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Waterview North
Traffic Impact Analysis
(LSC #204210)
May 29, 2020

Revise to "Master Traffic Impact Study" Supsequent prelim or final plat will require individual TIS.

Traffic Engineer's Statement

This traffic report and supporting information were prepared under my responsible charge and they comport with the standard of care. To the degree consistent with the standard of care, said report was prepared in general conformance with the criteria established by the County for traffic reports.

Developer's Statement

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

P. J. KOSCIELSKI, MANAGER
CPR ENTITLEMENTS, LLC

5/28/20
Date

Waterview North

Traffic Impact Analysis

Prepared for:
CPR Entitlements, LLC
31 N Tejon St #500,
Colorado Springs, CO 80903

Contact: Mr. P. A. Koscielski, Manager

MAY 29, 2020

LSC Transportation Consultants
Project Manager: Jeffrey C. Hodsdon, P.E.

LSC #204210

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MTCP Maps

Traffic Count Reports

Level of Service Reports

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May 29, 2020

Mr. P. A. Koscielski, Manager
CPR Entitlements, LLC
31 N Tejon St #500,
Colorado Springs, CO 80903

RE: Waterview North
Traffic Impact Analysis
El Paso County, CO
LSC #204210

Dear Mr. Koscielski,

In response to your request, LSC Transportation Consultants, Inc. has prepared this traffic impact and access analysis for Waterview North mixed-use development. As shown in Figure 1, the site is located northeast of the intersection of Powers Boulevard and Bradley Road in El Paso County, Colorado. This report contains the following:

REPORT CONTENTS

This report has been prepared to address the project's traffic impact at the proposed access points and adjacent intersections.

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 projected future background traffic volumes, which include estimates of traffic from other area development projects and increases in through traffic on the adjacent arterial streets
- The estimated average weekday and peak-hour trip generation
- The estimated directional distribution of site-generated trips and the projected site-generated traffic volumes
- Estimates of the resulting total traffic volumes on the adjacent streets and intersections
- The projected levels of service at the site access point and adjacent intersections

PREVIOUS TRAFFIC REPORTS COMPLETED IN THE AREA

A list of other traffic studies in the area of study completed within the past five years (that LSC is aware of) is attached for reference. This study accounts for the land use, trip generation and the roadway network included in these studies.

LAND USE AND ACCESS

Land Use

The Waterview North site is located north of Bradley Road and east of Powers Boulevard. The Springs at Waterview East Preliminary Plan area is located south of the site. The Trails at Aspen Ridge residential development located within the Springs at Waterview East Preliminary Plan area was recently approved. The parcels located in the northwest corner of the Springs at Waterview East Preliminary Plan area are planned to be developed with commercial uses in the future.

The Peak Innovation Park is a mixed-use development currently under review that is located north and east of the Waterview North Site. The Peak Innovation Park is planned to include a mix of office, industrial, and commercial land uses.

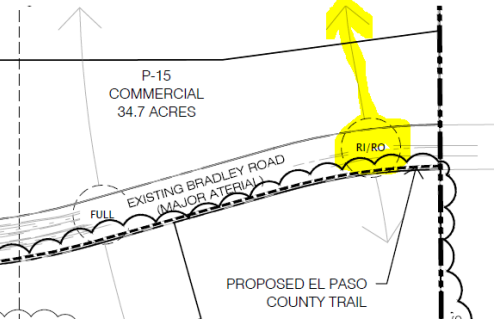
Figure 2 shows the proposed site plan for Waterview North. The site is planned to include about 22.3 acres for commercial uses, 24.4 acres for industrial uses, 425 single family homes, and 524 multi-family residential dwelling units.

Access

Access to Bradley Road is proposed via a full-movement intersection 1,030 feet east of Powers Boulevard aligning with the future Legacy Hill Drive, which will serve the Springs at Waterview East Preliminary Plan area. An additional three-quarter movement (left-in/right-in/right-out-only) access is proposed about 1,317 feet east of Legacy Hill Drive. The site plan also includes a future connection to the Peak Innovation Park site.

Pedestrian and Bicycle Access

There are currently no schools located within two miles of the proposed development. There are no existing sidewalks on Bradley Road or Powers Boulevard. Sidewalks should be provided on all of the internal streets within Waterview North. Sidewalks are also planned on Legacy Hill Drive south of Bradley Road.



Revise. The current approved sketch plan and the proposed amendment shows RI/RO only. Describe and include in the appendix the approved deviation request for RI/RO and the full movement access from SKP162

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.

- **Bradley Road** is shown with a Minor Arterial classification east of Grinnell Boulevard on the the 2016 2040 El Paso County *Major Transportation Corridors Plan (MTCP)*. Adjacent to the site, Bradley Road is a four-lane roadway with a 50-mph posted speed limit and has an edge-of-asphalt median, left-turn lanes, and rural paved shoulders. There is a short existing section of raised median approaching Powers Boulevard. The 2040 MTCP includes the construction of Bradley Road between Grinnell Boulevard and Powers Boulevard in the 2040 roadway improvement B list projects.

- **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 El Paso County Major Transportation Corridors Plan (MTCP). The posted speed limit on Marksheffel Road in the vicinity of Bradley Road is 55 mph.

2018 Traffic Volumes

Figure 3 shows the traffic volumes at the intersections of Powers Boulevard/Bradley Road and Marksheffel Road/Bradley Road, based on the attached traffic counts conducted by LSC in April and October 2018. Figure 3 also shows the 2018 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 based on the peak-hour traffic counts, assuming the afternoon peak hour represents 10 percent of the daily traffic volume. This ratio was based on the Colorado Department of Transportation 30th highest annual hourly traffic volume, reported as percentage of average annual daily traffic volumes for Powers Boulevard adjacent to the site.

Be advised: If the amended sketch plan is approved, the subsequent traffic impact studies will require new 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 1 shows the level of service delay ranges.

Table 1: Intersection Levels of Service Delay Ranges

Level of Service	Signalized Intersections: Average Control Delay (seconds per vehicle)	Unsignalized Intersections: 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 based on the unsignalized intersection analysis procedures from the *Highway Capacity Manual, 6th Edition* by the Transportation Research Board. Figure 3 shows the level of service analysis results.

All movements at these intersections are currently operating at LOS D or better during the peak hours.

BACKGROUND TRAFFIC

Background traffic is the traffic estimated to be on the adjacent roadways and at adjacent intersections without the proposed development's trip generation of site-generated traffic volumes. Background traffic includes the through traffic and the traffic generated by nearby developments, but assumes zero traffic generated by the site.

Figure 4 shows the projected short-term background traffic volumes. These traffic volumes are based on the existing traffic volumes shown in Figure 3 plus additional traffic projected to be generated by development of The Trails at Aspen Ridge Filing No. 1 and the Trails at Aspen Ridge PUD. The projected additional traffic volumes were taken from a traffic impact study prepared by LSC. The short-term background traffic volumes assume a connection has not yet been constructed to the Peak Innovation Park.

The existing traffic count was from two years ago. Either include a growth rate factor to 2020 or explain why included a growth rate is not conducted.

Figure 5 shows the projected 2040 background traffic volumes. The 2040 background traffic volumes were based on the *Trails at Aspen Ridge Filing No. 1 Updated Traffic Impact and Access Analysis* by LSC dated December 12, 2019. These volumes assume buildout of the Springs at Waterview East Preliminary Plan, Bradley Heights, and the Peak Innovation Park. The long-term background volumes assume Bradley Road has been constructed between Goldfield Drive and Powers Boulevard and assumes a connection to the Peak Innovation Park.

TRIP GENERATION

The site-generated vehicle-trips were estimated using the nationally published trip generation rates from *Trip Generation, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE). Table 2 shows the average weekday and peak-hour trip generation estimates.

The total number of 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. Table 2 shows the number of internal trips assumed for each land use. The internal trip reduction for the commercial parcels is an estimate by LSC, based on *National Highway Cooperative Highway Research Program (NCHRP) Report 684 Enhancing Internal Trip Capture Estimation for Mixed-Use Developments*. The results of the spreadsheet model are attached.

The total number of vehicle-trips generated has also been reduced to take into account 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 on Table 2 are from the *Trip Generation Handbook - An ITE Proposed Recommended Practice, 3rd Edition*, 2017 by ITE.

At buildout the Waterview North site is projected to generate about 14,419 new 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 371 vehicles would enter and 496 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 822 vehicles would enter and 759 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 6 shows the short-term and long-term directional distributions of traffic projected to be generated by the residential uses. Figure 7 shows the short-term and long-term directional distributions of traffic projected to be generated by the non-residential uses. The short-term directional distribution estimates were based on the existing area roadway system and the traffic counts. The long-term

directional distribution estimates were based on the anticipated regional development and future roadway networks including the construction of Bradley Road between Grinnell Street and Powers Boulevard and a future north/south connection between Bradley Road and Fontaine Boulevard through the Bradley Heights development located east of the Waterview East Preliminary Plan area.

This distribution was estimated with a focus on peak-hour trip assignment as the intersection analysis is based on peak-hour volumes.

- The distribution percentages to/from the east account for:
  - Some longer trip lengths by commuters;
  - The proximity of this development to Marksheffel Road;
  - Anticipated use of Marksheffel Road north as a viable alternative to Powers to/from many destinations east of and within the Powers Boulevard corridor. Powers Boulevard intersections experience congestion during peak hours. Marksheffel has recently been upgraded north and south of Bradley with a PPRTA project, which has increased its attractiveness as a north/south travel route;
  - Bradley to/from the east being the route to Schriever AFB and the improved east gate of Peterson AFB; and
  - Development occurring in the Marksheffel corridor and, over time, the number of trip destinations continuing to increase.
- The distribution percentages to/from the Bradley Heights connection account for:
  - Planned alternative street connections within Bradley Heights to Bradley Road and Marksheffel Road (south);
  - Future trip destinations within Bradley Heights;
  - The school and some potential future commercial within Lorson Ranch to the southeast;
  - The long-term distribution split accounts for a north-south road connection between Bradley Heights and Fontaine Boulevard, as shown on the Banning Lewis Master Plan and the City of Colorado Springs Intermodal Transportation Plan. This includes trips oriented to the south and southeast.
- The percentages to/from the south on Powers account for trips from the south and southeast, paired with destinations primarily in Fountain and Fort Carson as well as the south connection to Interstate 25.
- The percentages to/from the north on Powers primarily account for trips using Milton Proby Parkway and the Powers Boulevard corridor for travel.

When the distribution percentages (from Figures 5 and 6) are applied to the trip generation estimates (from Table 2), the resulting site-generated traffic volumes can be determined. Figures 8 and 9 show the projected short-term and long-term site-generated traffic volume due to Waterview North.

BUILDOUT TOTAL TRAFFIC

Figure 10 shows the projected short-term total traffic volumes. The short-term total traffic volumes are the sum of the short-term background traffic volumes (from Figure 4) plus the short-term site-generated traffic volumes (from Figure 8).

Figure 11 shows the projected 2040 total traffic volumes. The 2040 total traffic volumes are the sum of the 2040 background traffic volumes (from Figure 5) plus the long-term site-generated traffic volumes (from Figure 9).

PROJECTED LEVELS OF SERVICE

The key area intersections have been analyzed to determine the projected levels of service for the short-term and 2040 background and short-term and 2040 total traffic volumes, based on the signalized and unsignalized method of analysis procedures found in Synchro and the *Highway Capacity Manual, 6th Edition* by the Transportation Research Board. Figures 4, 5, 10, and 11 show the results of the level of service analysis. The level of service reports are attached.

Powers/Bradley

The intersection of Powers/Bradley is currently signalized and is operating at a satisfactory level of service. All movements at this intersection are projected to operate at LOS D or better during the peak hours, based on the short-term total traffic volumes. The short-term analysis assumes the addition of a second southbound left-turn lane. By 2040, it was assumed that the section of Bradley Road between Goldfield Drive and Powers Boulevard would be constructed. Based on the 2040 total traffic volumes shown and the lane geometry shown in Figure 11, the intersection is projected to operate at an overall LOS D during the peak hours. However, some of the minor movements are projected to operate at LOS E or F during the peak hours. It is common for left-turn and side-street through movements to have projected delays in the LOS E or F range as signal coordination timing plans generally give priority to moving through traffic. This often results in higher delay for left-turn and side-street movements and can result in movement/approach delays in the E or F range even though they are projected to have sufficient capacity for the projected traffic volumes. Note: This intersection is planned to be converted to a grade-separated interchange in the long-term future. Figure 12 shows the projected level of service if this occurs by 2040. As shown in Figure 12, all movements are projected to operate at LOS D or better during the peak hours.

Legacy Hill/Bradley

The intersection of Bradley Road/Legacy Hill Drive is projected to operate at LOS D or better during the peak hours for all movements as a signal-controlled intersection, based on the projected short-term total traffic volumes. By 2040, some of the minor movements are projected to operate at LOS E during the peak hours.

Three-Quarter Movement Site Access/Bradley

All movements at the proposed three-quarter movement (left-in/right-in/right-out) intersection of Bradley Road are projected to operate at LOS D or better during the peak hours, based on the projected short-term and 2040 total traffic volumes.

Marksheffel/Bradley

The intersection of Marksheffel/Bradley is currently signalized and is operating at a satisfactory level of service. A second eastbound left-turn lane will be needed in the short-term to maintain an acceptable level of service (LOS D or better) for the eastbound left-turn movement. By 2040, the eastbound left-turn movement is projected to operate at LOS E during the peak hours, even with dual eastbound left-turn lanes.

QUEUING ANALYSIS

A queuing analysis was performed using Synchro/SimTraffic to determine the storage length needed to accommodate the projected left-turn queue on Bradley Road based on the 2040 total traffic volumes. The 2040 total afternoon peak-hour traffic volumes were entered into the Synchro model. The simulation was run five times. The queuing reports are attached.

Based on the projected 2040 total traffic afternoon peak-hour volumes, the projected maximum eastbound left-turn queue on Bradley Road approaching Legacy Hill Drive is about 314 feet.

The projected maximum westbound left-turn queue on Bradley Road approaching Powers Boulevard is about 276 feet.

The projected maximum eastbound left-turn queue on Bradley Road approaching the proposed three-quarter movement site access is about 180 feet.

A copy of Figure 19 Long-Term Bradley Road Lane Recommendations figure from the *Springs at Waterview East Preliminary Plan Traffic Impact Study* has been attached. The location of the three-quarter movement access and proposed left-turn lane has been added to the figure. The projected queues can be accommodated by the lane recommendations shown in the figure.

TRAFFIC SIGNAL WARRANT ANALYSIS

The intersection of Bradley Road and Legacy Hill Drive was analyzed to determine when either an Eight-Hour or a Four-Hour Vehicular Volume Traffic Signal Warrant would be met or be close to being met, based on traffic projected to be generated by the Waterview North development only. As discussed in the *Trails at Aspen Ridge Filing No. 1 Updated Traffic Impact and Access Analysis* by LSC dated December 12, 2019, a Four-Hour Vehicular Volume Traffic Signal Warrant is projected to be met, once about 242 of the planned 786 lots for single family homes are

developed. This analysis assumes none of the homes in the Trails at Aspen Ridge have been developed.

Table 3 shows that Four-Hour and Eight-Hour Vehicular Volume Traffic Signal Warrants are projected to be met once either the residential or retail portion of the Waterview North site is fully developed. The satisfaction of warrants does not indicate that a signal must be installed. The decision to require a signal to be installed at this location rests with the County.

Details of the Analysis

The lower threshold volume for an Eight-Hour Vehicular Volume Traffic Signal Warrant for Condition B - Interruption of Continuous Traffic for a major street with two or more lanes and a posted speed limit greater than 40 mph, and a minor street approach with one lane, is 53 vehicles per hour. This lower threshold is applicable when the major street volumes (eastbound and westbound left, through, and right movements) exceed 630 vehicles per hour. The lower threshold volume for a Four-Hour Vehicular Volume Traffic Signal Warrant for a major street with two or more lanes and a posted speed limit greater than 40 mph, and a minor street approach with one lane, is 60 vehicles per hour. This lower threshold is applicable when the major street volumes (eastbound and westbound left, through, and right movements) exceed 1,000 vehicles per hour. The existing through volumes on Bradley Road adjacent to the site currently exceeds 1,000 vehicles per hour, during both the morning and afternoon peak hours.

Detailed analyses are presented in Table 3. The off-peak through volumes on Bradley Road were estimated, based on 24-hour counts conducted by CDOT on Powers Boulevard just south of Bradley Road. The off-peak volumes on Legacy Hill Drive were based on the short-term site-generated traffic volumes and hourly variation data published by the Institute of Transportation Engineers in August 2018.

ROADWAY CLASSIFICATION

Figure 13 shows the recommended street classification for all streets within Waterview North based on the projected 2040 weekday traffic volumes.

COUNTY ROAD IMPACT FEE PROGRAM

The applicant will be required to participate in the County Road Impact Fee Program. Details to be determined at Prelim/Plat stages.

TRAFFIC SIGNAL ESCROW PERCENTAGES/AMOUNTS

The *Trails at Aspen Ridge Filing No. 1 Updated Traffic Impact and Access Analysis* by LSC dated December 12, 2019 included a traffic signal warrant analysis and traffic signal escrow analysis for a future traffic signal at the intersection of Bradley Road Legacy Hill Drive. Table 4 shows an

updated analysis based on the currently proposed land uses for Waterview North. Assuming a total signal cost of $350,000, a fair share contribution for Waterview North would be $189,709.52.

Double check signal installation cost estimate. Contribution between the two development may need to be revised.

Additionally, earlier in the year the development team for Trails at Aspen Ridge planned to present to the Road Impact Fee committee to request the signal to be included as a reimburseable improvement. What was the outcome/determination?

DEVIATIONS

Deviations to the El Paso County *Engineering Criteria Manual* may be needed for the two access points to Bradley Road.

RECOMMENDED IMPROVEMENTS

A list of all recommended improvements in the vicinity of the site is presented in Table 5.

* * * * *

We trust this traffic impact analysis will assist you in gaining approval of the proposed Waterview North mixed-use development. Please contact me if you have any questions or need further assistance.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

Update narrative. Deviation request was approved for the two access location with SKP162

By_____
Jeffrey C. Hodsdon, P.E.
Principal

JCH:KDF:jas

Enclosures: Tables 2-5
Appendix Table 1
NCHRP Report 684 Internal Trip Capture Estimation Tool
Figures 1-12
MTCP Maps
Traffic Count Reports
Level of Service Reports
Figure 19 Long-Term Bradley Road Lane Recommendations figure from the *Springs at Waterview East Preliminary Plan Traffic Impact Study*

Tables 2-5

TRANSPORTATION
CONSULTANTS, INC.

Table 2
Trip Generation Estimate
Waterview North

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	Internal Trips[2]	Total Internal Trips Generated Average Weekday Traffic	Morning Peak-Hour In	Morning Peak-Hour Out	Afternoon Peak-Hour In	Afternoon Peak-Hour Out	Total External Trips Generated Average Weekday Traffic	Morning Peak-Hour In	Morning Peak-Hour Out	Afternoon Peak-Hour In	Afternoon Peak-Hour Out	Pass-by Trip Percent[3]	Total Future "External" Trips Generated Average Weekday
Trip Generation Estimate Based on the Currently Proposed Plan																										
820	Shopping Center	175	KSF[4]	50.26	0.85	0.52	2.26	2.44	8,796	148	91	395	428	2%	174	4	2	4	11	8,622	144	89	391	417	34%	5,691
130	Industrial Park	325	KSF	5.33	0.32	0.08	0.08	0.32	1,733	105	25	27	103	0%	0	0	0	0	0	1,733	105	25	27	103	0%	1,733
210	Single-Family Detached Housing	425	DU[5]	9.44	0.19	0.56	0.62	0.37	4,012	79	236	265	156	2%	72	1	2	6	2	3,884	77	232	254	152	0%	3,884
220	Multifamily Housing Low-Rise	425	DU	7.32	0.11	0.35	0.35	0.21	3,111	45	151	150	88	2%	56	1	2	5	2	3,111	45	151	150	88	0%	3,111
									17,652	**377**	**502**	**837**	**774**		**302**	**6**	**6**	**15**	**15**	**17,350**	**371**	**496**	**822**	**759**		**14,419**
Trip Generation Estimate Assumed in the *Trails at Aspend Ridge Fil No. 1 and PUD Updated Traffic Impact Analysis* by LSC dated December 12, 2019																										
770	Business Park	720	KSF	11.61	1.14	0.20	0.32	0.90	8,362	820	145	227	646	2%	167	16	3	5	13	8,195	804	142	222	633	0%	8,195
220	Multifamily Housing Low-Rise	288	DU	7.32	0.11	0.35	0.35	0.21	2,108	30	102	102	60	1%	21	0	1	1	1	2,087	30	101	101	59	0%	2,087
210	Single-Family Detached Housing	312	DU	9.44	0.19	0.56	0.62	0.37	2,945	58	173	195	114	1%	29	1	2	2	1	2,916	57	171	193	113	0%	2,916
									13,415	**908**	**420**	**523**	**820**		**217**	**17**	**6**	**8**	**15**	**13,198**	**891**	**414**	**515**	**805**		**13,198**
				Change (Decrease) in Trip Generation Estimate					**4,237**	**-531**	**82**	**314**	**-46**		**85**	**-11**	**0**	**7**	**0**	**4,152**	**-520**	**82**	**307**	**-46**		**1,221**

Notes:

(1) Source: based on *Trip Generation* , 10th Edition, 2017 by the Institute of Transportation Engineers (ITE)

(2) Internal trips to and from the commercial parcels were based on the attached NCHRP 684 Internal Trip Capture Estimation Tool. About one half the school trips were assumed to be internal to the site.

(3) Source: "Trip Generation Handbook - An ITE Proposed Recommended Practice 3rd Edition, September 2017" by ITE

(4) KSF = 1,000 square feet

(5) DU = dwelling unit

Source: LSC Transportation Consultants, Inc.

