



Sustainable Traffic Solutions

Joseph L. Henderson PE, PTOE
Traffic Engineer / Principal

July 17, 2022

Chadwin Cox, PE
Western Engineering Consultants, Inc.
20 South 5th Avenue
Brighton, CO 80601

RE: Trip Generation Estimate for the Trailers Direct Express in Monument

Dear Chad,

Based on your request, I have prepared this traffic impact letter for the Trailers Direct Express business that will be located on the east side of Beacon Lite Road and north of the Wolf Court intersection as shown in Figure 1. Beacon Lite Road is a two lane roadway with a rural cross section and a 35 MPH speed limit in the vicinity of the site. The business will sell trailers for use in construction, landscaping, and hauling. Refer to this website for more information. <https://trailersdirectexpress.com/> The site plan is contained in Figure 2 and it shows a single access planned from Beacon Lite Road. This lot was previously occupied by ABC Landscaping and it is currently vacant. The amount of traffic generated by Trailers Direct Express is expected to be low and distributed as shown in Figure 3.

Trip Generation

In order to estimate the traffic impacts associated with this development, the amount of traffic that will be generated by the project was calculated using rates contained in the Institute of Transportation Engineers (ITE) Trip Generation manual¹ (see Table 1). Trailer sales is a very unique land use and Trip Generation doesn't have rates for that use. Rates for recreational vehicle sales were used because that land use was the closest to the trailer sales land use. The development is expected to generate 28 trips on an average weekday, two drips during the morning peak hour, and four trips during the evening peak hour.

Level of Service Analysis

To evaluate the performance of the intersections within the study area, the level of service (LOS) was calculated using PTV VISTRO software. This software package utilizes criteria described in the Highway Capacity Manual². LOS is a measure used to describe operational conditions at an intersection. LOS categories ranging from A to F are assigned based on the predicted delay in seconds per vehicle for the intersection as a whole, as well as for individual turning movements. LOS A indicates very good operations, and LOS F indicates poor, congested operations. In urban

¹ Trip Generation, 11th Edition. Institute of Transportation Engineers. September 2021.

² Highway Capacity Manual, 7th Edition. National Academy of Sciences, Engineering, and Medicine. 2022.

areas, the typical threshold for acceptable operation is LOS D. The analysis showed that the site access is expected to perform at LOS A during the morning and evening peak hours. The analysis results are attached to this letter.

Alternate Mode Analysis

There are no bike lanes or sidewalks on Beacon Lite Road, and there is no transit in Monument. Therefore, there are no alternative mode opportunities at this site.

Auxiliary Lanes

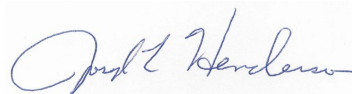
The Town's Roadway Design and Technical Criteria³ standard refers to the requirements in the State Highway Access Code⁴ (SHAC) for the need to construct auxiliary lanes. While the Town's standard doesn't identify which access category in the SHAC would apply to Beacon Lite Road, an NR-A roadway (highest access category) would not require auxiliary lanes for the volumes expected to be generated by this development. Therefore, traffic generated by this development will not require the construction of auxiliary lanes.

Conclusions

Trailers Direct Express is planning to develop a lot on the east side of Beacon Lite Road that is north of the Wolf Court intersection. The trip generation from the business is expected to be quite low which will not require the construction of auxiliary lanes. Analysis shows that the site access is expected to operate at LOS A during both peak hours and side-street stop-control will be the appropriate traffic control for this intersection.

Please contact me with questions.

