Karman Line

Transportation Memorandum

Prepared for:
Mr. Craig Dossey
Vertex
455 East Pikes Peak Avenue, Suite 101
Colorado Springs, CO 80909

AUGUST 14, 2023

LSC Transportation Consultants
Prepared by: Kirstin D. Ferrin, P.E.
Reviewed by: Jeffrey C. Hodsdon, P.E.

LSC #S234150

CONTENTS

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August 14, 2023

Mr. Craig Dossey
Vertex
455 East Pikes Peak Avenue, Suite 101
Colorado Springs, CO 80909

RE: Karman Line
Transportation Memorandum
Colorado Springs, CO
LSC #S234150

Dear Mr. Dossey,

In response to your request, LSC Transportation Consultants, Inc. has prepared this transportation memorandum for proposed Karman Line Master Plan. As shown in Figure 1, the site is located north of Bradley Road and west of Curtis Road in Colorado Springs, Colorado.

REPORT CONTENTS

This memorandum has been prepared to address the project's traffic impact.

This report contains the following:

- The existing street and traffic conditions in the site's vicinity including the street widths, lane geometries, traffic controls, and existing traffic counts at key area intersections;
- The estimated average weekday and peak-hour trip generation; and
- The estimated directional distribution of site-generated trips and the projected site-generated traffic volumes;

AREA DEVELOPMENTS

Figure 2 shows the location of known future major developments in the vicinity of the proposed Karman Line Master Plan.

LAND USE AND ACCESS

The site location is shown in Figure 1. Figure 2 presents a context map showing other area developments. The site plan for Karman Line is shown in Figure 3.

Land Use

Figure 3 shows the proposed Karman Line Master Plan. The site planned to be developed with a mix of residential, commercial industrial, and office uses. The total number of residential dwelling units within the Master Plan area is 6,500. About 105.12 acres are planned for commercial/retail uses and about 45.58 acres are planned for light industrial/office uses. Table 1 shows the land use assumed for each planning area.

Access

Six full-movement access points are proposed to Bradley Road and Curtis Road. All of the proposed access points are spaced greater than the ¼-mile spacing (1,320') except for the north Road 1/Curtis Road intersection which is about 1,051 feet south of Book Drive and the proposed access to the light industrial parcel (P-21) which is located about 1,193 feet north of Book Drive.

STREET AND TRAFFIC CONDITIONS

Area Streets

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.

- **Powers Boulevard** (State Highway 21) is classified as a Freeway (FW). Powers Boulevard is one of the region's main north/south corridors. Powers Boulevard has a center median and a posted speed limit of 60 miles per hour (mph) north of Crestera Parkway. South of this point, the posted speed limit is 65 mph. Powers Boulevard is ultimately planned to be converted to a Freeway with grade-separated intersections.
- **State Highway (SH) 94** is a two-lane roadway that extends east from US Highway (US Hwy) 24 to US Hwy 40. SH 94 is classified as a Principal Arterial (NR-A) and has a speed limit of 55 mph. The El Paso County Major Transportation Corridors Plan (MTCP) shows SH 94 as a four-lane road in 2040 from the US Hwy 24 to Slocum Road. The intersection of Curtis Road/SH 94 is signalized with auxiliary lanes for all turning movements.
- **Curtis Road** is a two-lane roadway that extends from Bradley Road to Judge Orr Road. The roadway is classified as a Minor Arterial south of SH 94. The posted speed limit is 55 mph adjacent to the site.
- **Bradley Road** is shown with a Minor Arterial classification on the 2016 2040 El Paso County *Major Transportation Corridors Plan (MTCP)*. Adjacent to the site, Bradley Road is a two-lane roadway with a 55-mph posted speed limit and has an edge-of-asphalt median, left-turn lanes, and rural paved shoulders.
- **Marksheffel Road** extends north from the Link Road/C&S Road intersection in Fountain, Colorado to north of Woodmen Road. It has recently been upgraded north and south of Bradley Road with a PPRTA project and is shown as a four-lane Expressway on the *MTCP*. The posted speed limit on Marksheffel Road in the vicinity of Bradley Road is 55 mph.

Existing Traffic Volumes

Figure 4 shows the existing traffic volumes at the intersections of Powers Boulevard/Bradley Road, Marksheffel Road/Bradley Road based on the attached traffic counts conducted by LSC in March 2021 and March 2023. The 2021 traffic-count data for the intersections of Powers/Bradley and Marksheffel/Bradley have been adjusted based on the more recent counts conducted at Legacy Hill/Bradley in February 2023. Figure 4 also shows traffic counts at the intersection of SH 94/Curtis Road based on the traffic counts conducted by LSC in October 2017.

Figure 4 also shows the 2021 Colorado Department of Transportation (CDOT) Average Annual Daily Traffic Volume (AADT) on Powers Boulevard and estimates of the average daily traffic volume on Bradley Road and Marksheffel Road based on the peak-hour traffic counts.

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 and signalized intersections. LOS F represents control delay of more than 50 seconds for unsignalized intersections and more than 80 seconds for signalized intersections. Table 2 shows the level of service delay ranges.

Table 2: Intersection Levels of Service Delay Ranges

	Signalized Intersections	Unsignalized Intersections
Level of Service	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 intersections of Powers/Bradley and Marksheffel/Bradley have been analyzed using Synchro. Figure 3 shows the level of service analysis results. The intersection of Legacy Hill Drive/Bradley Road has been analyzed based on the unsignalized method of analysis from the *Highway Capacity Manual, 6th Edition* by the Transportation Research Board.

All movements at the signalized intersections of Powers/Bradley and Marksheffel/Bradley are currently operating at LOS D or better during the peak hours.

The northbound left-turn movement at the stop-sign-controlled intersection of Legacy Hill/Bradley is currently operating at LOS D during the morning peak hours and LOS E during the afternoon peak hour.

TRIP GENERATION

The site-generated vehicle trips were estimated using the nationally-published trip-generation rates from *Trip Generation, 11th Edition, 2021* by the Institute of Transportation Engineers (ITE). Table 1 shows the average weekday and peak-hour trip-generation estimates.

The total number of external vehicle trips generated by the land uses has been reduced to account for the internal vehicle trips made within the site between land uses, without use of the external streets surrounding the site. The percentage of internal trips between the residential uses and the retail uses was estimated based on the NCHRP 684 Internal Trip Capture Estimation Tool. The percentage of internal trips related to the school site and the amenity center are estimates by LSC based on the proposed number of dwelling units. Appendix Table 1 shows the percentage of internal trips assumed for each land use.

The total number of vehicle trips generated has also been reduced to account for the "pass-by" phenomena. A pass-by trip is made by a motorist who would already be on the adjacent roadways regardless of the proposed development, but who stops in at the site while passing by. The motorist would then continue on his or her way to a final destination in the original direction. The pass-by percentages shown in Table 2 are from the *Trip Generation Handbook - An ITE Proposed Recommended Practice, 3rd Edition*, 2017 by ITE. As shown in Appendix Table 1, 34 percent of the retail trips were assumed to be pass-by trips.

At buildout, Karman Line is projected to generate about 70,171 new external vehicle trips on the average weekday, with about half entering and half exiting the site. During the morning peak hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 1,503 vehicles would enter and 2,918 vehicles would exit the site. During the afternoon peak hour, which generally occurs for one hour between 4:15 and 6:15 p.m., about 4,145 vehicles would enter and 3,174 vehicles would exit the site.

TRIP DISTRIBUTION AND ASSIGNMENT

The directional distribution of the site-generated traffic volumes on the adjacent roadway system is one of the most important factors in determining the traffic impacts of the site. Figure 5 shows the long-term directional distribution of new, external traffic projected to be generated by the site.

The long-term directional-distribution estimates were based on the anticipated regional development and future roadway networks, as shown on the attached map from the PlanCOS.

When the distribution percentages (from Figure 5) are applied to the trip-generation estimates (from Table 1), the resulting site-generated traffic volumes can be determined. Figures 6 and 7 show the projected daily site-generated traffic volumes on key links in the study area.

ROADWAY CLASSIFICATION

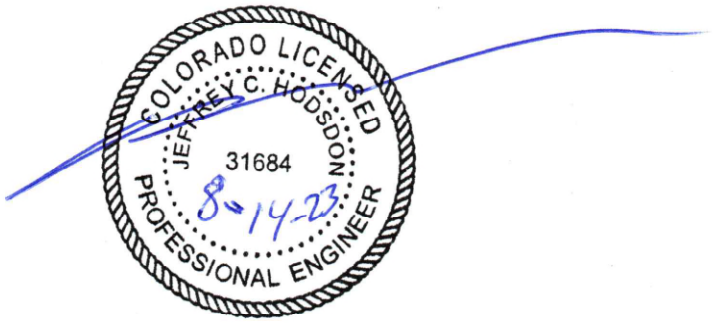
Figure 8 shows the recommended Roadway classification for the internal roadways.

* * * * *

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

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.



By Jeffrey C. Hodsdon, P.E.
Principal

JCH/KDF:jas

Enclosures: Table 1
Figures 1-8
Traffic Count Reports
Level of Service Reports
Appendix Table 1
NCHRP 684 Internal Trip Capture Estimation Tool
Pages from PlanCOS_2020

Table 1

TRANSPORTATION
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Table 2
Trip Generation Estimate
Karman Line

Planning Area	Area (Acres)	Use Type	Density (DU/Acre) or F.A.R.	Land Use Code	Land Use Description	Trip Generation Units		Trip Generation Rates [1] Average Weekday Traffic	Morning Peak-Hour In	Morning Peak-Hour Out	Afternoon Peak-Hour In	Afternoon Peak-Hour Out	Total Trips Generated Average Weekday Traffic	Morning Peak-Hour In	Morning Peak-Hour Out	Afternoon Peak-Hour In	Afternoon Peak-Hour Out
P-1	6.58	Commercial/Retail	0.17	820	Shopping Center (>150 KSF)	49	KSF[2]	37.01	0.52	0.32	1.63	1.77	1,813	26	15	80	87
P-2	4.65	Commercial/Retail	0.17	820	Shopping Center (>150 KSF)	34	KSF	37.01	0.52	0.32	1.63	1.77	1,258	18	11	55	61
P-3	6.00	Mixed-Use	17	220	Multifamily Housing (Low-Rise)	102	DU[3]	6.74	0.10	0.30	0.32	0.19	687	10	31	33	19
P-4	11.39	Mixed-Use	17	220	Multifamily Housing (Low-Rise)	195	DU	6.74	0.10	0.30	0.32	0.19	1,314	19	59	63	36
P-5	9.89	Commercial/Retail	0.17	820	Shopping Center (>150 KSF)	73	KSF	37.01	0.52	0.32	1.63	1.77	2,702	38	23	119	129
P-6	21.13	Commercial/Retail	0.17	820	Shopping Center (>150 KSF)	156	KSF	37.01	0.52	0.32	1.63	1.77	5,774	81	50	255	275
P-7	7.32	Commercial/Retail	0.17	820	Shopping Center (>150 KSF)	54	KSF	37.01	0.52	0.32	1.63	1.77	1,999	28	17	88	96
P-8	22.89	Commercial/Retail	0.17	820	Shopping Center (>150 KSF)	170	KSF	37.01	0.52	0.32	1.63	1.77	6,292	89	54	277	301
P-9	6.94	Commercial/Retail	0.17	820	Shopping Center (>150 KSF)	51	KSF	37.01	0.52	0.32	1.63	1.77	1,888	27	16	83	90
P-10	12.18	Mixed-Use	17	220	Multifamily Housing (Low-Rise)	208	DU	6.74	0.10	0.30	0.32	0.19	1,402	20	63	67	39
P-11	6.69	Mixed-Use	17	220	Multifamily Housing (Low-Rise)	114	DU	6.74	0.10	0.30	0.32	0.19	768	11	35	37	21
P-12	17.62	Commercial/Retail	0.17	820	Shopping Center (>150 KSF)	130	KSF	37.01	0.52	0.32	1.63	1.77	4,811	68	41	212	230
P-13	26.20	Mixed-Use	17	220	Multifamily Housing (Low-Rise)	447	DU	6.74	0.10	0.30	0.32	0.19	3,013	43	136	144	84
P-14	53.67	High Density	17	220	Multifamily Housing (Low-Rise)	917	DU	6.74	0.10	0.30	0.32	0.19	6,181	88	279	295	173
P-15	36.97	Mixed-Use	17	220	Multifamily Housing (Low-Rise)	631	DU	6.74	0.10	0.30	0.32	0.19	4,253	61	191	203	119
P-16	4.94	Commercial/Retail	0.17	820	Shopping Center (>150 KSF)	37	KSF	37.01	0.52	0.32	1.63	1.77	1,369	19	12	60	66
P-17	28.72	High Density	17	220	Multifamily Housing (Low-Rise)	490	DU	6.74	0.10	0.30	0.32	0.19	3,303	47	149	157	93
P-18	45.54	Medium Density	8	210	Single Family Detached Housing	354	DU	9.43	0.18	0.53	0.59	0.35	3,338	62	186	210	123
P-19	45.58	Medium Density	8	210	Single Family Detached Housing	354	DU	9.43	0.18	0.53	0.59	0.35	3,338	62	186	210	123
P-20	46.67	Medium Density	8	210	Single Family Detached Housing	362	DU	9.43	0.18	0.53	0.59	0.35	3,414	63	190	214	126
P-21	45.58	Light Industrial/Office	0.17	110	General Light Industrial	338	KSF	4.87	0.65	0.09	0.09	0.56	1,646	220	30	31	189
P-22 & P-40	38.57	Rural Residential	1	210	Single Family Detached Housing	30	DU	9.43	0.18	0.53	0.59	0.35	283	5	16	18	10
P-23 & P-39	76.93	Rural Residential	1	210	Single Family Detached Housing	60	DU	9.43	0.18	0.53	0.59	0.35	566	11	31	36	20
P-24	28.28	Low Density	5	210	Single Family Detached Housing	132	DU	9.43	0.18	0.53	0.59	0.35	1,245	23	69	78	46
P-25	37.56	Medium Density	8	210	Single Family Detached Housing	292	DU	9.43	0.18	0.53	0.59	0.35	2,754	51	153	173	101
P-26	21.40	Medium Density	8	210	Single Family Detached Housing	166	DU	9.43	0.18	0.53	0.59	0.35	1,565	29	87	98	58
P-27	111.21	Low Density	5	210	Single Family Detached Housing	518	DU	9.43	0.18	0.53	0.59	0.35	4,885	91	272	307	180
P-28	26.60	Low Density	5	210	Single Family Detached Housing	124	DU	9.43	0.18	0.53	0.59	0.35	1,169	22	65	73	44
P-29	21.87	Low Density	5	210	Single Family Detached Housing	102	DU	9.43	0.18	0.53	0.59	0.35	962	18	53	60	36
P-30	43.31	Low Density	5	210	Single Family Detached Housing	202	DU	9.43	0.18	0.53	0.59	0.35	1,905	35	106	120	70
P-31	12.45	Medium Density	8	210	Single Family Detached Housing	97	DU	9.43	0.18	0.53	0.59	0.35	915	17	51	57	34
P-32	39.11	Low Density	5	210	Single Family Detached Housing	182	DU	9.43	0.18	0.53	0.59	0.35	1,716	32	95	108	63
P-33	48.79	Rural Residential	1	210	Single Family Detached Housing	38	DU	9.43	0.18	0.53	0.59	0.35	358	7	20	23	13
P-34	30.90	Rural Residential	1	210	Single Family Detached Housing	24	DU	9.43	0.18	0.53	0.59	0.35	226	4	13	14	9
P-35	64.91	Low Density	5	210	Single Family Detached Housing	302	DU	9.43	0.18	0.53	0.59	0.35	2,848	53	158	179	105
P-36	21.21	Rural Residential	1	210	Single Family Detached Housing	16	DU	9.43	0.18	0.53	0.59	0.35	151	3	8	9	6
P-37	38.23	Rural Residential	1	210	Single Family Detached Housing	30	DU	9.43	0.18	0.53	0.59	0.35	283	5	16	18	10
P-38	14.59	Rural Residential	1	210	Single Family Detached Housing	11	DU	9.43	0.18	0.53	0.59	0.35	104	2	6	7	3
---	20.07	School	---	520	Elementary School	600	Students	2.27	0.40	0.34	0.07	0.09	1,362	240	204	44	52
				522	Middle School/Junior High School	500	Students	2.10	0.36	0.31	0.07	0.08	1,050	181	154	36	39
---	6.71	Amenity Center	---	495	Recreational Community Center	10	KSF	28.82	1.26	0.65	1.18	1.33	288	13	6	12	13
												Total Trips	**85,198**	**1,942**	**3,357**	**4,363**	**3,392**
												Internal Trips[4]	5,824	439	439	218	218
												External Trips (Total Trips - Internal Trips)	79,374	1,503	2,918	4,145	3,174
												Passby Trips[4]	9,203	105	105	419	419
												New External Trips (External Trips - Passby Trips)	**70,171**	**1,398**	**2,813**	**3,726**	**2,755**

