

McLaughlin Office Building

Transportation Memorandum

Prepared for:
Darin C. Weiss, Architect AIA
Design and Development Consultants
T-Bone Construction
1310 Ford Street
Colorado Springs, CO 80915

SEPTEMBER 24, 2020

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

LSC #204590



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Level of Service Reports



LSC TRANSPORTATION CONSULTANTS, INC.
2504 East Pikes Peak Avenue, Suite 304
Colorado Springs, CO 80909
(719) 633-2868
FAX (719) 633-5430
E-mail: lsc@lsctrans.com
Website: <http://www.lsctrans.com>

September 24, 2020

Darin c Weiss, Architect AIA
Design and Development Consultants
T-Bone Construction
1310 Ford Street
Colorado Springs, CO 80915

RE: McLaughlin Office Building
Transportation Memorandum
El Paso County, Colorado
LSC #204590

Dear Mr. Weiss:

LSC Transportation Consultants, Inc. has prepared this transportation memorandum for the proposed development planned to be located east of the intersection of McLaughlin Road/Midnight Road in El Paso County, Colorado. A 4,200-square-foot medical office building is proposed for the western portion of the parcel (parcel number 4306301002). This report has been prepared for submittal to El Paso County.

REPORT CONTENTS

The preparation of this report included the following:

- Inventory of the existing adjacent and nearby roadway system. This includes functional classifications, street widths, lane configurations, intersection traffic control, posted speed limits, pavement markings, intersection and access spacing, roadway and intersection alignments, auxiliary left- and right-turn lanes, intersection sight distances, etc.;
- A review of the proposed site land use and access locations;
- Morning and evening peak-hour traffic volumes at the intersection of McLaughlin Road/Midnight Road and the Safeway access;
- Estimates of short- and long-term background traffic volumes and total traffic (site traffic plus background traffic). Forecasts include buildout of adjacent proposed developments;
- Estimates of the daily and peak-hour trip generation for the proposed land use;
- The estimated directional distribution of site-generated vehicle trips on the study-area

- roadway system;
- Projections of peak-hour site-generated turning-movement traffic volumes at the study-area intersections;
- Level of service (LOS) analysis at the study-area intersections;
- Evaluation of the short-term and long-term projected intersection volumes to determine the potential need for any new auxiliary right-/left-turn lanes and/or the adequacy of existing lanes at the site access-point intersections and the other study-area intersections; and
- Findings and recommendations.

PREVIOUS TRAFFIC STUDIES

Reports completed in the past five years in the vicinity of the study area include:

- Falcon Marketplace
- Meadowlake Ranch
- Judge Orr/Eastonville (northeast corner)
- The Ranch
- US Highway Planning and Environment Linkage Study
- Falcon Highland Taco Bell deviation request memo
- Falcon Field
- Meridian Crossing

LAND USE AND ACCESS

Figure 1 shows the site location relative to the adjacent and nearby roadways. The site plan is shown in Figure 2

Land Use

As shown in Figure 2, the development is proposed to include a 4,200-square-foot office building on the west portion of the parcel. This office building may be expanded up to an additional 1,400 square feet for a total of 5,600 square feet.

Access & Circulation

As shown, the site is planned to access the service drive which provides access to the rear of the Safeway store and other businesses to the east. The access configuration is shown in Figure 2.

INTERSECTION SIGHT DISTANCE

The development will use an existing shopping center access to McLaughlin Road. The required intersection sight distance for this access, per the El Paso County Engineering Criteria Manual (ECM) and based on Table 2-35, is 250 feet for passenger vehicles. There is also sufficient stopping sight

distance along McLaughlin for entering trucks. This access meets this minimum sight-distance criterion. The intersection line of sight “triangles” will need to be kept free of site improvements (that would limit the line of sight needed to maintain ECM prescribed sight distance). Examples of site improvements include landscaping, monument signs, parking areas, berms, etc. Obstruction height to maintain passenger car line of sight is about 18 inches. Obstruction height to maintain truck line of sight is higher as the truck “driver’s eye” is significantly higher than the “driver’s eye” for a two-passenger vehicle.