Sincerely,

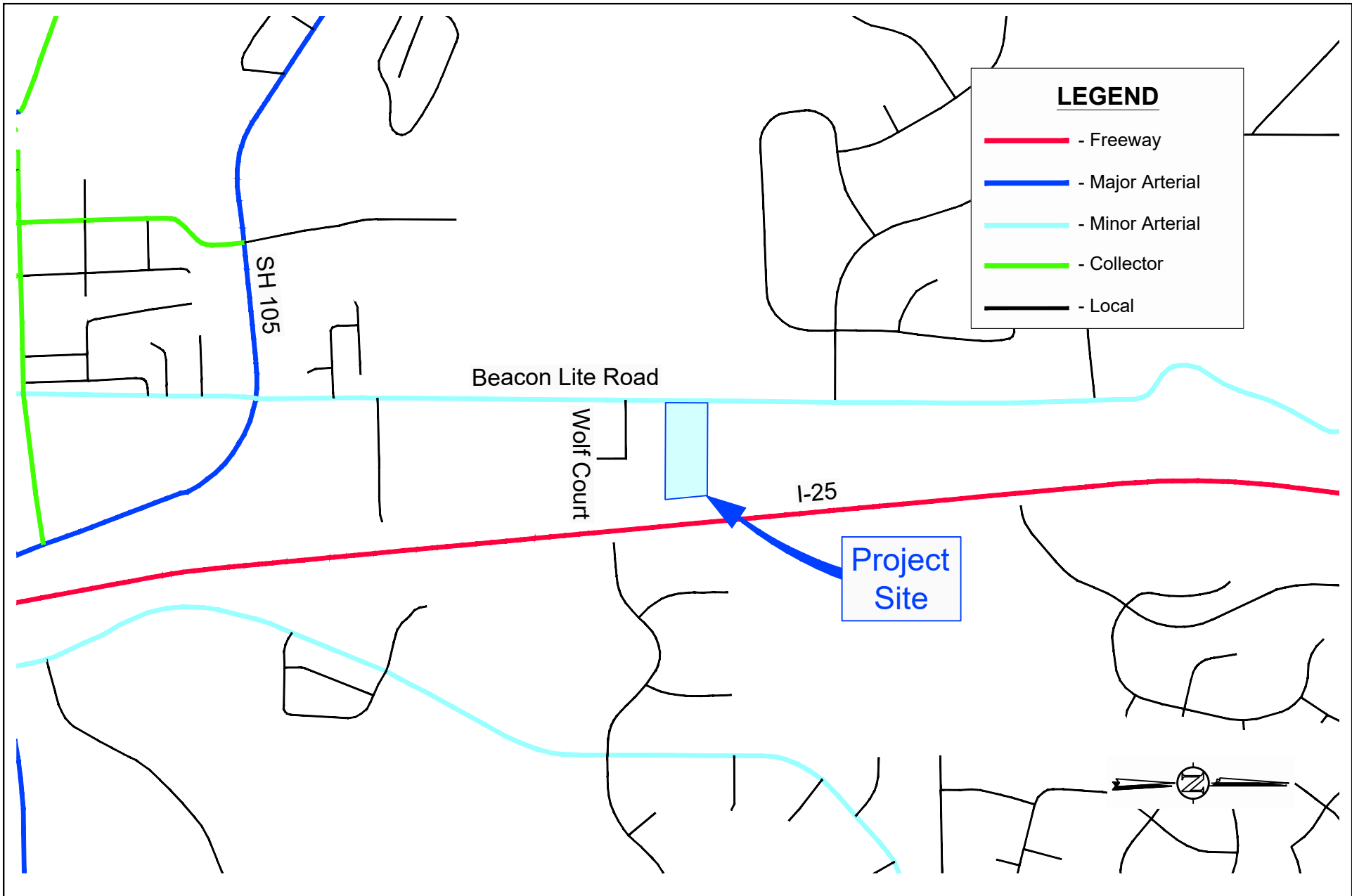


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Project Manager / Principal

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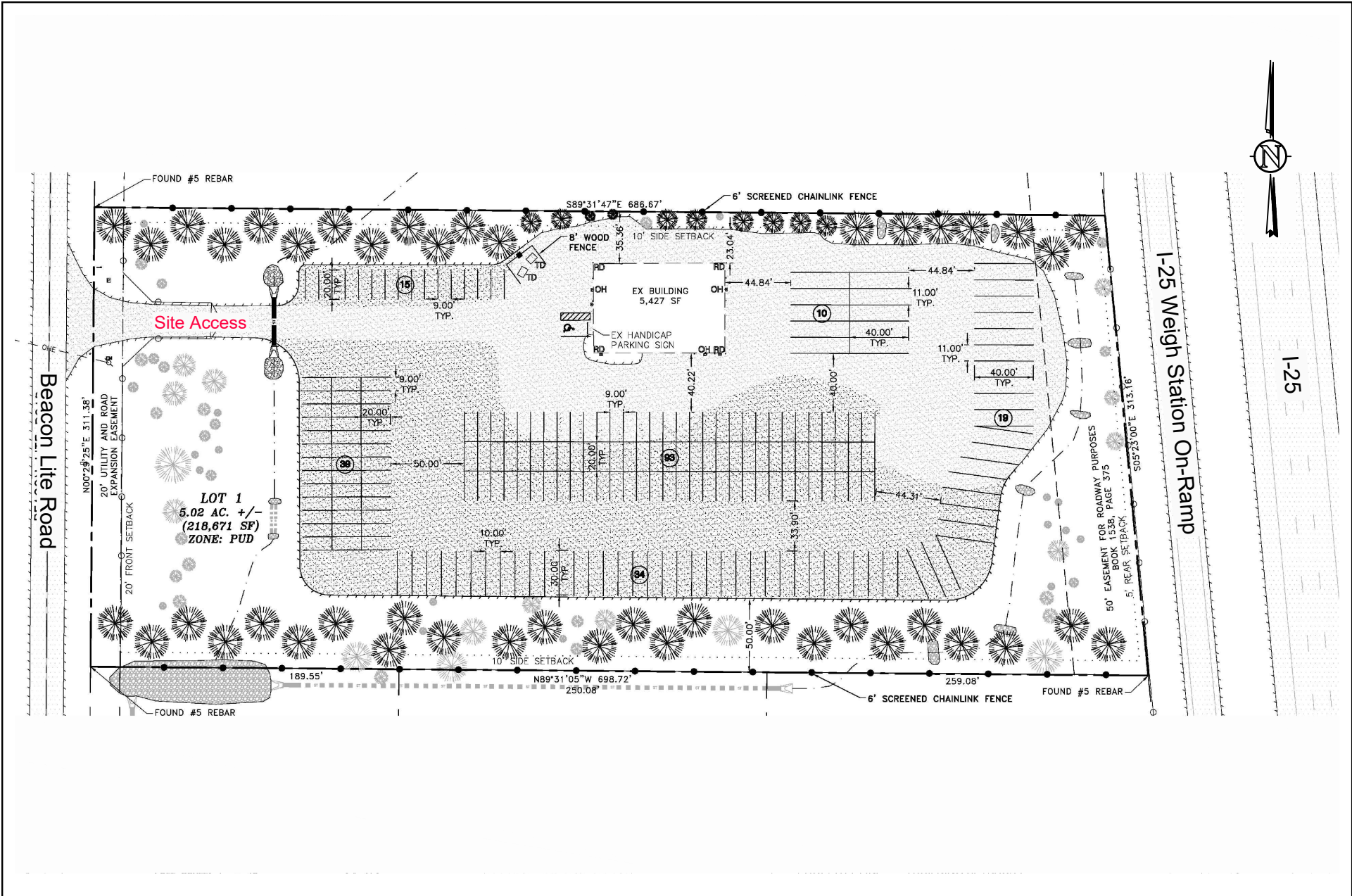
³ Roadway Design and Technical Criteria. Town of Monument. Updated October 9, 2013.

⁴ State Highway Access Code. The Transportation Commission of Colorado. Amended March 2002.



