CRADER LOT 5 – SUBDIVISION TRAFFIC ASSESSMENT

Durango, Colorado

April 28th, 2021

Prepared by:
Short Elliott Hendrickson, Inc.
934 Main Ave. Unit C
Durango, CO 81301

EXECUTIVE SUMMARY

The purpose of this traffic assessment is to evaluate the traffic generated by the proposed Crader Lot 5 development and its impact on Wilson Gulch Drive, which the site's only access. The existing Crader Lot 5 Lot, which is 16.685 Acres, will be subdivided into 5 commercial lots for future development. The lots, their proposed sizes and a proposed uses and densities are as follows:

Table 1 – Lot Summary

Lot Name	Lot Acreage	Access Point	Busines Name	Development Type	Land Use Code	# Of Units	DU ksf
Lot 1 -A	2.00	West	TBD	Fast Food/with Drive In	934	1.5	1000sf
Lot 1- B	0.93	West	TBD	Variety Store - Retail	814	10	1000sf
Lot 1 - C	2.22	East	TBD	Super Market - Retail	850	24	1000sf
Lot 1 - D	5.05	West	U-Haul	Interior Self-Storage	151	80	1000sf
Lot 1 - E	5.27	East	Big-R	Tractor Supply Store	810	43	1000sf

The purpose of the table above is to realistically estimate the uses and densities of the new lots, and to ultimately determine realistic traffic projects, which in turn will determine auxiliary lane requirements at the proposed entrances on Wilson Gulch Drive. It should be note that these uses are our best estimate at this time and with commercial land development the uses and configurations may change in the future. However, the findings are unlikely to change and will be confirmed with City of Durango Staff during future Site Plan approval processes.

PRINCIPAL FINDINGS:

1. West Entrance (Full Movement)
    a. A Right Turn Deceleration will be triggered and build as a part of this development
    b. A Left Turn Lane will NOT be triggered as a part of this development.
    c. Sight distance to the East is 1125', which is sufficient.
    d. Sight distance to the West is 595' which is sufficient.

2. East Entrance (Full Movement)
    a. A Right Turn Deceleration will be triggered and build as a part of this development
    b. A Left Turn Lane will be triggered as a part of this development.
    c. Sight distance to the East is 700', which is sufficient.
    d. Sight distance to the West is 1150' which is sufficient.

Based on findings of this Traffic Assessment, SEH has designed the above turn lanes required, which are included within the sub-division engineering plan set. See plans for details.

1. INTRODUCTION

The purpose of this traffic assessment is to evaluate the traffic impacts to Wilson Gulch Drive at the proposed project access locations with respect to auxiliary lanes and sight distance. This area has undergone several Traffic Studies through the Three Springs Development and CDOT's Grandview Interchange development, each of which contemplated the macro level developments in and around this area. The purpose of this Assessment is simply to confirm the location of the proposed access points as well as the required auxiliary lanes at said access points.

a. SITE AND STUDY AREA

This traffic assessment was prepared for the proposed Crader Lot 5 Sub-Division and a future commercial tenants. The existing development occupies 16.685 acres and will be subdivided into 5 separate commercial lots, along with incidental ROW dedications to the City. This traffic assessment focuses on the three proposed access locations:

West Access Location - Located 525' east of Grandview Interchange on North property line
East Access Location - Located 550' east of West Access Location on North property

See Engineering Plans for Preliminary Site Plan and Access Point locations.

b. DEVELOPMENT LAND USE DESCRIPTIONS

Error! Reference source not found. shows an itemized list of proposed land uses for the project. While two of the land uses are known at this time; the land uses for Lots A, B, and C are still unknown at this time. However, we believe we have utilized realistic projections for the lots and once the lots and their uses are certain, we or the future development engineers will work with the City of Durango to verify that the uses remain under the thresholds for future auxiliary lane triggers, or if they do trigger improvements, those improvements will be constructed.

