

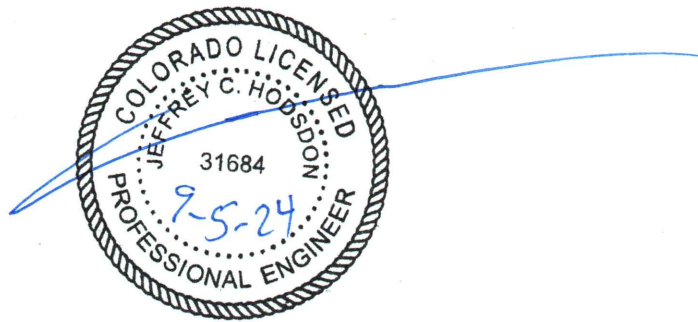


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Villas at Aspen Trails
 Traffic Impact and Access Analysis
 (LSC #S234390)
 PCD File No. SP234
 September 5, 2024

Traffic Engineer's Statement

This traffic report and supporting information were prepared under my responsible charge and they comport with the standard of care. So far as is 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.

DocuSigned by:
Ray O'Sullivan
 90FA985DBE0A4F2...

Ray O'Sullivan

9/24/2024

Date

Villas at Aspen Trails

Traffic Impact and Access Analysis

Prepared for:

Mr. James Buller
RJ Development, LLC
17 South Wahsatch Avenue
Colorado Springs, CO 80903

SEPTEMBER 5, 2024

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

LSC #S234390
PCD File No.: [SP234](#)



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MTCP Maps

Road Impact Fee Advisory Committee Meeting Minutes



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September 5, 2024

Mr. James Buller
RJ Development, LLC
17 South Wahsatch Avenue
Colorado Springs, CO 80903

RE: Villas at Aspen Trails
Traffic Impact and Access Analysis
El Paso County, CO
PCD File No.: [SP234](#)
LSC #S234390

Dear Mr. Buller,

In response to your request, LSC Transportation Consultants, Inc. has prepared this traffic impact and access analysis for the proposed Villas at Aspen Trails residential development. As shown in Figure 1, the site is located southeast of the intersection of Bradley Road and Legacy Hill Drive in El Paso County, Colorado. The *Waterview East RM-12 Rezone Traffic Impact Analysis* dated October 11, 2021 was completed as part of the rezone ([P202](#)) of this same parcel. This study is intended as a final site-specific traffic study for the currently proposed preliminary plan.

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; and
- The projected levels of service at the site-access point and adjacent intersections.

PREVIOUS TRAFFIC REPORTS COMPLETED IN THE AREA

The *Waterview East RM-12 Rezone Traffic Impact Analysis* dated October 11, 2021 was completed as part of the rezone (P202) of this same site. LSC also recently completed the *Waterview East Commercial Traffic Impact and Access Analysis* ([SP229](#)) dated August 15, 2023 with a minor revision September 12, 2023 for the parcel just west of the site.

Appendix Table 1: Area Traffic Impact Studies includes a list of other traffic studies in the area of study completed within the past five years (that LSC is aware of) and is attached for reference. This study accounts for the land use, trip generation, and the roadway network included in these studies. Figure 2 shows the location of the other known developments in the area.

LAND USE AND ACCESS

The site location is shown in Figure 1. Figure 2 presents a context map showing other area developments. The site plan for Villas at Aspen Trails is shown in Figure 3.

Land Use

Figure 3 shows the proposed site plan for the 22-acre Waterview East Commercial development. The 2018 Springs at Waterview East TIS assumed the site would be developed with about 148,000 square feet of general-retail floor space. The site is now planned to be developed with about 174,000 square feet of floor space, including a mix of general retail, fast-food restaurant, gas station, and mini storage uses.

Access

A full-movement access point is proposed to Sidewinder Drive about 460 feet east of Legacy Hill Drive and 175 feet west of Bull Run Drive. As shown in Figure 3, the proposed access spacing meets the 175-foot minimum set by the El Paso County *Engineering Criteria Manual (ECM)* for an Urban Local.

An additional emergency-only access (restricted to right-in/right-out only) is proposed to Legacy Hill Drive about 152 feet north of Frontside Drive/Sidewinder Drive. As this access is less than the 330-foot spacing required for an Urban Non-Residential Collector when intersecting local roadways this access will require a deviation to the *ECM*.

Pedestrian and Bicycle Accommodations

The El Paso County 2016 Major Transportation Corridors Plan Update shows Bradley Road as a future bicycle route.