Notes:

(1) Source: based on *Trip Generation*, 11th Edition, 2021 by the Institute of Transportation Engineers (ITE)

(2) KSF = 1,000 square feet

(3) DU = dwelling unit

(4) See Appendix Table 1 for internal and passby trip calculations

Source: LSC Transportation Consultants, Inc. *Aug-23*

Figures 1-8

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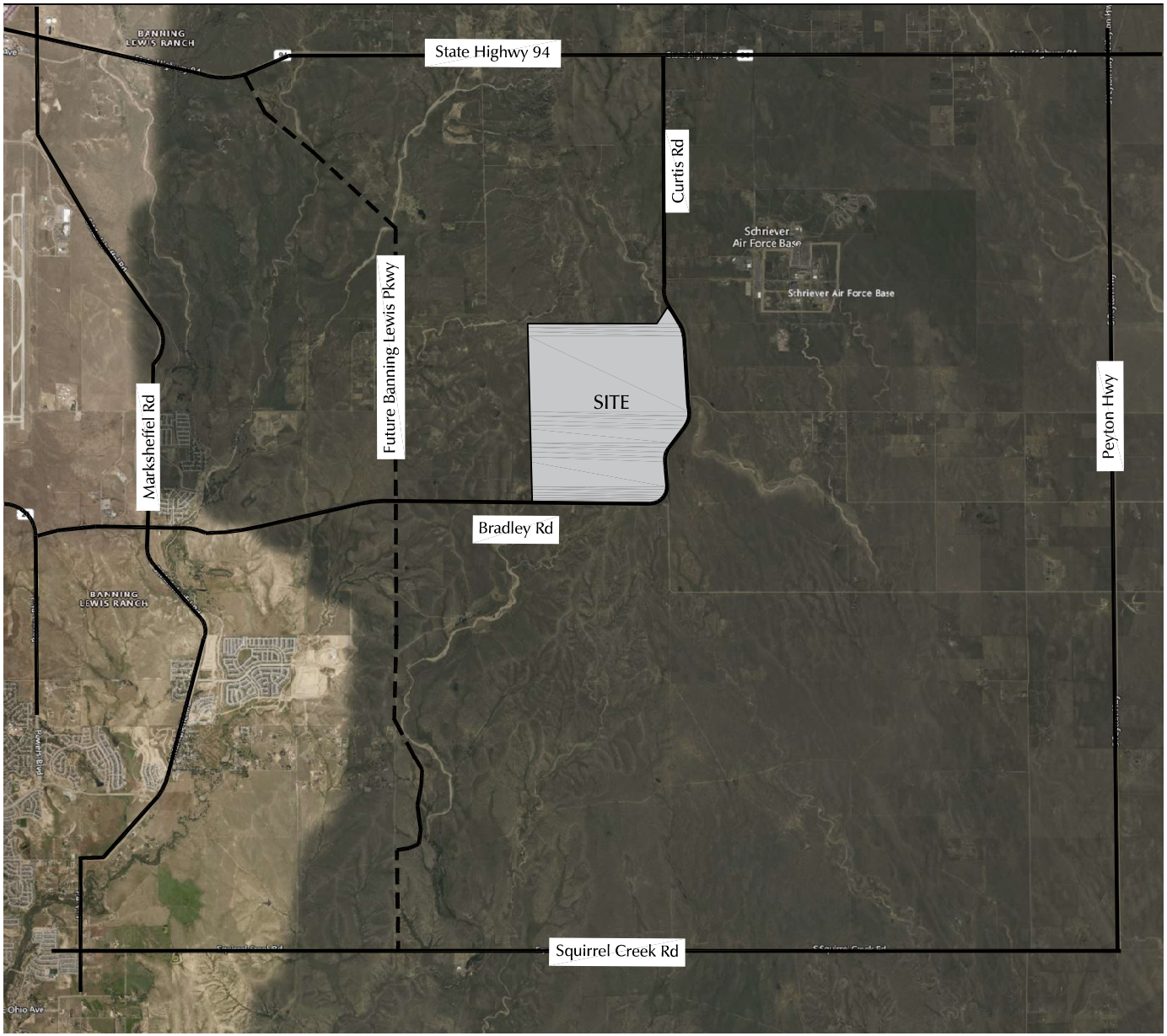

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Not to scale

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Figure 1

Vicinity Map

Karman Line (LSC# S234150)

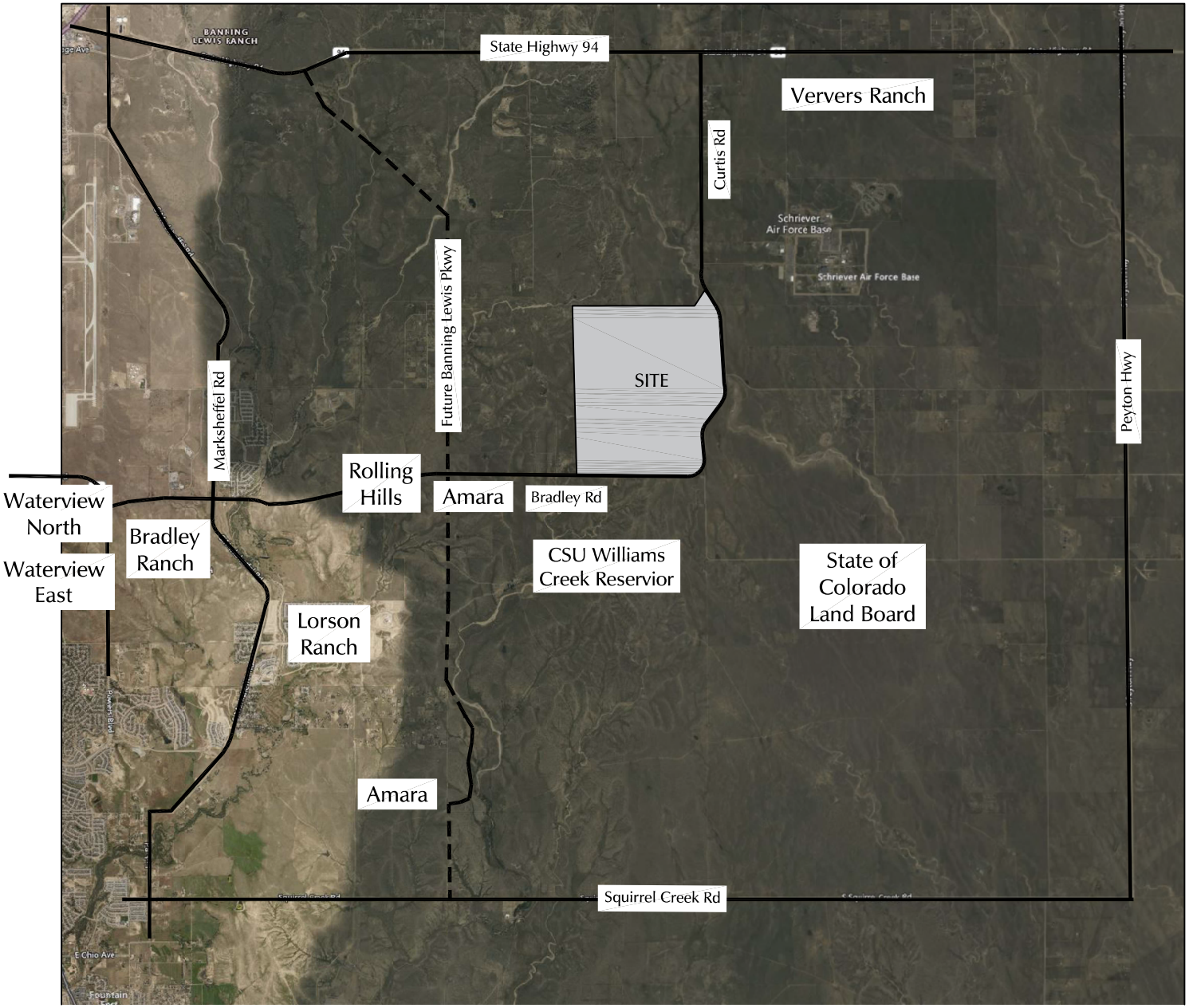

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Figure 2

Context Map

Karman Line (LSC# S234150)

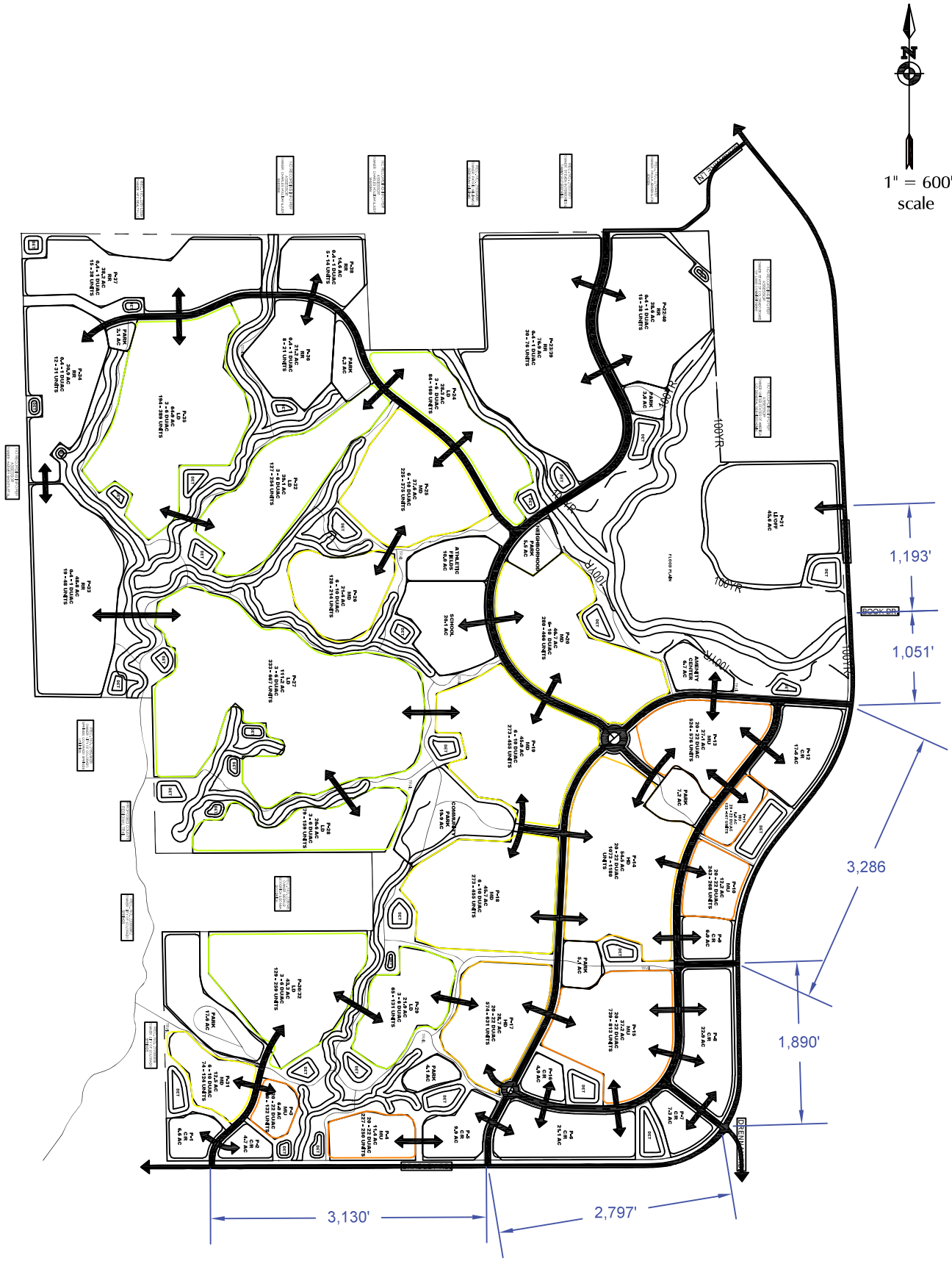

Figure 3

Site Plan

Karman Line (LSC# S234150)