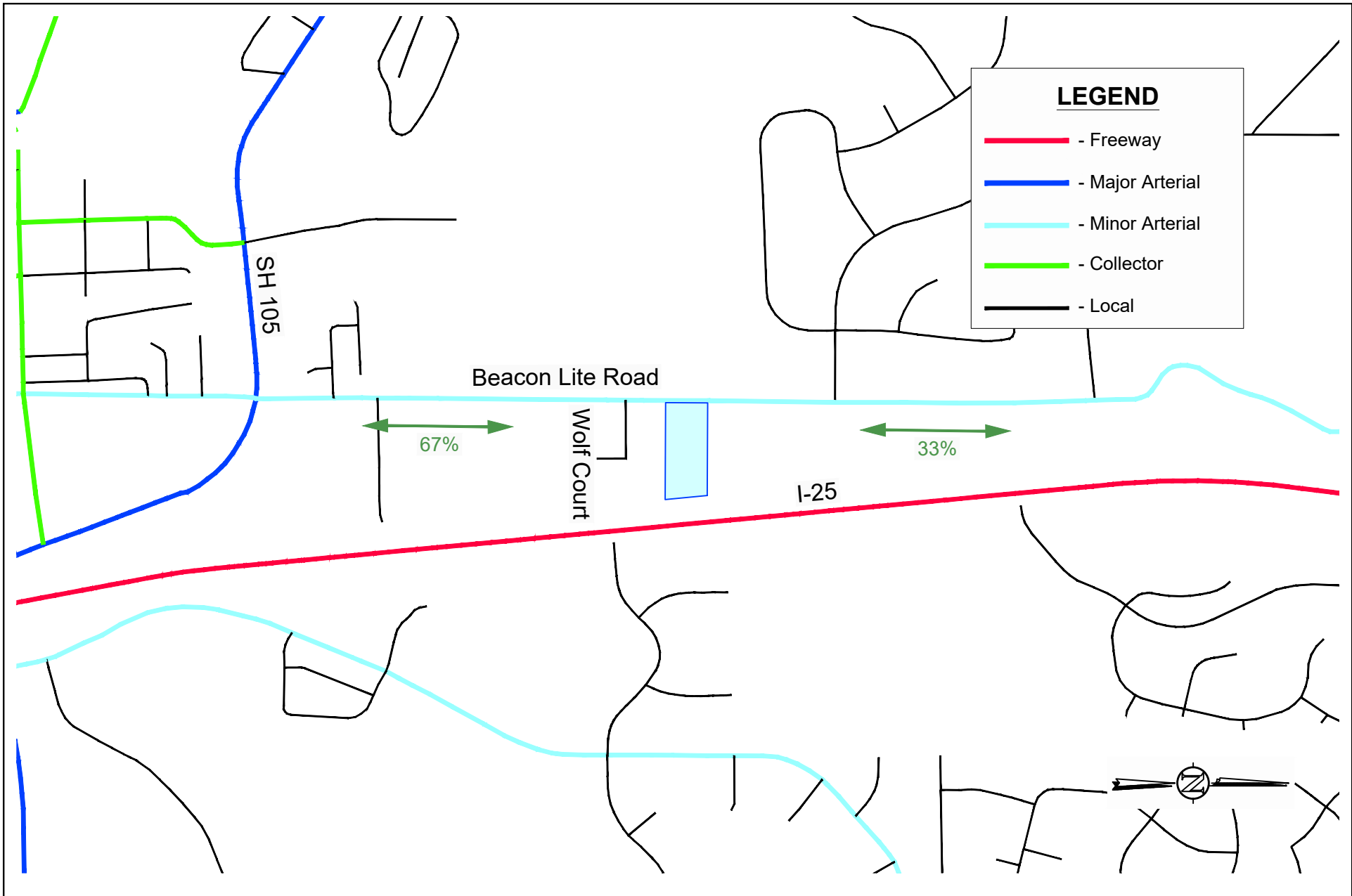
Trailers Direct Express Trip Generation Letter
VICINITY MAP

Scale	1" = 500'	Date	July 17, 2022	Drawn by	JLH	Job #	Western Engineering	Figure	1
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Trailers Direct Express Trip Generation Letter SITE PLAN

Scale	NTS	Date	July 17, 2022	Drawn by	JLH	Job #	Western Engineering	Figure	2
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Trailers Direct Express Trip Generation Letter
TRIP DISTRIBUTION

Scale	1" = 500'	Date	July 17, 2022	Drawn by	JLH	Job #	Western Engineering	Figure	3
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Table 1. Trip Generation Estimate

Land Use ²	ITE Code ¹	Size	Unit	Average Daily Trips			Morning Peak Hour Trips			Evening Peak Hour Trips		
				Rate	In	Out	Rate	In	Out	Rate	In	Out
Recreational Vehicle Sales	842	5.427	1,000 ft ²	5.00	14	14	0.46	2	0	0.77	1	3

Notes:

1. Trip generation estimates are based on rates contained in Trip Generation, 11th Edition (Institute of Transportation Engineers, September 2021).

Intersection Level Of Service Report
Intersection 1: Site Access

Control Type:	Two-way stop	Delay (sec / veh):	7.4
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.001

Intersection Setup

Name	Beacon Lite Road		Beacon Lite Road		Site Access	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	↬		↵		↶	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Beacon Lite Road		Beacon Lite Road		Site Access	
Base Volume Input [veh/h]	82	0	0	62	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	1	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	82	1	1	62	0	0
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	0	0	18	0	0
Total Analysis Volume [veh/h]	96	1	1	73	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	7.41	0.00	9.40	8.75
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.04	0.04	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.10		9.08	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.04					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 1: Site Access

Control Type:	Two-way stop	Delay (sec / veh):	9.8
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.003

Intersection Setup

Name	Beacon Lite Road		Beacon Lite Road		Site Access	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	↬		↵		↶	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Beacon Lite Road		Beacon Lite Road		Site Access	
Base Volume Input [veh/h]	88	0	0	112	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	2	1
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	88	1	0	112	2	1
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	0	0	33	1	0
Total Analysis Volume [veh/h]	104	1	0	132	2	1
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	7.42	0.00	9.81	8.81
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.28	0.28
d_A, Approach Delay [s/veh]	0.00		0.00		9.47	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.12					
Intersection LOS	A					