As shown in Figure 2, sidewalks will be provided on Legacy Hill Drive and Sidewinder Drive adjacent to the site.

There are no existing schools within two miles of the site.

Public Transportation

Per the *El Paso County 2016 Major Transportation Corridors Plan Update*:

The Pikes Peak Region's principal transit service provider is Mountain Metropolitan Transit, a department of the City of Colorado Springs. Mountain Metro currently provides fixed route bus service focused in Colorado Springs, and the 2040 Regional Transportation Plan – Transit (Appendix E of the 2040 Moving Forward Regional Transportation Plan) calls for the agency to continue with this service focus area. So, there are currently no plans to provide fixed route transit service to the unincorporated parts of El Paso County.

The *2045 Regional Transportation Plan – Transit Mountain Metropolitan Transit* also does not show any future plans to provide transit service to the area. The 2045 plan does suggest consideration of adding service to the nearby Colorado Springs Airport. However, the report also recommends that any airport service not be integrated with other traditional routes.

Access Sight Distance

Figure 4 shows the sight distance analysis for the proposed access point to Sidewinder Drive. Intersection sight-distance analysis was not analyzed for this intersection as guidance from the *Colorado Department of Transportation 2018 Roadway Design Guide* and *A Policy on Geometric Design of Highway and Street, 7th Edition* published by AASHTO indicates that intersection sight distance is not applicable to local urban/residential streets. See the attached Appendix A for further details. Based on a design speed of 25 miles per hour (mph) and the criteria contained in Table 2-17 of the *Engineering Criteria Manual (ECM)*, the required stopping sight distance at the site access is 155 feet. As shown in Figure 4, the stopping sight distance can be met at the proposed access point.

Figure 4 also shows the sight distance analysis for the proposed emergency-only access to Legacy Hill Drive. As this access will be restricted to right-in/right-out only, the sight distance to the south was analyzed. The sight-distance requirements were based on a design speed of 25 mph, which is the estimated maximum speed for vehicles exiting the Legacy Hill/Frontside/Sidewinder roundabout. As shown in Figure 4, the required stopping sight distance of 155 feet from Table 2-17 of the *ECM* can be met.

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 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.

Legacy Hill Drive is a Non-Residential Collector Street which extends south from Bradley Road, through the Frontside Drive roundabout intersection and into the Trails at Aspen Ridge development. The street is planned to be extended north of Bradley Road with the Villages at Waterview North development. This intersection of Legacy Hill Drive/Bradley Road is planned to be signalized in the future.

Existing Traffic Volumes

Figure 5 shows the traffic volumes at the intersection of Legacy Hill Drive/Bradley Road based on the attached traffic counts conducted by LSC in February 2023. Figure 5 also shows an estimate of the average daily traffic volumes on Bradley Road, based on the peak-hour traffic counts.

Existing Levels of Service

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection. Level of service is indicated on a scale from "A" to "F." LOS A represents control delay of less than 10 seconds for unsignalized and signalized intersections. LOS F represents control delay of more than 50 seconds for unsignalized intersections and more than 80 seconds for signalized intersections. Table 1 shows the level of service delay ranges.

Table 1: Intersection Levels of Service Delay Ranges

Level of Service	Signalized Intersections	Unsignalized Intersections
	Average Control Delay (seconds per vehicle)	Average Control Delay (seconds per vehicle) ⁽¹⁾
A	10.0 sec or less	10.0 sec or less
B	10.1-20.0 sec	10.1-15.0 sec
C	20.1-35.0 sec	15.1-25.0 sec
D	35.1-55.0 sec	25.1-35.0 sec
E	55.1-80.0 sec	35.1-50.0 sec
F	80.1 sec or more	50.1 sec or more

(1) For unsignalized intersections if V/C ratio is greater than 1.0 the level of service is LOS F regardless of the projected average control delay per vehicle.

The intersection of Legacy Hill Drive/Bradley Road has been analyzed based on the unsignalized method of analysis from the *Highway Capacity Manual, 6th Edition* by the Transportation Research Board. The results of the analysis are shown in Figure 5.