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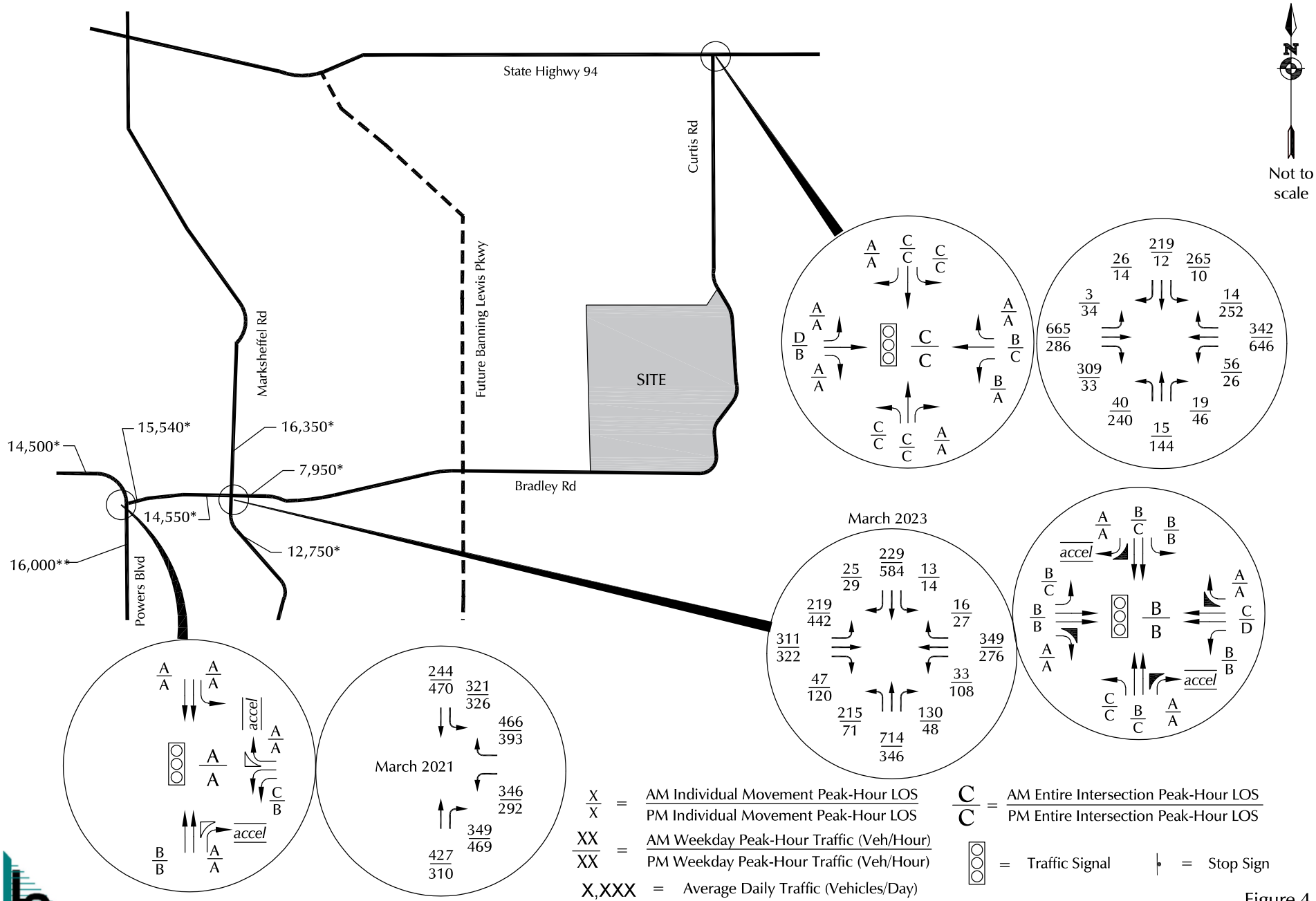


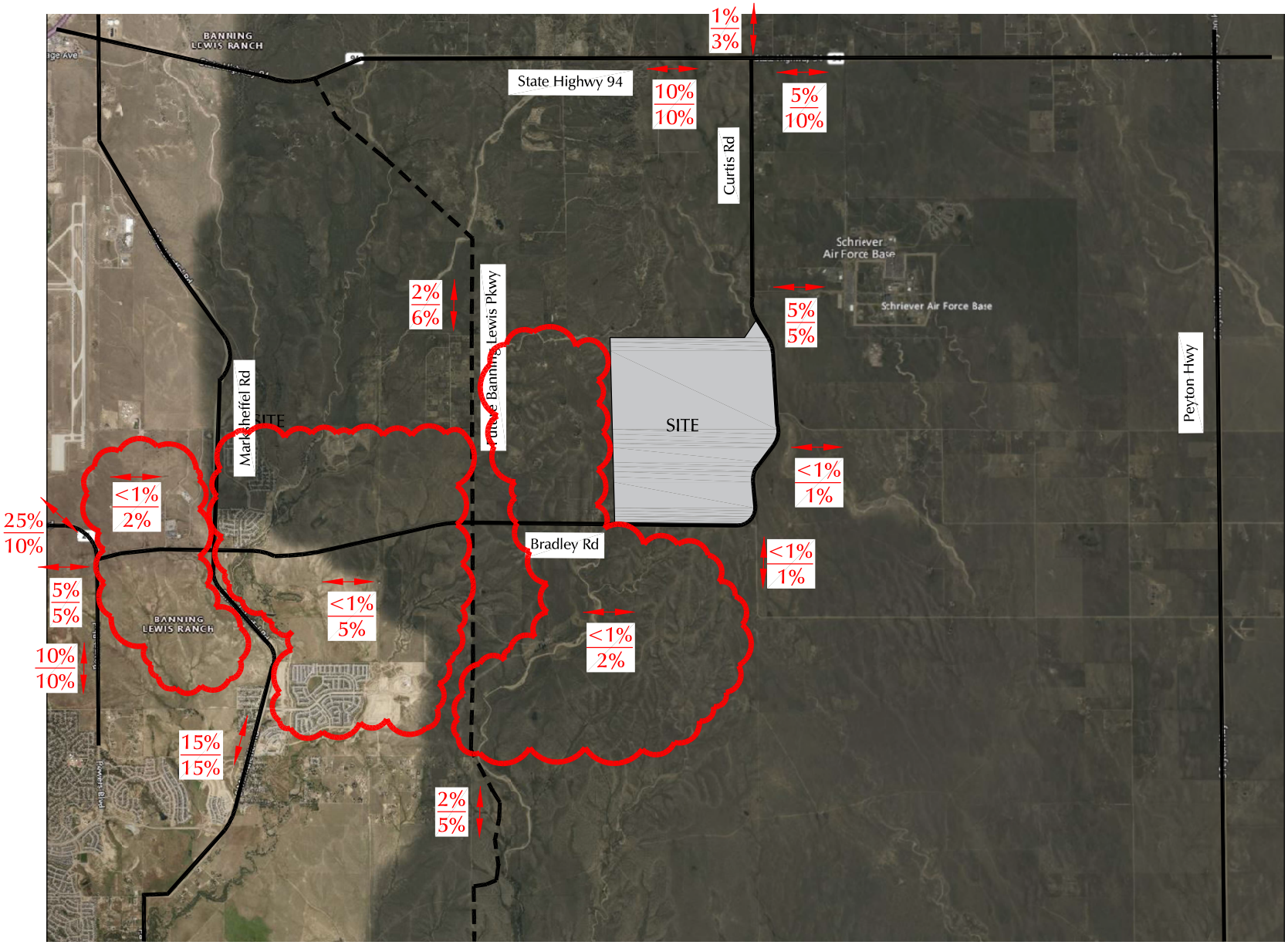
*Estimates by LSC
** 2021 AADT CDOT

Figure 4

Existing Traffic Conditions

Karman Line (LSC# S234150)

LSC TRANSPORTATION CONSULTANTS, INC.



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XX% / XX% = Residential % Distribution / Non-Residential % Distribution

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Figure 5

Directional Distribution

Karman Line (LSC# S234150)

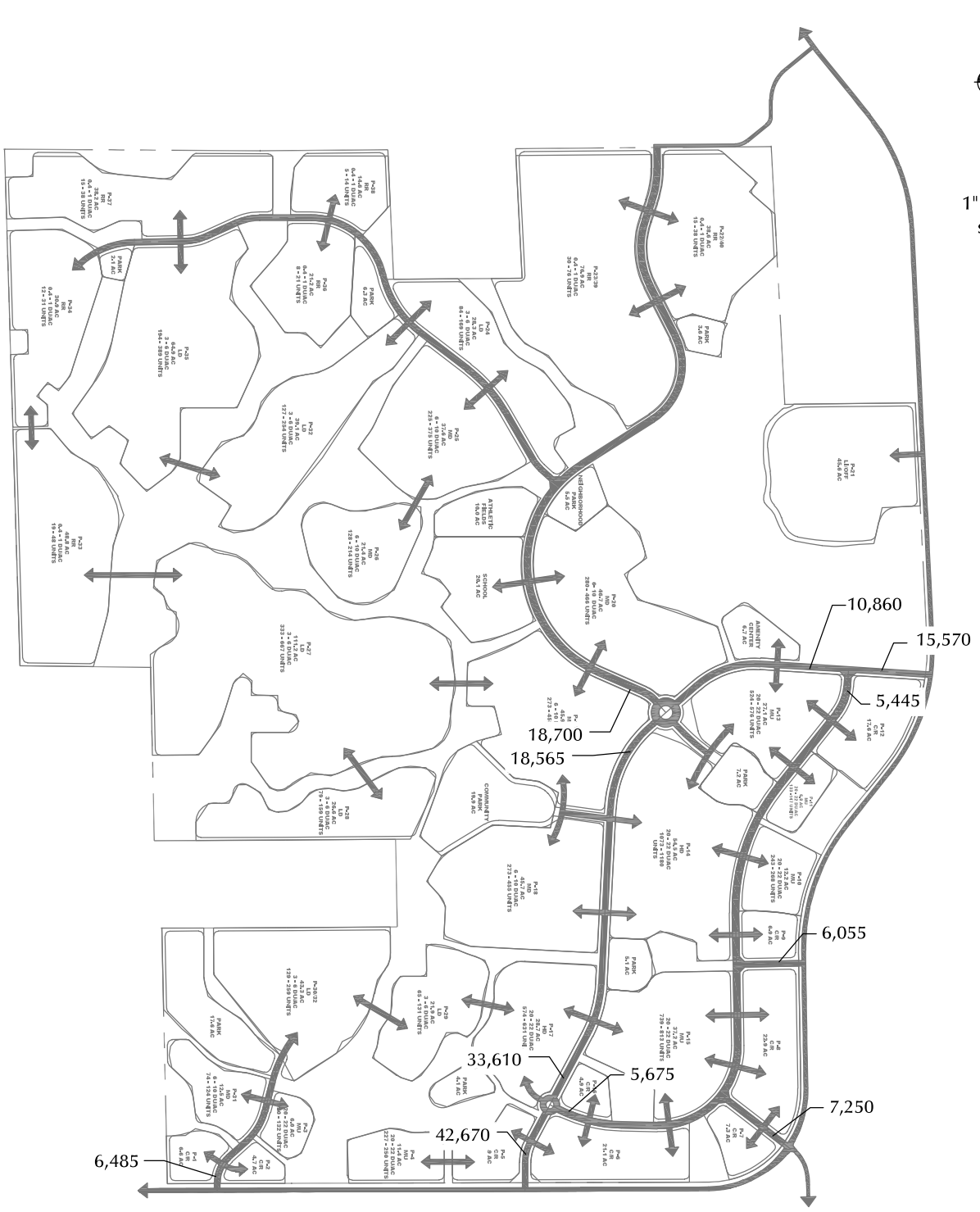


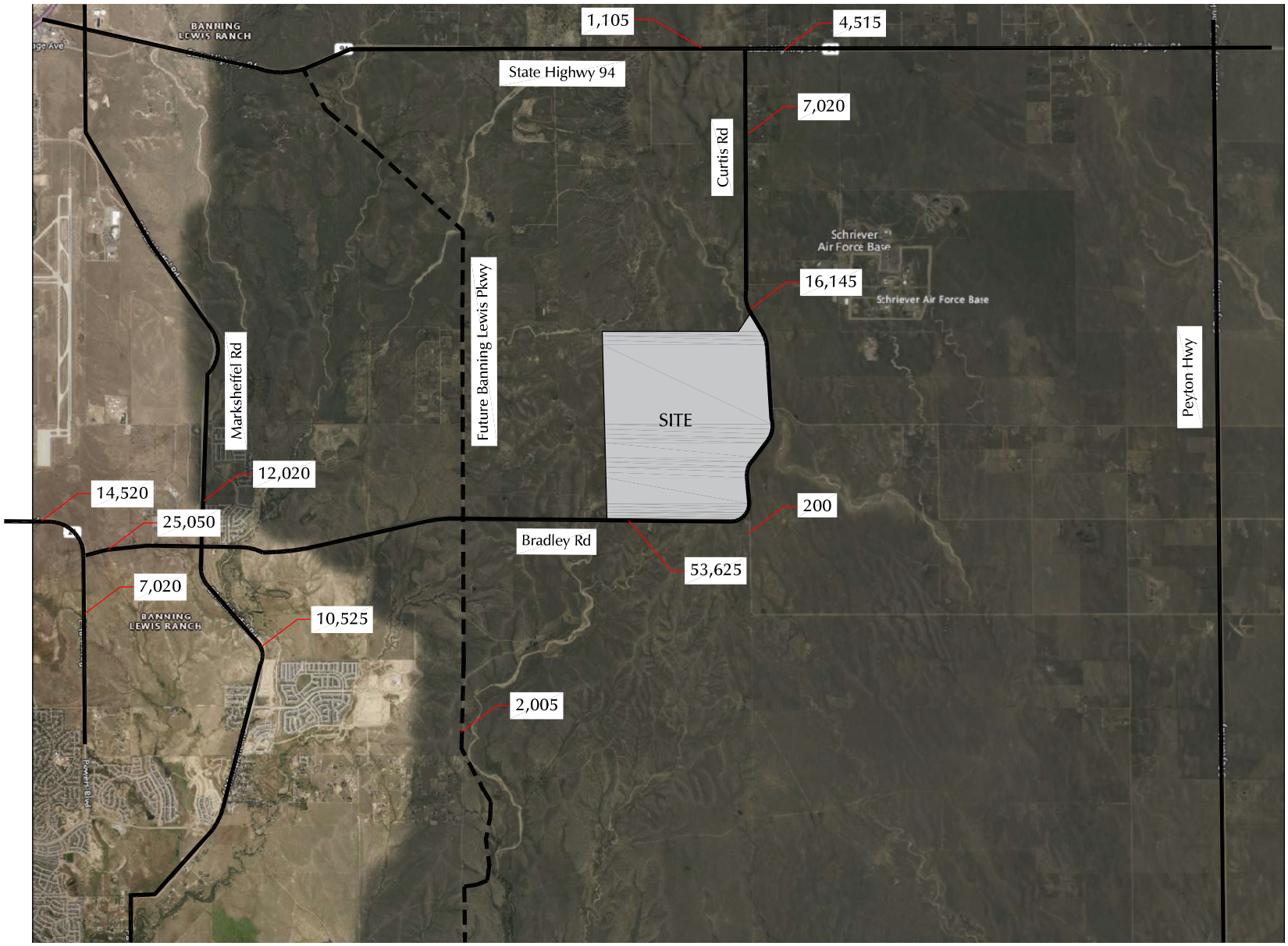
Figure 6

Site-Generated Traffic on Internal Roadways

Karman Line (LSC# S234150)

X,XXX = Average Daily Traffic (Vehicles/Day)

LSC TRANSPORTATION CONSULTANTS, INC.



