

LSC Responses to EPC TIS Redline Comments

Eric S. Howard
Colorado Concrete Crushing

Page 2

June 22, 2022
Transportation Memorandum

5:30 p.m. and one Saturday per month from 7:00 a.m. to noon. The operation currently has four employees but that may increase up to six in the future.

Tandem trucks and semi-trucks that are owned by third parties transport materials on and off the site throughout the operating hours. No trucks are stored on-site overnight. LSC was provided with information on the truck operations at the current facility from March 1, 2022, to May 18, 2022. **The maximum number of truck loads on a single day during that time period was 85** (17 tandem trucks and 68 semi-trucks). The average weekday (Monday through Friday) number of truck loads was 25 loads per day (18 tandem trucks and 7 semi-trucks).

The site is located just north of the Pioneer Landscape Center. The proposed recycling operation will share the existing Pioneer access to Vollmer Road located about 905 feet southwest of the future Marksheffel alignment.

EXISTING ROAD AND TRAFFIC CONDITIONS

The adjacent streets are shown in Figure 1 and are described below. Copies of the *2016 El Paso County Major Transportation Corridors Plan (MTCP)*, *2040 Roadway Plan*, and *2016 MTCP 2060 Corridor Preservation Plan* with the site location identified on them have been attached to this report.

Vollmer Road is currently a five-lane urban street within the City of Colorado Springs limits between Black Forest Road and Cowpoke Road; and a two-lane, rural, paved roadway north of Cowpoke Road extending to north of Hodgen Road. In the southbound direction, Vollmer Road has a posted speed limit of 45 mph. South of Cowpoke Road, Vollmer Road has a 40-mph posted speed limit. The *2040 El Paso County Major Transportation Corridors Plan (MTCP)* and the Sterling Ranch master traffic study show Vollmer Road as a four-lane Urban Minor Arterial in the vicinity of the site.

Existing Traffic Volumes

Figure 2 shows the existing peak-hour traffic volumes at the Pioneer access to Vollmer Road. The traffic volumes shown are based on traffic counts conducted by LSC in May 2022. The traffic-count sheets are attached.

Existing 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 represents control delay of less than 10 seconds for unsignalized intersections. LOS F represents control delay of more than 50 seconds for unsignalized intersections. Table 1 shows the level of service delay ranges.

loads or trips?

1

in the jurisdiction of the City of Colorado Springs

3

Address the recently-approved CDs and proposed improvements. Address the current use of the shoulder for right turns.

4

LSC Responses to EPC TIS Redline Comments

Page: 5

Number: 1 Author: dsdrice Subject: Callout Date: 8/1/2022 2:46:51 PM -06'00'

loads or trips?

Author: kdferrin Subject: Sticky Note Date: 1/27/2023 12:37:57 PM

LSC Response: The text has been revised to make it clear that each load results in one entering truck trip and one exiting truck trip.

Number: 2 Author: dsdrice Date: 8/1/2022 1:43:05 PM -06'00'

The maximum number of truck loads on a single day during that time period was 85

Author: jchodsdon Subject: Sticky Note Date: 1/30/2023 3:16:58 PM

LSC Notes:

- 1) We extended the data collection period through the summer and looked at the weekday daily variation in truck trips.
- 2) Given the variability of daily truck trips, the trip-generation table has been revised to reflect the 85th percentile of Weekday truck trips. These 85th Percentile calculated trips are intended for use in calculation of the peak hour "design volumes" at the site access intersection.

Number: 3 Author: dsdrice Subject: Callout Date: 8/1/2022 1:38:45 PM -06'00'

in the jurisdiction of the City of Colorado Springs

Author: kdferrin Subject: Sticky Note Date: 1/27/2023 12:38:22 PM

LSC Response: Revised as requested

Number: 4 Author: dsdrice Subject: Callout Date: 8/1/2022 1:41:01 PM -06'00'

Address the recently-approved CDs and proposed improvements. Address the current use of the shoulder for right turns.