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

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 6 shows the projected short-term (Year 2026) background traffic volumes. These traffic volumes are based on the existing traffic volumes shown in Figure 5, assuming a growth rate of 1 percent per year. The short-term background traffic volumes also include additional traffic projected to be generated by development of The Trails at Aspen Ridge Filing Nos. 1 and 2 taken from the *Trails at Aspen Ridge Filing No. 2 Traffic Impact and Access Analysis* by Matrix dated May 7, 2021

Figure 7 shows the projected 2044 background traffic volumes. The 2044 background traffic volumes were based on recent traffic studies completed by LSC in the vicinity of the site. These volumes assume buildout of The Trails at Aspen Ridge, Villages at Waterview North located north of Bradley Road, the Waterview East Commercial site located west of Legacy Hill Drive, and Bradley Heights located east of the Trails at Aspen Ridge. The 2044 background traffic volumes do not include any traffic projected to be generated by the Villas at Aspen Trails.

TRIP GENERATION

The site-generated vehicle trips were estimated using the nationally-published trip-generation rates from *Trip Generation, 11th Edition, 2021* by the Institute of Transportation Engineers (ITE). Table 2 shows the average weekday and peak-hour trip-generation estimates. Table 2 also shows a comparison to the trip-generation estimate assumed in Waterview East RM-12 Rezone Traffic Impact Analysis ([P202](#)) dated October 11, 2021.

The Villas at Aspen Trails is projected to generate about 295 new external vehicle trips on the average weekday, with about half entering and half exiting the site. This is about 144 **fewer** trips than were assumed for the same area in the recent traffic studies completed by LSC in the area, including studies for the Waterview East RM-12 Rezone TIS. During the morning peak hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 5 vehicles would enter and 15 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 14 vehicles would enter and 10 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 8 shows the short-term and long-term directional distributions of traffic projected to be generated by the site.

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. The directional-distribution estimate is consistent with the estimate assumed in the Waterview East RM-12 Rezone TIS. When the distribution percentages (from Figure 8) are applied to the trip-generation estimates (from Table 2), the resulting new-external site-generated traffic volumes can be determined. Figures 9 and 10 show the projected short-term and long-term site-generated traffic volumes, respectively.

BUILDOUT TOTAL TRAFFIC

Figure 11 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 6) plus the short-term site-generated traffic volumes (from Figure 9).

Figure 12 shows the projected 2044 total traffic volumes. The 2044 total traffic volumes are the sum of the 2044 background traffic volumes (from Figure 7) plus the long-term total, external site-generated traffic volumes (from Figure 10).

SIGNAL WARRANT ANALYSIS

The intersection of Bradley Road/Legacy Hill Drive was analyzed to determine when Four-Hour and/or Eight-Hour Vehicular-Volume Traffic-Signal Warrant thresholds would be reached or exceeded, based on the projected traffic volumes. The satisfaction of warrants does not indicate that a signal must be installed. The decision to require a signal to be installed rests with the City of Colorado Springs

Table 3 shows the results of the analysis. The off-peak traffic volumes were based on traffic counts conducted by LSC in February 2023 and vehicle time of day distribution data for single-family attached and single-family detached land uses published by the Institute of Transportation Engineers.

As shown in Table 3, based on traffic counts conducted in February 2023, none of the hours analyzed currently meet the thresholds for either a Four-Hour or an Eight-Hour Vehicular-Volume Traffic-Signal Warrant and are not anticipated to be met by the addition of site-generated traffic only. Both of these warrants are projected to be met with full buildout of Trails at Aspen Ridge Filing Nos. 1 and 2, which are approved and partially built out. A traffic-signal warrant could also potentially be met in the short-term with development of the recently approved Waterview East Commercial site.

PROJECTED LEVELS OF SERVICE

The key area intersections have been analyzed to determine the projected levels of service for the short-term background, 2044 background, short-term total, and 2044 total traffic volumes. The signalized intersection of Legacy Hill/Bradley were analyzed using Synchro. The site-access point to Sidewinder Drive and the intersection of Legacy Hill/Frontside were analyzed based on the unsignalized method of analysis from the *Highway Capacity Manual, 6th Edition* by the Transportation Research Board. Figures 6, 7, 11, and 12 show the results of the level of service analysis. The level of service reports are attached.

Legacy Hill/Bradley

The northbound left-turn movement at the stop-sign-controlled intersection of Legacy Hill/Bradley is currently operating at LOS D during the morning peak hour and LOS E during the afternoon peak hour. As discussed in the traffic-signal warrant section above multiple traffic-signal warrants are anticipated to be met in the short-term future. 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 and 2044 total traffic volumes. By 2044, the eastbound left-turn movement is projected to operate at LOS E during the morning peak hour.

Legacy Hill/Frontside

The intersection of Legacy Hill/Frontside is a one-lane modern roundabout. All approaches are projected to operate at LOS C or better during the peak hours, based on the projected short-term and 2044 total traffic volumes.