May-20

Table 3
Waterview North
Traffic Signal Warrant Analysis of Legacy Hill Drive/Bradley Road
Based on the Projected Volumes for the North Leg (Waterview North Access) Only

Period	2 or More Lanes on Major Approach & 1 Lane on Minor Approach																											
	Traffic Volumes														Warrant 1, Eight Hour Vehicular Volume Evaluation										Warrant 2, Four Hour Vehicular Volume Evaluation					
																			Warrant Threshold Met?											
															Warrant Thresholds															
	Existing [1]		Added by Residential Uses (950 DUs[4])		Added by Commercial Uses		Added by Industrial Uses		Existing + Residential Uses		Existing + Commercial Uses		Existing + Industrial Uses		Condition A 70%		Condition B 70%		Existing + Residential		Existing + Commercial		Existing + Industrial		Existing + Residential		Existing + Commercial		Existing + Industrial	
Hour	Major[2]	Minor[3]	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	A 70%	B 70%	A 70%	B 70%	A 70%	B 70%	Minor Street Minimum	Met?	Minor Street Minimum	Met?	Minor Street Minimum	Met?
6:00 AM	1002	0	123	58	26	5	64	3	1125	58	1028	5	1066	3	420	105	630	53	No	Yes	No	No	No	No	60	No	60	No	60	No
7:00 AM	1237	0	244	107	119	23	105	7	1481	107	1356	23	1342	7	420	105	630	53	Yes	Yes	No	No	No	No	60	Yes	60	No	60	No
8:00 AM	1098	0	237	88	221	38	63	10	1335	88	1319	38	1161	10	420	105	630	53	No	Yes	No	No	No	No	60	Yes	60	No	60	No
9:00 AM	866	0	195	61	400	64	41	17	1061	61	1266	64	907	17	420	105	630	53	No	Yes	No	Yes	No	No	60	Yes	60	Yes	65	No
10:00 AM	884	0	183	50	604	105	44	19	1067	50	1488	105	928	19	420	105	630	53	No	No	No	Yes	No	No	60	No	60	Yes	64	No
11:00 AM	1039	0	221	53	324	92	173	20	1260	53	1363	92	1212	20	420	105	630	53	No	No	No	Yes	No	No	60	No	60	Yes	60	No
12:00 Noon	824	0	230	55	354	127	239	26	1054	55	1178	127	1063	26	420	105	630	53	No	Yes	Yes	Yes	No	No	60	No	60	Yes	60	No
1:00 PM	789	0	225	54	307	128	206	16	1014	54	1096	128	995	16	420	105	630	53	No	Yes	Yes	Yes	No	No	60	No	60	Yes	60	No
2:00 PM	792	0	266	61	297	124	181	23	1058	61	1089	124	973	23	420	105	630	53	No	Yes	Yes	Yes	No	No	60	Yes	60	Yes	61	No
3:00 PM	949	0	308	57	284	122	148	31	1257	57	1233	122	1097	31	420	105	630	53	No	Yes	Yes	Yes	No	No	60	No	60	Yes	60	No
4:00 PM	1165	0	397	65	297	127	87	25	1562	65	1462	127	1252	25	420	105	630	53	No	Yes	Yes	Yes	No	No	60	Yes	60	Yes	60	No
5:00 PM	1222	0	361	67	307	127	28	31	1583	67	1529	127	1250	31	420	105	630	53	No	Yes	Yes	Yes	No	No	60	Yes	60	Yes	60	No
6:00 PM	995	0	334	60	254	115	3	6	1329	60	1249	115	998	6	420	105	630	53	No	Yes	Yes	Yes	No	No	60	No	60	Yes	60	No
																			1	11	7	10	0	0		6		10		0
																			No	Yes	No	Yes	No	No		Yes		Yes		No

Notes:
(1) Hourly variation based on traffic counts on Powers Boulevard south of Bradley Road
(2) The major street volumes include all (left/through/right) movements on Bradley Rd
(3) The minor street volumes includes only the southbound left movement on Legacy Hills Drive
(4) DU = Dwelling Unit

Source: LSC Transportation Consultants, Inc.

Table 4
Legacy Hill Drive and Bradley Road Signal Escrow Analysis
Waterview North

Development	Minor Approach Volume[(1)] AM	Minor Approach Volume[(1)] PM	Fair Share	Signal Escrow Amounts Escrow of $350,000
Based on Projected 2040 Total Traffic Volumes				
Trails at Aspen Ridge Fil No. 1	55	37	5.7%	$19,901.11
Trails at Aspen Ridge PUD	176	118	18.2%	$63,597.03
Springs at Waterview East Commercial	60	231	18.0%	$62,948.08
Waterview North	334	543	54.2%	$189,709.52
Peak Innovation Park	12	52	4.0%	$13,844.25
				$350,000

Notes:

(1) Minor approach volume includes all northbound left-turn and through movements plus 25% of northbound right-turn movements and all southbound left-turn and through movements plus the portion of the southbound right-turn movements anticipated to ultimately travel south on Powers Boulevard

Source: LSC Transportation Consultants, Inc. May 2020

Is this still an accurate cost estimate for installing the traffic signal?

Under the traffic signal escrow (pg 9) explain the anticipated process to make up the difference if the actual cost is more than $350K?

Revise to RI/RO

Table 5
Improvements Table
Waterview North

Improvement	Timing /"Trigger Point(s)"	Required Length	Proposed Length	Responsibility[1]
Access Points to Bradley Road (Future Public Street Intersections)				
Full-movement access to the north side of Bradley Road 1,030 feet east of Powers Boulevard (aligning with Legacy Hill Drive on the south side)	With this development	- - -	- - -	Applicant
Three-Quarter Movement (left-in/right-in/right-out access 1,317 feet east of Legacy Hill Drive	With this development	- - -	- - -	Applicant
Traffic Signals				
Traffic Signal Installation - Installation of the traffic signal at Legacy Hill Drive/Bradley Road.	As determined by El Paso County Public Works - typically this is when traffic signal warrants are met, however traffic signal warrants are guidelines and the actual timing of installation is at the discretion of El Paso County Public Works. An Eight-Hour Vehicular Volume Traffic Signal Warrant is projected to be met once any of the following levels of development are reached: 31% of the Trails at Aspen Ridge (242 DUs) 23% of the commercial portion of Springs at Waterview East 93% of the residential portion of Waterview North (884 DUs) 44% of the commercial/industrial portion of Waterview North A warrant may be met sooner if the residential and non-residential portions of either Waterview North or the Trails at Aspen Ridge and Springs at Waterview East are developed concurrently.These trigger points/timing estimates and the need for the signal are subject to change and would be evaluated with each final plat application. County public works approval is required for signal installation.	- - -	- - -	Please refer to the minutes of the County Fee Program Advisory Committe dated April 23, 2020 regarding this intersection.
Auxiliary Lanes				
Extend the existing northbound right-turn deceleration lane on Powers Boulevard approaching Bradley Road	As specified in the terms and conditions of a CDOT Access Permit if not completed sooner by another development. This can be addressed with plat applications.	800' plus 25:1 transition taper	Extend existing lane approximately 200'	To be evaluated with each final plat if not completed sooner by another development
Eastbound dual left-turn lane on Bradley Road approaching Legacy Hill Drive (the dual left would be striped as a single left-turn lane until the intersection is signalized AND dual left-turn operation is operationally necessary)	westbound left-turn volume of 25 vehicles per hour	435' plus 200' taper	250' plus 200' taper	Applicant
Eastbound left-turn lane on Bradley Road approaching the proposed three-quarter movement access	westbound left-turn volume of 25 vehicles per hour	385' plus 200' taper	385' plus 200' taper	Applicant
Westbound right-turn deceleration lane on Bradley Road approaching proposed three-quarter movement access	eastbound right-turn volume of 50 vehicles per hour.	235' plus 200' taper	235' plus 200' taper	Applicant
Westbound right-turn deceleration lane on Bradley Road approaching Legacy Hills Drive	eastbound right-turn volume of 50 vehicles per hour.	235' plus 200' taper	235' plus 200' taper	Applicant
Reconstruct the Powers Boulevard median north of Bradley Road to provide dual southbound left-turn lanes	With this development if not completed by other development(s) or CDOT. The timing of this improvement could be evaluated with each final plat.	- - -	- - -	Likely the applicant if not completed by other development(s) or CDOT.
Reconstruct the Bradley Road to provide dual eastbound left-turn lanes approaching Marksheffel Road	The timing of this improvement could be evaluated with each final plat.	- - -	- - -	Applicant

Source: LSC Transportation Consultants, Inc. (May 2020)

Attach the minutes in the TIS

Appendix Table 1

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NCHRP Report 684 Internal Trip Capture Estimation Tool

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Waterview North	**Organization:**	LSC Transportation Consultants, Inc.
Project Location:	Powers/Bradley	**Performed By:**	KDF
Scenario Description:	Buildout	**Date:**	4/22/2020
Analysis Year:	2040	**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				239	148	91
Restaurant				0		
Cinema/Entertainment				0		
Residential				511	124	387
Hotel				0		
All Other Land Uses[2]				130	105	25
				880	377	503

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	2	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	4	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	880	377	503
Internal Capture Percentage	1%	2%	1%
External Vehicle-Trips[5]	868	371	497
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	3%	2%
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

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Waterview North	**Organization:**	LSC Transportation Consultants, Inc.
Project Location:	Powers/Bradley	**Performed By:**	KDF
Scenario Description:	Buildout	**Date:**	4/22/2020
Analysis Year:	2040	**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				823	395	428
Restaurant				0		
Cinema/Entertainment				0		
Residential				659	415	244
Hotel				0		
All Other Land Uses[2]				130	27	103
				1,612	837	775

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		1000			5280	
Retail					5280	
Restaurant						
Cinema/Entertainment						
Residential		5280				
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	11	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	4	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	1,612	837	775
Internal Capture Percentage	2%	2%	2%
External Vehicle-Trips[5]	1,582	822	760
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	1%	3%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	3%	2%
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

[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.

Figures 1-12

TRANSPORTATION
CONSULTANTS, INC.

Figure 1

Vicinity Map

Waterview North (LSC #204210)

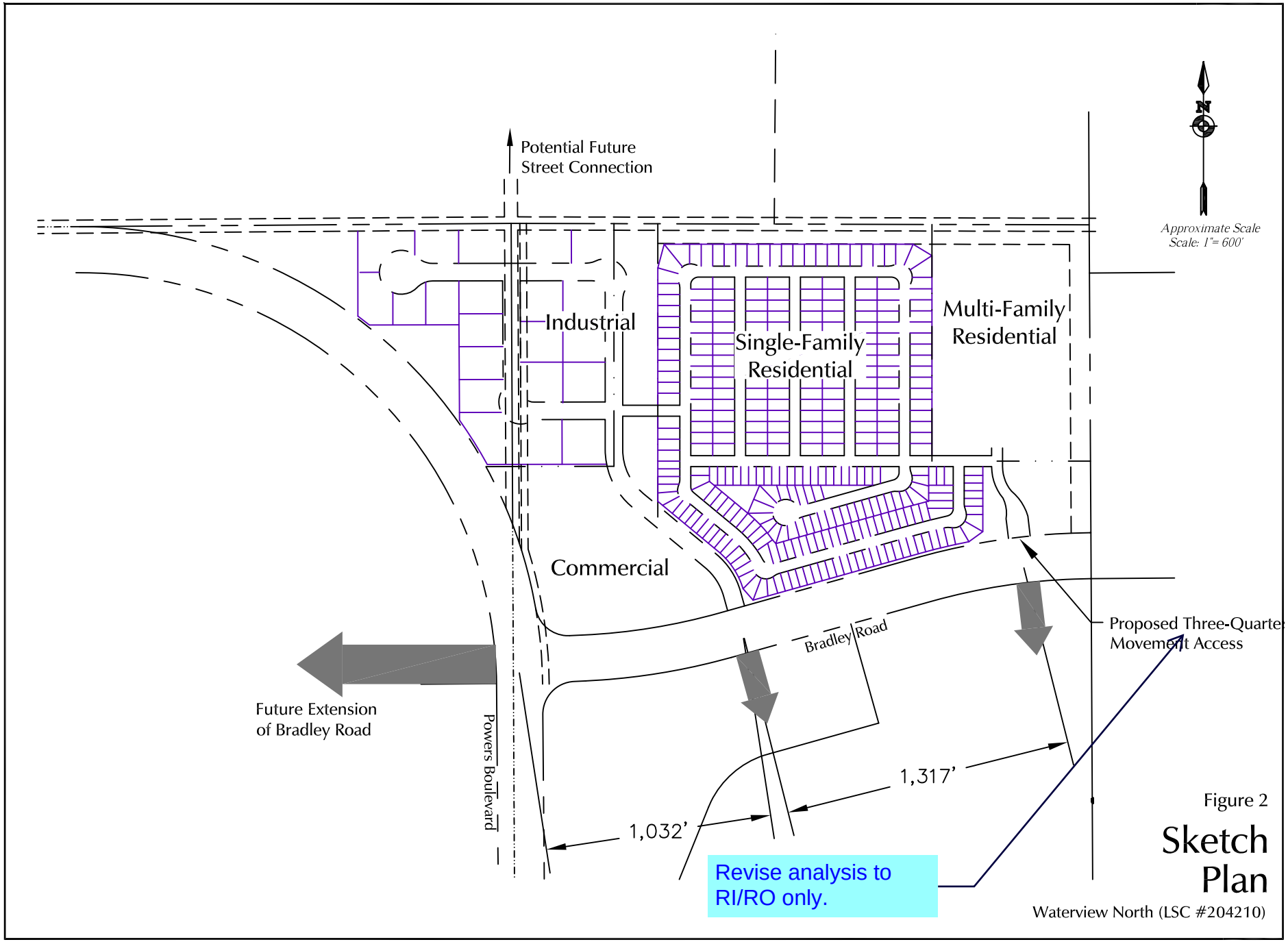
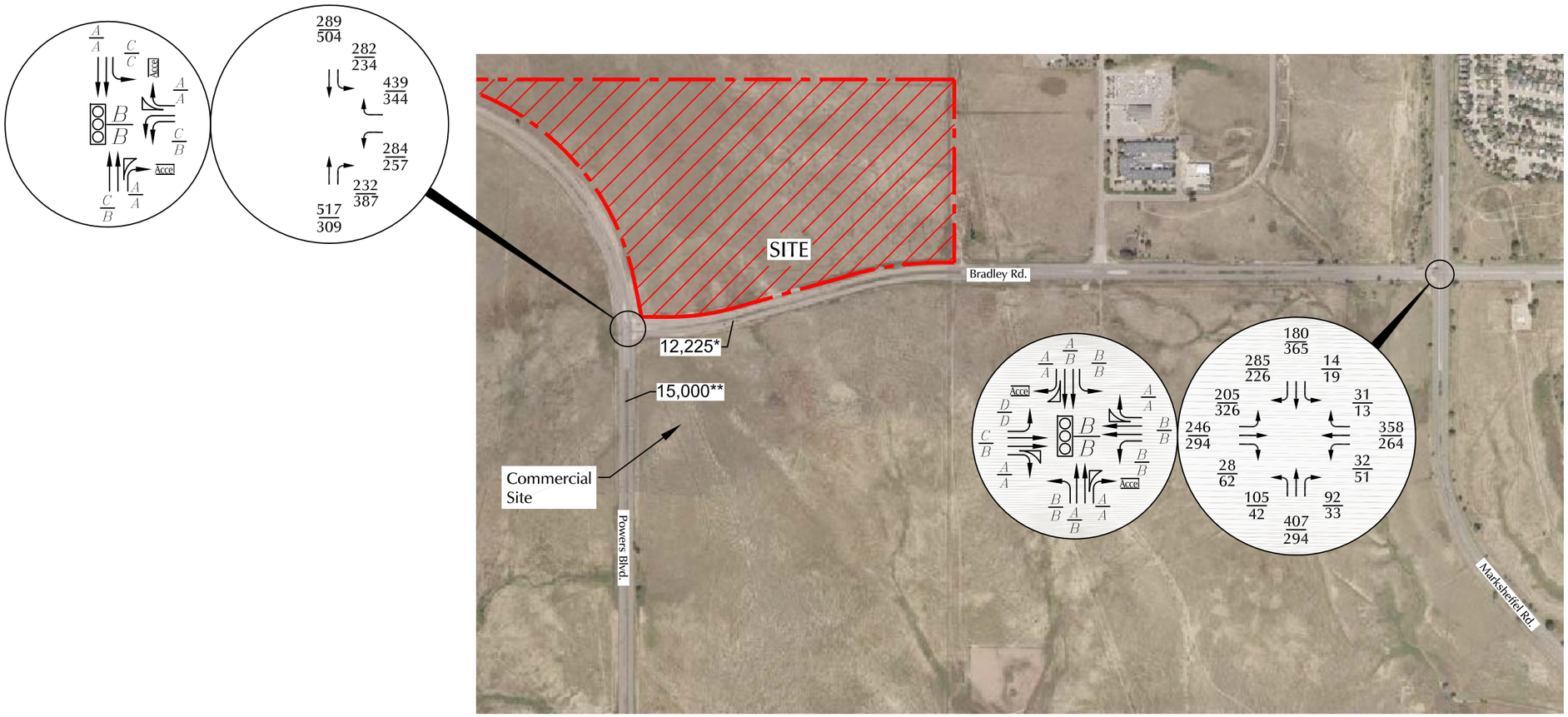


Figure 2

Sketch Plan

Waterview North (LSC #204210)



Approximate Scale
Scale: 1"= 1,000'

LEGEND:

= Traffic Signal

XX/XX = AM Weekday Peak-Hour Traffic (vehicles per hour) / PM Weekday Peak-Hour Traffic (vehicles per hour)

A/B = AM Individual Movement Peak-Hour Level of Service / PM Individual Movement Peak-Hour Level of Service

C/C = AM Entire Intersection Peak-Hour Level of Service / PM Entire Intersection Peak-Hour Level of Service

X,XXX= Average Daily Traffic (vehicles per day)

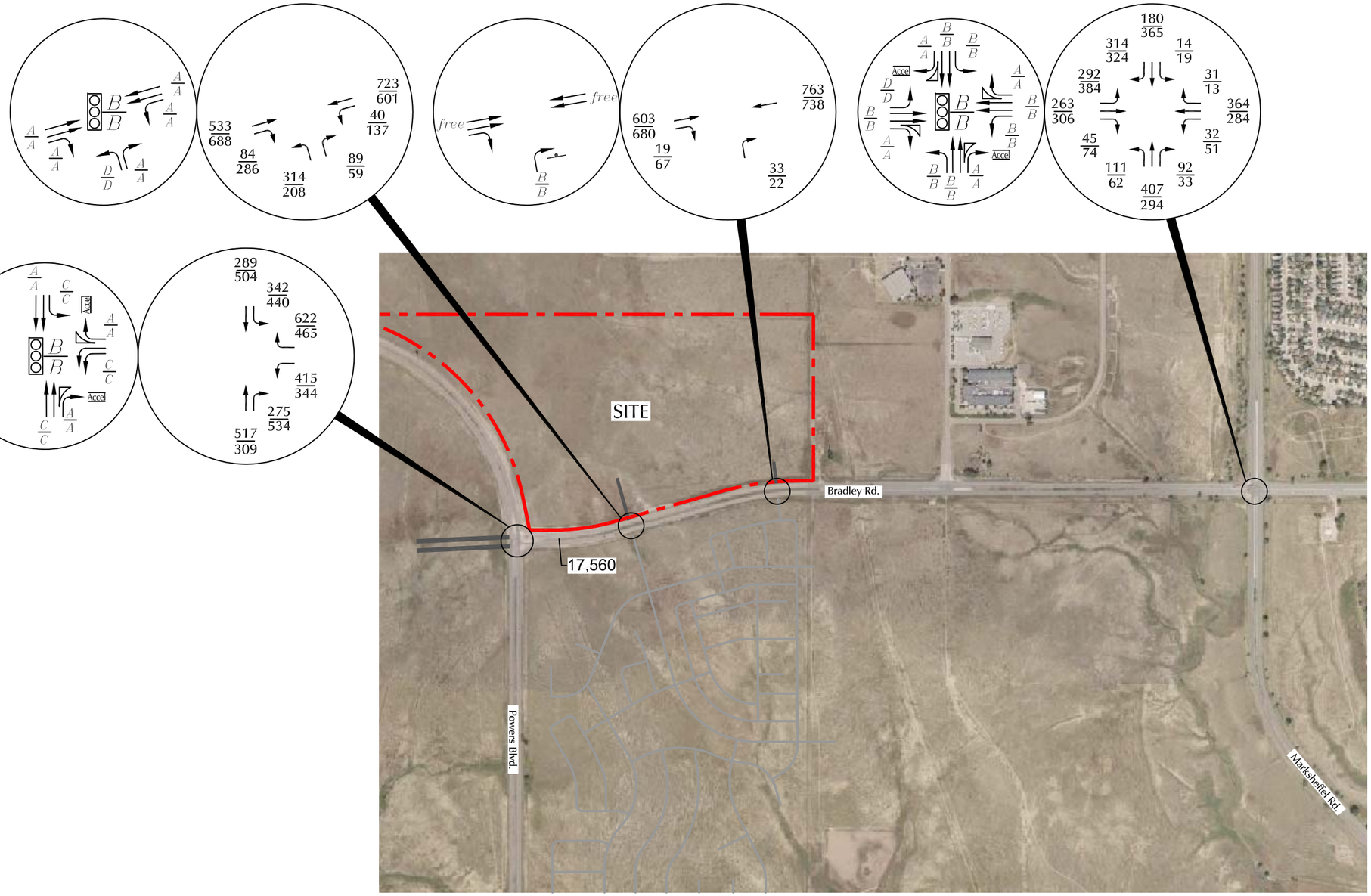
* Estimate by LSC
** 2018 AADT CDOT

Counts by LSC April and October 2018

Figure 3

Existing Traffic, Lane Geometry, Traffic Control and Level of Service

Waterview North (LSC #204210)