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X,XXX = Average Daily Traffic (Vehicles/Day)

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Figure 7

Site-Generated Traffic on External Roadways

Karman Line (LSC# S234150)

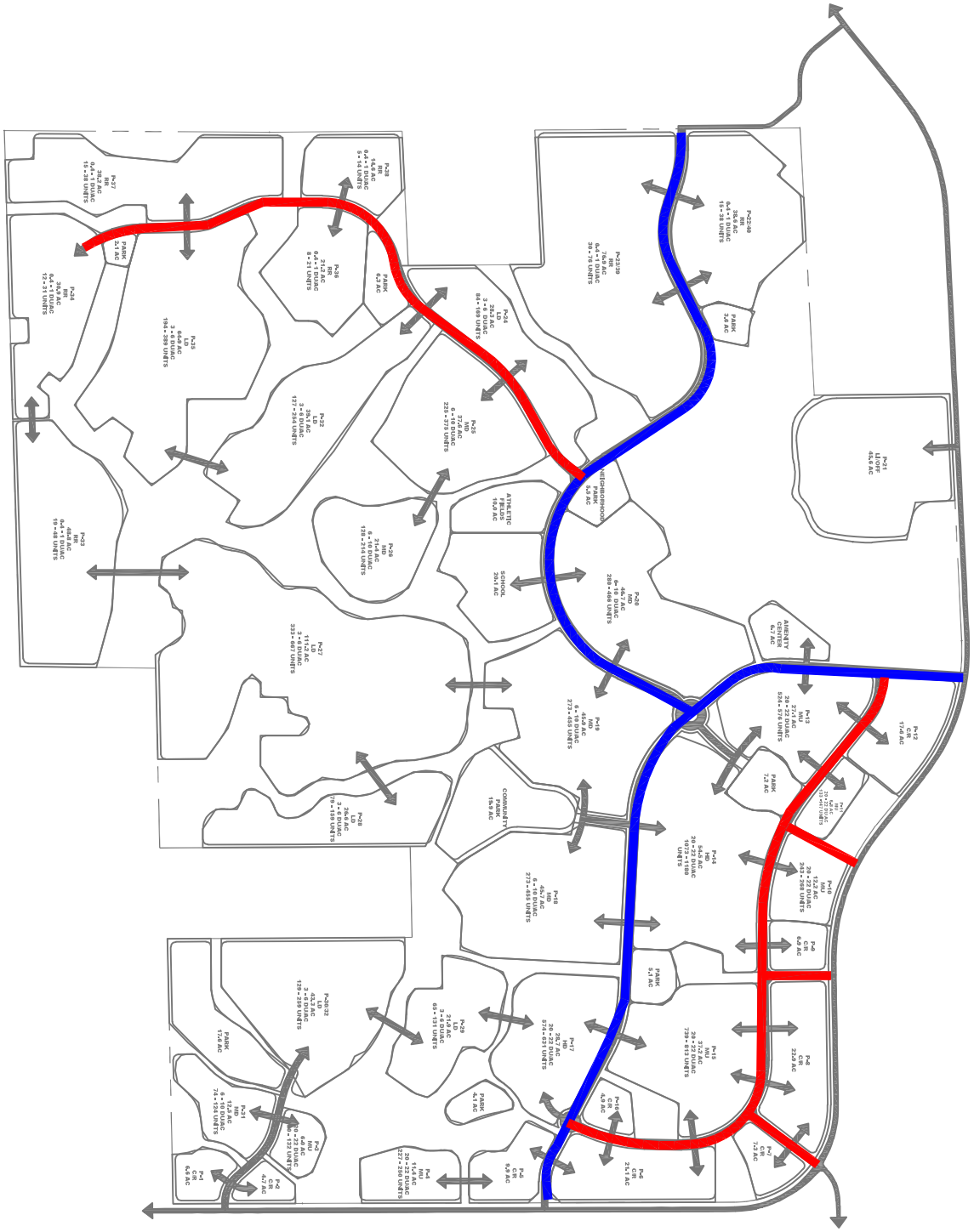


Figure 8

Recommended Classifications

Karman Line (LSC# S234150)

LSC TRANSPORTATION CONSULTANTS, INC.

Traffic Counts

TRANSPORTATION
CONSULTANTS, INC.

LSC Transportation Consultants, Inc.

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

File Name : Marksheffel Rd -Bradley Rd AM
Site Code : S234150
Start Date : 3/21/2023
Page No : 1

Groups Printed- Unshifted

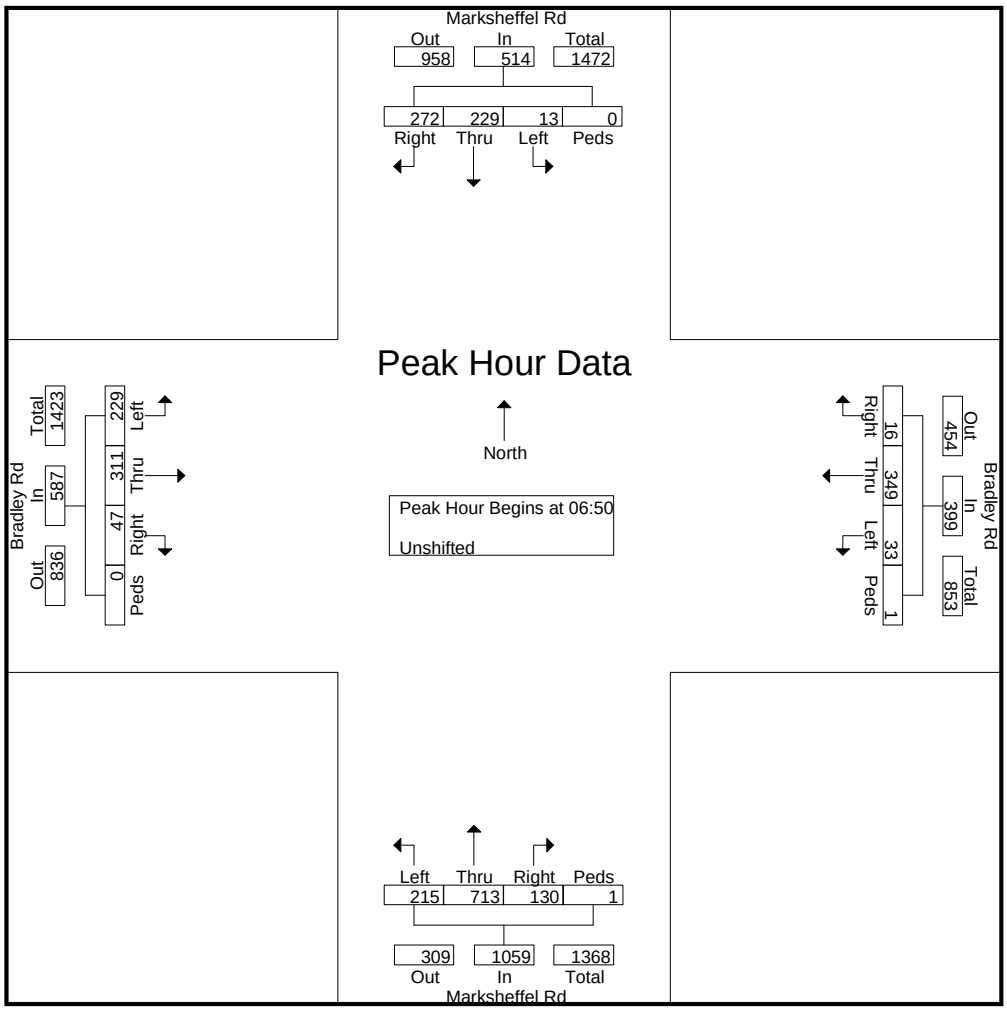
	Marksheffel Rd Southbound					Bradley Rd Westbound					Marksheffel Rd Northbound					Bradley Rd Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
06:30	18	23	1	0	42	0	18	0	0	18	7	52	8	0	67	2	17	22	0	41	168
06:35	15	27	0	0	42	1	16	1	0	18	12	59	6	0	77	1	19	25	0	45	182
06:40	23	24	1	0	48	2	24	1	0	27	8	44	20	0	72	7	24	15	0	46	193
06:45	15	18	0	0	33	0	29	3	0	32	5	36	9	0	50	2	24	18	0	44	159
06:50	24	23	1	0	48	0	22	2	0	24	8	43	18	0	69	6	14	20	0	40	181
06:55	20	12	2	0	34	2	36	3	0	41	6	44	13	0	63	4	27	11	0	42	180
Total	115	127	5	0	247	5	145	10	0	160	46	278	74	0	398	22	125	111	0	258	1063
07:00	23	18	0	0	41	2	42	3	0	47	6	58	16	0	80	3	29	8	0	40	208
07:05	23	16	2	0	41	4	31	4	0	39	11	56	13	0	80	9	21	21	0	51	211
07:10	25	23	1	0	49	1	27	5	0	33	16	70	19	0	105	2	31	22	0	55	242
07:15	14	24	2	0	40	0	36	2	0	38	12	67	28	0	107	2	30	20	0	52	237
07:20	24	29	2	0	55	0	33	3	0	36	11	73	17	0	101	1	26	16	0	43	235
07:25	29	21	0	0	50	0	26	4	0	30	12	49	15	0	76	6	30	29	0	65	221
07:30	26	18	0	0	44	2	19	0	0	21	11	63	29	1	104	5	29	17	0	51	220
07:35	28	19	0	0	47	0	29	1	0	30	16	65	14	0	95	2	29	17	0	48	220
07:40	16	14	3	0	33	4	25	3	0	32	13	65	20	0	98	5	22	26	0	53	216
07:45	20	12	0	0	32	1	23	3	1	28	8	60	13	0	81	2	23	22	0	47	188
07:50	24	20	1	0	45	0	21	2	0	23	11	24	6	0	41	6	22	12	0	40	149
07:55	28	15	1	0	44	3	18	4	0	25	7	31	12	0	50	2	12	19	0	33	152
Total	280	229	12	0	521	17	330	34	1	382	134	681	202	1	1018	45	304	229	0	578	2499
08:00	39	18	0	0	57	4	29	1	0	34	4	37	8	0	49	3	23	8	0	34	174
08:05	17	18	0	0	35	2	27	1	0	30	5	33	4	0	42	3	22	18	0	43	150
08:10	30	12	1	0	43	0	10	0	0	10	9	41	5	0	55	4	17	9	0	30	138
08:15	25	16	0	0	41	1	21	4	0	26	5	29	6	0	40	4	13	18	0	35	142
08:20	23	22	1	0	46	1	19	1	0	21	4	35	8	0	47	3	17	12	0	32	146
08:25	21	11	0	0	32	2	19	2	0	23	5	28	7	0	40	4	23	18	0	45	140
Grand Total	550	453	19	0	1022	32	600	53	1	686	212	1162	314	1	1689	88	544	423	0	1055	4452
Apprch %	53.8	44.3	1.9	0		4.7	87.5	7.7	0.1		12.6	68.8	18.6	0.1		8.3	51.6	40.1	0		
Total %	12.4	10.2	0.4	0	23	0.7	13.5	1.2	0	15.4	4.8	26.1	7.1	0	37.9	2	12.2	9.5	0	23.7	

LSC Transportation Consultants, Inc.

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

File Name : Marksheffel Rd -Bradley Rd AM
Site Code : S234150
Start Date : 3/21/2023
Page No : 2

	Marksheffel Rd Southbound					Bradley Rd Westbound					Marksheffel Rd Northbound					Bradley Rd Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 to 08:25 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 06:50																					
06:50	24	23	1	0	48	0	22	2	0	24	8	43	18	0	69	6	14	20	0	40	181
06:55	20	12	2	0	34	2	36	3	0	41	6	44	13	0	63	4	27	11	0	42	180
07:00	23	18	0	0	41	2	**42**	3	0	**47**	6	58	16	0	80	3	29	8	0	40	208
07:05	23	16	2	0	41	**4**	31	4	0	39	11	56	13	0	80	**9**	21	21	0	51	211
07:10	25	23	1	0	49	1	27	**5**	0	33	**16**	70	19	0	105	2	**31**	22	0	55	**242**
07:15	14	24	2	0	40	0	36	2	0	38	12	67	28	0	**107**	2	30	20	0	52	237
07:20	24	**29**	2	0	**55**	0	33	3	0	36	11	**73**	17	0	101	1	26	16	0	43	235
07:25	**29**	21	0	0	50	0	26	4	0	30	12	49	15	0	76	6	30	**29**	0	**65**	221
07:30	26	18	0	0	44	2	19	0	0	21	11	63	**29**	**1**	104	5	29	17	0	51	220
07:35	28	19	0	0	47	0	29	1	0	30	16	65	14	0	95	2	29	17	0	48	220
07:40	16	14	**3**	0	33	4	25	3	0	32	13	65	20	0	98	5	22	26	0	53	216
07:45	20	12	0	0	32	1	23	3	**1**	28	8	60	13	0	81	2	23	22	0	47	188
Total Volume	272	229	13	0	514	16	349	33	1	399	130	713	215	1	1059	47	311	229	0	587	2559
% App. Total	52.9	44.6	2.5	0		4	87.5	8.3	0.3		12.3	67.3	20.3	0.1		8	53	39	0		
PHF	.782	.658	.361	.000	.779	.333	.692	.550	.083	.707	.677	.814	.618	.083	.825	.435	.836	.658	.000	.753	.881



LSC Transportation Consultants, Inc.

