noted that construction may have impacted the counts at Meridian Road/Falcon Highway and US Hwy 24/New Meridian Road.

1 Were traffic counts collected by other reports that studied the area considered?

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Number: 1 Author: lpackman Subject: Callout Date: 2/17/2022 15:48:03 -07'00'

Were traffic counts collected by other reports that studied the area considered?

Author: jchodsdon Subject: Sticky Note Date: 4/20/2022 17:20:26

Author: jchodsdon Subject: Sticky Note Date: 5/7/2022 16:36:23

This October 12, 2021 report utilized the latest count data available at the time. Since the preparation of this report, new counts have been conducted - both for other traffic reports in the area as well as new April 2022 counts at several study area intersections. Please refer to the updated Figure 3. New count data sheets **have been attached for reference.**

FUTURE BACKGROUND CONDITIONS

Background traffic is traffic that is anticipated to occur without the addition of the proposed development. Only the afternoon peak was analyzed in the future scenarios. The morning peak hour of the site doesn't coincide with the morning peak hour of the adjacent roadways. Therefore, analyzing the two morning peaks together would not represent a realistic scenario and does not make sense to analyze. Short-term background volumes were developed that adjusted traffic volumes at the study intersections for the construction of the Park-and-Ride. Figure 4 provides the resulting short-term background volumes.

Figure 5 shows the estimated long-term background traffic volumes. These projected volumes include estimates from planned future Falcon-area development and increases in through traffic volumes on the study-area roadways to be consistent with the *US Highway 24 Planning and Linkage Study* (CDOT). In the long-term scenarios, it has been assumed that US Hwy 24 has been widened to a six-lane roadway.

TRIP GENERATION

Typically, estimates of site-generated vehicle trips for the proposed development are made using the nationally-published trip-generation rates from *Trip Generation, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE). However, this site is unique and, therefore, estimates were made using information provided by D-49.

Tables 2 and 3 provide the estimated short-term and long-term peak-hour trip generation for the site, respectively. Tables 5 and 6 provide short-term and long-term detailed trip-generation estimates that include all high-volume hours of trip generation for the site, as well as a breakdown of passenger cars and buses.

As shown in the attached tables, staff are expected to arrive to the site between 5:00 and 5:30 a.m., with the buses leaving the site between 5:30-6:30 a.m. After taking children to school, the buses are expected to arrive back to the site and staff leave the site between 8:00 and 9:00 a.m. This period is the peak hour of the generator and used for all morning peak analysis.

A similar pattern is expected to occur in the afternoon, with staff arriving between 1:30 and 2:00 p.m., buses leaving between 2:00-2:30 p.m., then buses returning and staff leaving between 4:30 and 5:30 p.m. This last timeframe is the afternoon peak generator and has been used for the afternoon analysis.

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Number: 1 Author: lpackman Subject: Callout Date: 2/22/2022 09:53:21 -07'00'

Please explain how many trips are generated by parents picking up their kids since the site is located next to a high school and an elementary school. What are the peak hours for the adjacent sites and how will this traffic impact the functionality at the access points ?

Author: jchodsdon Subject: Sticky Note Date: 5/6/2022 08:38:07

The proposed land use for which this study has been prepared will not generate any parent pick-up and drop-off trips. This is a bus transportation center where buses are parked between routes and overnight. Only bus trips and district transportation employee trips will be generated by this land use.

The peak hours for the adjacent schools are: Falcon Elementary School of Technology 8:30 a.m. – 3:40 p.m.; Patriot Learning Center 8:00 a.m. – 3:00 p.m. The traffic peaks of this facility would occur prior to the end-of-day dismissal time of the Patriot Learning center and after the PM peak traffic period of Falcon Elementary School.

Table 2: Short-Term Estimated Peak-Hour Vehicle-Trip Generation

Analysis Period	Weekday		
	In	Out	Total
Morning Peak Hour	85	100	185
Afternoon Peak Hour	85	100	185

Table 3: Long-Term Estimated Peak-Hour Vehicle-Trip Generation

Analysis Period	Weekday		
	In	Out	Total
Morning Peak Hour	180	225	405
Afternoon Peak Hour	180	225	405

TRIP DISTRIBUTION AND ASSIGNMENT

Short-Term

Estimating the directional distribution of site-generated vehicle trips to the study-area roads and intersections is a necessary component in determining the site's traffic impacts. Figure 6 shows directional distribution of the site-generated vehicle trips. The directional distribution has been split because it is anticipated that staff will have a different directional distribution than the buses. Estimates for the staff directional distribution were based on existing counts, the access plan, the area road system serving the site, the site's geographic location, the Pikes Peak Area Council of Governments (PPACG) travel demand model, and previously conducted LSC studies in the vicinity.

The directional distribution for the buses was based on census data within the D-49 school boundaries. It was assumed that areas with higher density and more housing would have more buses.

Short-term site-generated traffic volumes have been estimated at the study intersections, as shown in Figure 7. These volumes have been calculated by applying the directional-distribution percentages to the trip-generation estimates (from Table 2).

Long-Term

The directional distribution was not changed for the long-term scenario. Figure 6 provides the directional distribution. Long-term site-generated traffic volumes have been estimated at the study intersections, as shown in Figure 8. These volumes have been calculated by applying the directional-distribution percentages to the trip-generation estimates (from Table 3).

Please explain what guarantees the directional distribution will remain the same if Gelbvien Road can provide both ingress and egress to the site? [1]

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Number: 1 Author: lpackman Subject: Text Box Date: 2/22/2022 10:37:18 -07'00'

Please explain what guarantees the directional distribution will remain the same if Gelbvien Road can provide both ingress and egress to the site?

Author: jchodsdon Subject: Sticky Note Date: 5/6/2022 08:39:02

The directional distribution is an estimate and as such LSC cannot guarantee distribution estimates. The estimate assigned trips to the area arterial and Collector roadways. Granted, Gelbvien Road is a local street and is open to public use. Unless part of a bus route, buses are likely to avoid Gelbvien. Should district employee use of Gelbvien for travel between Falcon Highway & Swingline Road become problematic for residents on Gelbvien, the District could likely direct employees not to use the street as a through route.

- As plans for this transportation center move forward, the access radii and width at the west Elementary School access to Falcon Highway should be checked to ensure that current standards for a school bus design vehicle are met.

- The design team is currently working on the configuration and design of the access connections to the existing cul-de-sac at the east terminus of Swingline Road.

* * * * *

Please contact me if you have any questions regarding this report.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

By Jeffrey C. Hodsdon, P.E.
Principal

JCH/CRG:jas

Enclosures: Tables 5-6
Figures 1-10
Traffic Count Reports
Level of Service Reports

References:

El Paso County Major Transportation Corridors Plan, 2016
State Highway Access Code, Volume Two, 2002, Colorado Department of Transportation
US 24 Access Control Plan, 2005
US 24/Meridian Road Construction Plans
US 24 PEL Final Corridor Conditions Report, December 2016
US 24 PEL Final Alternatives Report, October 2017

Please note: comments issued during the rezone application are precursory and more comments will be issued during the site development plan. 1

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Number: 1 Author: lpackman Subject: Text Box Date: 2/22/2022 14:42:41 -07'00'

Please note: comments issued during the rezone application are precursory and more comments will be issued during the site development plan.

Author: jchodsdon Subject: Sticky Note Date: 4/24/2022 20:35:48

LSC Response: Comment Noted.