Approximate Scale
Scale: 1"= 1,000'

LEGEND:

= Stop Sign

= Traffic Signal

= Modern Roundabout

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour) / PM Weekday Peak-Hour Traffic (vehicles per hour)

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

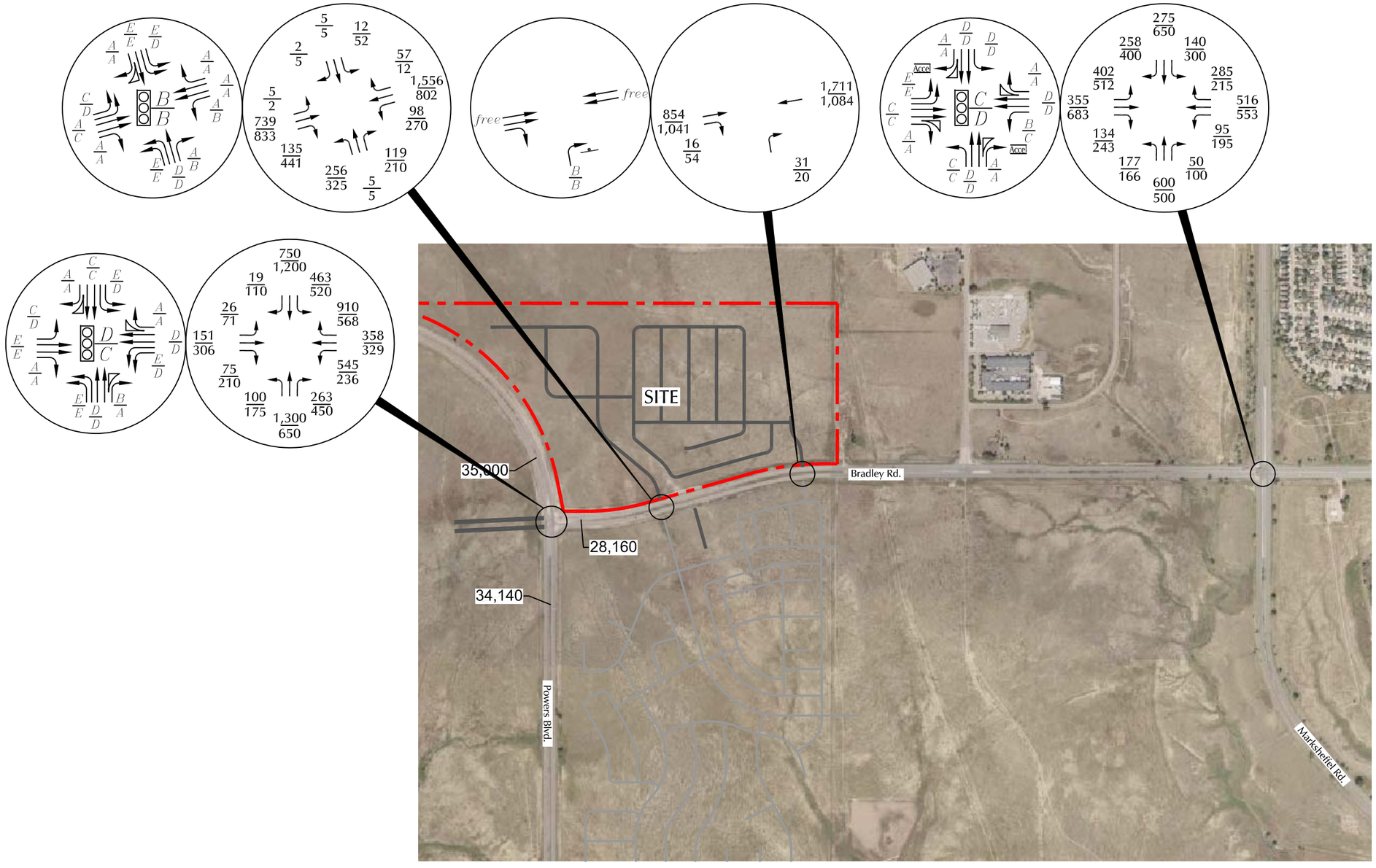
$\frac{C}{C}$ = AM Entire Intersection Peak-Hour Level of Service / PM Entire Intersection Peak-Hour Level of Service

X,XXX= Average Daily Traffic (vehicles per day)

Figure 4

Short-Term Background Traffic, Lane Geometry,Traffic Control and Level of Service

Waterview North (LSC #204210)



Approximate Scale
Scale: 1"= 1,000'

LEGEND:

= Stop Sign

= Traffic Signal

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour) / PM Weekday Peak-Hour Traffic (vehicles per hour)

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

$\frac{C}{C}$ = AM Entire Intersection Peak-Hour Level of Service / PM Entire Intersection Peak-Hour Level of Service

X,XXX= Average Daily Traffic (vehicles per day)

Figure 5

Year 2040 Background Traffic, Lane Geometry,Traffic Control and Level of Service

Waterview North (LSC #204210)

N

Approximate Scale
Scale: 1"= 2,000'

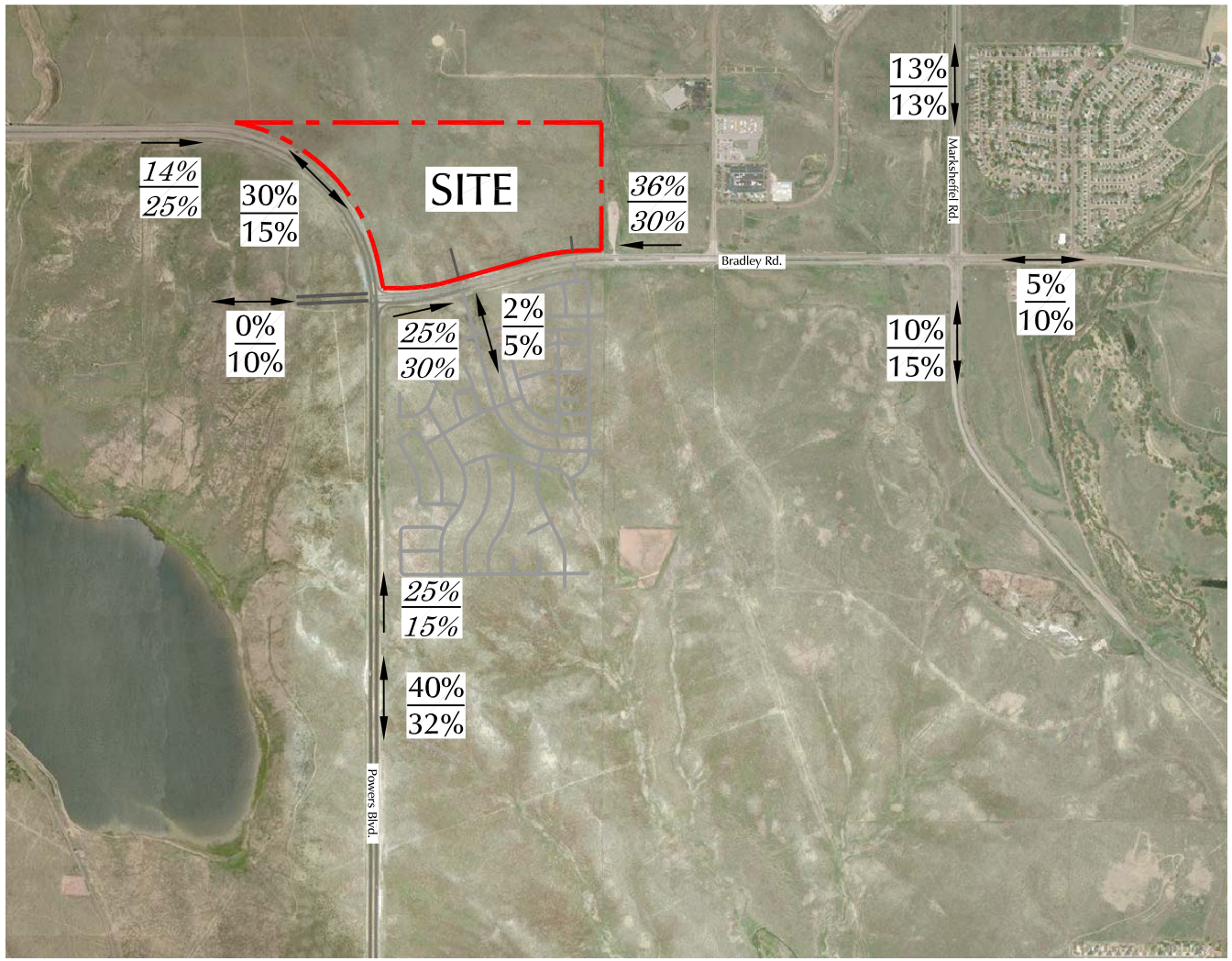
Figure 6

Directional Distribution of Residential Site Generated Traffic

Waterview North (LSC #204210)

LEGEND:

XX% / XX% = Short-Term Percent Directional Distribution / Long-Term Percent Directional Distribution



N

Approximate Scale
Scale: 1"= 2,000'

LEGEND:

XX% / XX% = Short-Term Percent Directional Distribution / Long-Term Percent Directional Distribution

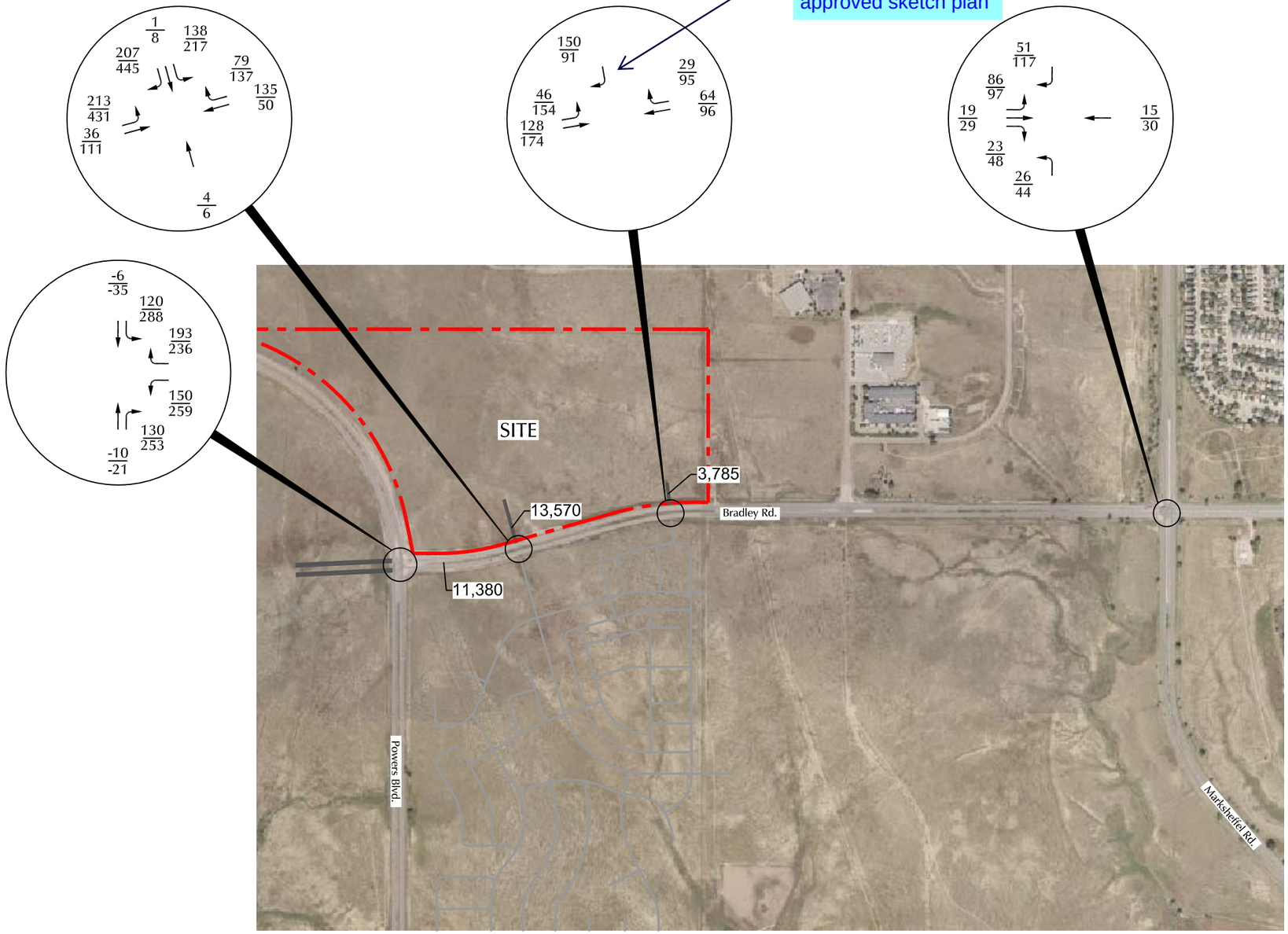
XX% / XX% = Passby Percent Directional Distribution AM / Passby Percent Directional Distribution PM

Figure 7

Directional Distribution of Non-Residential Site Generated Traffic

Waterview North (LSC #204210)

Revise all analysis to RI/RO only per the approved sketch plan



Approximate Scale
Scale: 1"= 1,000'

LEGEND:

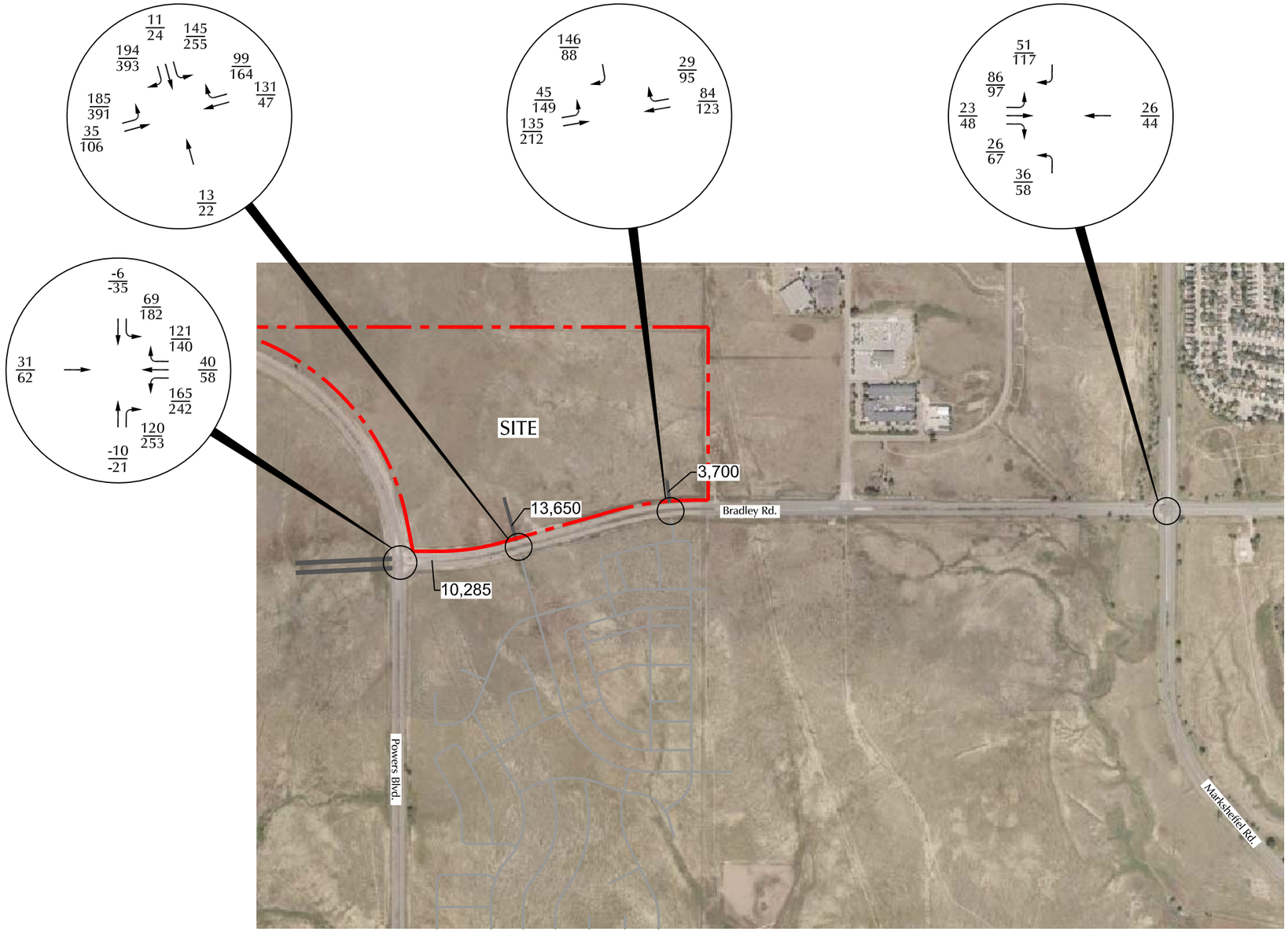
XX/XX = AM Weekday Peak-Hour Traffic (vehicles per hour) / PM Weekday Peak-Hour Traffic (vehicles per hour)

X,XXX= Average Daily Traffic (vehicles per day)

Figure 8

Short-Term Assignment of Site-Generated Traffic

Waterview North (LSC #204210)



Approximate Scale
Scale: 1"= 1,000'

LEGEND:

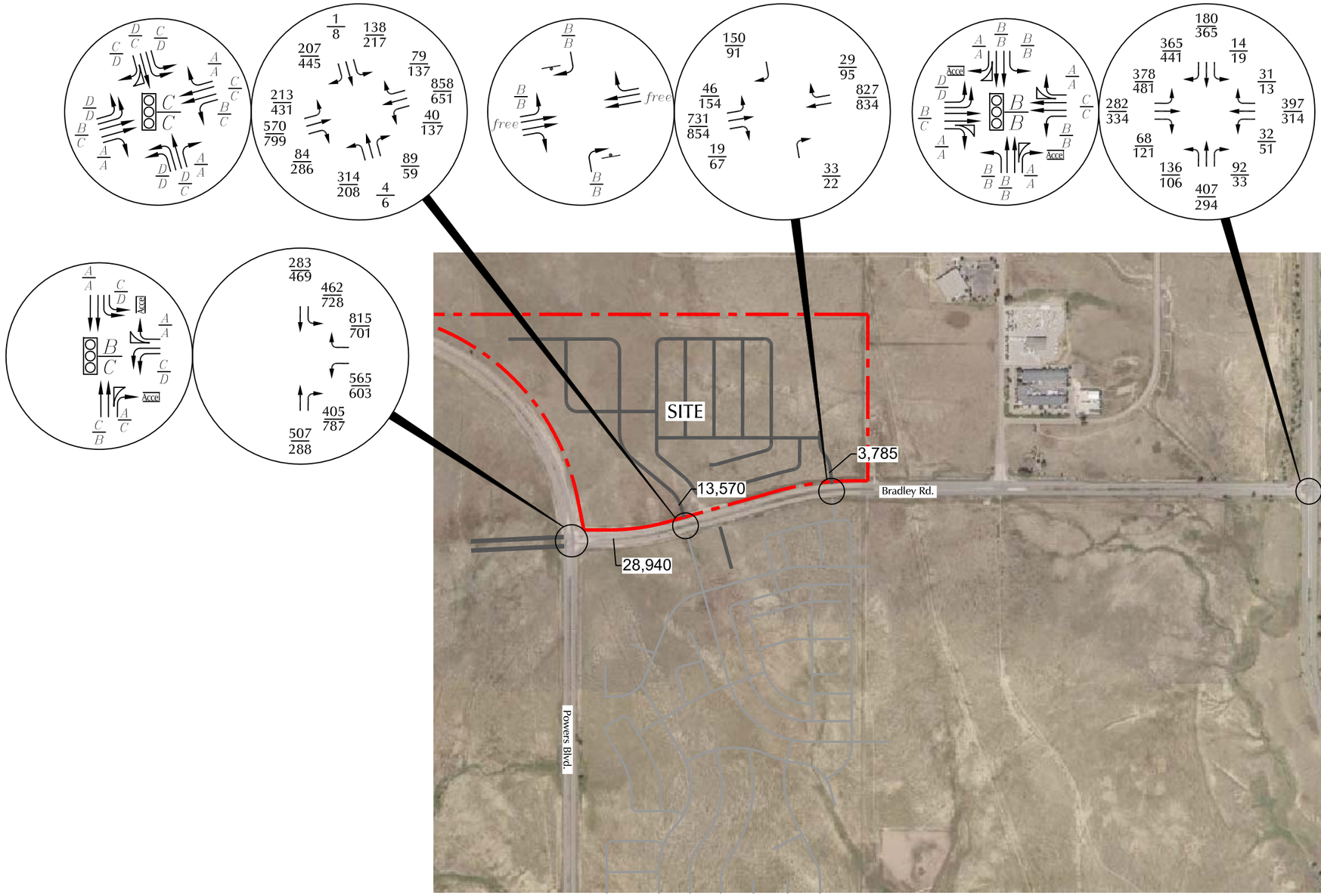
XX/XX = AM Weekday Peak-Hour Traffic (vehicles per hour) / PM Weekday Peak-Hour Traffic (vehicles per hour)

X,XXX= Average Daily Traffic (vehicles per day)

Figure 9

Long-Term Assignment of Site-Generated Traffic

Waterview North (LSC #204210)



Approximate Scale
Scale: 1"= 1,000'

LEGEND:

= Stop Sign

= Traffic Signal

= Modern Roundabout

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour) / PM Weekday Peak-Hour Traffic (vehicles per hour)