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

File Name : Marksheffel Rd - Bradley Rd PM 3-23
Site Code : S234150
Start Date : 3/21/2023
Page No : 1

Groups Printed- Unshifted

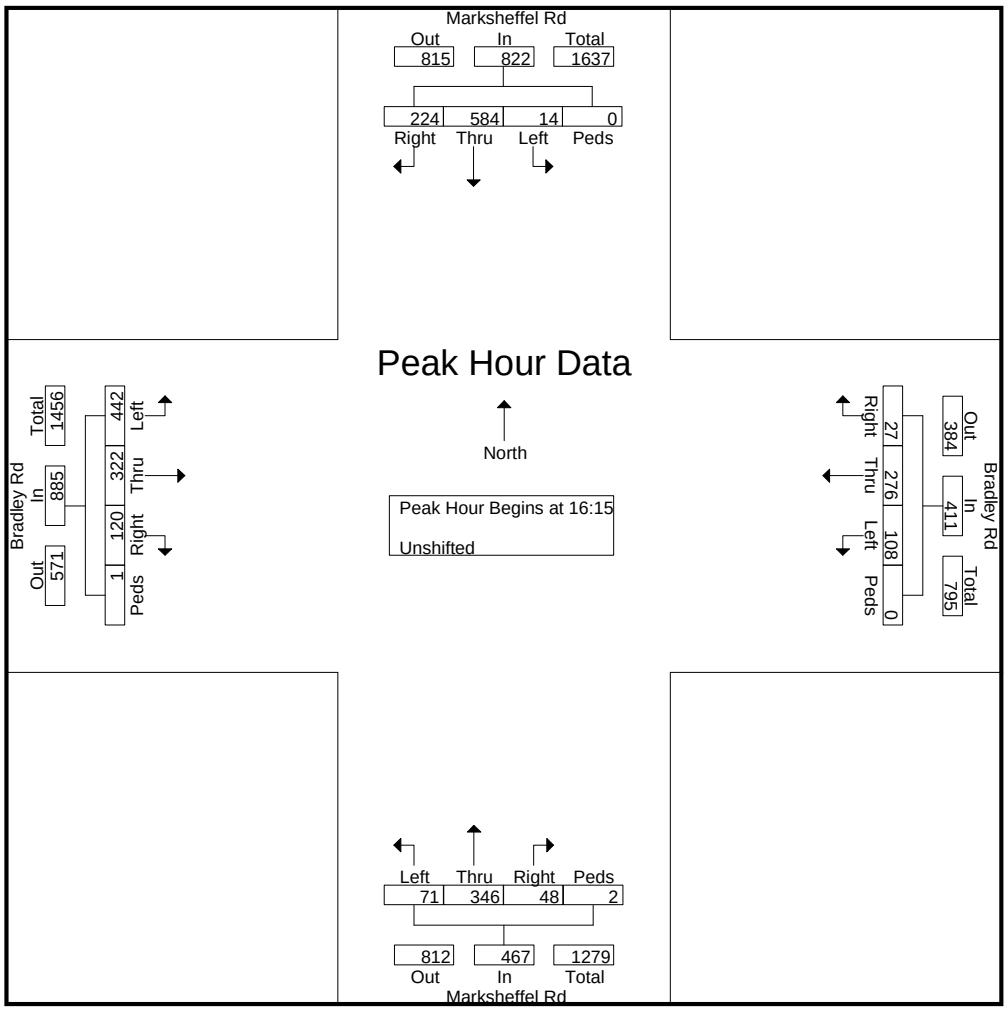
	Marksheffel Rd Southbound					Bradley Rd Westbound					Marksheffel Rd Northbound					Bradley Rd Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
16:00	12	50	2	0	64	0	25	8	0	33	2	31	6	0	39	5	19	27	0	51	187
16:05	13	53	0	0	66	2	13	5	0	20	3	36	11	0	50	11	19	22	0	52	188
16:10	22	53	0	0	75	2	18	7	0	27	5	31	7	0	43	6	17	29	0	52	197
16:15	23	55	2	0	80	4	31	9	0	44	6	28	6	1	41	5	29	39	0	73	238
16:20	28	48	3	0	79	2	28	8	0	38	2	29	11	0	42	14	24	34	0	72	231
16:25	12	38	3	0	53	1	40	8	0	49	8	32	7	0	47	12	32	37	0	81	230
16:30	20	53	2	0	75	1	16	11	0	28	5	34	8	0	47	12	32	38	0	82	232
16:35	19	66	0	0	85	2	25	15	0	42	2	36	4	1	43	14	17	40	0	71	241
16:40	16	34	0	0	50	2	24	10	0	36	4	27	7	0	38	14	39	46	0	99	223
16:45	20	53	0	0	73	1	25	10	0	36	4	20	2	0	26	10	24	38	0	72	207
16:50	16	48	1	0	65	5	12	9	0	26	7	27	6	0	40	14	19	28	1	62	193
16:55	17	41	2	0	60	1	23	9	0	33	1	27	2	0	30	5	33	46	0	84	207
Total	218	592	15	0	825	23	280	109	0	412	49	358	77	2	486	122	304	424	1	851	2574
17:00	17	61	0	0	78	1	23	5	0	29	4	25	3	0	32	4	16	19	0	39	178
17:05	16	39	1	0	56	1	21	6	0	28	3	23	8	0	34	10	27	38	0	75	193
17:10	20	48	0	0	68	6	8	8	0	22	2	38	7	0	47	6	30	39	0	75	212
17:15	32	48	2	0	82	0	14	7	0	21	8	27	6	0	41	7	30	36	0	73	217
17:20	16	59	6	0	81	0	17	5	0	22	1	33	10	0	44	10	20	37	0	67	214
17:25	19	43	0	0	62	1	9	3	0	13	5	25	6	0	36	5	21	33	0	59	170
17:30	16	38	3	0	57	2	14	0	0	16	1	26	7	0	34	10	22	26	0	58	165
17:35	9	43	0	0	52	2	10	4	0	16	3	30	8	0	41	9	22	35	0	66	175
17:40	19	44	3	0	66	1	7	2	0	10	4	27	6	0	37	12	22	21	0	55	168
17:45	15	44	0	0	59	1	21	4	0	26	5	23	2	0	30	4	18	37	0	59	174
17:50	19	44	2	0	65	0	14	2	0	16	3	27	4	0	34	10	20	18	0	48	163
17:55	8	30	0	0	38	1	10	3	0	14	2	28	4	0	34	10	14	17	0	41	127
Total	206	541	17	0	764	16	168	49	0	233	41	332	71	0	444	97	262	356	0	715	2156
Grand Total	424	1133	32	0	1589	39	448	158	0	645	90	690	148	2	930	219	566	780	1	1566	4730
Apprch %	26.7	71.3	2	0		6	69.5	24.5	0		9.7	74.2	15.9	0.2		14	36.1	49.8	0.1		
Total %	9	24	0.7	0	33.6	0.8	9.5	3.3	0	13.6	1.9	14.6	3.1	0	19.7	4.6	12	16.5	0	33.1	

LSC Transportation Consultants, Inc.

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

File Name : Marksheffel Rd - Bradley Rd PM 3-23
Site Code : S234150
Start Date : 3/21/2023
Page No : 2

	Marksheffel Rd Southbound					Bradley Rd Westbound					Marksheffel Rd Northbound					Bradley Rd Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:55 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 16:15																					
16:15	23	55	2	0	80	4	31	9	0	44	6	28	6	**1**	41	5	29	39	0	73	238
16:20	**28**	48	**3**	0	79	2	28	8	0	38	2	29	**11**	0	42	**14**	24	34	0	72	231
16:25	12	38	3	0	53	1	**40**	8	0	**49**	**8**	32	7	0	**47**	12	32	37	0	81	230
16:30	20	53	2	0	75	1	16	11	0	28	5	34	8	0	47	12	32	38	0	82	232
16:35	19	**66**	0	0	**85**	2	25	**15**	0	42	2	36	4	1	43	14	17	40	0	71	**241**
16:40	16	34	0	0	50	2	24	10	0	36	4	27	7	0	38	14	**39**	**46**	0	**99**	223
16:45	20	53	0	0	73	1	25	10	0	36	4	20	2	0	26	10	24	38	0	72	207
16:50	16	48	1	0	65	5	12	9	0	26	7	27	6	0	40	14	19	28	**1**	62	193
16:55	17	41	2	0	60	1	23	9	0	33	1	27	2	0	30	5	33	46	0	84	207
17:00	17	61	0	0	78	1	23	5	0	29	4	25	3	0	32	4	16	19	0	39	178
17:05	16	39	1	0	56	1	21	6	0	28	3	23	8	0	34	10	27	38	0	75	193
17:10	20	48	0	0	68	**6**	8	8	0	22	2	**38**	7	0	47	6	30	39	0	75	212
Total Volume	224	584	14	0	822	27	276	108	0	411	48	346	71	2	467	120	322	442	1	885	2585
% App. Total	27.3	71	1.7	0		6.6	67.2	26.3	0		10.3	74.1	15.2	0.4		13.6	36.4	49.9	0.1		
PHF	.667	.737	.389	.000	.806	.375	.575	.600	.000	.699	.500	.759	.538	.167	.828	.714	.688	.801	.083	.745	.894



LSC Transportation Consultants, Inc.

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

File Name : Legacy Hill Dr - Bradley Rd AM SW
Site Code : S214630
Start Date : 2/8/2023
Page No : 1

Groups Printed- Unshifted

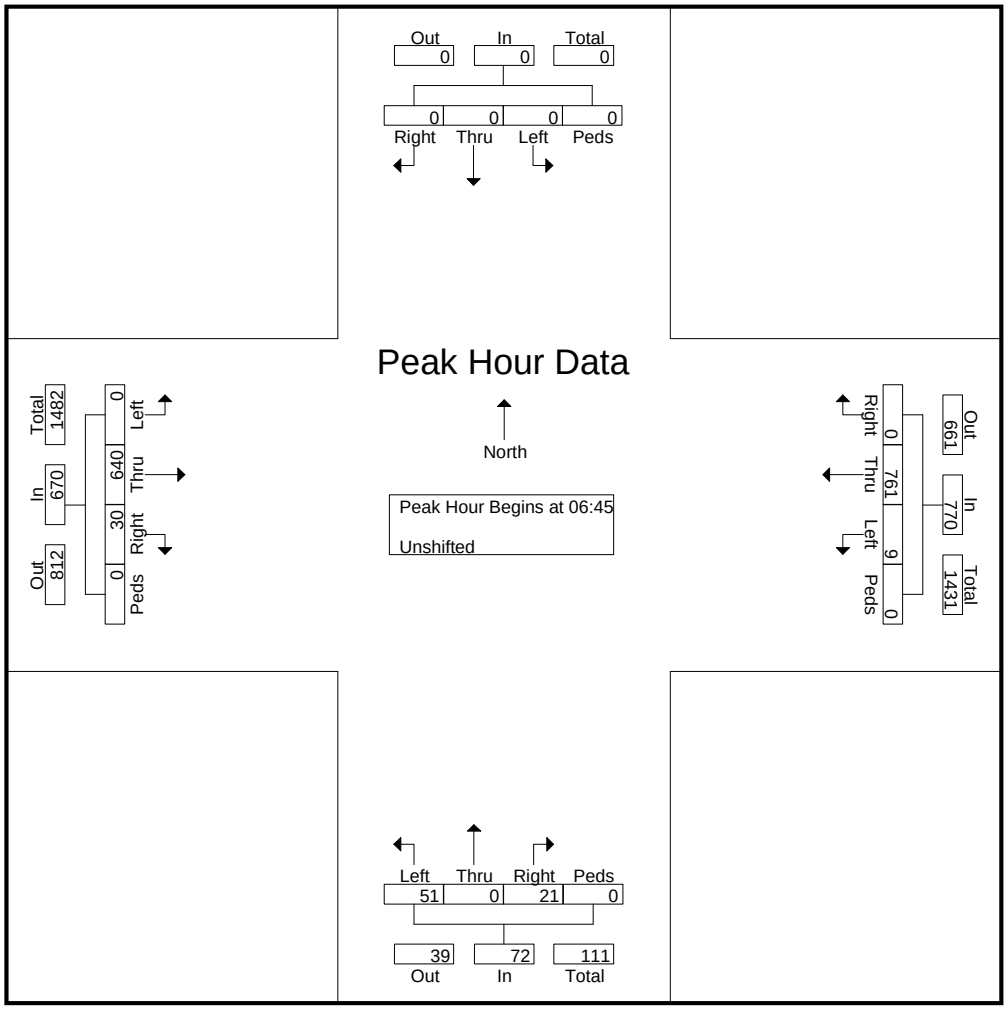
	Southbound					Westbound					Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
06:30	0	0	0	0	0	0	143	5	0	148	5	0	12	0	17	11	131	0	0	142	307
06:45	0	0	0	0	0	0	190	2	0	192	5	0	11	0	16	2	146	0	0	148	356
Total	0	0	0	0	0	0	333	7	0	340	10	0	23	0	33	13	277	0	0	290	663
07:00	0	0	0	0	0	0	185	2	0	187	6	0	10	0	16	8	167	0	0	175	378
07:15	0	0	0	0	0	0	207	4	0	211	4	0	15	0	19	10	154	0	0	164	394
07:30	0	0	0	0	0	0	179	1	0	180	6	0	15	0	21	10	173	0	0	183	384
07:45	0	0	0	0	0	0	155	8	0	163	5	0	8	0	13	9	132	0	1	142	318
Total	0	0	0	0	0	0	726	15	0	741	21	0	48	0	69	37	626	0	1	664	1474
08:00	0	0	0	0	0	0	172	7	0	179	4	0	9	0	13	15	95	0	0	110	302
08:15	0	0	0	0	0	0	150	6	1	157	4	0	12	0	16	16	109	0	0	125	298
Grand Total	0	0	0	0	0	0	1381	35	1	1417	39	0	92	0	131	81	1107	0	1	1189	2737
Apprch %	0	0	0	0		0	97.5	2.5	0.1		29.8	0	70.2	0		6.8	93.1	0	0.1		
Total %	0	0	0	0	0	0	50.5	1.3	0	51.8	1.4	0	3.4	0	4.8	3	40.4	0	0	43.4	

LSC Transportation Consultants, Inc.

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

File Name : Legacy Hill Dr - Bradley Rd AM SW
Site Code : S214630
Start Date : 2/8/2023
Page No : 2

	Southbound					Westbound					Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 6:45:00 AM																					
6:45:00 AM	0	0	0	0	0	0	190	2	0	192	5	0	11	0	16	2	146	0	0	148	356
7:00:00 AM	0	0	0	0	0	0	185	2	0	187	**6**	0	10	0	16	8	167	0	0	175	378
7:15:00 AM	0	0	0	0	0	0	**207**	**4**	0	**211**	4	0	**15**	0	19	**10**	154	0	0	164	**394**
7:30:00 AM	0	0	0	0	0	0	179	1	0	180	6	0	15	0	**21**	10	**173**	0	0	**183**	384
Total Volume	0	0	0	0	0	0	761	9	0	770	21	0	51	0	72	30	640	0	0	670	1512
% App. Total	0	0	0	0		0	98.8	1.2	0		29.2	0	70.8	0		4.5	95.5	0	0		
PHF	.000	.000	.000	.000	.000	.000	.919	.563	.000	.912	.875	.000	.850	.000	.857	.750	.925	.000	.000	.915	.959



LSC Transportation Consultants, Inc.