Table 1 – Lot Summary

Lot Name	Lot Acreage	Access Point	Busines Name	Development Type	Land Use Code	# Of Units	DU ksf
Lot 1 -A	2.00	West	TBD	Fast Food/with Drive In	934	1.5	1000sf
Lot 1- B	0.93	West	TBD	Variety Store - Retail	814	10	1000sf
Lot 1 - C	2.22	East	TBD	Super Market - Retail	850	24	1000sf
Lot 1 - D	5.05	West	U-Haul	Interior Self-Storage	151	80	1000sf
Lot 1 - E	5.27	East	Big-R	Tractor Supply Store	810	43	1000sf

The land use of the proposed development can be used with transportation engineering analyses to estimate the projected traffic volumes that will be generated by the subdivision and future development of Crader Lot 5. It was determined that ITE Land Use Codes 934, 850, 814, 810, and 151 would yield a realistic mix of traffic for the purposes of this analysis.

c. EXISTING ROADWAY

Wilson Gulch Drive

Wilson Gulch Road is an arterial road per the City of Durango Master Plan. The road section is two lanes in each direction, which are separated by a center median this planted with street trees and alternates with patterned concrete. The center median currently prohibits left turns into and out of Lot 5. As a part of the sub-division design and construction, the median will be removed, as needed, to facilitate left turns into and out of the development.

The existing speed limit on the Wilson Gulch Drive is 35mph, which yields a required sight distance of 420' for passenger vehicles and 525' for trucks, and 700' for multi-unit trucks.

Sight Distance was measured on 04/15/2021 at each location and it was determined that the West Entrance has sufficient sight distance in each direction.

The East Entrance also has sufficient sight distance. Of note the East Entrance looking East has roughly 700' of sight distance for multi-unit trucks, which is the required distance. SEH measured the distance in the field and observed WB vehicles coming into view at the required sight distance interval. Staff also set flagging at the eye height of a multi-unit truck (7.5') and were able to observe the flagging at the 700' mark in the oncoming lane at the target height of 3.5'.

Exhibit 1 – East Entrance, Sight Distance looking East

2. TRIP GENERATION AND PEAK HOUR VOLUMES

Trip generation represents the amount of traffic generated by a development. A trip is defined as a one-way vehicle movement with either the origin or destination within the proposed development. The Trip Generation Manual, also known as the ITE Manual, written by the Institute of Transportation Engineers (ITE), 9th Edition (2012), was used to estimate the projected traffic volume by the proposed development. The land use types from the ITE that were used for determining the appropriate trip generation rates, vehicular rates, and directional distributions are shown in Table 1.

Table 1: Land Use Descriptions and Trip Generation Rates

Lot Number	Development Type	Land Use Code	# Of Units	DU? ksf?	Weekday			Weekday AM Peak Hour of Generator			Weekday PM Peak Hour of Generator			Saturday			Saturday Peak Hour of Generator		
					Rate	In	Out	Rate	In	Out	Rate	In	Out	Rate	In	Out	Rate	In	Out
Lot 1 - A	Hotel	930	125	Rooms	8.36	50%	50%	0.54	54%	46%	0.61	58%	42%	8.19	50%	50%	0.72	56%	44%
						523	523		36	31		44	32		512	512		50	40
Lot 1 - B	Fast Casual Restaurant	930	3.5	1000sf	315.17	50%	50%	36.21	62%	38%	43.80	46%	54%	319	50%	50%	34.02	55%	45%
						552	552		79	48		71	83		**558**	**558**		**65**	**54**
Lot 1 - C	Fast Casual Restaurant	930	3.5	1000sf	315.17	50%	50%	36.21	62%	38%	43.80	46%	54%	319	50%	50%	34.02	55%	45%
						552	552		79	48		71	83		**558**	**558**		**65**	**54**
Lot 1 - D	Interior Self-Storage	151	80	1000sf	1.51	50%	50%	0.20	50%	50%	0.20	51%	49%	1.95	50%	50%	0.31	59%	41%
						60	60		8	8		8	8		78	20		15	10
Lot 1 - E	Tractor Supply Store	810	43	1000sf				3.17	50%	50%	3.17	50%	50%	3.17	50%	50%	3.17	50%	50%
									68	68		68	68		68	68		68	68
						In	**Out**		**In**	**Out**		**In**	**Out**		**In**	**Out**		**In**	**Out**
			Trip Volumes			**583**	**583**		**113**	**107**		**121**	**108**		**658**	**600**		**133**	**118**
					Total =		**1166**			**220**			**229**			**1258**			**251**

It should be noted that due to the commercial nature of the proposed development, that Saturday will be the highest traffic generation day for the businesses, which will offset the typical Monday-Friday Peak Day and Peak Hour Traffic Generated by US 550/160 and the adjacent Three Springs Development. This counter generation of traffic will benefit local and state traffic infrastructure by reducing and offsetting the expected overall peak in traffic through the corridor.