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

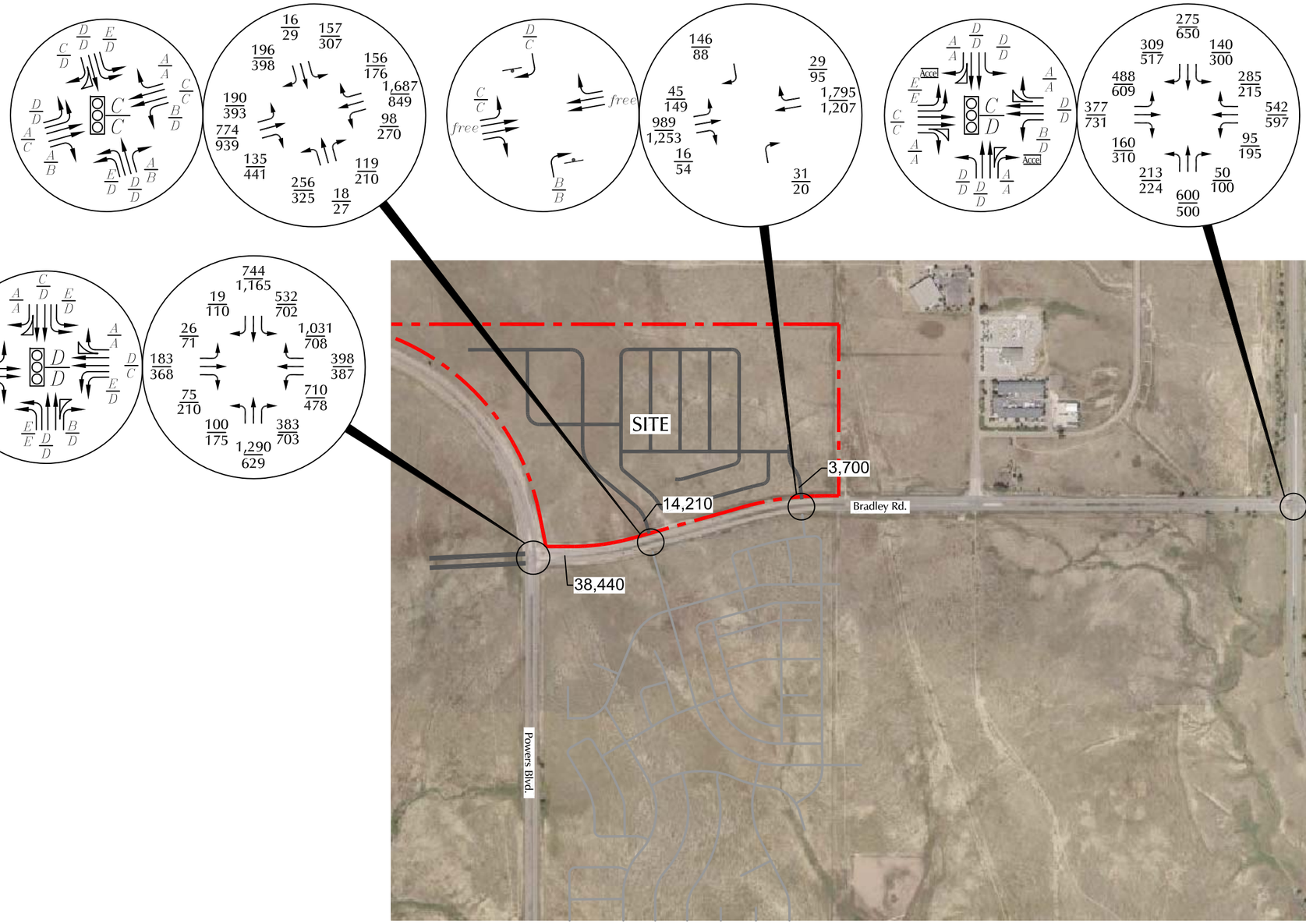
$\frac{C}{C}$ = AM Entire Intersection Peak-Hour Level of Service / PM Entire Intersection Peak-Hour Level of Service

X,XXX= Average Daily Traffic (vehicles per day)

Figure 10

Short-Term Total Traffic, Lane Geometry,Traffic Control and Level of Service

Trails at Aspen Ridge PUD (LSC #184362)



Approximate Scale
Scale: 1"= 1,000'

LEGEND:

= Stop Sign

= Traffic Signal

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour) / PM Weekday Peak-Hour Traffic (vehicles per hour)

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

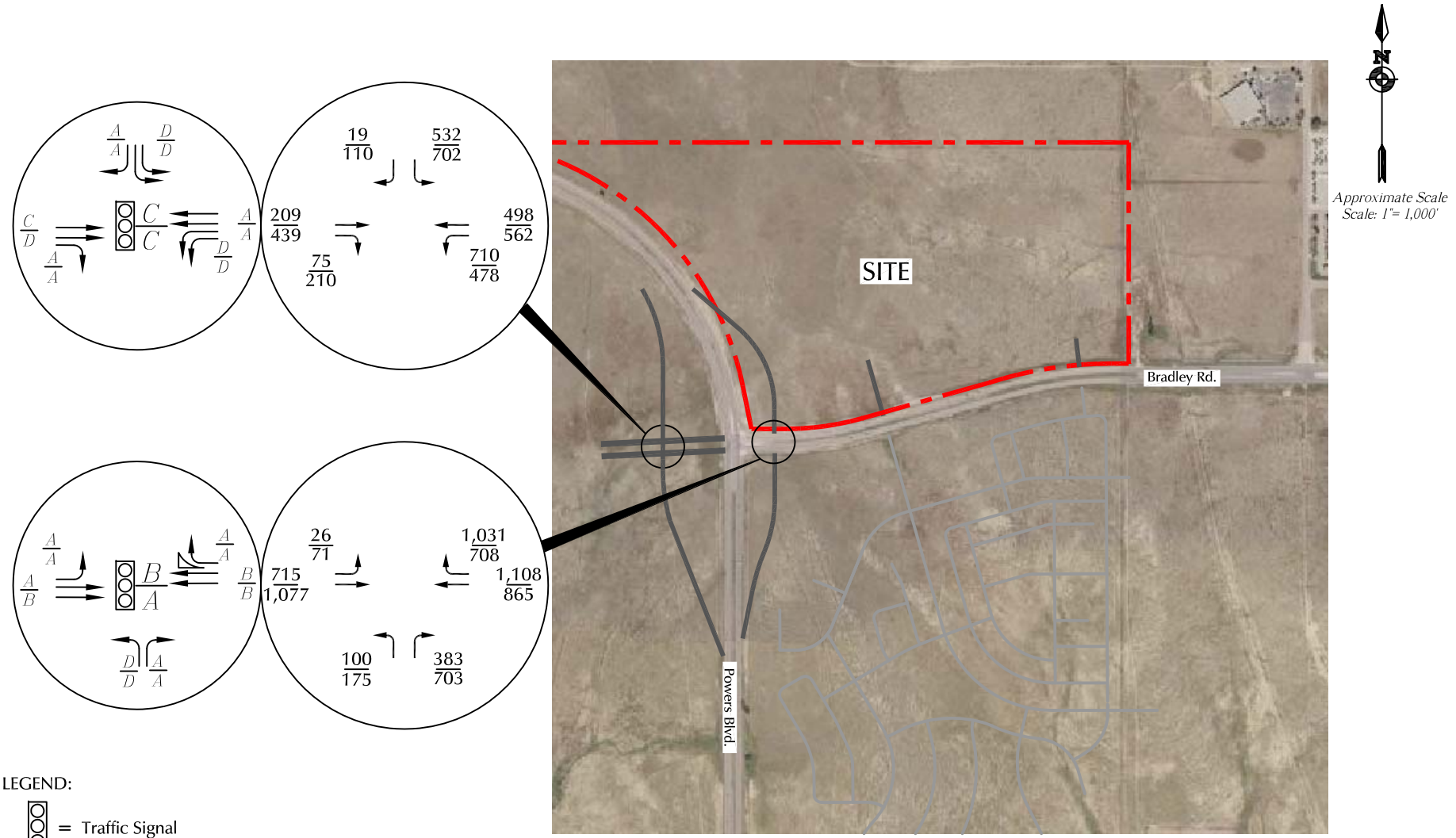
$\frac{C}{C}$ = AM Entire Intersection Peak-Hour Level of Service / PM Entire Intersection Peak-Hour Level of Service

X,XXX= Average Daily Traffic (vehicles per day)

Figure 11

Year 2040 Total Traffic, Lane Geometry,Traffic Control and Level of Service

Waterview North (LSC #204210)



LEGEND:

= Traffic Signal

XX/XX = AM Weekday Peak-Hour Traffic (vehicles per hour) / PM Weekday Peak-Hour Traffic (vehicles per hour)

A/B = AM Individual Movement Peak-Hour Level of Service / PM Individual Movement Peak-Hour Level of Service

C/C = AM Entire Intersection Peak-Hour Level of Service / PM Entire Intersection Peak-Hour Level of Service

Figure 12

Year 2040 Total Traffic, Lane Geometry, Traffic Control and Level of Service with an Interchange

Waterview North (LSC #204210)

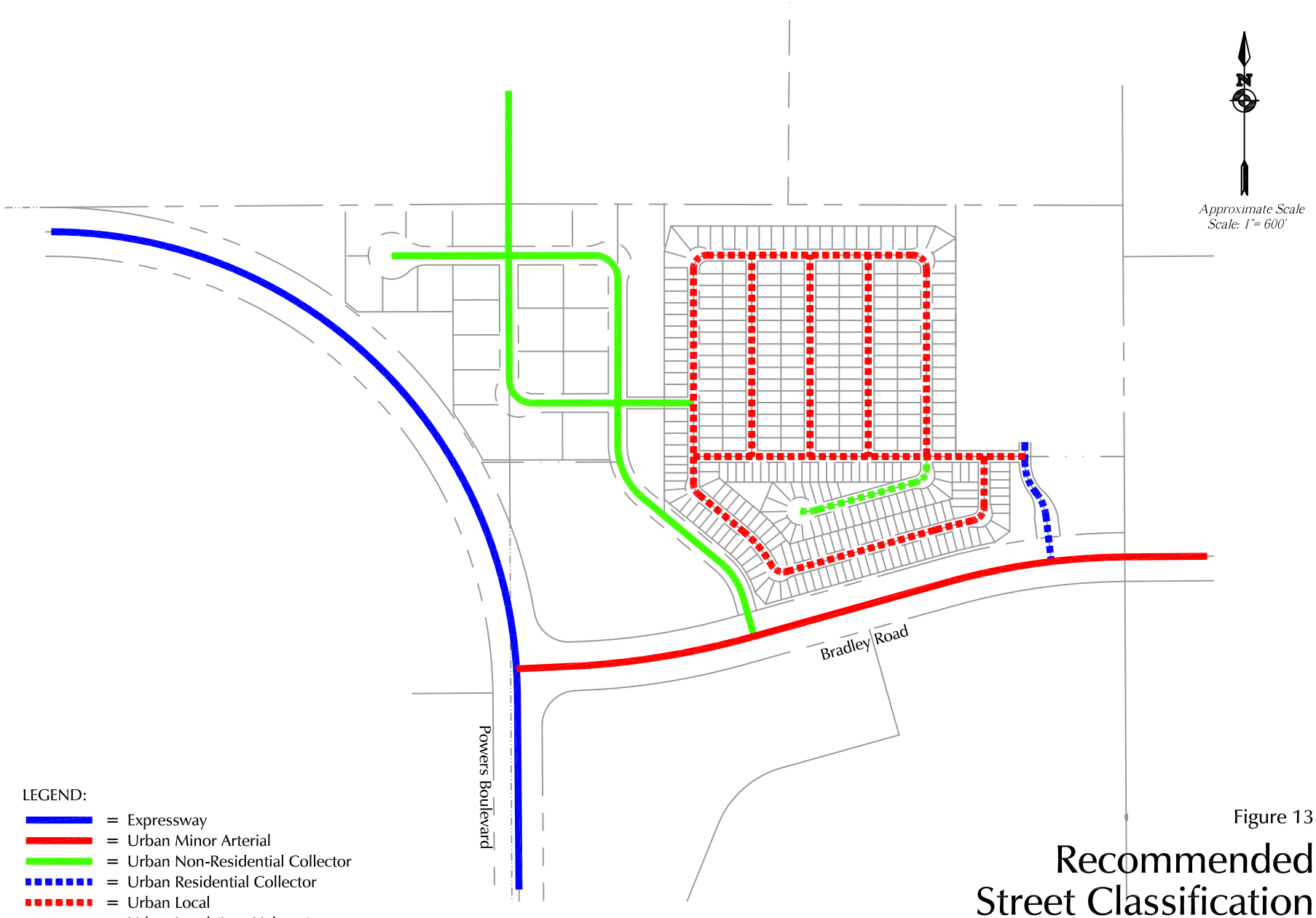


Figure 13

Recommended Street Classification

Waterview North (LSC #204210)

MTCP Maps

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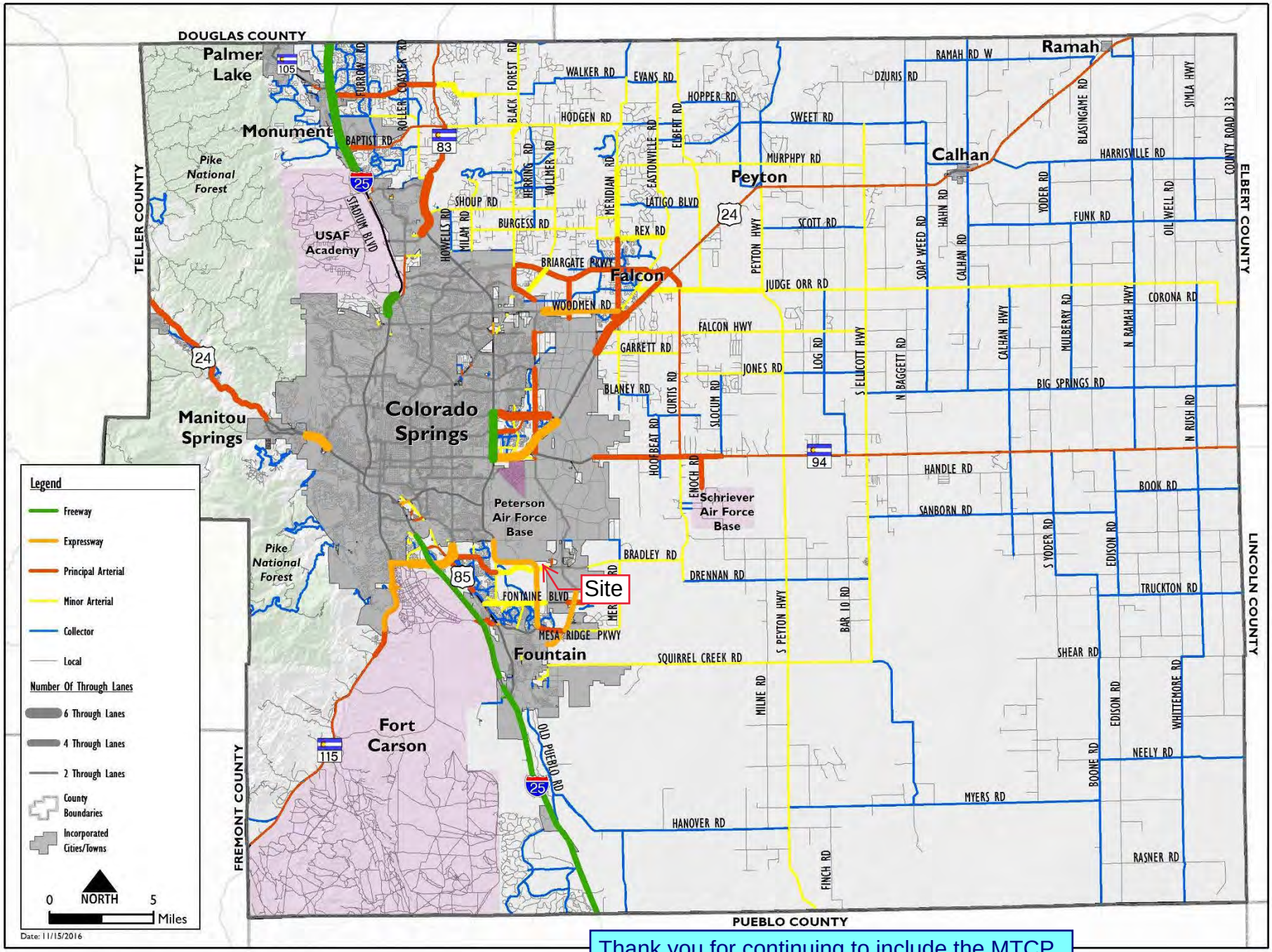
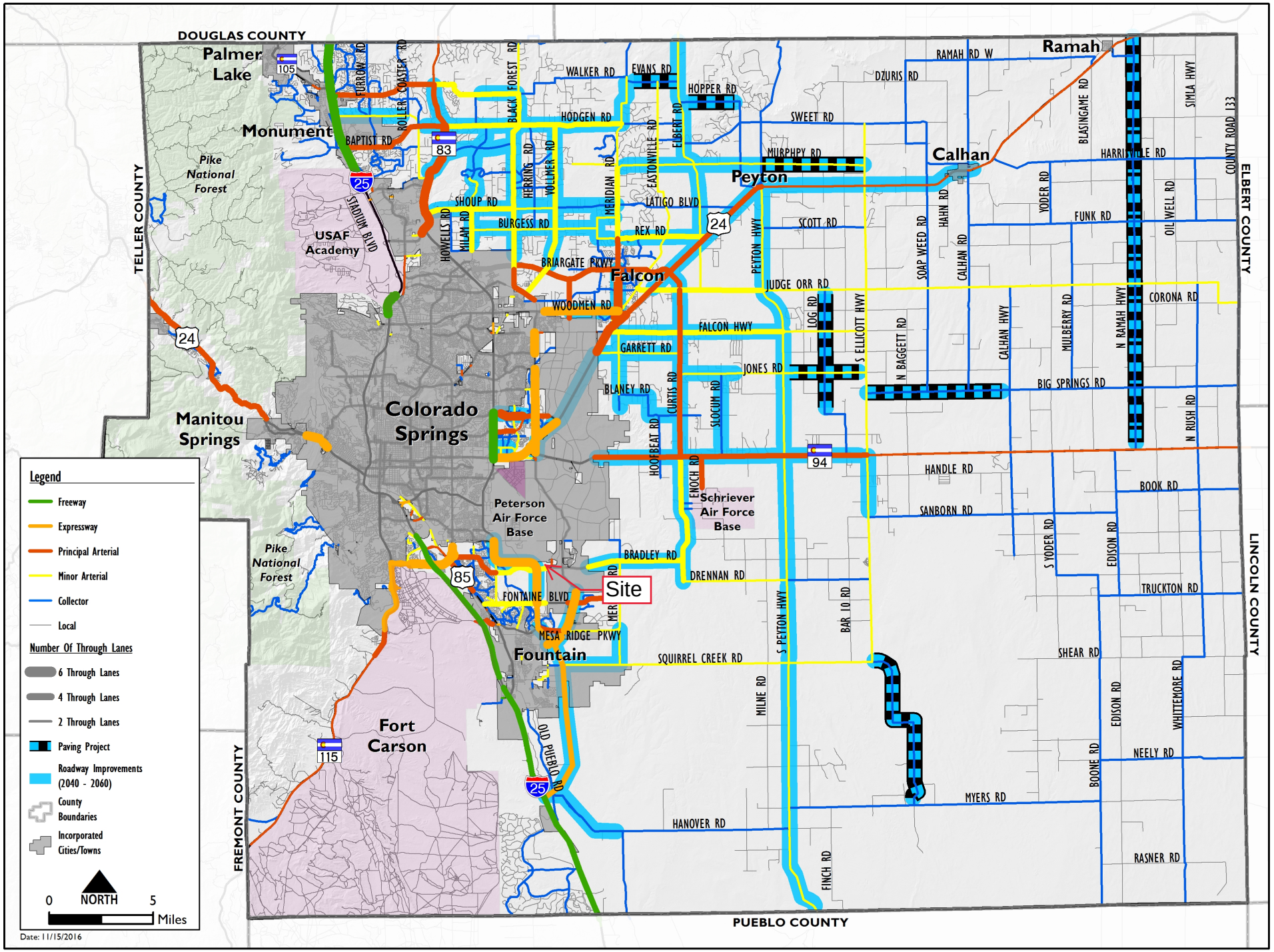


Map 14: 2040 Roadway Plan (Classification and Lanes)

Thank you for continuing to include the MTCP classification and corridor preservation exhibit on the TIS.