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

File Name : Legacy Hill Dr - Bradley Rd Mid SW
Site Code : S214630
Start Date : 2/8/2023
Page No : 1

Groups Printed- Unshifted

	Southbound					Bradley Rd Westbound					Legacy Hill Dr Northbound					Bradley Rd Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:30	0	0	0	0	0	0	59	3	0	62	5	0	10	0	15	12	71	0	0	83	160
11:45	0	0	0	0	0	0	50	1	0	51	8	0	9	0	17	10	69	0	0	79	147
Total	0	0	0	0	0	0	109	4	0	113	13	0	19	0	32	22	140	0	0	162	307
12:00	0	0	0	0	0	0	80	8	0	88	3	0	9	0	12	6	53	0	1	60	160
12:15	0	0	0	0	0	0	66	2	1	69	4	0	14	0	18	9	78	0	0	87	174
12:30	0	0	0	0	0	0	66	0	0	66	1	0	6	0	7	13	63	0	0	76	149
12:45	0	0	0	0	0	0	58	2	0	60	3	0	9	0	12	12	59	0	0	71	143
Total	0	0	0	0	0	0	270	12	1	283	11	0	38	0	49	40	253	0	1	294	626
13:00	0	0	0	0	0	0	54	3	0	57	3	0	9	0	12	2	65	0	0	67	136
13:15	0	0	0	0	0	0	66	3	0	69	2	0	7	0	9	13	88	0	0	101	179
13:30	0	0	0	0	0	0	49	4	0	53	2	0	9	0	11	11	61	0	0	72	136
13:45	0	0	0	0	0	0	59	9	0	68	2	0	8	0	10	11	92	0	0	103	181
Total	0	0	0	0	0	0	228	19	0	247	9	0	33	0	42	37	306	0	0	343	632
14:00	0	0	0	0	0	0	86	4	0	90	6	0	6	0	12	22	70	0	0	92	194
14:15	0	0	0	0	0	0	110	2	0	112	5	0	7	0	12	9	87	0	0	96	220
Grand Total	0	0	0	0	0	0	803	41	1	845	44	0	103	0	147	130	856	0	1	987	1979
Apprch %	0	0	0	0		0	95	4.9	0.1		29.9	0	70.1	0		13.2	86.7	0	0.1		
Total %	0	0	0	0	0	0	40.6	2.1	0.1	42.7	2.2	0	5.2	0	7.4	6.6	43.3	0	0.1	49.9	

LSC Transportation Consultants, Inc.

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

File Name : Legacy Hill Dr - Bradley Rd PM SW
Site Code : S214630
Start Date : 2/8/2023
Page No : 1

Groups Printed- Unshifted

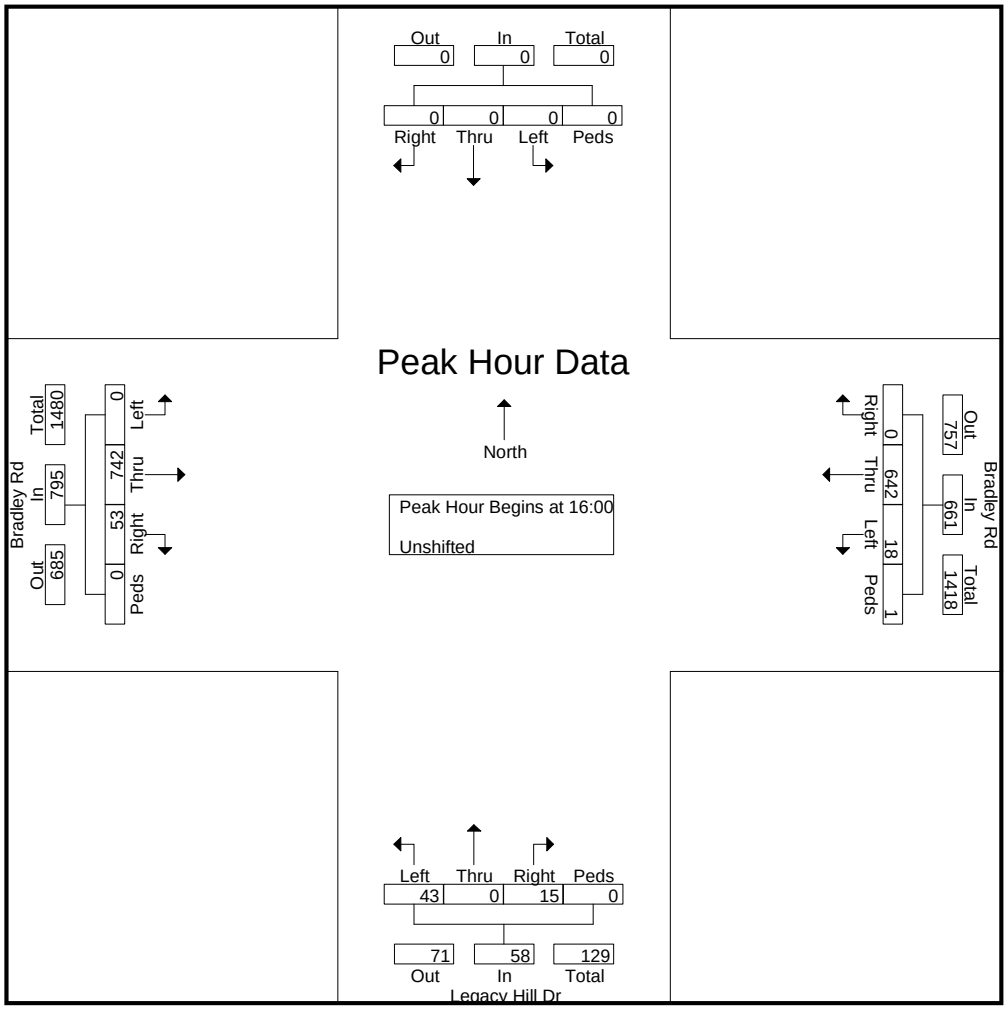
	Southbound					Bradley Rd Westbound					Legacy Hill Dr Northbound					Bradley Rd Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
15:00	0	0	0	0	0	0	117	3	0	120	7	0	14	0	21	10	121	0	0	131	272
15:15	0	0	0	0	0	0	134	4	0	138	5	0	17	0	22	7	116	0	0	123	283
15:30	0	0	0	0	0	0	123	4	0	127	4	0	4	0	8	15	150	0	1	166	301
15:45	0	0	0	0	0	0	137	5	0	142	4	0	13	0	17	7	178	0	0	185	344
Total	0	0	0	0	0	0	511	16	0	527	20	0	48	0	68	39	565	0	1	605	1200
16:00	0	0	0	0	0	0	157	4	0	161	5	0	13	0	18	9	195	0	0	204	383
16:15	0	0	0	0	0	0	160	4	0	164	3	0	5	0	8	17	193	0	0	210	382
16:30	0	0	0	0	0	0	174	7	1	182	3	0	10	0	13	19	172	0	0	191	386
16:45	0	0	0	0	0	0	151	3	0	154	4	0	15	0	19	8	182	0	0	190	363
Total	0	0	0	0	0	0	642	18	1	661	15	0	43	0	58	53	742	0	0	795	1514
17:00	0	0	0	0	0	0	110	2	1	113	3	0	21	0	24	17	170	0	0	187	324
17:15	0	0	0	0	0	0	119	3	0	122	0	0	10	0	10	13	171	0	0	184	316
17:30	0	0	0	0	0	0	121	2	0	123	5	0	9	0	14	16	145	0	0	161	298
17:45	0	0	0	0	0	0	89	4	0	93	0	0	6	0	6	3	146	0	1	150	249
Total	0	0	0	0	0	0	439	11	1	451	8	0	46	0	54	49	632	0	1	682	1187
Grand Total	0	0	0	0	0	0	1592	45	2	1639	43	0	137	0	180	141	1939	0	2	2082	3901
Apprch %	0	0	0	0		0	97.1	2.7	0.1		23.9	0	76.1	0		6.8	93.1	0	0.1		
Total %	0	0	0	0	0	0	40.8	1.2	0.1	42	1.1	0	3.5	0	4.6	3.6	49.7	0	0.1	53.4	

LSC Transportation Consultants, Inc.

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

File Name : Legacy Hill Dr - Bradley Rd PM SW
Site Code : S214630
Start Date : 2/8/2023
Page No : 2

	Southbound					Bradley Rd Westbound					Legacy Hill Dr Northbound					Bradley Rd Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 3:00:00 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	0	0	0	0	157	4	0	161	**5**	0	13	0	18	9	**195**	0	0	204	383
4:15:00 PM	0	0	0	0	0	0	160	4	0	164	3	0	5	0	8	17	193	0	0	**210**	382
4:30:00 PM	0	0	0	0	0	0	**174**	**7**	**1**	**182**	3	0	10	0	13	**19**	172	0	0	191	**386**
4:45:00 PM	0	0	0	0	0	0	151	3	0	154	4	0	**15**	0	**19**	8	182	0	0	190	363
Total Volume	0	0	0	0	0	0	642	18	1	661	15	0	43	0	58	53	742	0	0	795	1514
% App. Total	0	0	0	0		0	97.1	2.7	0.2		25.9	0	74.1	0		6.7	93.3	0	0		
PHF	.000	.000	.000	.000	.000	.000	.922	.643	.250	.908	.750	.000	.717	.000	.763	.697	.951	.000	.000	.946	.981



LSC Transportation Consultants, Inc.

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

File Name : Powers Blvd - Bradley Rd AM
Site Code : S214180
Start Date : 3/16/2021
Page No : 1

Groups Printed- Unshifted

	Powers Blvd Southbound					Bradley Rd Westbound					Powers Blvd Northbound					Eastbound					
Start Time	**L**	**T**	**R**	**U**	**App. Total**	**L**	**T**	**R**	**U**	**App. Total**	**L**	**T**	**R**	**U**	**App. Total**	**L**	**T**	**R**	**U**	**App. Total**	**Int. Total**
07:00 AM	65	72	0	0	137	62	0	89	0	151	0	117	67	0	184	0	0	0	0	0	472
07:15 AM	60	45	0	1	106	71	0	99	0	170	0	115	58	0	173	0	0	0	0	0	449
07:30 AM	64	60	0	0	124	64	0	89	1	154	0	101	70	0	171	0	0	0	0	0	449
07:45 AM	56	67	0	0	123	67	0	79	0	146	0	94	47	0	141	0	0	0	0	0	410
Total	245	244	0	1	490	264	0	356	1	621	0	427	242	0	669	0	0	0	0	0	1780
08:00 AM	55	57	0	0	112	92	0	53	0	145	0	104	57	0	161	0	0	0	0	0	418
08:15 AM	60	67	0	0	127	74	0	46	2	122	0	97	55	0	152	0	0	0	0	0	401
08:30 AM	62	59	0	1	122	67	0	55	0	122	0	71	56	0	127	0	0	0	0	0	371
08:45 AM	59	74	0	0	133	48	0	48	0	96	0	63	38	1	102	0	0	0	0	0	331
Total	236	257	0	1	494	281	0	202	2	485	0	335	206	1	542	0	0	0	0	0	1521
Grand Total	481	501	0	2	984	545	0	558	3	1106	0	762	448	1	1211	0	0	0	0	0	3301
Apprch %	48.9	50.9	0	0.2		49.3	0	50.5	0.3		0	62.9	37	0.1		0	0	0	0		
Total %	14.6	15.2	0	0.1	29.8	16.5	0	16.9	0.1	33.5	0	23.1	13.6	0	36.7	0	0	0	0	0	

LSC Transportation Consultants, Inc.
2504 E Pikes Peak Ave, Suite 304
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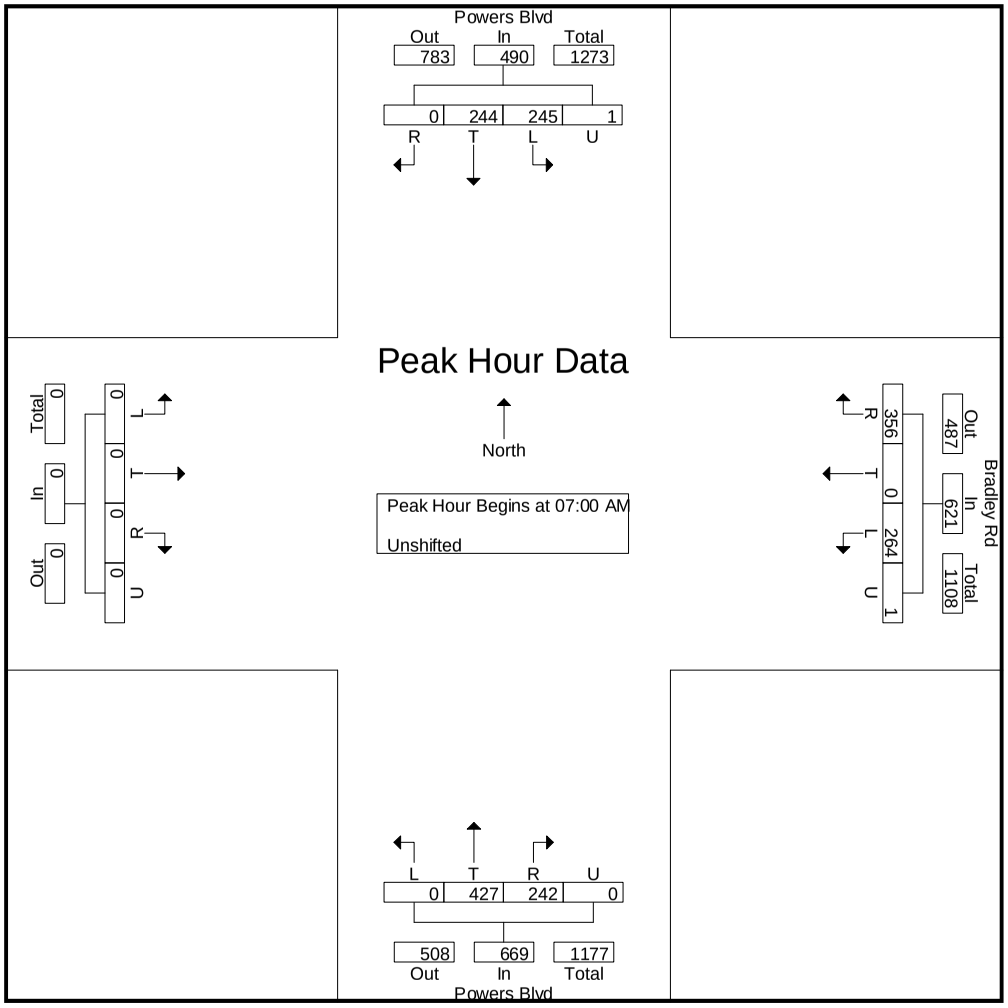
719-633-2868

File Name : Powers Blvd - Bradley Rd AM
Site Code : S214180
Start Date : 3/16/2021
Page No : 3



LSC Transportation Consultants, Inc.