Author: kdferrin Subject: Sticky Note Date: 1/27/2023 2:04:24 PM

LSC Response: Revised as requested

Table 1: 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 Pioneer access to Vollmer Road has been analyzed based on the unsignalized intersection analysis procedures from the *Highway Capacity Manual, 6th Edition* by the Transportation Research Board. All movements at this stop-sign-controlled intersection are currently operating at LOS B or better during the peak hours.

If 85 truck loads (not trips?) were observed, justify how traffic would be this low rather than increasing over time.

TRIP GENERATION

The site-generated vehicle trips have been estimated by LSC based on the existing operating data provided by Colorado Concrete Crushing discussed in the Land Use and Access section above. Table 2 shows the trip-generation estimates.

Table 2: Trip Generation Estimate

Vehicle Type	Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour	
		IN	OUT	IN	OUT
Passenger Cars	19	6	1	1	6
Tandem Trucks	35	2	2	2	2
Semi-Trucks	15	1	1	1	1
Total	69	9	4	4	9

LSC Transportation Consultants, Inc (June 2022) 6-22-22

The proposed recycling operation is projected to generate about 69 new external vehicle trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about nine vehicles would enter and four vehicles would exit the site. During the afternoon peak

Number: 1 Author: dsdrice Subject: Callout Date: 8/1/2022 1:43:58 PM -06'00'

If 85 **truck loads** (not trips?) were observed, justify how traffic would be this low rather than increasing over time.

← Author: kdferrin Subject: Sticky Note Date: 1/30/2023 3:18:45 PM

LSC Response: The trip generation estimate was based on the **average** truck loads (25 loads per day with 25 entering trucks and 25 exiting trucks per day) not the **maximum** truck loads.

The updated TIS contains a revised trip-generation table.

- 1) The revised table is based on expanded truck load data from March 2022 to December 2022. These data show seasonal and daily variation in truck trips.
- 2) Given the variability of daily truck trips, the trip-generation table has been revised to reflect the 85th percentile of Weekday truck trips. These 85th Percentile calculated trips are intended for use in calculation of the peak-hour "design volumes" at the site-access intersection.

The report also contains explanation regarding the potential for future growth in trip generation.

hour, which generally occurs for one hour between 4:15 and 6:15 p.m., about four vehicles would enter and nine vehicles would exit the site.

TRIP DISTRIBUTION AND ASSIGNMENT

The directional distribution of the site-generated traffic volumes on the street and roadway system serving the site is one of the most important factors in determining the site's traffic impacts. Based on information provided by Colorado Concrete Crushing, all trucks will arrive from and depart to the south on Vollmer Road. Figure 3 shows the proposed haul route, as well as the site-generated traffic volume estimate at the shared access point to Vollmer Road.

TOTAL TRAFFIC

Figure 4 shows the sum of the existing volumes from Figure 2 plus the site-generated traffic volumes from Figure 3.

LEVEL OF SERVICE ANALYSIS

The site access to Vollmer been analyzed to determine the projected intersection levels of service based on the unsignalized intersection analysis procedures from the *Highway Capacity Manual 6th Edition*. Figure 4 shows the level of service analysis results. The level of service reports are attached. All movements at this stop-sign-controlled access intersection are projected to operate at LOS C or better during the peak hours with the addition of the site-generated traffic.

CONCLUSIONS

Provide totals ¹

- The proposed recycling operation is projected to generate about 69 new external vehicle trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak hour, about nine vehicles would enter and four vehicles would exit the site. During the afternoon peak hour, about four vehicles would enter and nine vehicles would exit the site.
- Based on the projected existing plus site-generated traffic volumes and the criteria contained in the El Paso County Engineering Criteria Manual (ECM), a northbound right-turn deceleration lane is **not** projected to be warranted on Vollmer Road approaching the existing Pioneer Sand access.
- Based on the projected existing plus site-generated traffic volumes and the criteria contained in the El Paso County Engineering Criteria Manual (ECM), a southbound left-turn lane is **not** projected to be warranted on Vollmer Road approaching the existing Pioneer Sand access.