Map 17: 2060 Corridor Preservation



Traffic Counts

TRANSPORTATION
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LSC Transportation Consultants, Inc.
Colorado Springs, CO 80905
719-633-2868

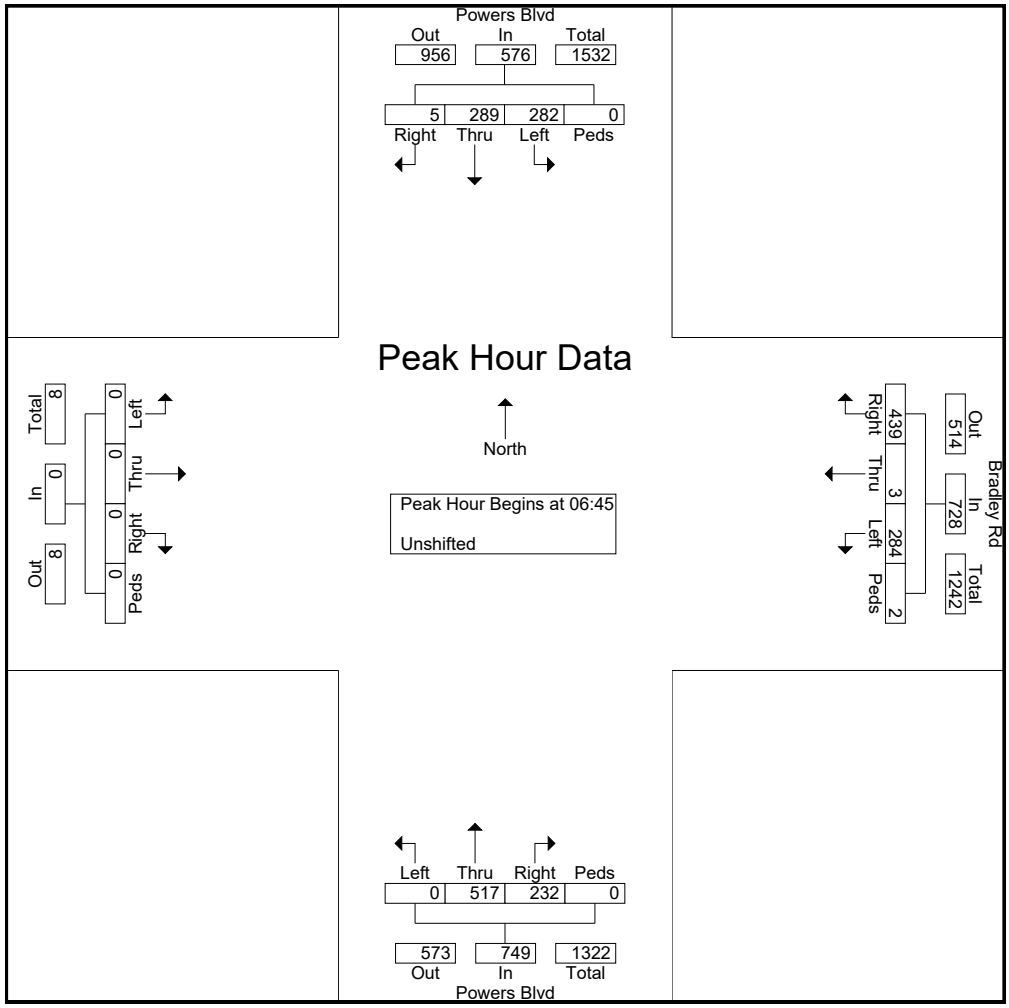
Default Comments
Change These in The Preferences Window
Select File/Preference in the Main Scree
Then Click the Comments Tab

Groups Printed- Unshifted

	Powers Blvd Southbound					Bradley Rd Westbound					Powers Blvd Northbound					Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:30	61	54	0	0	115	68	0	71	0	139	0	89	73	0	162	0	0	0	0	0	416
06:45	67	68	0	0	135	80	0	104	0	184	0	110	55	0	165	0	0	0	0	0	484
Total	128	122	0	0	250	148	0	175	0	323	0	199	128	0	327	0	0	0	0	0	900
07:00	67	87	0	0	154	71	0	119	0	190	0	120	58	0	178	0	0	0	0	0	522
07:15	66	56	5	0	127	65	3	111	2	181	0	154	65	0	219	0	0	0	0	0	527
07:30	82	78	0	0	160	68	0	105	0	173	0	133	54	0	187	0	0	0	0	0	520
07:45	63	77	0	0	140	78	0	62	0	140	0	93	54	0	147	0	0	0	0	0	427
Total	278	298	5	0	581	282	3	397	2	684	0	500	231	0	731	0	0	0	0	0	1996
08:00	36	66	0	0	102	89	0	70	0	159	0	97	47	0	144	0	0	0	0	0	405
08:15	50	72	0	0	122	93	0	61	0	154	0	73	37	0	110	0	0	0	0	0	386

LSC Transportation Consultants, Inc.
Colorado Springs, CO 80905
719-633-2868

	Powers Blvd Southbound					Bradley Rd Westbound					Powers Blvd Northbound					Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 to 08:15 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 06:45																					
06:45	67	68	0	0	135	**80**	0	104	0	184	0	110	55	0	165	0	0	0	0	0	484
07:00	67	**87**	0	0	154	71	0	**119**	0	**190**	0	120	58	0	178	0	0	0	0	0	522
07:15	66	56	**5**	0	127	65	**3**	111	**2**	181	0	**154**	**65**	0	**219**	0	0	0	0	0	**527**
07:30	**82**	78	0	0	**160**	68	0	105	0	173	0	133	54	0	187	0	0	0	0	0	520
Total Volume	282	289	5	0	576	284	3	439	2	728	0	517	232	0	749	0	0	0	0	0	2053
% App. Total	49	50.2	0.9	0		39	0.4	60.3	0.3		0	69	31	0		0	0	0	0		
PHF	.860	.830	.250	.000	.900	.888	.250	.922	.250	.958	.000	.839	.892	.000	.855	.000	.000	.000	.000	.000	.974



LSC Transportation Consultants, Inc.
Colorado Springs, CO 80905
719-633-2868

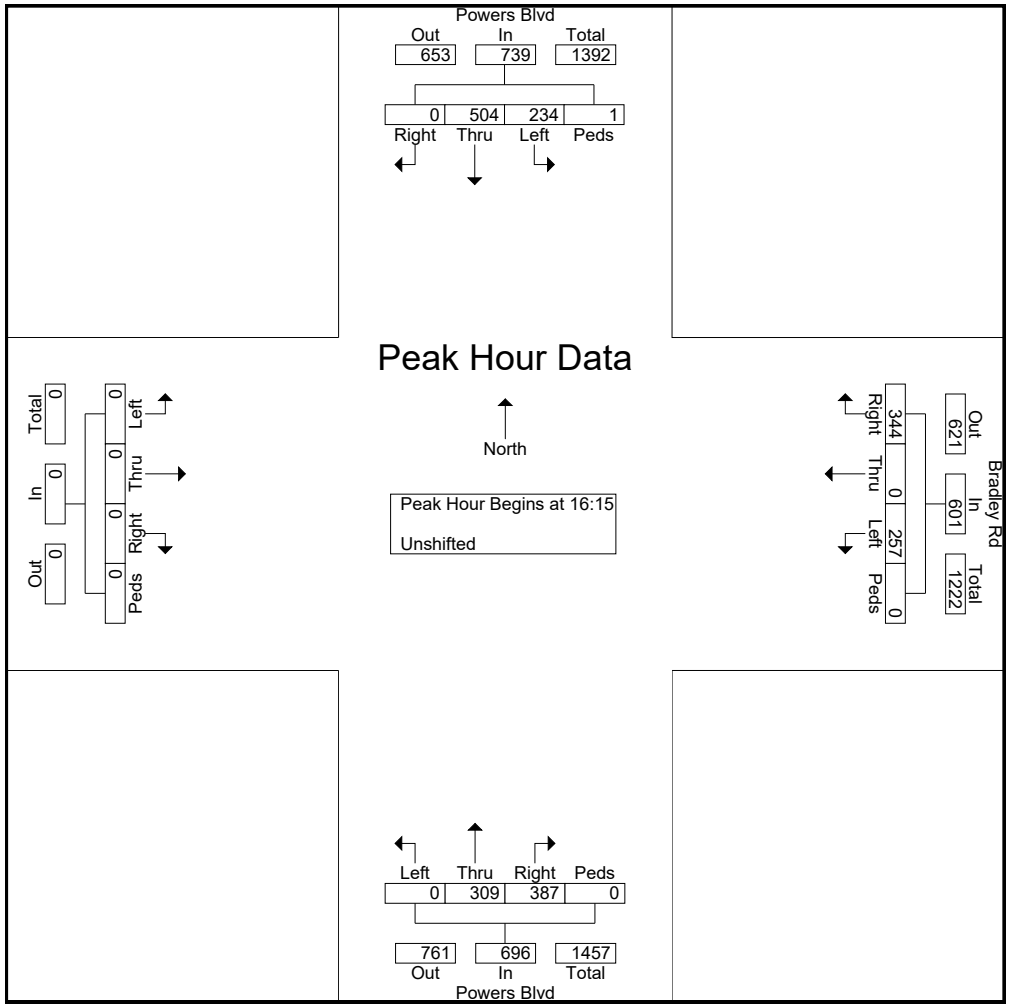
Default Comments
Change These in The Preferences Window
Select File/Preference in the Main Scree
Then Click the Comments Tab

Groups Printed- Unshifted

	Powers Blvd Southbound					Bradley Rd Westbound					Powers Blvd Northbound					Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
16:00	82	119	0	0	201	55	1	100	0	156	0	75	70	0	145	0	0	0	0	0	502
16:15	66	121	0	0	187	63	0	90	0	153	0	55	115	0	170	0	0	0	0	0	510
16:30	64	122	0	0	186	65	0	95	0	160	0	81	80	0	161	0	0	0	0	0	507
16:45	45	124	0	1	170	64	0	95	0	159	0	66	103	0	169	0	0	0	0	0	498
Total	257	486	0	1	744	247	1	380	0	628	0	277	368	0	645	0	0	0	0	0	2017
17:00	59	137	0	0	196	65	0	64	0	129	0	107	89	0	196	0	0	0	0	0	521
17:15	78	125	0	0	203	52	0	58	0	110	0	77	97	0	174	0	0	0	0	0	487
17:30	55	109	0	0	164	54	0	46	0	100	0	80	78	0	158	0	0	0	0	0	422
17:45	57	116	0	0	173	49	0	52	0	101	0	82	81	0	163	0	0	0	0	0	437
Total	249	487	0	0	736	220	0	220	0	440	0	346	345	0	691	0	0	0	0	0	1867

LSC Transportation Consultants, Inc.
Colorado Springs, CO 80905
719-633-2868

	Powers Blvd Southbound					Bradley Rd Westbound					Powers Blvd Northbound					Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 16:15																					
16:15	**66**	121	0	0	187	63	0	90	0	153	0	55	**115**	0	170	0	0	0	0	0	510
16:30	64	122	0	0	186	**65**	0	**95**	0	**160**	0	81	80	0	161	0	0	0	0	0	507
16:45	45	124	0	**1**	170	64	0	95	0	159	0	66	103	0	169	0	0	0	0	0	498
17:00	59	**137**	0	0	**196**	65	0	64	0	129	0	**107**	89	0	**196**	0	0	0	0	0	**521**
Total Volume	234	504	0	1	739	257	0	344	0	601	0	309	387	0	696	0	0	0	0	0	2036
% App. Total	31.7	68.2	0	0.1		42.8	0	57.2	0		0	44.4	55.6	0		0	0	0	0		
PHF	.886	.920	.000	.250	.943	.988	.000	.905	.000	.939	.000	.722	.841	.000	.888	.000	.000	.000	.000	.000	.977



LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210
Colorado Springs, CO 80905
719-633-2868

File Name : Marksheffel Rd - Bradley Rd AM
Site Code : 184690
Start Date : 10/16/2018
Page No : 1

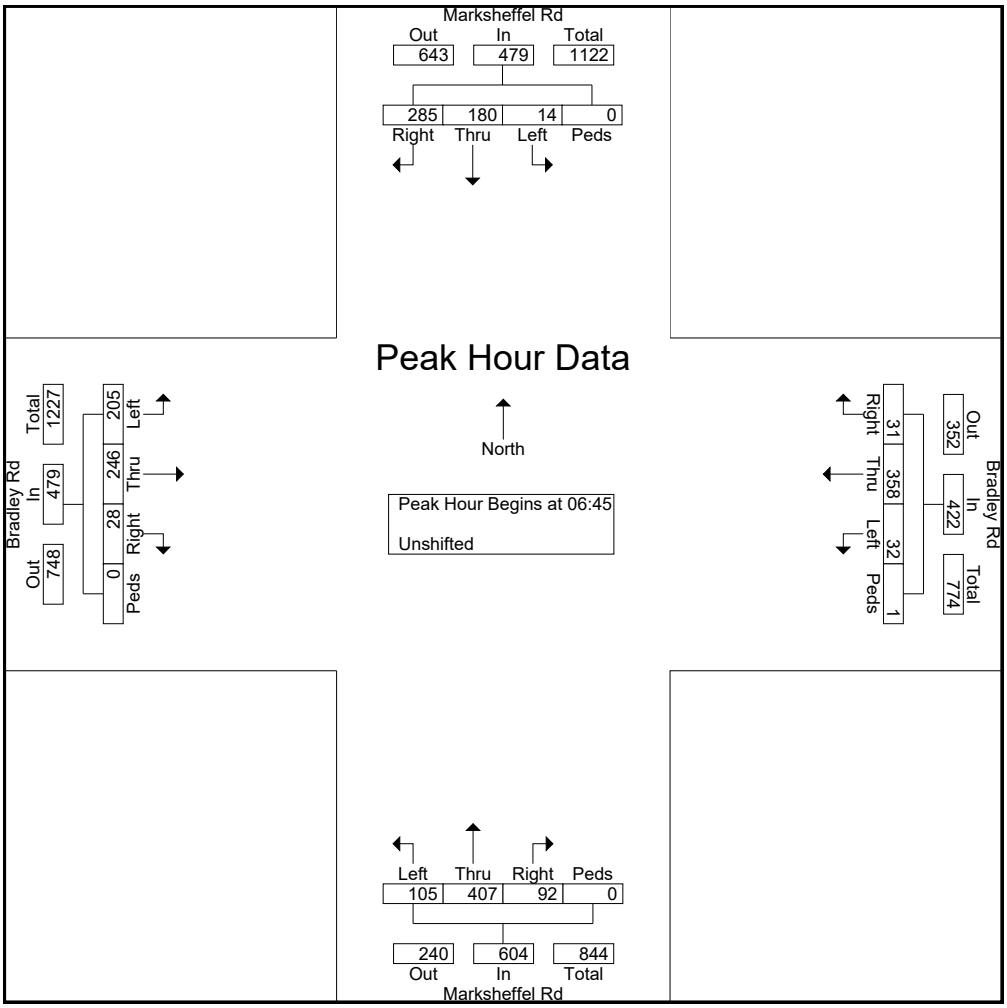
Groups Printed- Unshifted

	Marksheffel Rd Southbound				Bradley Rd Westbound				Marksheffel Rd Northbound				Bradley Rd Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
06:30	2	52	59	0	5	78	7	0	12	116	16	0	47	56	6	0	456
06:45	3	48	76	0	7	88	4	0	17	101	21	0	38	54	10	0	467
Total	5	100	135	0	12	166	11	0	29	217	37	0	85	110	16	0	923
07:00	3	36	66	0	12	94	10	0	32	124	31	0	48	69	4	0	529
07:15	6	37	71	0	6	105	6	1	40	91	18	0	65	72	6	0	524
07:30	2	59	72	0	7	71	11	0	16	91	22	0	54	51	8	0	464
07:45	3	49	56	0	4	47	3	0	22	94	9	0	57	59	10	0	413
Total	14	181	265	0	29	317	30	1	110	400	80	0	224	251	28	0	1930
08:00	4	25	48	0	4	54	5	0	14	68	6	0	31	23	8	0	290
08:15	2	43	80	0	9	52	1	0	13	59	2	0	38	30	8	0	337
Grand Total	25	349	528	0	54	589	47	1	166	744	125	0	378	414	60	0	3480
Apprch %	2.8	38.7	58.5	0	7.8	85.2	6.8	0.1	16	71.9	12.1	0	44.4	48.6	7	0	
Total %	0.7	10	15.2	0	1.6	16.9	1.4	0	4.8	21.4	3.6	0	10.9	11.9	1.7	0	

LSC Transportation Consultants, Inc.
545 E Pikes Peak Ave, Suite 210
Colorado Springs, CO 80905
719-633-2868

File Name : Marksheffel Rd - Bradley Rd AM
Site Code : 184690
Start Date : 10/16/2018
Page No : 2

	Marksheffel Rd Southbound					Bradley Rd Westbound					Marksheffel Rd Northbound					Bradley Rd Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 to 08:15 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 06:45																					
06:45	3	48	**76**	0	127	7	88	4	0	99	17	101	21	0	139	38	54	**10**	0	102	467
07:00	3	36	66	0	105	**12**	94	10	0	116	32	**124**	**31**	0	**187**	48	69	4	0	121	**529**
07:15	**6**	37	71	0	114	6	**105**	6	**1**	**118**	**40**	91	18	0	149	**65**	**72**	6	0	**143**	524
07:30	2	**59**	72	0	**133**	7	71	**11**	0	89	16	91	22	0	129	54	51	8	0	113	464
Total Volume	14	180	285	0	479	32	358	31	1	422	105	407	92	0	604	205	246	28	0	479	1984
% App. Total	2.9	37.6	59.5	0		7.6	84.8	7.3	0.2		17.4	67.4	15.2	0		42.8	51.4	5.8	0		
PHF	.583	.763	.938	.000	.900	.667	.852	.705	.250	.894	.656	.821	.742	.000	.807	.788	.854	.700	.000	.837	.938



LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210
Colorado Springs, CO 80905
719-633-2868

File Name : Marksheffel Rd - Bradley Rd PM
Site Code : 184960
Start Date : 10/16/2018
Page No : 1

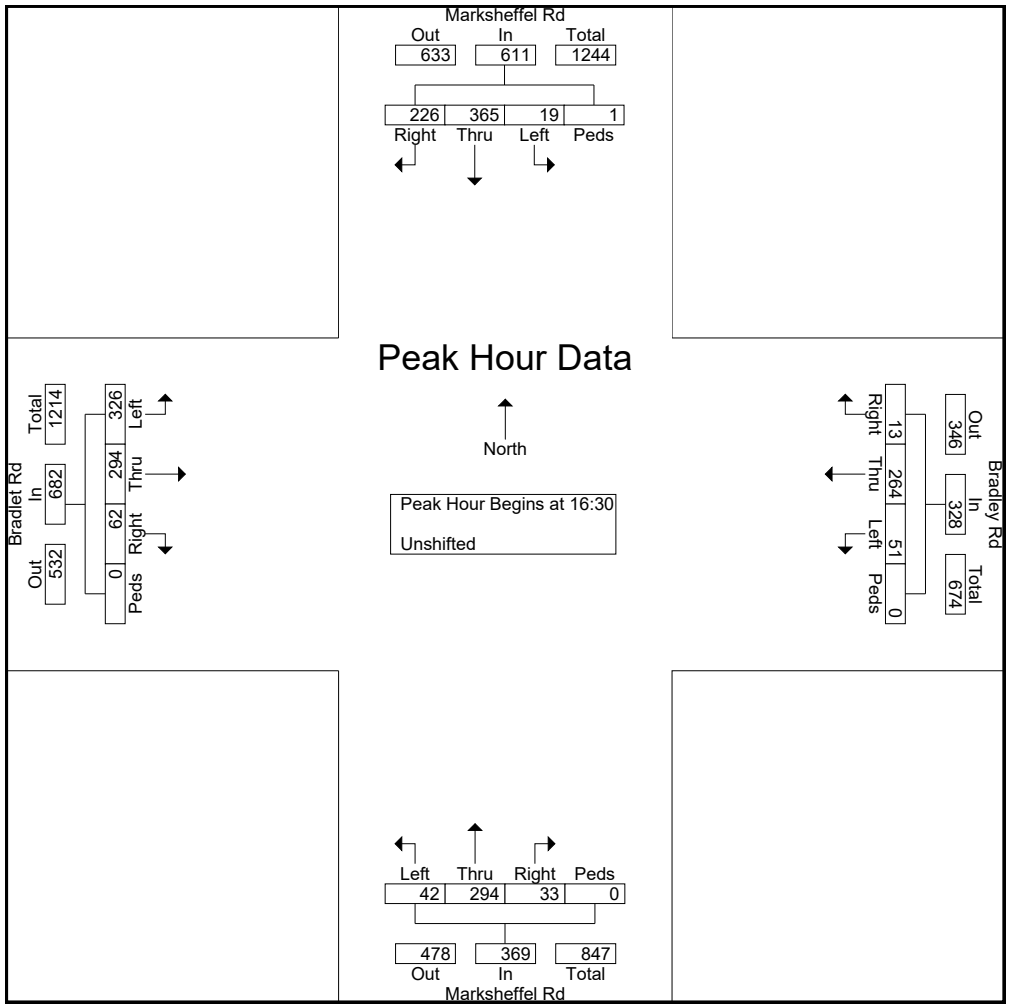
Groups Printed- Unshifted

	Marksheffel Rd Southbound				Bradley Rd Westbound				Marksheffel Rd Northbound				Bradlet Rd Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
16:00	3	82	46	0	14	50	9	0	18	64	8	0	87	63	21	0	465
16:15	5	90	46	1	23	75	4	0	8	57	5	0	77	78	18	0	487
16:30	6	89	51	1	15	59	3	0	11	73	10	0	79	76	16	0	489
16:45	4	98	53	0	8	74	5	0	9	57	9	0	91	67	17	0	492
Total	18	359	196	2	60	258	21	0	46	251	32	0	334	284	72	0	1933
17:00	3	82	60	0	15	81	2	0	10	77	6	0	69	83	10	0	498
17:15	6	96	62	0	13	50	3	0	12	87	8	0	87	68	19	0	511
17:30	4	70	49	0	11	53	6	0	11	65	12	0	71	95	24	0	471
17:45	6	79	31	0	8	37	3	0	13	44	6	0	63	71	16	0	377
Total	19	327	202	0	47	221	14	0	46	273	32	0	290	317	69	0	1857
Grand Total	37	686	398	2	107	479	35	0	92	524	64	0	624	601	141	0	3790
Apprch %	3.3	61.1	35.4	0.2	17.2	77.1	5.6	0	13.5	77.1	9.4	0	45.7	44	10.3	0	
Total %	1	18.1	10.5	0.1	2.8	12.6	0.9	0	2.4	13.8	1.7	0	16.5	15.9	3.7	0	

LSC Transportation Consultants, Inc.
545 E Pikes Peak Ave, Suite 210
Colorado Springs, CO 80905
719-633-2868

File Name : Marksheffel Rd - Bradley Rd PM
Site Code : 184960
Start Date : 10/16/2018
Page No : 2