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

File Name : Powers Blvd - Bradley Rd PM
Site Code : S214180
Start Date : 3/16/2021
Page No : 1

Groups Printed- Unshifted

	Powers Blvd Southbound					Bradley Rd Westbound					Powers Blvd Northbound					Eastbound					
Start Time	**L**	**T**	**R**	**U**	**App. Total**	**L**	**T**	**R**	**U**	**App. Total**	**L**	**T**	**R**	**U**	**App. Total**	**L**	**T**	**R**	**U**	**App. Total**	**Int. Total**
04:00 PM	72	109	0	0	181	54	0	75	0	129	0	72	75	0	147	0	0	0	0	0	457
04:15 PM	68	105	0	0	173	74	0	82	0	156	0	85	102	0	187	0	0	0	0	0	516
04:30 PM	87	110	0	0	197	72	0	73	1	146	0	78	111	0	189	0	0	0	0	0	532
04:45 PM	69	128	0	0	197	71	0	60	0	131	0	73	100	0	173	0	0	0	0	0	501
Total	296	452	0	0	748	271	0	290	1	562	0	308	388	0	696	0	0	0	0	0	2006
05:00 PM	83	127	0	0	210	60	0	63	0	123	0	74	78	0	152	0	0	0	0	0	485
05:15 PM	75	110	0	0	185	58	0	45	0	103	0	76	102	0	178	0	0	0	0	0	466
05:30 PM	61	111	0	0	172	55	0	49	0	104	0	69	106	0	175	0	0	0	0	0	451
05:45 PM	59	97	0	0	156	52	0	44	0	96	0	86	73	0	159	0	0	0	0	0	411
Total	278	445	0	0	723	225	0	201	0	426	0	305	359	0	664	0	0	0	0	0	1813
Grand Total	574	897	0	0	1471	496	0	491	1	988	0	613	747	0	1360	0	0	0	0	0	3819
Apprch %	39	61	0	0		50.2	0	49.7	0.1		0	45.1	54.9	0		0	0	0	0		
Total %	15	23.5	0	0	38.5	13	0	12.9	0	25.9	0	16.1	19.6	0	35.6	0	0	0	0	0	

LSC Transportation Consultants, Inc.
2504 E Pikes Peak Ave, Suite 304
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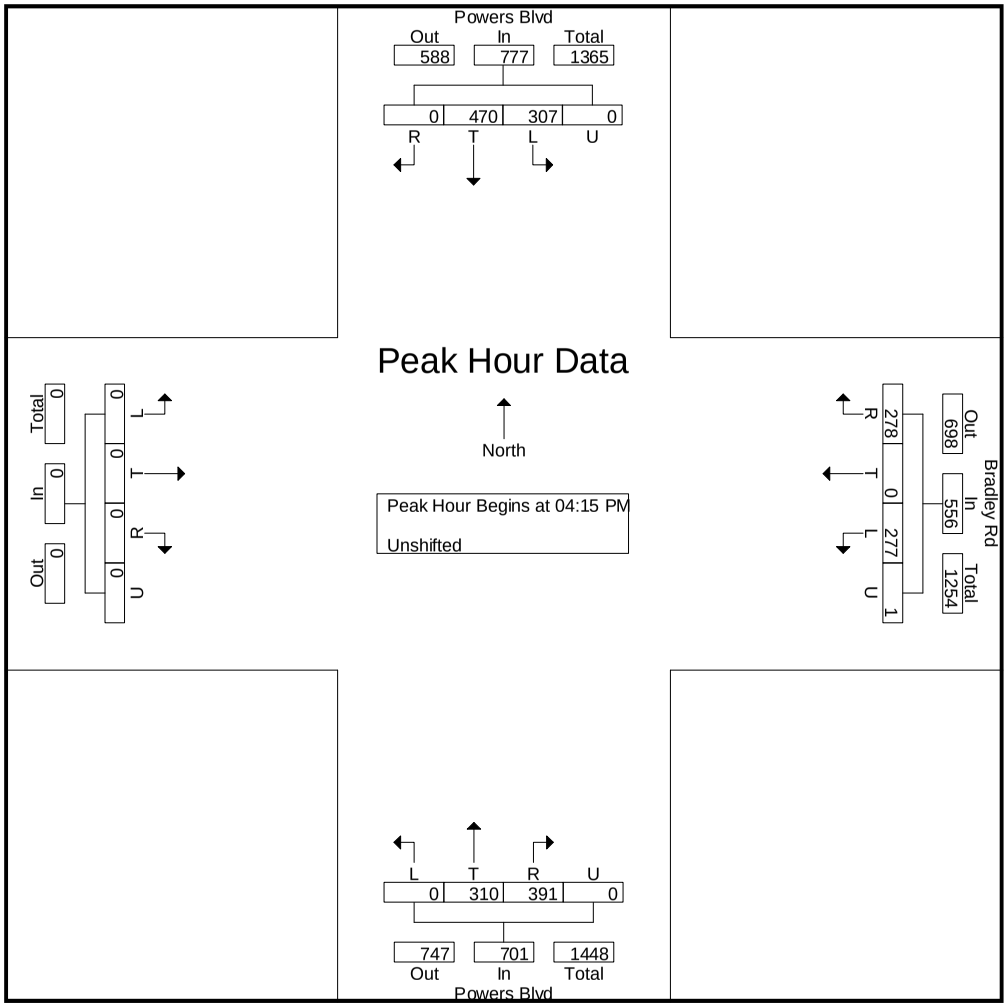
719-633-2868

File Name : Powers Blvd - Bradley Rd PM
Site Code : S214180
Start Date : 3/16/2021
Page No : 3



Levels of Service

TRANSPORTATION
CONSULTANTS, INC.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	346	466	427	349	321	244
Future Volume (vph)	346	466	427	349	321	244
Turn Type	Prot	Free	NA	Free	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		Free		Free	6	
Detector Phase	8		2		1	6
Switch Phase						
Minimum Initial (s)	4.0		4.0		4.0	4.0
Minimum Split (s)	9.0		9.0		9.0	9.0
Total Split (s)	20.0		60.0		20.0	80.0
Total Split (%)	20.0%		60.0%		20.0%	80.0%
Yellow Time (s)	3.0		3.0		3.0	3.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0
Total Lost Time (s)	5.0		5.0		5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None		None	None
Act Effct Green (s)	10.9	50.3	12.4	50.3	29.2	29.2
Actuated g/C Ratio	0.22	1.00	0.25	1.00	0.58	0.58
v/c Ratio	0.51	0.32	0.54	0.24	0.58	0.13
Control Delay	20.9	0.5	19.6	0.4	9.9	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	0.5	19.6	0.4	9.9	5.1
LOS	C	A	B	A	A	A
Approach Delay	9.2		11.0			7.8
Approach LOS	A		B			A

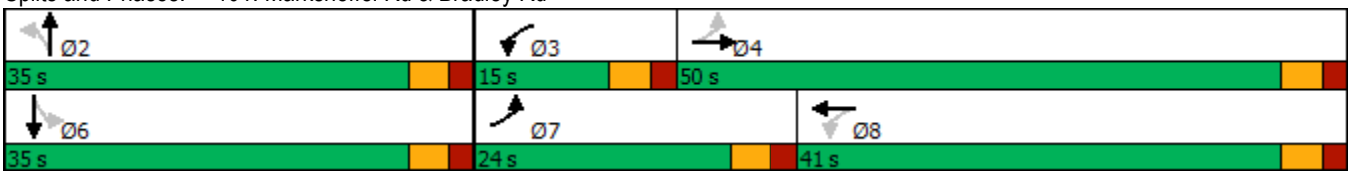
Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 50.3	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 9.5	Intersection LOS: A
Intersection Capacity Utilization 52.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Powers Blvd & Bradley Rd.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	229	311	47	33	349	16	215	713	130	13	229	272
Future Volume (vph)	229	311	47	33	349	16	215	713	130	13	229	272
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Perm	NA	Free	Perm	NA	Free
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		Free	8		Free	2		Free	6		Free
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	4.0		5.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	11.0	21.0		10.0	21.0		21.0	21.0		21.0	21.0	
Total Split (s)	24.0	50.0		15.0	41.0		35.0	35.0		35.0	35.0	
Total Split (%)	24.0%	50.0%		15.0%	41.0%		35.0%	35.0%		35.0%	35.0%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)	32.5	28.0	72.8	19.5	13.2	72.8	30.2	30.2	72.8	30.2	30.2	72.8
Actuated g/C Ratio	0.45	0.38	1.00	0.27	0.18	1.00	0.41	0.41	1.00	0.41	0.41	1.00
v/c Ratio	0.50	0.25	0.03	0.11	0.63	0.01	0.51	0.53	0.09	0.07	0.17	0.19
Control Delay	16.3	16.9	0.0	13.0	32.6	0.0	22.4	18.7	0.1	16.8	15.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	16.9	0.0	13.0	32.6	0.0	22.4	18.7	0.1	16.8	15.0	0.3
LOS	B	B	A	B	C	A	C	B	A	B	B	A
Approach Delay		15.3			29.7			17.2			7.2	
Approach LOS		B			C			B			A	

Intersection Summary		
Cycle Length: 100		
Actuated Cycle Length: 72.8		
Natural Cycle: 60		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.63		
Intersection Signal Delay: 16.8	Intersection LOS: B	
Intersection Capacity Utilization 62.0%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 101: Marksheffel Rd & Bradley Rd



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	292	393	310	469	326	470
Future Volume (vph)	292	393	310	469	326	470
Turn Type	Prot	Free	NA	Free	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		Free		Free	6	
Detector Phase	8		2		1	6
Switch Phase						
Minimum Initial (s)	4.0		4.0		4.0	4.0
Minimum Split (s)	9.0		9.0		9.0	9.0
Total Split (s)	30.0		37.0		33.0	70.0
Total Split (%)	30.0%		37.0%		33.0%	70.0%
Yellow Time (s)	3.0		3.0		3.0	3.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0
Total Lost Time (s)	5.0		5.0		5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None		None	None
Act Effct Green (s)	10.2	47.3	10.3	47.3	26.9	26.9
Actuated g/C Ratio	0.22	1.00	0.22	1.00	0.57	0.57
v/c Ratio	0.43	0.27	0.43	0.32	0.54	0.25
Control Delay	19.0	0.4	18.8	0.5	9.0	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	0.4	18.8	0.5	9.0	5.6
LOS	B	A	B	A	A	A
Approach Delay	8.3		7.8			7.0
Approach LOS	A		A			A

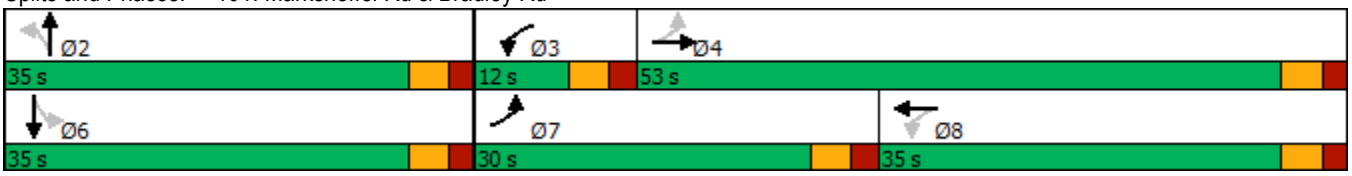
Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 47.3	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 7.7	Intersection LOS: A
Intersection Capacity Utilization 47.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Powers Blvd & Bradley Rd.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	442	322	120	108	276	27	71	346	48	14	584	224
Future Volume (vph)	442	322	120	108	276	27	71	346	48	14	584	224
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Perm	NA	Free	Perm	NA	Free
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		Free	8		Free	2		Free	6		Free
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	4.0		5.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	21.0		10.0	21.0		21.0	21.0		21.0	21.0	
Total Split (s)	30.0	53.0		12.0	35.0		35.0	35.0		35.0	35.0	
Total Split (%)	30.0%	53.0%		12.0%	35.0%		35.0%	35.0%		35.0%	35.0%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)	40.3	28.4	80.6	20.0	13.1	80.6	30.2	30.2	80.6	30.2	30.2	80.6
Actuated g/C Ratio	0.50	0.35	1.00	0.25	0.16	1.00	0.37	0.37	1.00	0.37	0.37	1.00
v/c Ratio	0.78	0.28	0.08	0.44	0.62	0.02	0.33	0.29	0.03	0.04	0.45	0.15
Control Delay	23.9	19.0	0.1	18.5	36.8	0.0	25.2	19.6	0.0	19.1	21.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	19.0	0.1	18.5	36.8	0.0	25.2	19.6	0.0	19.1	21.4	0.2
LOS	C	B	A	B	D	A	C	B	A	B	C	A
Approach Delay		18.9			29.6			18.4			15.6	
Approach LOS		B			C			B			B	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 80.6	
Natural Cycle: 60	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 19.8	Intersection LOS: B
Intersection Capacity Utilization 68.9%	ICU Level of Service C
Analysis Period (min) 15	

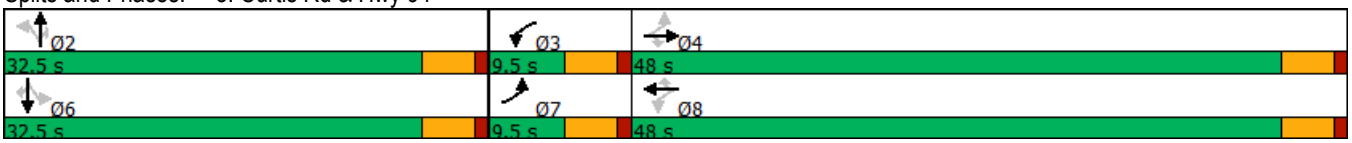
Splits and Phases: 101: Marksheffel Rd & Bradley Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	665	309	56	342	14	40	15	19	265	219	26
Future Volume (vph)	3	665	309	56	342	14	40	15	19	265	219	26
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.484			0.091			0.487			0.747		
Satd. Flow (perm)	902	1863	1583	170	1863	1583	907	1863	1583	1391	1863	1583
Satd. Flow (RTOR)			364			73			73			73
Peak Hour Factor	0.85	0.85	0.85	0.85	0.90	0.85	0.85	0.94	0.85	0.85	0.85	0.85
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	782	364	66	380	16	47	16	22	312	258	31
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Total Split (s)	9.5	48.0	48.0	9.5	48.0	48.0	32.5	32.5	32.5	32.5	32.5	32.5
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Act Effct Green (s)	42.9	39.1	39.1	45.4	44.5	44.5	28.5	28.5	28.5	28.5	28.5	28.5
Actuated g/C Ratio	0.51	0.47	0.47	0.54	0.53	0.53	0.34	0.34	0.34	0.34	0.34	0.34
v/c Ratio	0.01	0.90	0.39	0.35	0.39	0.02	0.15	0.03	0.04	0.66	0.41	0.05
Control Delay	7.7	36.3	2.9	13.3	13.1	0.1	24.2	21.8	0.1	34.4	26.1	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.7	36.3	2.9	13.3	13.1	0.1	24.2	21.8	0.1	34.4	26.1	0.5
LOS	A	D	A	B	B	A	C	C	A	C	C	A
Approach Delay		25.6			12.7			17.5			29.1	
Approach LOS		C			B			B			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 84	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 23.6	Intersection LOS: C
Intersection Capacity Utilization 73.0%	ICU Level of Service D
Analysis Period (min) 15	