Address the current use of the shoulder for right turns. This lane should be paved per ECM 2.3.7.D, but this is up to Colorado Springs. Provide correspondence specifically addressing this and any other City requirements. ²

State the prohibition on left turns if this is the case, otherwise a left turn lane(s) (striping) may be required. Address intersection spacing and sight/stopping distances for design vehicles, etc. ³

Number: 1 Author: dsdrice Subject: Callout Date: 8/1/2022 1:46:16 PM -06'00'

Provide totals

Author: kdferrin Subject: Sticky Note Date: 1/27/2023 4:51:33 PM

LSC Response: The additional information has been provided as requested

Number: 2 Author: dsdrice Subject: Callout Date: 8/1/2022 2:00:01 PM -06'00'

Address the current use of the shoulder for right turns. This lane should be paved per ECM 2.3.7.D, but this is up to Colorado Springs. Provide correspondence specifically addressing this and any other City requirements.

Author: kdferrin Subject: Sticky Note Date: 1/30/2023 3:19:11 PM

LSC Response: Based on our discussion with the City of Colorado Springs the updated traffic memo recommends a right-turn deceleration lane be constructed.

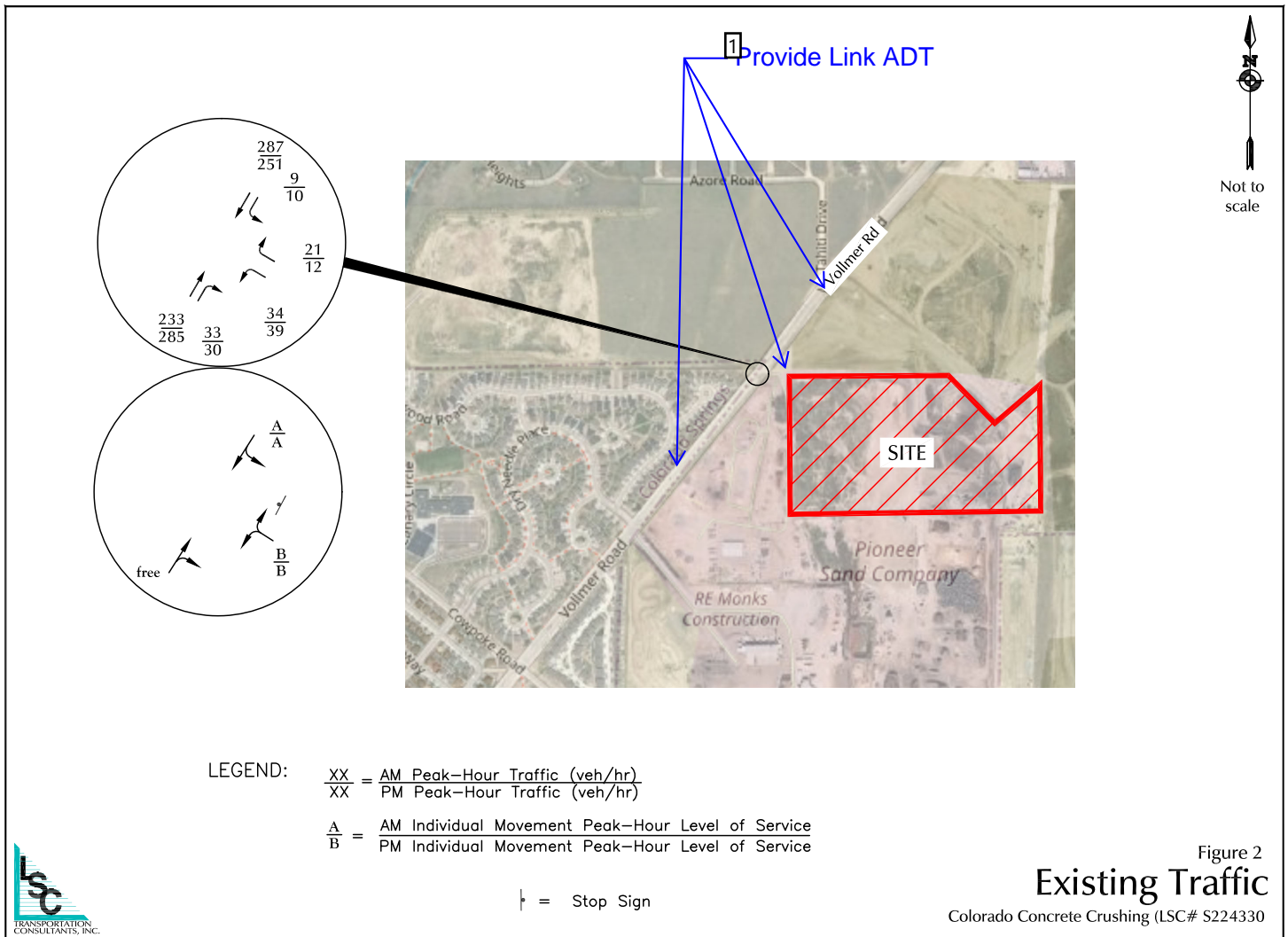
The report also contains a summary of correspondence with City Traffic Engineering.