	Marksheffel Rd Southbound					Bradley Rd Westbound					Marksheffel Rd Northbound					Bradlet Rd Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 16:30																					
16:30	**6**	89	51	**1**	147	**15**	59	3	0	77	11	73	**10**	0	94	79	76	16	0	171	489
16:45	4	**98**	53	0	155	8	74	**5**	0	87	9	57	9	0	75	**91**	67	17	0	**175**	492
17:00	3	82	60	0	145	15	**81**	2	0	**98**	10	77	6	0	93	69	**83**	10	0	162	498
17:15	6	96	**62**	0	**164**	13	50	3	0	66	**12**	**87**	8	0	**107**	87	68	**19**	0	174	**511**
Total Volume	19	365	226	1	611	51	264	13	0	328	42	294	33	0	369	326	294	62	0	682	1990
% App. Total	3.1	59.7	37	0.2		15.5	80.5	4	0		11.4	79.7	8.9	0		47.8	43.1	9.1	0		
PHF	.792	.931	.911	.250	.931	.850	.815	.650	.000	.837	.875	.845	.825	.000	.862	.896	.886	.816	.000	.974	.974



Levels of Service

TRANSPORTATION
CONSULTANTS, INC.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	284	439	517	232	282	289
Future Volume (vph)	284	439	517	232	282	289
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	9.0	9.0	9.0	9.0	9.0
Total Split (s)	20.0	20.0	60.0	60.0	20.0	80.0
Total Split (%)	20.0%	20.0%	60.0%	60.0%	20.0%	80.0%
Yellow Time (s)	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
Lost Time Adjust (s)	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
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	15.0	15.0	14.4	14.4	15.0	34.4
Actuated g/C Ratio	0.25	0.25	0.24	0.24	0.25	0.58
v/c Ratio	0.67	0.62	0.61	0.42	0.68	0.15
Control Delay	30.2	6.6	23.1	5.5	30.6	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.2	6.6	23.1	5.5	30.6	5.9
LOS	C	A	C	A	C	A
Approach Delay	15.9		17.7			18.1
Approach LOS	B		B			B

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 59.5	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 17.1	Intersection LOS: B
Intersection Capacity Utilization 58.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Powers & Bradley Rd.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	257	344	309	387	234	504
Future Volume (vph)	257	344	309	387	234	504
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	9.0	9.0	9.0	9.0	9.0
Total Split (s)	20.0	20.0	61.0	61.0	19.0	80.0
Total Split (%)	20.0%	20.0%	61.0%	61.0%	19.0%	80.0%
Yellow Time (s)	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
Lost Time Adjust (s)	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
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	14.9	14.9	11.3	11.3	14.0	30.3
Actuated g/C Ratio	0.27	0.27	0.20	0.20	0.25	0.55
v/c Ratio	0.54	0.51	0.48	0.65	0.55	0.28
Control Delay	22.9	5.6	21.6	7.5	24.2	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	5.6	21.6	7.5	24.2	7.0
LOS	C	A	C	A	C	A
Approach Delay	13.0		13.8			12.4
Approach LOS	B		B			B

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 55.2	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 13.1	Intersection LOS: B
Intersection Capacity Utilization 48.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Powers & Bradley Rd.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	415	622	517	275	342	289
Future Volume (vph)	415	622	517	275	342	289
Turn Type	Prot	Free	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		Free		2		
Detector Phase	8		2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	9.0		9.0	9.0	9.0	9.0
Total Split (s)	25.0		54.0	54.0	21.0	75.0
Total Split (%)	25.0%		54.0%	54.0%	21.0%	75.0%
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None		None	None	None	None
Act Effct Green (s)	13.9	60.1	16.9	16.9	17.2	38.1
Actuated g/C Ratio	0.23	1.00	0.28	0.28	0.29	0.63
v/c Ratio	0.55	0.41	0.52	0.43	0.73	0.14
Control Delay	23.8	0.8	20.3	4.9	32.3	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	0.8	20.3	4.9	32.3	4.8
LOS	C	A	C	A	C	A
Approach Delay	10.0		15.0			19.7
Approach LOS	B		B			B

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 60.1	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 14.1	Intersection LOS: B
Intersection Capacity Utilization 55.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Powers & Bradley Rd.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	533	84	40	723	314	89
Future Volume (vph)	533	84	40	723	314	89
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	68.0	68.0	68.0	68.0	32.0	32.0
Total Split (%)	68.0%	68.0%	68.0%	68.0%	32.0%	32.0%
Yellow Time (s)	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
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	67.8	67.8	67.8	67.8	24.2	24.2
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.24	0.24
v/c Ratio	0.24	0.08	0.08	0.33	0.80	0.21
Control Delay	7.0	1.7	7.0	7.6	49.6	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	1.7	7.0	7.6	49.6	7.0
LOS	A	A	A	A	D	A
Approach Delay	6.2			7.5	40.2	
Approach LOS	A			A	D	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 46.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Legacy Dr & Bradley Rd.

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱		↑↑		↱
Traffic Vol, veh/h	603	19	0	763	0	33
Future Vol, veh/h	603	19	0	763	0	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	500	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	655	21	0	829	0	36

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	328
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	668
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	668
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

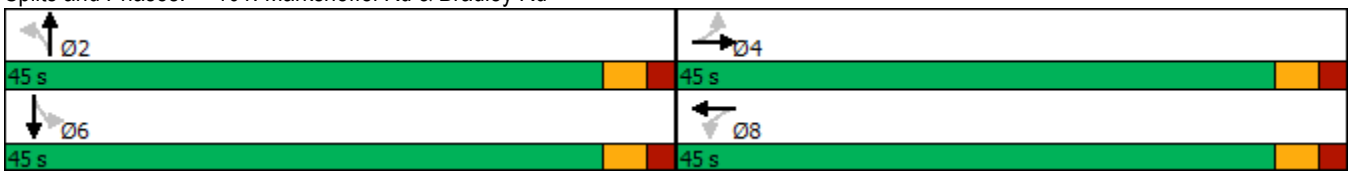
Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	668	-	-	-
HCM Lane V/C Ratio	0.054	-	-	-
HCM Control Delay (s)	10.7	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	292	263	45	32	364	31	111	407	92	14	180	314
Future Volume (vph)	292	263	45	32	364	31	111	407	92	14	180	314
Turn Type	Perm	NA	Free	Perm	NA	Free	Perm	NA	Free	Perm	NA	Free
Protected Phases		4			8			2			6	
Permitted Phases	4		Free	8		Free	2		Free	6		Free
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		21.0	21.0		21.0	21.0	
Total Split (s)	45.0	45.0		45.0	45.0		45.0	45.0		45.0	45.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
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 Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)	29.8	29.8	80.5	29.8	29.8	80.5	40.5	40.5	80.5	40.5	40.5	80.5
Actuated g/C Ratio	0.37	0.37	1.00	0.37	0.37	1.00	0.50	0.50	1.00	0.50	0.50	1.00
v/c Ratio	0.88	0.20	0.03	0.09	0.31	0.02	0.23	0.28	0.07	0.03	0.10	0.20
Control Delay	50.3	16.8	0.0	15.6	17.8	0.0	15.0	13.7	0.1	14.0	12.7	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	50.3	16.8	0.0	15.6	17.8	0.0	15.0	13.7	0.1	14.0	12.7	0.3
LOS	D	B	A	B	B	A	B	B	A	B	B	A
Approach Delay		31.8			16.4			11.9			5.0	
Approach LOS		C			B			B			A	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 80.5			
Natural Cycle: 50			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 16.5		Intersection LOS: B	
Intersection Capacity Utilization 57.5%		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)	344	465	309	534	440	504
Future Volume (vph)	344	465	309	534	440	504
Turn Type	Prot	Free	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		Free		2		
Detector Phase	8		2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	9.0		9.0	9.0	9.0	9.0
Total Split (s)	25.0		49.0	49.0	26.0	75.0
Total Split (%)	25.0%		49.0%	49.0%	26.0%	75.0%
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None		None	None	None	None
Act Effct Green (s)	12.0	63.9	15.2	15.2	21.4	41.7
Actuated g/C Ratio	0.19	1.00	0.24	0.24	0.33	0.65
v/c Ratio	0.56	0.31	0.41	0.75	0.79	0.23
Control Delay	28.0	0.5	21.9	9.5	34.0	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.0	0.5	21.9	9.5	34.0	5.0
LOS	C	A	C	A	C	A
Approach Delay	12.2		14.0			18.5
Approach LOS	B		B			B

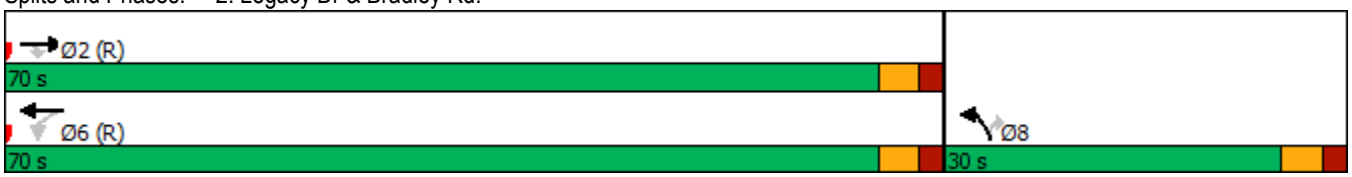
Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 63.9	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 15.1	Intersection LOS: B
Intersection Capacity Utilization 65.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Powers & Bradley Rd.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	688	286	137	601	208	59
Future Volume (vph)	688	286	137	601	208	59
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	70.0	70.0	70.0	70.0	30.0	30.0
Total Split (%)	70.0%	70.0%	70.0%	70.0%	30.0%	30.0%
Yellow Time (s)	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
Lost Time Adjust (s)	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
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	72.0	72.0	72.0	72.0	18.0	18.0
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.18	0.18
v/c Ratio	0.29	0.25	0.32	0.26	0.71	0.19
Control Delay	5.8	1.3	8.2	5.6	50.6	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.8	1.3	8.2	5.6	50.6	9.5
LOS	A	A	A	A	D	A
Approach Delay	4.5			6.1	41.5	
Approach LOS	A			A	D	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 10.1	Intersection LOS: B
Intersection Capacity Utilization 50.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Legacy Dr & Bradley Rd.



Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱		↑↑		↱
Traffic Vol, veh/h	680	67	0	738	0	22
Future Vol, veh/h	680	67	0	738	0	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	500	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	739	73	0	802	0	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	370
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	627
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	627
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

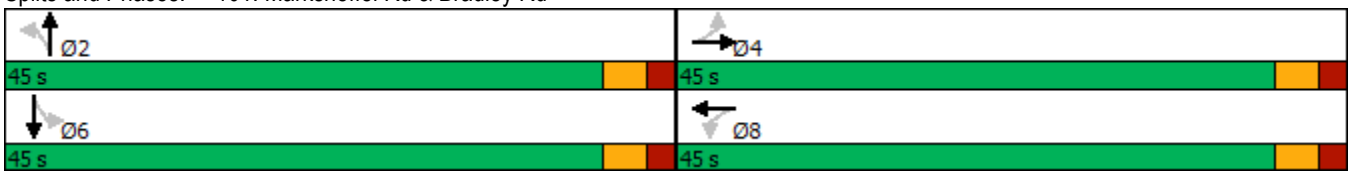
Approach	EB	WB	NB
HCM Control Delay, s	0	0	11
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	627	-	-	-
HCM Lane V/C Ratio	0.038	-	-	-
HCM Control Delay (s)	11	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	384	306	74	51	284	13	62	294	33	19	365	324
Future Volume (vph)	384	306	74	51	284	13	62	294	33	19	365	324
Turn Type	Perm	NA	Free	Perm	NA	Free	Perm	NA	Free	Perm	NA	Free
Protected Phases		4			8			2			6	
Permitted Phases	4		Free	8		Free	2		Free	6		Free
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		21.0	21.0		21.0	21.0	
Total Split (s)	45.0	45.0		45.0	45.0		45.0	45.0		45.0	45.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
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 Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)	34.1	34.1	84.5	34.1	34.1	84.5	40.3	40.3	84.5	40.3	40.3	84.5
Actuated g/C Ratio	0.40	0.40	1.00	0.40	0.40	1.00	0.48	0.48	1.00	0.48	0.48	1.00
v/c Ratio	0.90	0.22	0.05	0.12	0.20	0.01	0.16	0.20	0.02	0.04	0.23	0.22
Control Delay	49.4	16.4	0.1	15.8	16.2	0.0	15.8	14.4	0.0	14.4	14.6	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	49.4	16.4	0.1	15.8	16.2	0.0	15.8	14.4	0.0	14.4	14.6	0.3
LOS	D	B	A	B	B	A	B	B	A	B	B	A
Approach Delay		31.4			15.5			13.4			8.1	
Approach LOS		C			B			B			A	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 84.5	
Natural Cycle: 55	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 18.0	Intersection LOS: B
Intersection Capacity Utilization 59.3%	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)	565	815	507	405	462	283
Future Volume (vph)	565	815	507	405	462	283
Turn Type	Prot	Free	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		Free		2		
Detector Phase	8		2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	9.0		9.0	9.0	9.0	9.0
Total Split (s)	20.0		60.0	60.0	20.0	80.0
Total Split (%)	20.0%		60.0%	60.0%	20.0%	80.0%
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None		None	None	None	None
Act Effct Green (s)	15.1	60.7	15.9	15.9	14.7	35.6
Actuated g/C Ratio	0.25	1.00	0.26	0.26	0.24	0.59
v/c Ratio	0.70	0.54	0.55	0.57	0.60	0.15
Control Delay	27.2	1.3	21.6	5.7	24.5	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	1.3	21.6	5.7	24.5	5.7
LOS	C	A	C	A	C	A
Approach Delay	11.9		14.5			17.4
Approach LOS	B		B			B

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 60.7	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 14.0	Intersection LOS: B
Intersection Capacity Utilization 55.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Powers & Bradley Rd.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	570	84	40	858	79	314	4	89	138	1	207
Future Volume (vph)	213	570	84	40	858	79	314	4	89	138	1	207
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0	23.0
Total Split (s)	15.0	47.0	47.0	10.0	42.0	42.0	20.0	23.0	23.0	20.0	23.0	23.0
Total Split (%)	15.0%	47.0%	47.0%	10.0%	42.0%	42.0%	20.0%	23.0%	23.0%	20.0%	23.0%	23.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	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	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	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	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	11.3	53.5	53.5	50.5	44.2	44.2	25.2	11.3	11.3	23.7	9.5	9.5
Actuated g/C Ratio	0.11	0.54	0.54	0.50	0.44	0.44	0.25	0.11	0.11	0.24	0.10	0.10
v/c Ratio	0.60	0.33	0.10	0.09	0.60	0.11	0.84	0.02	0.33	0.39	0.01	0.71
Control Delay	48.9	15.5	1.5	10.5	24.2	1.5	50.4	36.8	6.1	29.5	37.0	23.6
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	48.9	15.5	1.5	10.5	24.2	1.5	50.4	36.8	6.1	29.5	37.0	23.6
LOS	D	B	A	B	C	A	D	D	A	C	D	C
Approach Delay		22.4			21.8			40.6			26.0	
Approach LOS		C			C			D			C	

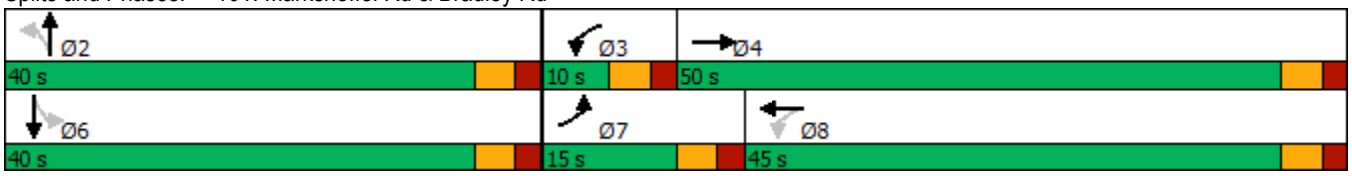
Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 37 (37%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 25.5	Intersection LOS: C
Intersection Capacity Utilization 66.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Waterview Full Access & Bradley Rd.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	378	282	68	32	379	31	136	407	92	14	180	365
Future Volume (vph)	378	282	68	32	379	31	136	407	92	14	180	365
Turn Type	Prot	NA	Free	pm+pt	NA	Free	Perm	NA	Free	Perm	NA	Free
Protected Phases	7	4		3	8			2			6	
Permitted Phases			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)	15.0	50.0		10.0	45.0		40.0	40.0		40.0	40.0	
Total Split (%)	15.0%	50.0%		10.0%	45.0%		40.0%	40.0%		40.0%	40.0%	
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)	10.0	25.2	74.1	19.0	14.0	74.1	35.1	35.1	74.1	35.1	35.1	74.1
Actuated g/C Ratio	0.13	0.34	1.00	0.26	0.19	1.00	0.47	0.47	1.00	0.47	0.47	1.00
v/c Ratio	0.82	0.24	0.04	0.11	0.62	0.02	0.30	0.30	0.07	0.04	0.11	0.23
Control Delay	48.5	19.3	0.1	15.1	31.9	0.0	14.6	13.0	0.1	12.0	11.6	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	48.5	19.3	0.1	15.1	31.9	0.0	14.6	13.0	0.1	12.0	11.6	0.3
LOS	D	B	A	B	C	A	B	B	A	B	B	A
Approach Delay		32.7			28.4			11.5			4.3	
Approach LOS		C			C			B			A	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 74.1	
Natural Cycle: 55	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 19.2	Intersection LOS: B
Intersection Capacity Utilization 52.5%	ICU Level of Service A
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)	603	701	288	787	728	469
Future Volume (vph)	603	701	288	787	728	469
Turn Type	Prot	Free	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		Free		2		
Detector Phase	8		2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	9.0		9.0	9.0	9.0	9.0
Total Split (s)	25.0		47.0	47.0	28.0	75.0
Total Split (%)	25.0%		47.0%	47.0%	28.0%	75.0%
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None		None	None	None	None
Act Effct Green (s)	19.4	94.3	36.6	36.6	23.1	64.8
Actuated g/C Ratio	0.21	1.00	0.39	0.39	0.24	0.69
v/c Ratio	0.90	0.47	0.24	0.95	0.92	0.21
Control Delay	54.9	1.0	19.5	32.5	53.8	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.9	1.0	19.5	32.5	53.8	5.6
LOS	D	A	B	C	D	A
Approach Delay	25.9		29.0			34.9
Approach LOS	C		C			C

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 94.3	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 29.9	Intersection LOS: C
Intersection Capacity Utilization 77.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Powers & Bradley Rd.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	431	799	286	137	651	137	208	6	59	217	8	445
Future Volume (vph)	431	799	286	137	651	137	208	6	59	217	8	445
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0	23.0
Total Split (s)	22.0	47.0	47.0	10.0	35.0	35.0	20.0	23.0	23.0	20.0	23.0	23.0
Total Split (%)	22.0%	47.0%	47.0%	10.0%	35.0%	35.0%	20.0%	23.0%	23.0%	20.0%	23.0%	23.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	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	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	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	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	16.5	44.2	44.2	39.7	33.7	33.7	11.8	16.5	16.5	15.3	17.9	17.9
Actuated g/C Ratio	0.16	0.44	0.44	0.40	0.34	0.34	0.12	0.16	0.16	0.15	0.18	0.18
v/c Ratio	0.83	0.55	0.36	0.52	0.59	0.23	0.56	0.02	0.15	0.45	0.03	0.92
Control Delay	53.8	22.9	3.4	23.1	31.1	2.9	46.6	33.5	0.8	42.5	33.4	40.9
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	53.8	22.9	3.4	23.1	31.1	2.9	46.6	33.5	0.8	42.5	33.4	40.9
LOS	D	C	A	C	C	A	D	C	A	D	C	D
Approach Delay		28.0			25.7			36.4			41.3	
Approach LOS		C			C			D			D	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 30.7	Intersection LOS: C
Intersection Capacity Utilization 64.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: Waterview Full Access & Bradley Rd.