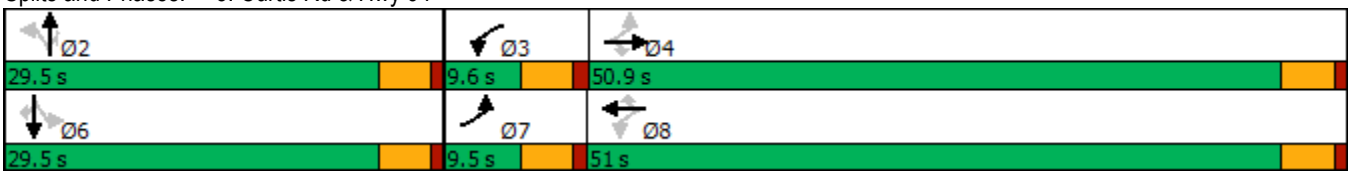
Splits and Phases: 3: Curtis Rd & Hwy 94



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	286	33	26	646	252	240	144	46	10	12	14
Future Volume (vph)	34	286	33	26	646	252	240	144	46	10	12	14
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.110			0.503			0.748			0.625		
Satd. Flow (perm)	205	1863	1583	937	1863	1583	1393	1863	1583	1164	1863	1583
Satd. Flow (RTOR)			73			268			73			73
Peak Hour Factor	0.85	0.92	0.85	0.85	0.85	0.94	0.85	0.85	0.85	0.85	0.85	0.85
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	311	39	31	760	268	282	169	54	12	14	16
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Total Split (s)	9.5	50.9	50.9	9.6	51.0	51.0	29.5	29.5	29.5	29.5	29.5	29.5
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Act Effct Green (s)	39.5	36.9	36.9	39.6	36.9	36.9	26.0	26.0	26.0	26.0	26.0	26.0
Actuated g/C Ratio	0.51	0.48	0.48	0.51	0.48	0.48	0.34	0.34	0.34	0.34	0.34	0.34
v/c Ratio	0.19	0.35	0.05	0.06	0.85	0.30	0.60	0.27	0.09	0.03	0.02	0.03
Control Delay	9.1	13.9	1.0	7.2	28.6	2.5	32.5	24.5	4.4	24.0	23.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	13.9	1.0	7.2	28.6	2.5	32.5	24.5	4.4	24.0	23.7	0.1
LOS	A	B	A	A	C	A	C	C	A	C	C	A
Approach Delay		12.1			21.4			26.8			14.8	
Approach LOS		B			C			C			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 77.2	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 20.8	Intersection LOS: C
Intersection Capacity Utilization 62.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Curtis Rd & Hwy 94



Appendix Table 1

TRANSPORTATION
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Appendix Table 1
Internal & Passby Trip Calculation
Karman Line

Land Use	Trip Generation Units		Raw ITE Trip Generation[1] (Individual Driveway Trips)					Percent Internal Trips[2]					Total Internal Trips					Total External Trips					Percent Passby Trips[3]	Total Passby Trips				
				AM		PM			AM		PM			AM		PM			AM		PM				AM		PM	
	Quantity	Unit	Daily	In	Out	In	Out	Daily	In	Out	In	Out	Daily	In	Out	In	Out	Daily	In	Out	In	Out		Daily	In	Out	In	Out
Residential Uses																												
Single-Family Detached Housing	3,396	DU[4]	32,025	595	1,781	2,012	1,180	5%	11%	12%	5%	4%	1,761	67	221	93	53	30,264	528	1,560	1,919	1,127	0%	0	0	0	0	0
Multifamily Housing (Low-Rise)	3,104	DU	20,921	299	943	999	584	6%	11%	12%	5%	4%	1,151	34	117	46	26	19,770	265	826	953	558	0%	0	0	0	0	0
	6,500	**DU**	**52,946**	**894**	**2,724**	**3,011**	**1,764**						**2,912**	**101**	**338**	**139**	**79**	**50,034**	**793**	**2,386**	**2,872**	**1,685**		**0**	**0**	**0**	**0**	**0**
Non-Residential Uses																												
Shopping Center (>150 KSF)	754	KSF[5]	27,906	394	239	1,229	1,335	3%	2%	2%	4%	4%	837	8	5	49	53	27,069	386	234	1,180	1,282	34%	9,203	105	105	419	419
General Light Industrial	338	KSF	1,646	220	30	31	189	3%	2%	2%	4%	4%	49	4	1	1	8	1,597	216	29	30	181	0%	0	0	0	0	0
Elementary School	600	Students	1,362	240	204	44	52	75%	75%	25%	25%	75%	1,022	180	51	11	39	340	60	153	33	13	0%	0	0	0	0	0
Middle School	500	Students	1,050	181	154	36	39	75%	75%	25%	25%	75%	788	136	39	9	29	262	45	115	27	10	0%	0	0	0	0	0
Community Center	10	KSF	288	13	6	12	13	75%	75%	75%	75%	75%	216	10	5	9	10	72	3	1	3	3	0%	0	0	0	0	0
	Non-Residential Total		**32,252**	**1,048**	**633**	**1,352**	**1,628**						**2,912**	**338**	**101**	**79**	**139**	**29,340**	**710**	**532**	**1,273**	**1,489**		**9,203**	**105**	**105**	**419**	**419**
	Graand Total		**85,198**	**1,942**	**3,357**	**4,363**	**3,392**						**5,824**	**439**	**439**	**218**	**218**	**79,374**	**1,503**	**2,918**	**4,145**	**3,174**		**9,203**	**105**	**105**	**419**	**419**

Notes:

(1) See Table 2

(2) Estimates by LSC based on the NCHRP 684 Internal Trip Capture Estimation Tool, the number of residential dwelling units, and the number of students

(3) 34% of the external retail trips were assumed to be pass-by trips based on the percentages shown for Land Use No. 820 - Shopping Center in Table E.9 of the *Trip Generation Handbook - An ITE Proposed Recommended Practice, Third Edition 2017* by ITE

(4) DU = dwelling unit

(5) KSF = thousand square feet of floor area

NCHRP Report 684 Internal Trip Capture Estimation Tool

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Karman Line	**Organization:**	LSC Transportation Consultants, Inc.
Project Location:	El Paso County, CO	**Performed By:**	KDF
Scenario Description:	Buildout	**Date:**	8/14/2023
Analysis Year:	2043	**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				633	394	239
Restaurant				0		
Cinema/Entertainment				0		
Residential				3,618	894	2,724
Hotel				0		
All Other Land Uses[2]				1,048	654	394
				5,299	1,942	3,357

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	18	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	27	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	5,299	1,942	3,357
Internal Capture Percentage	2%	2%	1%
External Vehicle-Trips[5]	5,209	1,897	3,312
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	7%	8%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	2%	1%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	Karman Line
Analysis Period:	AM Street Peak Hour

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	394	394	1.00	239	239
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	894	894	1.00	2724	2724
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	69		31	0	33	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	54	27	545	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		126	0	0	0	0
Retail	0		0	0	18	0
Restaurant	0	32		0	45	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	67	0	0		0
Hotel	0	16	0	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	27	367	394	367	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	18	876	894	876	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	654	654	654	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	18	221	239	221	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	27	2697	2724	2697	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	394	394	394	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Karman Line	**Organization:**	LSC Transportation Consultants, Inc.
Project Location:	El Paso County, CO	**Performed By:**	KDF
Scenario Description:	Buildout	**Date:**	8/14/2023
Analysis Year:	2043	**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				2,564	1,229	1,335
Restaurant				0		
Cinema/Entertainment				0		
Residential				4,775	3,011	1,764
Hotel				0		
All Other Land Uses[2]				416	123	293
				7,755	4,363	3,392

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office					5280	
Retail					5280	
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	35	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	123	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	7,755	4,363	3,392
Internal Capture Percentage	4%	4%	5%
External Vehicle-Trips[5]	7,439	4,205	3,234
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	10%	3%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	1%	7%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-P, 9-P (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Project Name:	Karman Line
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends							
Land Use	Table 7-P (D): Entering Trips				Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*		Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0		1.00	0	0
Retail	1.00	1229	1229		1.00	1335	1335
Restaurant	1.00	0	0		1.00	0	0
Cinema/Entertainment	1.00	0	0		1.00	0	0
Residential	1.00	3011	3011		1.00	1764	1764
Hotel	1.00	0	0		1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	27		387	53	35	67
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	71	741	370	0		53
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		98	0	0	120	0
Retail	0		0	0	1385	0
Restaurant	0	615		0	482	0
Cinema/Entertainment	0	49	0		120	0
Residential	0	123	0	0		0
Hotel	0	25	0	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	123	1106	1229	1106	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	35	2976	3011	2976	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	123	123	123	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	35	1300	1335	1300	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	123	1641	1764	1641	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	293	293	293	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

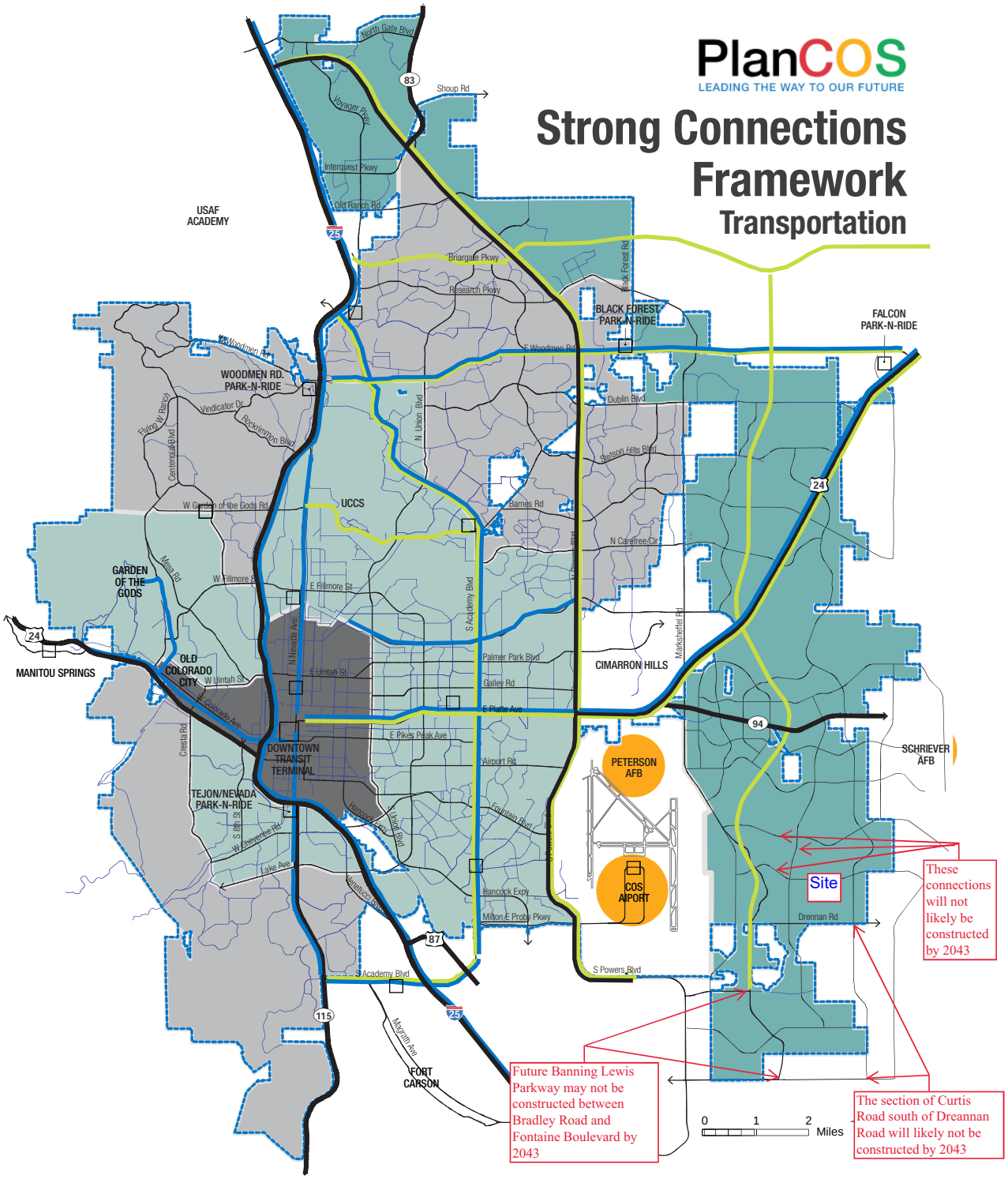
Pages from PlanCOS_2020

TRANSPORTATION
CONSULTANTS, INC.

PlanCOS
LEADING THE WAY TO OUR FUTURE

Strong Connections Framework

Transportation



Predominant Typology

- Urban Core Streets
- Established Suburban Streets
- Developing Suburban Streets
- Future Streets
- Smart Corridors
- Multimodal Corridors
- Bike Master Plan Network
- Major Destination Areas
- Transportation Hubs
- Park-N-Rides
- City Boundary
- Intercity Corridors
- Major Roads

MOBILITY FRAMEWORK

The Mobility Framework Map provides a high level graphic framework of the transportation vision for Strong Connections. This map is intended to be used as one means of furthering the City's focus on enhancing the multimodal opportunities in the city and on improving the efficiency of the system. This map is expected to be a living and evolving graphic. It is recognized that some major streets combine the characteristics of more than one typology. As a high level city-wide framework, this map is also not able or intended to fully represent the sometimes unique and important conditions associated with specific segments of larger and sometimes multistreet corridors. This map is not intended to strictly define street types for all city streets. More detail will be provided with the City's Intermodal Mobility Plan.