Number: 3 Author: dsdrice Subject: Callout Date: 8/1/2022 1:51:49 PM -06'00'

State the prohibition on left turns if this is the case, otherwise a left turn lane(s) (striping) may be required. Address intersection spacing and sight/stopping distances for design vehicles, etc.


Author: kdferrin Subject: Sticky Note Date: 1/30/2023 3:19:35 PM

LSC Response: The updated memo includes a recommendation for a left-turn lane and addresses spacing and sight distance.



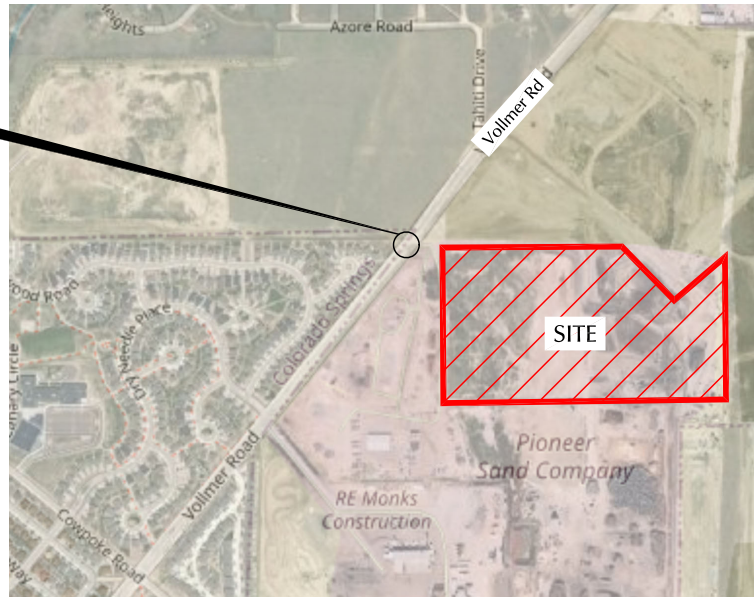
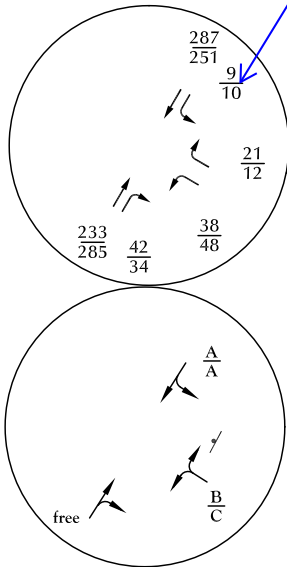
Number: 1 Author: dsdrice Subject: Callout Date: 8/1/2022 1:53:16 PM -06'00'

[Provide Link ADT](#)

 Author: kdferrin Subject: Sticky Note Date: 1/30/2023 3:19:59 PM

LSC Response: The additional information has been included as requested.

1. A left turn lane may be required based on the combination of existing and proposed traffic. If it only requires striping would it not be recommended?