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	154	854	67	0	834	95	0	0	22	0	0	91
Future Vol, veh/h	154	854	67	0	834	95	0	0	22	0	0	91
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	500	-	500	-	-	500	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	167	928	73	0	907	103	0	0	24	0	0	99

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1010	0	0	-	-	0	-	-	464	-	-	454
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	682	-	-	0	-	-	0	0	545	0	0	553
Stage 1	-	-	-	0	-	-	0	0	-	0	0	-
Stage 2	-	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	682	-	-	-	-	-	-	-	545	-	-	553
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

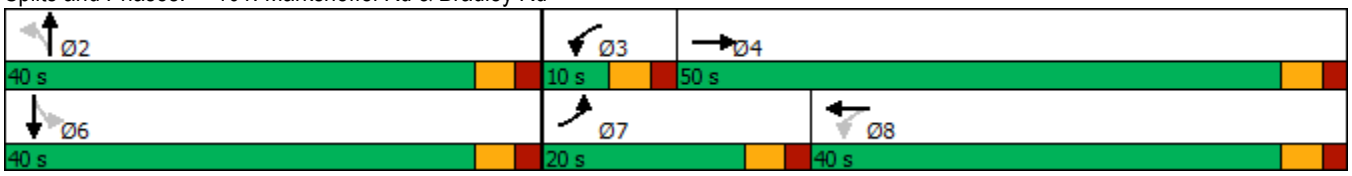
Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	0	11.9	12.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	545	682	-	-	-	-	553
HCM Lane V/C Ratio	0.044	0.245	-	-	-	-	0.179
HCM Control Delay (s)	11.9	12	-	-	-	-	12.9
HCM Lane LOS	B	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0.1	1	-	-	-	-	0.6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	481	334	121	51	314	13	106	294	33	19	365	441
Future Volume (vph)	481	334	121	51	314	13	106	294	33	19	365	441
Turn Type	Prot	NA	Free	pm+pt	NA	Free	Perm	NA	Free	Perm	NA	Free
Protected Phases	7	4		3	8			2			6	
Permitted Phases			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)	20.0	50.0		10.0	40.0		40.0	40.0		40.0	40.0	
Total Split (%)	20.0%	50.0%		10.0%	40.0%		40.0%	40.0%		40.0%	40.0%	
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)	14.9	26.1	77.0	17.0	12.0	77.0	35.0	35.0	77.0	35.0	35.0	77.0
Actuated g/C Ratio	0.19	0.34	1.00	0.22	0.16	1.00	0.45	0.45	1.00	0.45	0.45	1.00
v/c Ratio	0.74	0.28	0.08	0.19	0.57	0.01	0.28	0.21	0.02	0.04	0.24	0.30
Control Delay	37.5	20.5	0.1	16.5	34.3	0.0	16.1	13.5	0.0	12.9	13.7	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	37.5	20.5	0.1	16.5	34.3	0.0	16.1	13.5	0.0	12.9	13.7	0.5
LOS	D	C	A	B	C	A	B	B	A	B	B	A
Approach Delay		26.6			30.7			13.1			6.6	
Approach LOS		C			C			B			A	

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 77			
Natural Cycle: 55			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 18.2		Intersection LOS: B	
Intersection Capacity Utilization 55.0%		ICU Level of Service B	
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)	26	151	75	545	358	910	100	1300	263	463	750	19
Future Volume (vph)	26	151	75	545	358	910	100	1300	263	463	750	19
Turn Type	pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free			Free			2			6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	10.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	15.0		9.0	9.0		9.0	9.0	9.0	9.0	9.0	9.0
Total Split (s)	15.0	20.0		32.0	37.0		15.0	55.0	55.0	23.0	63.0	63.0
Total Split (%)	11.5%	15.4%		24.6%	28.5%		11.5%	42.3%	42.3%	17.7%	48.5%	48.5%
Yellow Time (s)	3.0	3.0		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	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-2.0	-1.0		-1.0	-2.0	0.0	-2.0	-2.0	-1.0
Total Lost Time (s)	4.0	4.0		3.0	4.0		4.0	3.0	5.0	3.0	3.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	None	None	C-Max	None	None
Act Effct Green (s)	20.4	12.6	130.0	26.9	34.9	130.0	10.1	52.0	50.0	25.5	66.4	65.4
Actuated g/C Ratio	0.16	0.10	1.00	0.21	0.27	1.00	0.08	0.40	0.38	0.20	0.51	0.50
v/c Ratio	0.13	0.47	0.05	0.79	0.39	0.59	0.39	0.95	0.37	0.71	0.43	0.02
Control Delay	31.8	59.9	0.1	55.3	38.0	2.7	61.0	52.2	10.3	56.1	21.6	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	31.8	59.9	0.1	55.3	38.0	2.7	61.0	52.2	10.3	56.1	21.6	0.1
LOS	C	E	A	E	D	A	E	D	B	E	C	A
Approach Delay		39.2			25.5			46.1			34.2	
Approach LOS		D			C			D			C	

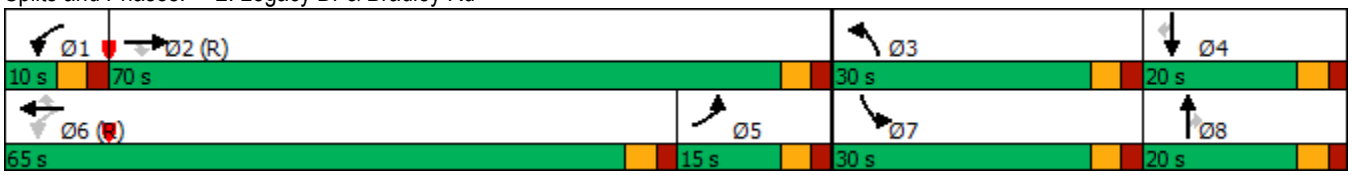
Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 125 (96%), Referenced to phase 1:SBL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 35.3	Intersection LOS: D
Intersection Capacity Utilization 86.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Powers & Bradley Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	739	135	98	1556	57	256	5	119	12	5	2
Future Volume (vph)	5	739	135	98	1556	57	256	5	119	12	5	2
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	15.0	70.0	70.0	10.0	65.0	65.0	30.0	20.0	20.0	30.0	20.0	20.0
Total Split (%)	11.5%	53.8%	53.8%	7.7%	50.0%	50.0%	23.1%	15.4%	15.4%	23.1%	15.4%	15.4%
Yellow Time (s)	3.0	3.0	3.0	3.0	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	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	7.5	90.4	90.4	100.0	100.0	100.0	16.6	14.3	14.3	7.0	7.0	7.0
Actuated g/C Ratio	0.06	0.70	0.70	0.77	0.77	0.77	0.13	0.11	0.11	0.05	0.05	0.05
v/c Ratio	0.03	0.32	0.12	0.20	0.60	0.05	0.61	0.02	0.42	0.07	0.05	0.01
Control Delay	32.8	3.4	0.3	6.9	10.1	0.5	59.6	50.6	9.7	58.9	59.2	0.0
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	32.8	3.4	0.3	6.9	10.1	0.5	59.6	50.6	9.7	58.9	59.2	0.0
LOS	C	A	A	A	B	A	E	D	A	E	E	A
Approach Delay		3.1			9.6			43.8			53.1	
Approach LOS		A			A			D			D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 102 (78%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 12.3	Intersection LOS: B
Intersection Capacity Utilization 71.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Legacy Dr & Bradley Rd



Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	854	16	0	1711	0	31
Future Vol, veh/h	854	16	0	1711	0	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	95	95	98	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	871	17	0	1746	0	33

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	436
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	568
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	568
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

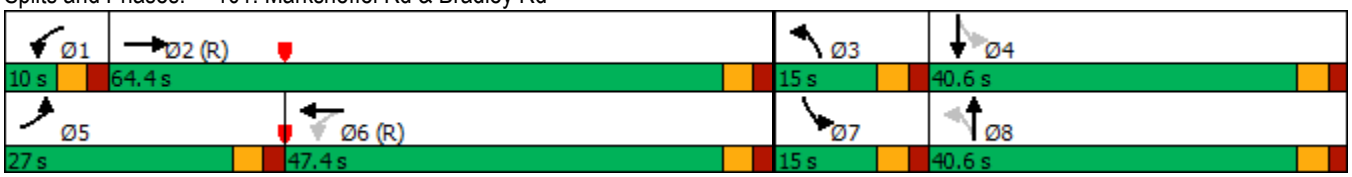
Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	568	-	-	-
HCM Lane V/C Ratio	0.057	-	-	-
HCM Control Delay (s)	11.7	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	402	355	134	95	516	285	177	600	50	140	275	258
Future Volume (vph)	402	355	134	95	516	285	177	600	50	140	275	258
Turn Type	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free	6		Free	8		Free	4		Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	4.0		5.0	4.0		5.0	4.0		5.0	4.0	
Minimum Split (s)	10.0	21.0		10.0	21.0		10.0	21.0		10.0	21.0	
Total Split (s)	27.0	64.4		10.0	47.4		15.0	40.6		15.0	40.6	
Total Split (%)	20.8%	49.5%		7.7%	36.5%		11.5%	31.2%		11.5%	31.2%	
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		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Act Effct Green (s)	20.0	59.4	130.0	49.4	44.4	130.0	45.9	35.9	130.0	45.3	35.6	130.0
Actuated g/C Ratio	0.15	0.46	1.00	0.38	0.34	1.00	0.35	0.28	1.00	0.35	0.27	1.00
v/c Ratio	0.80	0.23	0.09	0.25	0.45	0.19	0.47	0.65	0.03	0.60	0.30	0.17
Control Delay	65.1	21.9	0.1	19.5	35.2	0.3	32.2	45.2	0.0	37.6	38.3	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	65.1	21.9	0.1	19.5	35.2	0.3	32.2	45.2	0.0	37.6	38.3	0.2
LOS	E	C	A	B	D	A	C	D	A	D	D	A
Approach Delay		38.1			22.4			39.7			23.6	
Approach LOS		D			C			D			C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 31.2	Intersection LOS: C
Intersection Capacity Utilization 66.7%	ICU Level of Service C
Analysis Period (min) 15	

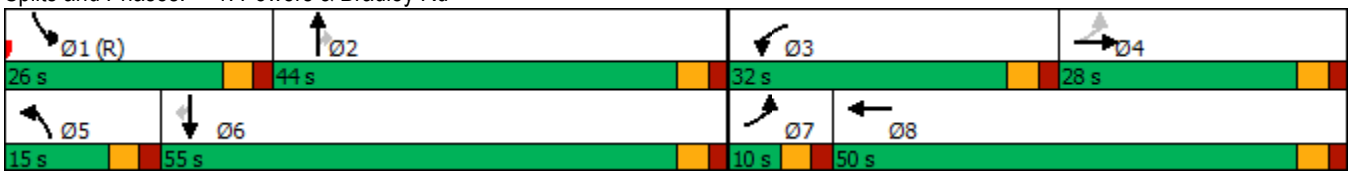
Splits and Phases: 101: Marksheffel Rd & Bradley Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	306	210	236	329	568	175	650	450	520	1200	110
Future Volume (vph)	71	306	210	236	329	568	175	650	450	520	1200	110
Turn Type	pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free			Free			2			6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	9.0		9.0	9.0		9.0	9.0	9.0	9.0	9.0	9.0
Total Split (s)	10.0	28.0		32.0	50.0		15.0	44.0	44.0	26.0	55.0	55.0
Total Split (%)	7.7%	21.5%		24.6%	38.5%		11.5%	33.8%	33.8%	20.0%	42.3%	42.3%
Yellow Time (s)	3.0	3.0		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	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	0.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	5.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	Max	Max	C-Max	Max	Max
Act Effct Green (s)	24.1	18.1	130.0	15.5	29.6	130.0	13.1	40.0	39.0	40.4	67.3	67.3
Actuated g/C Ratio	0.19	0.14	1.00	0.12	0.23	1.00	0.10	0.31	0.30	0.31	0.52	0.52
v/c Ratio	0.34	0.66	0.14	0.59	0.42	0.37	0.52	0.62	0.59	0.50	0.67	0.13
Control Delay	38.1	59.3	0.2	53.4	44.1	0.9	60.6	41.4	7.7	39.8	27.1	1.9
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	38.1	59.3	0.2	53.4	44.1	0.9	60.6	41.4	7.7	39.8	27.1	1.9
LOS	D	E	A	D	D	A	E	D	A	D	C	A
Approach Delay		35.6			24.4			32.1			29.2	
Approach LOS		D			C			C			C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 1 (1%), Referenced to phase 1:SBL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 29.6	Intersection LOS: C
Intersection Capacity Utilization 66.7%	ICU Level of Service C
Analysis Period (min) 15	

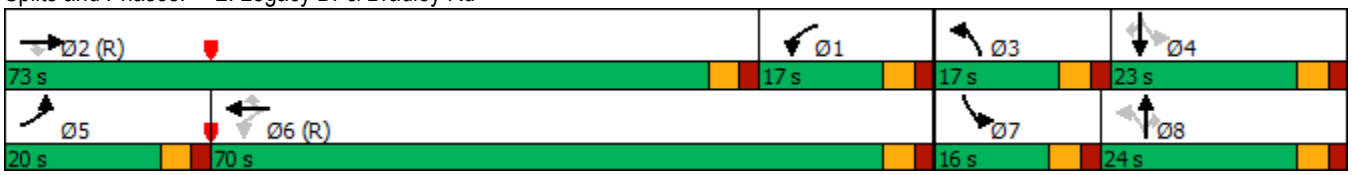
Splits and Phases: 1: Powers & Bradley Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	833	441	270	802	12	325	5	210	52	5	5
Future Volume (vph)	2	833	441	270	802	12	325	5	210	52	5	5
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	20.0	73.0	73.0	17.0	70.0	70.0	17.0	24.0	24.0	16.0	23.0	23.0
Total Split (%)	15.4%	56.2%	56.2%	13.1%	53.8%	53.8%	13.1%	18.5%	18.5%	12.3%	17.7%	17.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	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	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	6.6	84.1	84.1	99.0	99.0	99.0	20.7	10.7	10.7	12.2	7.9	7.9
Actuated g/C Ratio	0.05	0.65	0.65	0.76	0.76	0.76	0.16	0.08	0.08	0.09	0.06	0.06
v/c Ratio	0.01	0.38	0.39	0.53	0.31	0.01	0.72	0.03	0.66	0.18	0.04	0.02
Control Delay	47.5	21.0	9.3	16.6	6.3	0.0	59.3	53.4	17.0	48.6	56.4	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	47.5	21.0	9.3	16.6	6.3	0.0	59.3	53.4	17.0	48.6	56.4	0.2
LOS	D	C	A	B	A	A	E	D	B	D	E	A
Approach Delay		17.0			8.8			42.8			45.5	
Approach LOS		B			A			D			D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 67 (52%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 19.3	Intersection LOS: B
Intersection Capacity Utilization 63.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: Legacy Dr & Bradley Rd



Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1041	54	0	1084	0	20
Future Vol, veh/h	1041	54	0	1084	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	95	95	98	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1062	57	0	1106	0	21

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	531
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	493
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	493
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

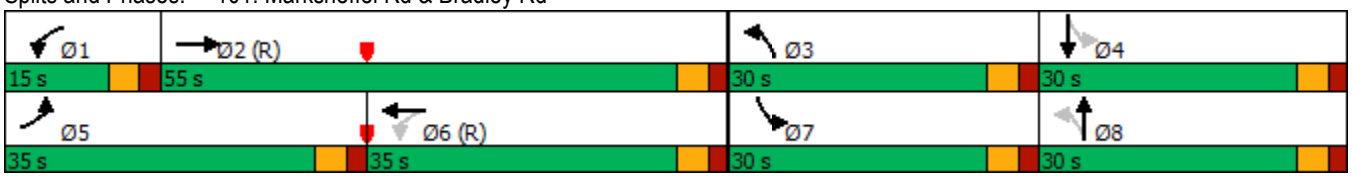
Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	493	-	-	-
HCM Lane V/C Ratio	0.043	-	-	-
HCM Control Delay (s)	12.6	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	512	683	243	195	553	215	166	500	100	300	650	400
Future Volume (vph)	512	683	243	195	553	215	166	500	100	300	650	400
Turn Type	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free	6		Free	8		Free	4		Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	4.0		5.0	4.0		5.0	4.0		5.0	4.0	
Minimum Split (s)	10.0	21.0		10.0	21.0		10.0	21.0		10.0	21.0	
Total Split (s)	35.0	55.0		15.0	35.0		30.0	30.0		30.0	30.0	
Total Split (%)	26.9%	42.3%		11.5%	26.9%		23.1%	23.1%		23.1%	23.1%	
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		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Act Effct Green (s)	25.3	50.0	130.0	44.7	34.7	130.0	43.0	28.6	130.0	54.9	35.7	130.0
Actuated g/C Ratio	0.19	0.38	1.00	0.34	0.27	1.00	0.33	0.22	1.00	0.42	0.27	1.00
v/c Ratio	0.81	0.53	0.16	0.64	0.62	0.14	0.60	0.68	0.07	0.81	0.71	0.27
Control Delay	59.9	32.6	0.2	33.2	45.9	0.2	34.3	52.3	0.1	44.2	47.8	0.4
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	59.9	32.6	0.2	33.2	45.9	0.2	34.3	52.3	0.1	44.2	47.8	0.4
LOS	E	C	A	C	D	A	C	D	A	D	D	A
Approach Delay		36.8			33.1			41.6			33.0	
Approach LOS		D			C			D			C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 35.7	Intersection LOS: D
Intersection Capacity Utilization 77.0%	ICU Level of Service D
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)	26	183	75	710	398	1031	100	1290	383	532	744	19
Future Volume (vph)	26	183	75	710	398	1031	100	1290	383	532	744	19
Turn Type	pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free			Free			2			6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	10.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	15.0		9.0	9.0		9.0	9.0	9.0	9.0	9.0	9.0
Total Split (s)	14.0	19.0		32.0	37.0		15.0	54.0	54.0	25.0	64.0	64.0
Total Split (%)	10.8%	14.6%		24.6%	28.5%		11.5%	41.5%	41.5%	19.2%	49.2%	49.2%
Yellow Time (s)	3.0	3.0		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	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-2.0	-1.0		-1.0	-2.0	0.0	-2.0	-2.0	-1.0
Total Lost Time (s)	4.0	4.0		3.0	4.0		4.0	3.0	5.0	3.0	3.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	None	None	C-Max	None	None
Act Effct Green (s)	21.1	13.2	130.0	29.0	37.7	130.0	9.9	51.0	49.0	23.8	63.9	62.9
Actuated g/C Ratio	0.16	0.10	1.00	0.22	0.29	1.00	0.08	0.39	0.38	0.18	0.49	0.48
v/c Ratio	0.13	0.54	0.05	0.96	0.40	0.67	0.39	0.96	0.51	0.87	0.44	0.02
Control Delay	31.2	61.0	0.1	77.6	42.0	5.2	61.5	54.7	11.6	67.6	22.9	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	31.2	61.0	0.1	77.6	42.0	5.2	61.5	54.7	11.6	67.6	22.9	0.1
LOS	C	E	A	E	D	A	E	D	B	E	C	A
Approach Delay		42.2			36.1			45.8			40.9	
Approach LOS		D			D			D			D	

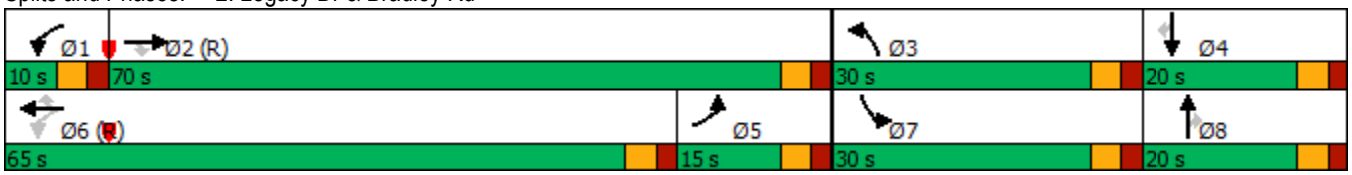
Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 125 (96%), Referenced to phase 1:SBL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 40.7	Intersection LOS: D
Intersection Capacity Utilization 92.8%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Powers & Bradley Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	774	135	98	1687	156	256	18	119	157	16	196
Future Volume (vph)	190	774	135	98	1687	156	256	18	119	157	16	196
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	15.0	70.0	70.0	10.0	65.0	65.0	30.0	20.0	20.0	30.0	20.0	20.0
Total Split (%)	11.5%	53.8%	53.8%	7.7%	50.0%	50.0%	23.1%	15.4%	15.4%	23.1%	15.4%	15.4%
Yellow Time (s)	3.0	3.0	3.0	3.0	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	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	11.0	77.7	77.7	75.9	75.9	75.9	16.5	14.5	14.5	12.6	10.6	10.6
Actuated g/C Ratio	0.08	0.60	0.60	0.58	0.58	0.58	0.13	0.11	0.11	0.10	0.08	0.08
v/c Ratio	0.69	0.39	0.14	0.28	0.86	0.17	0.62	0.09	0.41	0.50	0.11	0.71
Control Delay	45.5	7.1	0.6	15.6	29.1	6.5	59.9	49.8	9.3	60.5	54.1	25.4
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	45.5	7.1	0.6	15.6	29.1	6.5	59.9	49.8	9.3	60.5	54.1	25.4
LOS	D	A	A	B	C	A	E	D	A	E	D	C
Approach Delay		12.9			26.6			44.1			41.6	
Approach LOS		B			C			D			D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 102 (78%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 25.9	Intersection LOS: C
Intersection Capacity Utilization 76.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: Legacy Dr & Bradley Rd



Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	989	16	0	1795	29	0	0	31	0	0	146
Future Vol, veh/h	45	989	16	0	1795	29	0	0	31	0	0	146
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	500	-	0	-	-	0	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	98	95	95	98	92	95	92	95	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	1009	17	0	1832	32	0	0	33	0	0	159

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1864	0	0	-	-	0	-	-	505	-	-	916
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	320	-	-	0	-	-	0	0	512	0	0	275
Stage 1	-	-	-	0	-	-	0	0	-	0	0	-
Stage 2	-	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	320	-	-	-	-	-	-	-	512	-	-	275
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

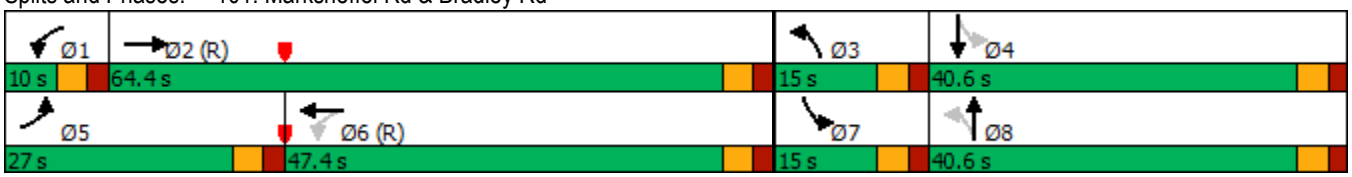
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0	12.5	34.5
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	512	320	-	-	-	-	275
HCM Lane V/C Ratio	0.064	0.153	-	-	-	-	0.577
HCM Control Delay (s)	12.5	18.3	-	-	-	-	34.5
HCM Lane LOS	B	C	-	-	-	-	D
HCM 95th %tile Q(veh)	0.2	0.5	-	-	-	-	3.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	488	377	160	95	542	285	213	600	50	140	275	309
Future Volume (vph)	488	377	160	95	542	285	213	600	50	140	275	309
Turn Type	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free	6		Free	8		Free	4		Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	4.0		5.0	4.0		5.0	4.0		5.0	4.0	
Minimum Split (s)	10.0	21.0		10.0	21.0		10.0	21.0		10.0	21.0	
Total Split (s)	27.0	64.4		10.0	47.4		15.0	40.6		15.0	40.6	
Total Split (%)	20.8%	49.5%		7.7%	36.5%		11.5%	31.2%		11.5%	31.2%	
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		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Act Effct Green (s)	21.6	59.4	130.0	47.8	42.8	130.0	45.9	35.9	130.0	45.3	35.6	130.0
Actuated g/C Ratio	0.17	0.46	1.00	0.37	0.33	1.00	0.35	0.28	1.00	0.35	0.27	1.00
v/c Ratio	0.90	0.25	0.11	0.26	0.49	0.19	0.56	0.65	0.03	0.60	0.30	0.21
Control Delay	73.4	22.1	0.1	19.8	36.7	0.3	35.5	45.2	0.0	37.6	38.4	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	73.4	22.1	0.1	19.8	36.7	0.3	35.5	45.2	0.0	37.6	38.4	0.3
LOS	E	C	A	B	D	A	D	D	A	D	D	A
Approach Delay		43.1			23.7			40.2			22.0	
Approach LOS		D			C			D			C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 33.0	Intersection LOS: C
Intersection Capacity Utilization 69.9%	ICU Level of Service C
Analysis Period (min) 15	