ROAD AND TRAFFIC CONDITIONS

Area Roads

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

- **McLaughlin Road** is a two-lane, non-residential Collector road that extends north from Rolling Thunder Avenue to Eastonville Road. The roadway provides retail and residential access both north and south of Woodmen Road. The posted speed limit is 25 miles per hour (mph).
- **Midnight Road** is a two-lane, non-residential Collector road that extends north from McLaughlin Road west to Eastonville Road, where it then becomes a north/south road and is classified as a Local road.

Traffic Volumes

Traffic counts were conducted in September 2020 at the study intersections. Figure 3 provides the peak-hour traffic. These volumes may be lower than Pre-Covid 19 levels.

TRIP GENERATION

Estimates of the vehicle trips projected to be generated by the proposed development have been made using the nationally published trip-generation rates from *Trip Generation, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE). The ITE land use Medical Office Building (IE Code 720) was used for the analysis. As mentioned previously, the building will initially be constructed as a 4,200-square-foot building, but may be expanded to 5,600 square feet in the future.

Table 1, below, presents a summary of the estimated site trip generation on a typical weekday during phase 1. Table 2 provides a summary of the estimated trip generation, if the building is expanded in the future. The detailed trip-generation estimate for the development, including ITE rates for the proposed land use, is presented in Table 4.

With the initial construction, approximately 74 total vehicle trips are projected to enter and exit the site at the access point (“driveway trips”) on the average weekday during a 24-hour period.

During the morning peak hour, approximately 10 vehicles would enter and 6 vehicles would exit the site. During the evening peak hour, approximately 6 vehicles would enter and 9 vehicles would exit the site.

Table 1: Phase 1 Estimated External Site Vehicle-Trip Generation (Vehicles per Hour)

Analysis Period	Total Trips		
	In	Out	Total
A.M. Peak Hour	10	6	16
P.M. Peak Hour	6	9	15
Daily/24-Hour	37	37	74

Table 2: Buildout Estimated External Site Vehicle-Trip Generation (Vehicles per Hour)

Analysis Period	Total Trips		
	In	Out	Total
A.M. Peak Hour	14	8	22
P.M. Peak Hour	7	12	19
Daily/24-Hour	64	64	128

BACKGROUND TRAFFIC

Background traffic includes growth that is projected to occur on the study roadways, due to future development in the area. Background volumes do not include projected traffic to be generated by the proposed development.

Long-term volumes have been projected assuming two percent growth per year for the through volumes on McLaughlin Road. However, changes in the area are worth noting. The area is growing and the transportation system is changing to have less emphasis on McLaughlin as a through route. Area changes include the planned new Meridian connection to US Highway 24 and removal of the signal at US Highway 24/"Old" Meridian Road. Also, a signal will be installed soon at Meridian/Eastonville Road.

Additionally, it was assumed the east half of the parcel would be developed along with the other adjacent parcels within the study area. Figure 4 shows the projected 20-year background traffic volumes for the year 2040.

TRIP DISTRIBUTION AND ASSIGNMENT

Trip Directional Distribution

Estimation of 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 5

shows the directional distribution estimates for the proposed development. Estimates were based on the following factors: existing traffic counts, existing area development, and the area roadway system.

Site-Generated Traffic

Site-generated traffic volumes at the study intersections have been calculated by applying the directional-distribution percentages estimated by LSC to the trip-generation estimates (from Table 2). To be conservative, the buildout trip generation that includes the potential future expansion was used for the analysis. Figure 5 provides the site-generated traffic for the site.

Short-Term Total Traffic Volumes

Figure 6 shows the sum of the existing traffic volumes (from Figure 3) and the site-generated peak-hour traffic volumes for the development (shown in Figure 5). These volumes represent the projected short-term total traffic following construction of development.

Long-Term Total Traffic Volumes

Figure 7 shows the projected 2040 total traffic volumes, which are the sum of 2040 background traffic volumes (from Figure 4) plus the site-generated traffic volumes (from Figure 5).

LEVEL OF SERVICE ANALYSIS

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection and is indicated on a scale from "A" to "F." LOS A is indicative of little congestion or delay. LOS F indicates a high level of congestion or delay. Table 3 shows the level of service delay ranges for signalized and unsignalized intersections.