Sidewinder Drive Access Point

The proposed access point to Sidewinder Drive is projected to operate at an acceptable level of service (LOS A for all movements) as a stop-sign-controlled intersection.

ROADWAY CLASSIFICATION

Figure 13 shows the recommended street classifications. All of the internal streets within The Villas at Aspen Trails are planned to be classified as private. Sidewinder Drive, which forms the south boundary of the site, was previously shown as an Urban Non-Residential Collector adjacent to the site. However, based on the change to residential land use from retail land use that was approved as part of the Rezone (PCD No. 202) and the projected 2044 average weekday traffic volumes of 1,000 vehicles per day shown in Figure 12, an Urban Local classification is appropriate for this street.

LEGACY HILL/BRADLEY SIGNAL ESCROW

The intersection of Legacy Hill/Bradley has recently been transferred to the City of Colorado Springs. The City will require the applicant to escrow \$200,000 towards the future signal at the intersection of Legacy Hill/Bradley prior to construction plan approval. LSC recommends that the escrow amount called out by the City for the southeast and southwest corners (one half of the signal cost), should be shared by this development, Aspen Ridge, and the future multi-family development on the SE corner. The cost sharing could be based on peak-hour trips creating the need for a signal at this intersection (generally, traffic on the northbound approach) this cost-sharing agreement should consider any amount already escrowed by the Aspen Ridge Development. Since this intersection was approved as an eligible intersection by the El Paso County Roadway Improvement Fee program, amounts escrowed by county developments on the south side of Bradley should be eligible for credit, based on fee program unit costs for signals, once the signal is installed.

COUNTY ROAD IMPACT FEE PROGRAM

The applicant will be required to participate in the County Road Impact Fee Program. The Villas at Aspen Trails will join the ten-mil PID. The ten-mil PID building permit fee portion associated with this option is \$1,221 per single-family dwelling unit. Based on 41 dwelling units, the total building permit fee would be \$50,061.

Mr. James Buller
Villas at Aspen Trails

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September 5, 2024
Traffic Impact Analysis

ROADWAY IMPROVEMENTS

Based on the 2044 total traffic volumes shown in Figure 12 and the criteria contained in the *El Paso County Engineering Criteria Manual (ECM)* no auxiliary lanes are required on Sidewinder Drive approaching the site access.

DEVIATIONS

The following deviations to the criteria contained in the *El Paso County Engineering Criteria Manual (ECM)* have been recently submitted as part of this application:

- Public street intersection spacing for the proposed emergency access to Legacy Hill Drive about 152 feet north of Frontside Drive/Sidewinder Drive was submitted as part of this application.
- Modified roadway cross section and roadway design elements for the private Urban, Local (Low Volume) roadways

Discuss aux lanes on
Legacy Hills Drive

* * * * *

Please discuss if any
auxiliary lane
improvements on
Bradley Road/Legacy
Hills Drive int. as
detailed on Table #5
from PCD File P202
TIS under have been
triggered

Please contact me if you have any questions regarding this r

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

By Jeffrey C. Hodsdon, P.E.
Principal

JCH/KDF:jas

- Enclosures:
- Tables 2-3
 - Figures 1-13
 - Traffic Count Reports
 - Level of Service Reports
 - Appendix Table 1
 - MTCP Maps
 - Road Impact Fee Advisory Committee Meeting Minutes

Tables 2-3



**Table 2
Trip Generation Estimate
Villas at Aspen Trails**

Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾				Total Trips Generated					
			Average Weekday Traffic	Morning Peak-Hour In	Afternoon Peak-Hour Out	Average Weekday Traffic	Morning Peak-Hour In	Afternoon Peak-Hour Out				
				Out	In		Out	In	Out			
Trip Generation Estimate for the Currently Proposed Villas at Aspen Trails												
215	Single Family Attached Housing	41 DU ⁽²⁾	7.20	0.12	0.36	0.34	0.23	295	5	15	14	10
Trip Generation Estimate From the Waterview East RM-12 Rezone Traffic Impact Analysis dated October 11, 2021 (PCD Project No. P202)												
220	Multifamily Housing Low-Rise	60 DU	7.32	0.11	0.35	0.35	0.21	439	6	21	21	12
Change (Decrease) in Trip Generation Estimate								-144	-1	-6	-7	-3
Notes:												
(1) Source: based on <i>Trip Generation</i> , 11th Edition, 2021 by the Institute of Transportation Engineers (ITE)												
(2) DU = dwelling unit												
Source: LSC Transportation Consultants, Inc.											Jan-24	