LEGEND:

$\frac{XX}{XX}$ = AM Peak-Hour Traffic (veh/hr)
 $\frac{XX}{XX}$ = PM Peak-Hour Traffic (veh/hr)

$\frac{A}{B}$ = AM Individual Movement Peak-Hour Level of Service
 $\frac{A}{B}$ = PM Individual Movement Peak-Hour Level of Service

⊥ = Stop Sign

Existing plus Site-Generated Traffic


Colorado Concrete Crushing (LSC# S224330)

Figure 4



Number: 1 Author: dsdrice Subject: Callout Date: 8/1/2022 1:57:02 PM -06'00'

A left turn lane may be required based on the combination of existing and proposed traffic. If it only requires striping would it not be recommended?

 Author: kdferrin Subject: Sticky Note Date: 1/30/2023 3:20:25 PM

LSC Response: The updated memo includes a recommendation that the current approved construction drawings be modified to provide a southbound left-turn lane.

LSC Transportation Consultants, Inc.

2504 E. Pikes Peak Ave, Suite 304
 Colorado Springs, CO 80909
 719-633-2868

File Name : Vollmer Rd - Pioneer Sand Trucks AM
 Site Code : S22433
 Start Date : 5/25/2022
 Page No : 1

**Passenger Cars/
 Pickup-Trucks**

Groups Printed- Unshifted

Start Time	Vollmer Rd Southbound					Pioneer Sand Acces Westbound					Vollmer Rd Northbound					Eastbound					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
06:30	0	49	0	0	49	3	0	2	0	5	13	15	0	0	28	0	0	0	0	0	0	82
06:45	0	49	3	0	52	1	0	0	0	1	14	26	0	0	40	0	0	0	0	0	0	93
Total	0	98	3	0	101	4	0	2	0	6	27	41	0	0	68	0	0	0	0	0	0	175
07:00	0	63	1	0	64	2	0	6	0	8	5	38	0	0	43	0	0	0	0	0	0	115
07:15	0	68	1	0	69	8	0	8	0	16	7	44	0	0	51	0	0	0	0	0	0	136
07:30	0	82	2	0	84	3	0	8	0	11	9	57	0	0	66	0	0	0	0	0	0	161
07:45	0	79	1	0	80	2	0	2	0	4	5	68	0	0	73	0	0	0	0	0	0	157
Total	0	292	5	0	297	15	0	24	0	39	26	207	0	0	233	0	0	0	0	0	0	569
08:00	0	58	4	0	62	1	0	8	0	9	7	64	0	0	71	0	0	0	0	0	0	142
08:15	0	57	1	1	59	1	0	7	0	8	3	52	0	0	55	0	0	0	0	0	0	122
Grand Total	0	505	13	1	519	21	0	41	0	62	63	364	0	0	427	0	0	0	0	0	0	1008
Apprch %	0	97.3	2.5	0.2		33.9	0	66.1	0		14.8	85.2	0	0		0	0	0	0	0	0	
Total %	0	50.1	1.3	0.1	51.5	2.1	0	4.1	0	6.2	6.2	36.1	0	0	42.4	0	0	0	0	0	0	

Passenger Cars/ Pickup-Trucks

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Trucks

1

File Name : Vollmer Rd - Pioneer Sand Trucks AM

Site Code : S224330

Start Date : 5/25/2022

Page No : 1

Groups Printed- Bank 1

Start Time	Vollmer Rd Southbound					Pioneer Sand Acces Westbound					Vollmer Rd Northbound					Eastbound					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
06:30	0	0	0	0	0	3	0	2	0	5	0	0	0	0	0	0	0	0	0	0	0	5
06:45	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	1	0	1	3	0	2	0	5	0	0	0	0	0	0	0	0	0	0	0	6
07:00	0	0	0	0	0	2	0	4	0	6	0	0	0	0	0	0	0	0	0	0	0	6
07:15	0	0	0	0	0	6	0	7	0	13	1	0	0	0	1	0	0	0	0	0	0	14
07:30	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	2
07:45	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	2
Total	0	0	0	0	0	9	0	12	0	21	3	0	0	0	3	0	0	0	0	0	0	24
08:00	0	0	1	0	1	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	3
08:15	0	0	1	0	1	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	3
Grand Total	0	0	3	0	3	12	0	16	0	28	5	0	0	0	5	0	0	0	0	0	0	36
Apprch %	0	0	100	0		42.9	0	57.1	0		100	0	0	0		0	0	0	0			
Total %	0	0	8.3	0	8.3	33.3	0	44.4	0	77.8	13.9	0	0	0	13.9	0	0	0	0			