Table 3: Intersection Levels of Service Delay Ranges

Level of Service	Signalized Intersections	Unsignalized Intersections
	Average Control Delay (seconds per vehicle)	Average Control Delay (seconds per vehicle) ⁽¹⁾
A	10.0 sec or less	10.0 sec or less
B	10.1-20.0 sec	10.1-15.0 sec
C	20.1-35.0 sec	15.1-25.0 sec
D	35.1-55.0 sec	25.1-35.0 sec
E	55.1-80.0 sec	35.1-50.0 sec
F	80.1 sec or more	50.1 sec or more
(1) For unsignalized intersections if V/C ratio is greater than 1.0 the level of service is LOS F regardless of the projected average control delay per vehicle.		

The intersection of State Highway (SH) 94/Curtis Road and the site access point have been analyzed to determine the projected control delay and corresponding levels of service for turning movements. Figure 3 provides the existing levels of service. Figure 4 provides the background levels of service for the long-term scenarios. Figure 6 and Figure 7 provide the levels of service for the short-term and long-term total traffic scenarios, respectively.

McLaughlin Road/Midnight Road

All yielding turning movements at the unsignalized intersection of McLaughlin Road/Midnight Road currently operate at LOS D or better during both peak hours, with the exception of the westbound left-turning movement. This movement currently operates at LOS E during the afternoon peak hour. In all future scenarios, this movement is expected to continue to operate at LOS E or F with potentially increasing delay and queues.

This intersection is not expected to meet signal warrants (see Figure 8 for four-hour signal warrant chart). If the westbound delay or queuing (See section on Vehicle Queuing) is found to be a significant problem in the long-term, then a potential traffic control change to all-way stop or a mini roundabout/roundabout are options for consideration. Figure 7 shows the levels of service for roundabout and all-way stop control alternatives. As shown, all movements are anticipated to operate at LOS D or better with an all-way stop in the long-term. All approaches are expected to operate at LOS A during both peak hours in the long-term total traffic scenario if the intersection is reconstructed as a roundabout.

It should be noted that this intersection is just one of two exits from the shopping center onto McLaughlin Road. Therefore, any change at this access would likely affect volumes at the south access and vice versa. All long-term solutions should consider both access points. While this study only looked at the north access, installing all-way stop control or constructing a roundabout at the one of the access points could potentially improve operations at the other as well.

Site Accesses

In all future scenarios, the access to the office building and the access to the parking lot are projected to have all movements operate at LOS B or better.

AUXILIARY TURN LANES

No additional auxiliary lanes are necessary with this proposed development.

VEHICLE QUEUING

The first internal access east of the McLaughlin Road intersection is approximately 110 feet to the east, with the second access located approximately 225 feet to the east. The westbound left turn

at the intersection of McLaughlin Road/Midnight Road currently has a 100-foot 95th percentile queue during the afternoon peak hour (Synchro-calculated). With the addition of the site, the queue is expected to remain 100 feet. In the existing and short-term total scenarios, the queue does not impact either access.

In the long-term background, the 95th percentile queue is expected to be 200 feet, which will block the first access. With the addition of the site-generated traffic, this queue is projected to be 225 feet. Neither of these queues will block the 2nd access, but both will block the first access east of McLaughlin. It should be noted that this condition is expected to exist both with and without the proposed development. Should queues periodically extend across the first internal access, a “Do Not Block Intersection” sign (R10-7) could be placed just east of the access for westbound traffic that may be queuing for the McLaughlin Road/Midnight Road intersection. Pavement markings could also be added to encourage motorists to leave a gap at the access for entering traffic to turn left into this access.

As mentioned previously, the McLaughlin Road/Midnight Road intersection is not expected to meet signal warrants. An all-way stop would reduce queuing to prevent the access from being blocked, but will cause queuing on the northbound and southbound approaches. Potential future modification of the intersection to a mini roundabout/roundabout would reduce queuing on all approaches to 50 feet or less.

MTCP ROADWAY IMPROVEMENTS

The 2016 El Paso County Major Transportation Corridor Plan does not show any planned improvements in the study area.