3. TRIP DISTRIBUTION AND TRIP ASSIGNMENT

Trip distributions for the development entrances have been estimated based on the geometry of the surrounding roads and locations of adjacent developments and major roadways. Trips generated by the individual lots within the project will be multiplied by the anticipated traffic splits to determine if an unreasonable number of right or left turns will be generated and thus trigger auxiliary lane improvements on Wilson Gulch Drive.

The following exhibits illustrate the projected vehicle directional volumes based on the access points locations and the most likely direction of the vehicles entering and exiting the project.

Exhibit 2 – West Access Point Directional Splits:
Due to the proximity of the Grandview Interchange, most of the traffic to/from the west entrance will travel to/from the West (80%) vs. traveling to/from the East (20%).

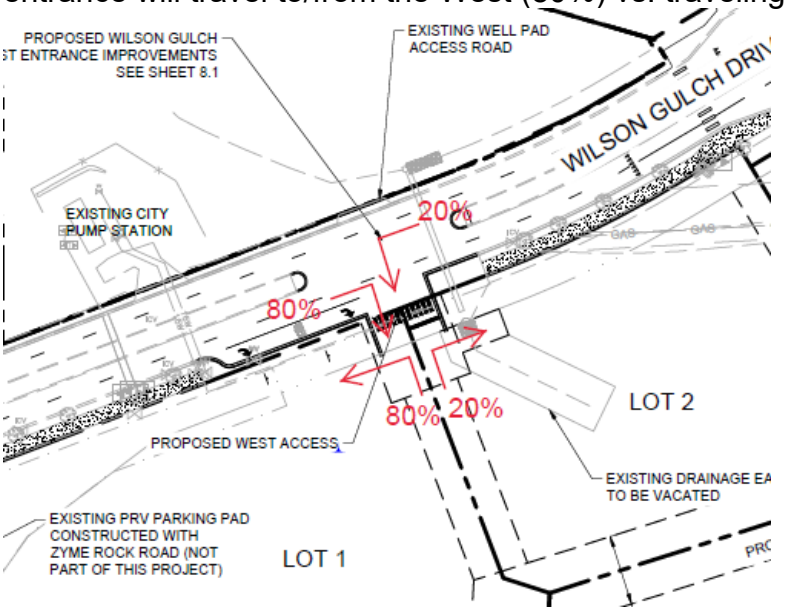
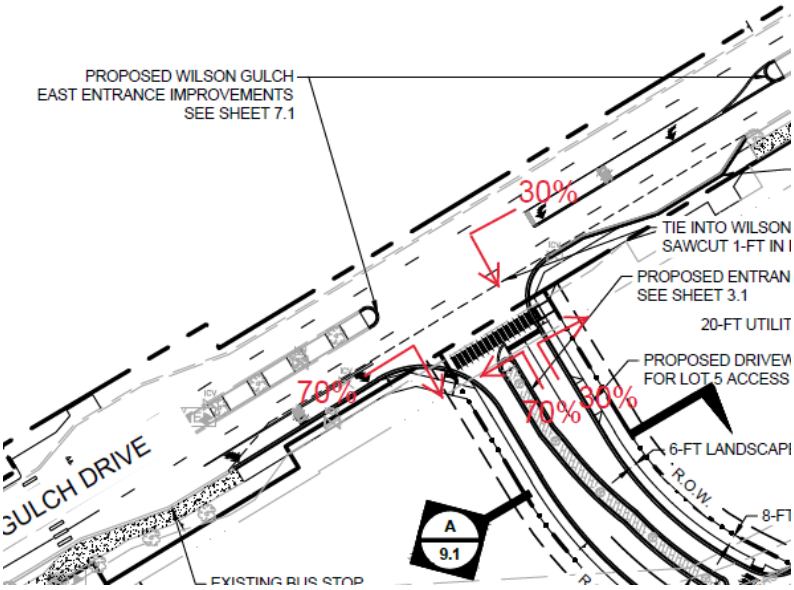


Exhibit 3 – East Access Point Directional Splits:
Due to the proximity of the Grandview Interchange, most of the traffic to/from the west entrance will travel to/from the West (70%). However, due the rural nature of the Big-R business and potential storage units serving Three Springs, additional traffic is projected to/from the East (30%) when compared to the West Entrance.



Next the proposed splits were applied to the 5 lots in tabular form to determine the number or trips that would travel to/from each lot, in each direction, at each access location. For Example, Lot 1-A takes access from the West Access point, thus 80% of its traffic travels to/from the West and 20% of its traffic travels to/from the East and 0% of its traffic utilizes the East Access point, as shown in the table below.