Trucks

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Passenger Cars/
Pickup-Trucks

File Name : Vollmer Rd - Pioneer Sand Trucks PM
 Site Code : S224330
 Start Date : 5/24/2022
 Page No : 1

Groups Printed- Unshifted

Start Time	Vollmer Rd Southbound					Pioneer Sand Acces Westbound					Vollmer Rd Northbound					Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
16:00	0	72	1	0	73	2	0	8	0	10	6	69	0	0	75	0	0	0	0	0	158
16:15	0	61	2	0	63	1	0	7	0	8	11	69	0	0	80	0	0	0	0	0	151
16:30	0	64	1	0	65	2	0	8	0	10	6	75	0	0	81	0	0	0	0	0	156
16:45	0	54	2	0	56	6	0	8	0	14	2	72	0	0	74	0	0	0	0	0	144
Total	0	251	6	0	257	11	0	31	0	42	25	285	0	0	310	0	0	0	0	0	609
17:00	0	60	1	0	61	1	0	9	0	10	3	58	0	0	61	0	0	0	0	0	132
17:15	0	65	2	0	67	0	0	5	0	5	1	58	0	0	59	0	0	0	0	0	131
17:30	0	50	0	0	50	2	0	21	0	23	2	68	0	0	70	0	0	0	0	0	143
17:45	0	48	1	0	49	0	0	2	0	2	0	77	0	0	77	0	0	0	0	0	128
Total	0	223	4	0	227	3	0	37	0	40	6	261	0	0	267	0	0	0	0	0	534
Grand Total	0	474	10	0	484	14	0	68	0	82	31	546	0	0	577	0	0	0	0	0	1143
Apprch %	0	97.9	2.1	0		17.1	0	82.9	0		5.4	94.6	0	0		0	0	0	0		
Total %	0	41.5	0.9	0	42.3	1.2	0	5.9	0	7.2	2.7	47.8	0	0	50.5	0	0	0	0	0	

Passenger Cars/ Pickup-Trucks

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Trucks

1

File Name : Vollmer Rd - Pioneer Sand Trucks PM

Site Code : S224330

Start Date : 5/24/2022

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Groups Printed- Bank 1

Start Time	Vollmer Rd Southbound					Pioneer Sand Acces Westbound					Vollmer Rd Northbound					Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
16:00	0	0	1	0	1	1	0	2	0	3	3	0	0	0	3	0	0	0	0	0	7
16:15	0	0	1	0	1	0	0	2	0	2	5	0	0	0	5	0	0	0	0	0	8
16:30	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	0	0	0	4
16:45	0	0	2	0	2	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	3
Total	0	0	4	0	4	1	0	4	0	5	13	0	0	0	13	0	0	0	0	0	22
17:00	0	0	1	0	1	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	3
17:15	0	0	2	0	2	0	0	2	0	2	1	0	0	0	1	0	0	0	0	0	5
17:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
17:45	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	4	0	4	0	0	3	0	3	4	0	0	0	4	0	0	0	0	0	11
Grand Total	0	0	8	0	8	1	0	7	0	8	17	0	0	0	17	0	0	0	0	0	33
Apprch %	0	0	100	0		12.5	0	87.5	0		100	0	0	0		0	0	0	0		
Total %	0	0	24.2	0	24.2	3	0	21.2	0	24.2	51.5	0	0	0	51.5	0	0	0	0	0	

Trucks

LSC Transportation Consultants, Inc.