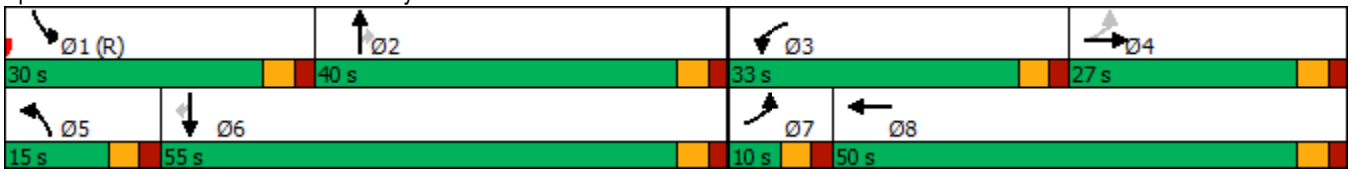
Splits and Phases: 101: Marksheffel Rd & Bradley Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	368	210	478	387	708	175	629	703	702	1165	110
Future Volume (vph)	71	368	210	478	387	708	175	629	703	702	1165	110
Turn Type	pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free			Free			2			6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	9.0		9.0	9.0		9.0	9.0	9.0	9.0	9.0	9.0
Total Split (s)	10.0	27.0		33.0	50.0		15.0	40.0	40.0	30.0	55.0	55.0
Total Split (%)	7.7%	20.8%		25.4%	38.5%		11.5%	30.8%	30.8%	23.1%	42.3%	42.3%
Yellow Time (s)	3.0	3.0		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	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	0.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	5.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	Max	Max	C-Max	Max	Max
Act Effct Green (s)	26.0	20.0	130.0	24.5	40.5	130.0	11.8	36.0	35.0	33.5	57.7	57.7
Actuated g/C Ratio	0.20	0.15	1.00	0.19	0.31	1.00	0.09	0.28	0.27	0.26	0.44	0.44
v/c Ratio	0.33	0.71	0.14	0.76	0.36	0.46	0.58	0.66	1.00	0.82	0.77	0.14
Control Delay	31.4	59.8	0.2	54.4	30.2	1.2	64.4	45.5	54.8	54.8	35.8	2.2
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	31.4	59.8	0.2	54.4	30.2	1.2	64.4	45.5	54.8	54.8	35.8	2.2
LOS	C	E	A	D	C	A	E	D	D	D	D	A
Approach Delay		37.4			24.5			52.0			40.7	
Approach LOS		D			C			D			D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 1 (1%), Referenced to phase 1:SBL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 38.9	Intersection LOS: D
Intersection Capacity Utilization 84.6%	ICU Level of Service E
Analysis Period (min) 15	

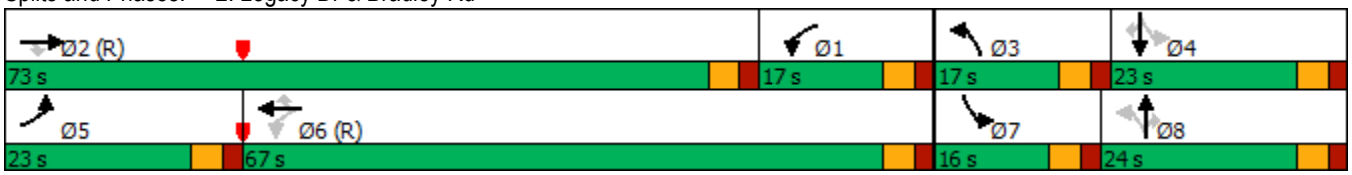
Splits and Phases: 1: Powers & Bradley Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	393	939	441	270	849	176	325	27	210	307	29	398
Future Volume (vph)	393	939	441	270	849	176	325	27	210	307	29	398
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	23.0	73.0	73.0	17.0	67.0	67.0	17.0	24.0	24.0	16.0	23.0	23.0
Total Split (%)	17.7%	56.2%	56.2%	13.1%	51.5%	51.5%	13.1%	18.5%	18.5%	12.3%	17.7%	17.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	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	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	18.9	72.3	72.3	66.4	66.4	66.4	29.7	16.7	16.7	27.7	15.7	15.7
Actuated g/C Ratio	0.15	0.56	0.56	0.51	0.51	0.51	0.23	0.13	0.13	0.21	0.12	0.12
v/c Ratio	0.83	0.50	0.43	0.71	0.49	0.21	0.52	0.12	0.56	0.51	0.14	0.91
Control Delay	53.3	32.0	10.9	44.5	22.6	3.1	42.9	49.1	11.9	42.8	50.4	40.0
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	53.3	32.0	10.9	44.5	22.6	3.1	42.9	49.1	11.9	42.8	50.4	40.0
LOS	D	C	B	D	C	A	D	D	B	D	D	D
Approach Delay		31.5			24.5			31.6			41.6	
Approach LOS		C			C			C			D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 67 (52%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 31.1	Intersection LOS: C
Intersection Capacity Utilization 67.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Legacy Dr & Bradley Rd



Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	149	1253	54	0	1207	95	0	0	20	0	0	88
Future Vol, veh/h	149	1253	54	0	1207	95	0	0	20	0	0	88
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	500	-	0	-	-	0	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	98	95	95	98	92	95	92	95	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	162	1279	57	0	1232	103	0	0	21	0	0	96

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1335	0	0	-	-	0	-	-	640	-	-	616
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	513	-	-	0	-	-	0	0	418	0	0	433
Stage 1	-	-	-	0	-	-	0	0	-	0	0	-
Stage 2	-	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	513	-	-	-	-	-	-	-	418	-	-	433
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

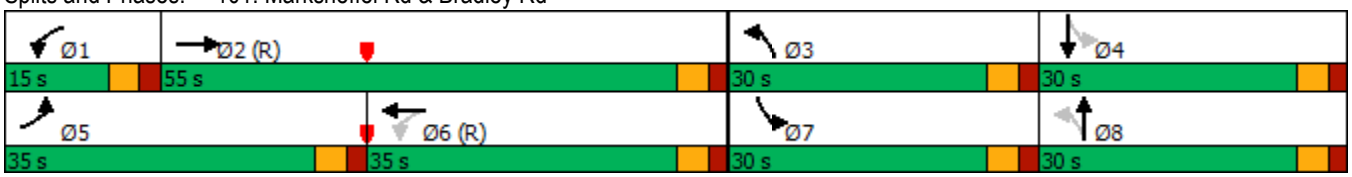
Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	0	14.1	15.7
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	418	513	-	-	-	-	433
HCM Lane V/C Ratio	0.05	0.316	-	-	-	-	0.221
HCM Control Delay (s)	14.1	15.2	-	-	-	-	15.7
HCM Lane LOS	B	C	-	-	-	-	C
HCM 95th %tile Q(veh)	0.2	1.3	-	-	-	-	0.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	609	731	310	195	597	215	224	500	100	300	650	517
Future Volume (vph)	609	731	310	195	597	215	224	500	100	300	650	517
Turn Type	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free	6		Free	8		Free	4		Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	4.0		5.0	4.0		5.0	4.0		5.0	4.0	
Minimum Split (s)	10.0	21.0		10.0	21.0		10.0	21.0		10.0	21.0	
Total Split (s)	35.0	55.0		15.0	35.0		30.0	30.0		30.0	30.0	
Total Split (%)	26.9%	42.3%		11.5%	26.9%		23.1%	23.1%		23.1%	23.1%	
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		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Act Effct Green (s)	27.9	50.0	130.0	42.1	32.1	130.0	46.7	28.6	130.0	53.3	31.9	130.0
Actuated g/C Ratio	0.21	0.38	1.00	0.32	0.25	1.00	0.36	0.22	1.00	0.41	0.25	1.00
v/c Ratio	0.87	0.57	0.21	0.68	0.72	0.14	0.75	0.68	0.07	0.81	0.79	0.34
Control Delay	62.6	33.4	0.3	36.1	50.8	0.2	44.0	52.3	0.1	45.1	54.0	0.6
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	62.6	33.4	0.3	36.1	50.8	0.2	44.0	52.3	0.1	45.1	54.0	0.6
LOS	E	C	A	D	D	A	D	D	A	D	D	A
Approach Delay		38.0			37.1			43.7			33.4	
Approach LOS		D			D			D			C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 37.4	Intersection LOS: D
Intersection Capacity Utilization 81.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 101: Marksheffel Rd & Bradley Rd



Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	26	715	1108	1031	100	383
Future Volume (vph)	26	715	1108	1031	100	383
Turn Type	pm+pt	NA	NA	Free	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases	2			Free		Free
Detector Phase	5	2	6		8	
Switch Phase						
Minimum Initial (s)	4.0	10.0	4.0		20.0	
Minimum Split (s)	9.0	15.0	9.0		25.0	
Total Split (s)	15.0	95.0	80.0		35.0	
Total Split (%)	11.5%	73.1%	61.5%		26.9%	
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)	-1.0	-1.0	-1.0		-1.0	
Total Lost Time (s)	4.0	4.0	4.0		4.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	C-Max	C-Max		None	
Act Effct Green (s)	101.0	101.0	94.3	130.0	21.0	130.0
Actuated g/C Ratio	0.78	0.78	0.73	1.00	0.16	1.00
v/c Ratio	0.08	0.27	0.45	0.69	0.37	0.25
Control Delay	2.7	7.3	15.3	6.1	52.8	0.4
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0
Total Delay	2.7	7.3	15.5	6.1	52.8	0.4
LOS	A	A	B	A	D	A
Approach Delay		7.1	11.0			
Approach LOS		A	B			

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 25 (19%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 10.2	Intersection LOS: B
Intersection Capacity Utilization 60.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Powers NB Ramp & Bradley Rd

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	209	75	710	498	532	19
Future Volume (vph)	209	75	710	498	532	19
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Detector Phase	2	2	1	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	10.0	23.0	23.0	23.0
Total Split (s)	45.0	45.0	40.0	85.0	45.0	45.0
Total Split (%)	34.6%	34.6%	30.8%	65.4%	34.6%	34.6%
Yellow Time (s)	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
Lost Time Adjust (s)	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
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	40.0	40.0	35.0	80.0	40.0	40.0
Actuated g/C Ratio	0.31	0.31	0.27	0.62	0.31	0.31
v/c Ratio	0.20	0.15	0.81	0.24	0.53	0.04
Control Delay	33.8	7.5	44.3	7.8	39.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.8	7.5	44.3	7.8	39.4	0.2
LOS	C	A	D	A	D	A
Approach Delay	26.9			29.3		
Approach LOS	C			C		

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 67 (52%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 31.3	Intersection LOS: C
Intersection Capacity Utilization 60.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 26: Bradley Rd & Powers SB Ramp

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	71	1070	865	708	175	703
Future Volume (vph)	71	1070	865	708	175	703
Turn Type	pm+pt	NA	NA	Free	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases	2			Free		Free
Detector Phase	5	2	6		8	
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)	15.0	100.0	85.0		30.0	
Total Split (%)	11.5%	76.9%	65.4%		23.1%	
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)	-1.0	-1.0	-1.0		-1.0	
Total Lost Time (s)	4.0	4.0	4.0		4.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	C-Max	C-Max		Max	
Act Effct Green (s)	96.0	96.0	86.2	130.0	26.0	130.0
Actuated g/C Ratio	0.74	0.74	0.66	1.00	0.20	1.00
v/c Ratio	0.17	0.43	0.39	0.47	0.52	0.47
Control Delay	9.6	11.0	10.3	1.4	52.5	1.0
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	9.6	11.1	10.3	1.4	52.5	1.0
LOS	A	B	B	A	D	A
Approach Delay		11.0	6.3			
Approach LOS		B	A			

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 47 (36%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 59.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Powers NB Ramp & Bradley Rd

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	439	210	478	562	702	110
Future Volume (vph)	439	210	478	562	702	110
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Detector Phase	2	2	1	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	10.0	23.0	23.0	23.0
Total Split (s)	40.0	40.0	45.0	85.0	45.0	45.0
Total Split (%)	30.8%	30.8%	34.6%	65.4%	34.6%	34.6%
Yellow Time (s)	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
Lost Time Adjust (s)	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
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	35.0	35.0	40.0	80.0	40.0	40.0
Actuated g/C Ratio	0.27	0.27	0.31	0.62	0.31	0.31
v/c Ratio	0.49	0.38	0.48	0.27	0.70	0.20
Control Delay	42.0	6.6	44.6	7.7	43.9	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	6.6	44.6	7.7	43.9	6.6
LOS	D	A	D	A	D	A
Approach Delay	30.5			24.7		
Approach LOS	C			C		

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 67 (52%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 60	
Control Type: Pretimed	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 30.8	Intersection LOS: C
Intersection Capacity Utilization 59.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 26: Bradley Rd & Powers SB Ramp

Additional Attachments

Figure 19 Long-Term Bradley Road Lane Recommendations figure from the *Springs at Waterview East Preliminary Plan Traffic Impact Study*

TRANSPORTATION
CONSULTANTS, INC.

revise to RI/RO

Proposed 3/4
Movement Access

Approximate Scale
Scale: 1"= 200'

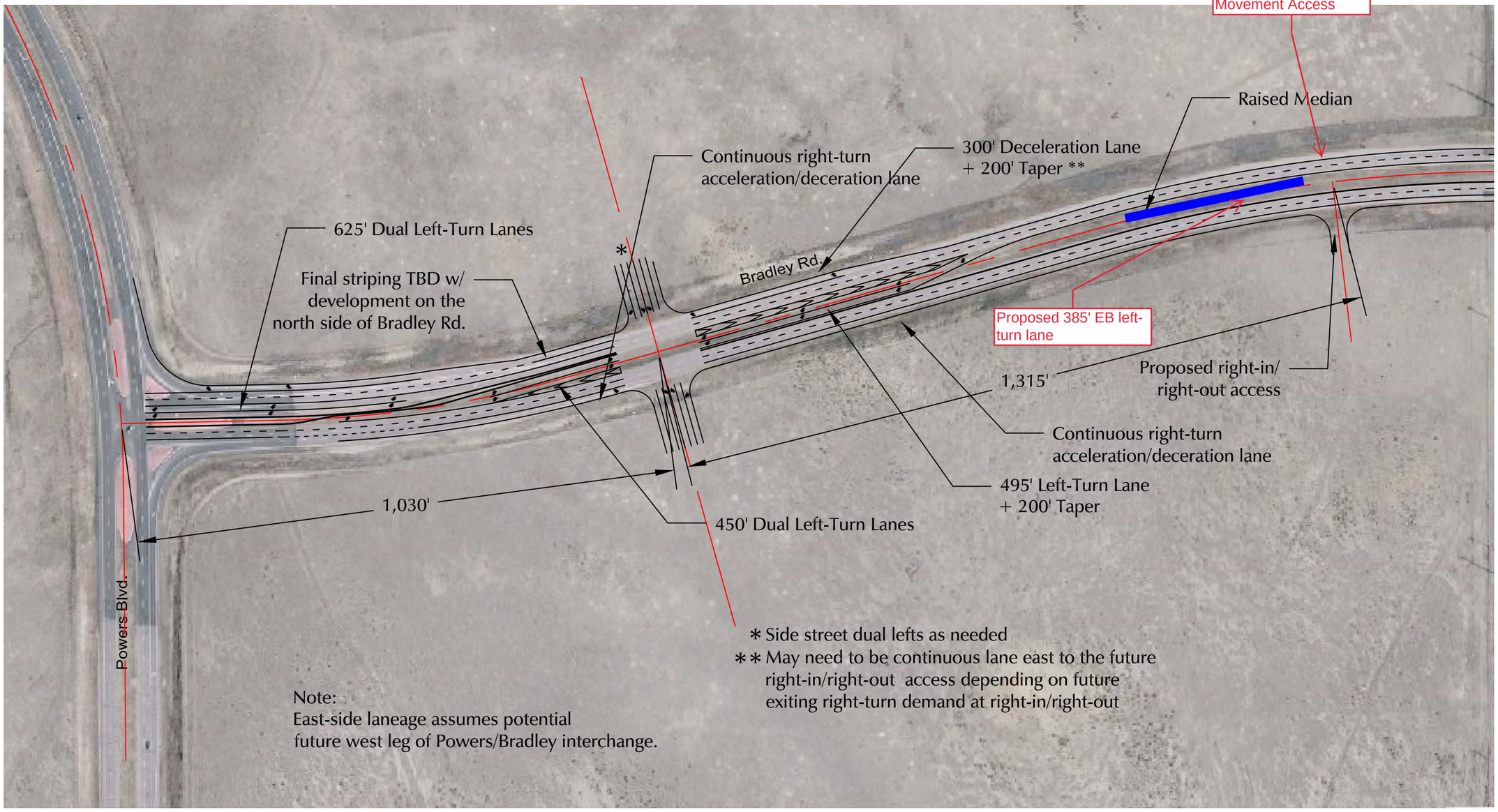


Figure 19

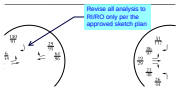
Long-Term
Bradley Road Lane Recommendations

Springs at Waterview East (LSC #184360)

LSC TRANSPORTATION CONSULTANTS, INC.

TIS_r1.pdf Markup Summary

dsdlaforce (15)



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Revise all analysis to RI/RO only per the approved sketch plan

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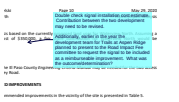

Subject: Callout
Page Label: 14
Author: dsdlaforce
Date: 7/27/2020 10:18:22 AM
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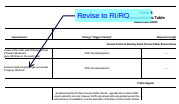
Double check signal installation cost estimate. Contribution between the two development may need to be revised.

Additionally, earlier in the year the development team for Trails at Aspen Ridge planned to present to the Road Impact Fee committee to request the signal to be included as a reimburseable improvement. What was the outcome/determination?



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Author: dsdlaforce
Date: 7/27/2020 10:35:22 AM
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Revise to RI/RO

Subject: Callout
Page Label: 89
Author: dsdlaforce
Date: 7/27/2020 10:39:05 AM
Status:
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Space:

revise to RI/RO

Subject: Callout
Page Label: 14
Author: dsdlaforce
Date: 7/27/2020 10:41:11 AM
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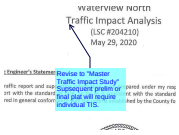
Update narrative. Deviation request was approved for the two access location with SKP162



Subject: Callout
Page Label: 1
Author: dsdlaforce
Date: 7/27/2020 10:53:34 AM
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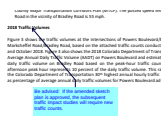
Revise to "Master Traffic Impact Study" Supsequent prelim or final plat will require individual TIS.



Subject: Callout
Page Label: 7
Author: dsdlaforce
Date: 7/27/2020 10:55:57 AM
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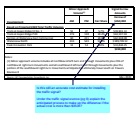
Be advised: If the amended sketch plan is approved, the subsequent traffic impact studies will require new traffic counts.



Subject: Callout
Page Label: 18
Author: dsdlaforce
Date: 7/27/2020 10:58:43 AM
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Is this still an accurate cost estimate for installing the traffic signal?

Under the traffic signal escrow (pg 9) explain the anticipated process to make up the difference if the actual cost is more than $350K?

Subject: Callout
Page Label: 19
Author: dsdlaforce
Date: 7/27/2020 10:59:10 AM
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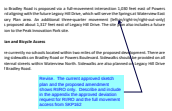
Attach the minutes in the TIS



Subject: Callout
Page Label: 6
Author: dsdlaforce
Date: 7/27/2020 9:03:29 AM
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Revise. The current approved sketch plan and the proposed amendment shows RI/RO only. Describe and include in the appendix the approved deviation request for RI/RO and the full movement access from SKP162

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Page Label: 6
Author: dsdlaforce
Date: 7/27/2020 9:04:37 AM
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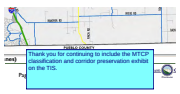

Subject: Text Box
Page Label: 39
Author: dsdlaforce
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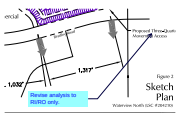
Thank you for continuing to include the MTCP classification and corridor preservation exhibit on the TIS.



Subject: Callout
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Author: dsdlaforce
Date: 7/27/2020 9:16:17 AM
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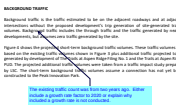
Revise analysis to RI/RO only.



Subject: Callout
Page Label: 8
Author: dsdlaforce
Date: 7/27/2020 9:21:20 AM
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The existing traffic count was from two years ago. Either include a growth rate factor to 2020 or explain why included a growth rate is not conducted.

Subject: Text Box
Page Label: 25
Author: dsdlaforce
Date: 7/27/2020 9:26:56 AM
Status:
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Identify "Springs at Waterview East", "Bradley Heights" and "Peak Innovation Park" referenced in pg 4 & 5