Table 3: Traffic Splits by Lot.

Lot	Use	Primary Access	Direction	West Full Movement Entrance (split %)		East Full Movement Entrance (split %)		Total (%)	
				In	Out	In	Out	In	Out
Lot 1 - A	Fast Food	West	Eastbound	80	20	0	0		
			Westbound	20	80	0	0	100	100
Lot 1 - B	Variety Store	West	Eastbound	80	20	0	0		
			Westbound	20	80	0	0	100	100
Lot 1 - C	Super Market	East	Eastbound	0	0	70	30		
			Westbound	0	0	30	70	100	100
Lot 1 - D	U-Haul	West	Eastbound	80	20	0	0		
			Westbound	20	80	0	0	100	100
Lot 1 - E	Big-R	East	Eastbound	0	0	70	30		
			Westbound	0	0	30	70	100	100

Lastly, the trips generated in the Saturday Peak Hour (Table 2), were multiplied by the directional percentages (Table 3) to yield the direction splits at each entrance for each lot. The totals of the lots utilizing each access location were then summed to determine the directional trips at the East and West Access locations.

Table 3: Traffic Splits by Lot.

Lot	Direction	West Full Movement Entrance (AM)		West Full Movement Entrance (PM)		East Full Movement Entrance (AM)		East Full Movement Entrance (PM)	
		In	Out	In	Out	In	Out	In	Out
Lot 1 - A	Eastbound	34	8	34	8	0	0	0	0
	Westbound	8	32	8	32	0	0	0	0
Lot 1 - B	Eastbound	30	7	30	7	0	0	0	0
	Westbound	7	30	7	30	0	0	0	0
Lot 1 - C	Eastbound	0	0	0	0	89	38	85	36
	Westbound	0	0	0	0	38	89	36	85
Lot 1 - D	Eastbound	12	2	12	2	0	0	0	0
	Westbound	3	8	3	8	0	0	0	0
Lot 1 - E	Eastbound	0	0	0	0	48	20	48	20
	Westbound	0	0	0	0	20	48	20	48
Total	Eastbound	75	18	75	18	136	58	133	57
	Westbound	19	70	19	70	58	136	57	133

The color-coded numbers above correspond to the incoming traffic into the development at each access point. Per the CDOT Access Code Wilson Gulch Drive corresponds to a Non-Rural Arterial if it was a State Highway, which allows for moderate traffic speeds with moderate to high traffic volumes. The triggers for a left turn lane is 25 vph and the trigger for a right turn lane is 50 vph. See below for a corresponding summary of the calculated volumes and the auxiliary lanes that would be triggered.

Left Turn Deceleration Lane Triggered at 25 vph per CDOT Access Code (Westbound "In" (lefts) at East Full Movement Access would trigger left turn deceleration lane, 58vph vs. 25vph trigger)

Right Turn Deceleration Lane Triggered at 50 vph per CDOT Access Code (Eastbound "In" (rights) at East Full Movement Access will trigger right turn deceration lane, 136 vph vs. 50 vph trigger)

Left Turn Deceleration Lane Triggered at 25 vph per CDOT Access Code (Westbound "In" (lefts) at West Full Movement Access would NOT trigger left turn deceleration lane, 19vph vs. 25vph trigger)

Right Turn Deceleration Lane Triggered at 50 vph per CDOT Access Code (Eastbound "In" (rights) at West Full Movement Acces would trigger right turn deceration lane, 75 vph vs. 50 vph trigger)

4. CONCLUSIONS & RECOMMENDATIONS

Based on our analysis of the development's traffic and proposed Lots, it is our opinion that the two full-movement access points meet City and CDOT spacing and development requirements with the proposed auxiliary lanes below:

1. West Entrance (Full Movement)
    a. A Right Turn Deceleration will be triggered and build as a part of this development
    b. A Left Turn Lane will NOT be triggered as a part of this development.
    c. Sight distance to the East is 1125', which is sufficient.
    d. Sight distance to the West is 595' which is sufficient.

2. East Entrance (Full Movement)
    a. A Right Turn Deceleration will be triggered and build as a part of this development
    b. A Left Turn Lane will be triggered as a part of this development.
    c. Sight distance to the East is 700', which is sufficient.
    d. Sight distance to the West is 1150' which is sufficient.

SEH has designed the above turn lanes required, which are included within the sub-division engineering plan set. See plans for details.