2504 E. Pikes Peak Ave, Suite 304
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Trucks

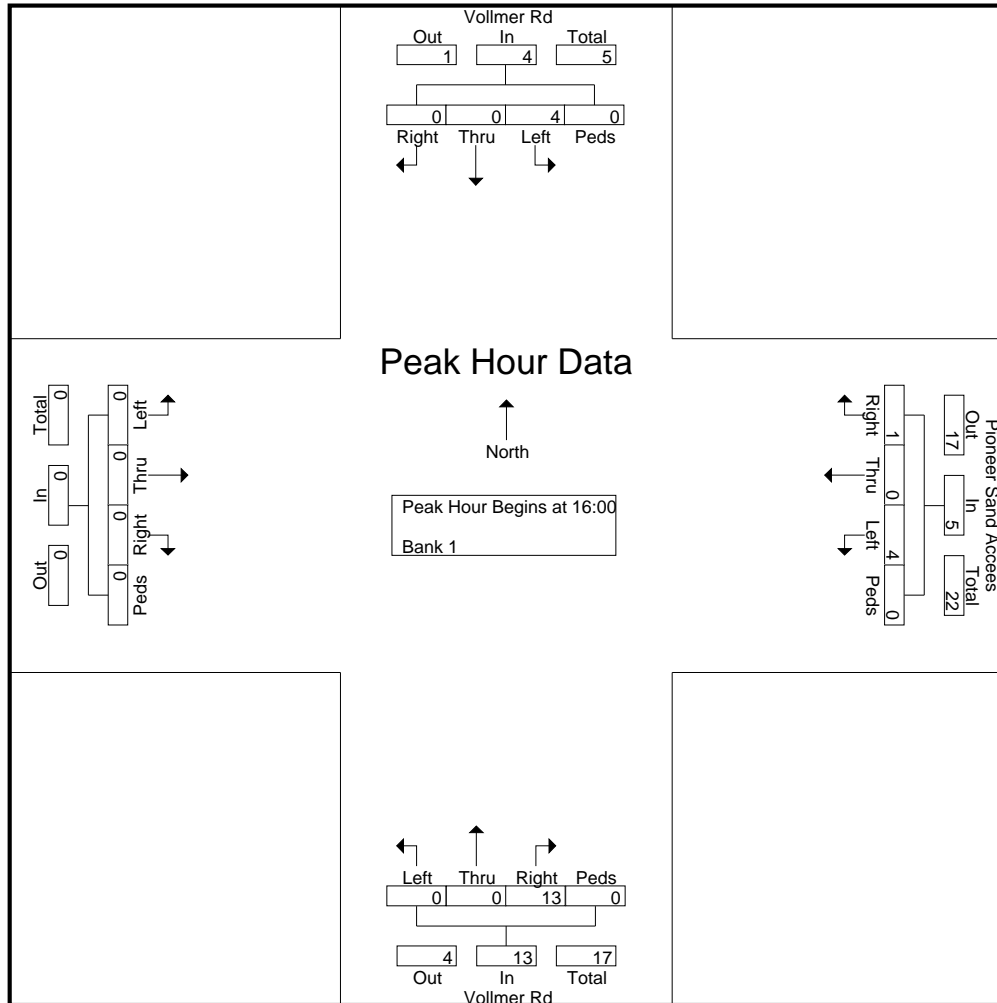
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Start Time	Vollmer Rd Southbound					Pioneer Sand Accesses Westbound					Vollmer Rd Northbound					Eastbound					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
Peak Hour Analysis From 4:00:00 PM to 5:45:00 PM - Peak 1 of 1																						
Peak Hour for Entire Intersection Begins at 4:00:00 PM																						
4:00:00 PM	0	0	1	0	1	1	0	2	0	3	3	0	0	0	3	0	0	0	0	0	0	7
4:15:00 PM	0	0	1	0	1	0	0	2	0	2	5	0	0	0	5	0	0	0	0	0	0	8
4:30:00 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	0	0	0	0	4
4:45:00 PM	0	0	2	0	2	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	3
Total Volume	0	0	4	0	4	1	0	4	0	5	13	0	0	0	13	0	0	0	0	0	0	22
% App. Total	0	0	100	0		20	0	80	0		100	0	0	0		0	0	0	0	0		
PHF	.000	.000	.500	.000	.500	.250	.000	.500	.000	.417	.650	.000	.000	.000	.650	.000	.000	.000	.000	.000	.000	.688



Trucks