PEDESTRIAN AND BICYCLE ACCOMMODATION

There are currently sidewalks along McLaughlin Road adjacent to the site and along the south boundary of the parcel.

COUNTY ROAD IMPROVEMENT FEE PROGRAM

Transportation Impact Fees

Per ECM Appendix B: *State what the current applicable Transportation Impact Fees are and what option the developer will be selecting for payment.*

The applicant intends to opt out of the PID options and will pay the full-fee amount at the time of building permit. The current “full fee” is \$3,180 per 1,000 square feet of office building floor area. The total fee amount for the proposed development is \$13,356 for the initial 4,200 square foot office.

Reimbursable MTCP Improvements

There are no apparent reimbursable improvements programmed in the MTCP in the general vicinity of this site.

FINDINGS AND CONCLUSIONS

Trip Generation

- The development is expected to generate approximately 74 vehicle trips on the average weekday with approximately 16 trips occurring during the morning peak hour and 15 trips during the evening peak hour when first constructed.
- If the building is expanded to 5,600 square feet, the development would generate approximately 128 vehicle trips on the average weekday with approximately 22 trips occurring during the morning peak hour and 19 trips during the evening peak hour

Recommendations

- In the short-term future, no additional improvements should be necessary to accommodate the trips generated by this project.
- In the future, the delay for vehicles exiting the shopping center (as indicated by the LOS F for the left turn movement at the north access) during the afternoon peak hour has the potential to increase to levels deemed unacceptable for a higher percentage of patrons and employees. The LOS E (existing) and projected LOS F typically requires mitigation by El Paso County. This project and associated trip generation adds a relatively minor level of additional traffic to the McLaughlin/Midnight/north shopping center access intersection. However, this project in conjunction with developers of other vacant lots could potentially be part of a future solution to improve exiting level of service that could be programmed for implementation should delays and queues increase at either or both access points.

As this north access intersection is only one of two exits from the greater shopping center, improving either exit could potentially result in improved levels of service and operations at both. Two potential methods for mitigating E/F level of service at this north access intersection are conversion to all-way stop control (AWSC) or mini roundabout/roundabout traffic control. A future traffic signal may also be a consideration.

Should queues periodically extend across the first internal shopping center access, a "Do Not Block Intersection" sign (R10-7) could be placed just east of this internal access for westbound traffic that may be queuing for the McLaughlin Road/Midnight Road intersection. Pavement

markings could also be added to encourage motorists to leave a gap at the access for entering traffic to turn left into this access.

Auxiliary Lanes

- No additional auxiliary lanes along McLaughlin Road are required for the proposed development.

* * * * *

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

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

By: Colleen Guillotte, P.E., PTOE, RSP
Project Manager

CRG

Enclosures: Table 3
 Figures 1-7
 Level of Service Reports

Table 4: Detailed Trip Generation Estimate

Table 1: Trip Generation Rates and Total Trips Generated												
Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾						Total Trips Generated			
			Average Weekday Traffic ⁽²⁾	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour	
				In	Out	In	Out		In	Out	In	Out
Phase 1												
720	Medical/Dental Office Building	4.2 KSF ⁽²⁾	17.56	2.41	1.48	1.32	2.06	74	10	6	6	9
Buildout												
720	Medical/Dental Office Building	5.6 KSF	22.77	2.41	1.48	1.32	2.06	128	14	8	7	12
Notes:												
(1) Source: "Trip Generation, 10th Edition, 2017" by the Institute of Transportation Engineers (ITE)												
(2) KSF = thousand square feet												
Source: LSC Transportation Consultants, Inc.												



LSC TRANSPORTATION CONSULTANTS, INC.
2504 East Pikes Peak Avenue, Suite 304
Colorado Springs, CO 80909
(719) 633-2868
FAX (719) 633-5430
E-mail: lsc@lsctrans.com
Website: <http://www.lsctrans.com>

McLaughlin Office Building
Transportation Memorandum
(LSC #204590)
September 25, 2020

Traffic Engineer's Statement

This 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.

Developer's Statement

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

A handwritten signature in blue ink, consisting of a series of loops and a final flourish, is written over a horizontal line.

9-25-2020
Date