Table 3
Traffic Signal Warrant Analysis
 Bradley Road & Legacy Hill Drive
 Villas as Aspen Trails

Warrant Analysis⁽¹⁾

Hour	Existing Traffic Volumes (vehicles per hour) ⁽²⁾		Warrant 1: Eight Hour Vehicular Volume Evaluation						Warrant 2: Four Hour Vehicular Volume	
			Warrant Thresholds				Warrant Threshold Met?		70% Warrant Threshold Minimum	Warrant Threshold Met?
	Major ⁽³⁾	Minor Leg ⁽⁴⁾	Condition A (70%)		Condition B (70%)					
			Major	Minor	Major	Minor	A	B		

Existing Traffic

6:30 AM	1367	48	350	105	525	53	No	No	60	No
7:30 AM	1237	44	350	105	525	53	No	No	60	No
11:30 AM	577	42	350	105	525	53	No	No	125	No
12:30 PM	567	31	350	105	525	53	No	No	125	No
1:30 PM	686	30	350	105	525	53	No	No	90	No
3:00 PM	1131	48	350	105	525	53	No	No	60	No
4:00 PM	1455	43	350	105	525	53	No	No	60	No
5:00 PM	1131	46	350	105	525	53	No	No	60	No

Numbers of Hours the Warrant Thresholds Are Met	0	0	0
Warrant Met?	No		No

Existing + Buildout of Villas at Aspen Trails

6:30 AM	1371	55	350	105	525	53	No	Yes	60	No
7:30 AM	1242	55	350	105	525	53	No	Yes	60	No
11:30 AM	584	45	350	105	525	53	No	No	125	No
12:30 PM	575	34	350	105	525	53	No	No	125	No
1:30 PM	694	33	350	105	525	53	No	No	90	No
3:00 PM	1141	53	350	105	525	53	No	No	60	No
4:00 PM	1466	49	350	105	525	53	No	No	60	No
5:00 PM	1145	53	350	105	525	53	No	No	60	No

Numbers of Hours the Warrant Thresholds Are Met	0	2	0
Warrant Met?	No		No

Existing + Buildout of Aspen Ridge Fil Nos. 1 & 2 Traffic⁽⁵⁾

6:30 AM	1370	100	350	105	525	53	No	Yes	60	Yes
7:30 AM	1242	110	350	105	525	53	Yes	Yes	60	Yes
11:30 AM	637	65	350	105	525	53	No	Yes	90	No
12:30 PM	631	57	350	105	525	53	No	Yes	90	No
1:30 PM	752	57	350	105	525	53	No	Yes	70	No
3:00 PM	1222	76	350	105	525	53	No	Yes	60	Yes
4:00 PM	1565	76	350	105	525	53	No	Yes	60	Yes
5:00 PM	1235	79	350	105	525	53	No	Yes	60	Yes

Numbers of Hours the Warrant Thresholds Are Met	1	8	5
Warrant Met?	Yes		Yes

Existing + Buildout of Aspen Ridge Fil Nos. 1 & 2 Traffic + Buildout of Villas at Aspen Trails

6:30 AM	1374	107	350	105	525	53	Yes	Yes	60	Yes
7:30 AM	1247	121	350	105	525	53	Yes	Yes	60	Yes
11:30 AM	644	68	350	105	525	53	No	Yes	90	No
12:30 PM	639	60	350	105	525	53	No	Yes	90	No
1:30 PM	760	60	350	105	525	53	No	Yes	70	No
3:00 PM	1232	81	350	105	525	53	No	Yes	60	Yes
4:00 PM	1576	82	350	105	525	53	No	Yes	60	Yes
5:00 PM	1249	86	350	105	525	53	No	Yes	60	Yes

Numbers of Hours the Warrant Thresholds Are Met	2	8	5
Warrant Met?	Yes		Yes

Notes:

- (1) Thresholds are based on 1 lane on the major approach and 1 lane on the minor approach with the 70% factor applied for a posted speed limit above 40 mph
- (2) Based on traffic counts by LSC Transportation Consultants, Inc February 2023
- (3) The major street traffic includes all movements (left, through, and right) on Bradley Road
- (4) The minor street traffic includes only the northbound left volume from Legacy Hill Drive
- (5) Source: *Trails at Aspen Ridge Filing No. 2 - Traffic Impact and Access Analysis* by Matrix Design Group, Inc. May 7, 2021

Source: LSC Transportation Consultants, Inc.

Figures 1-13



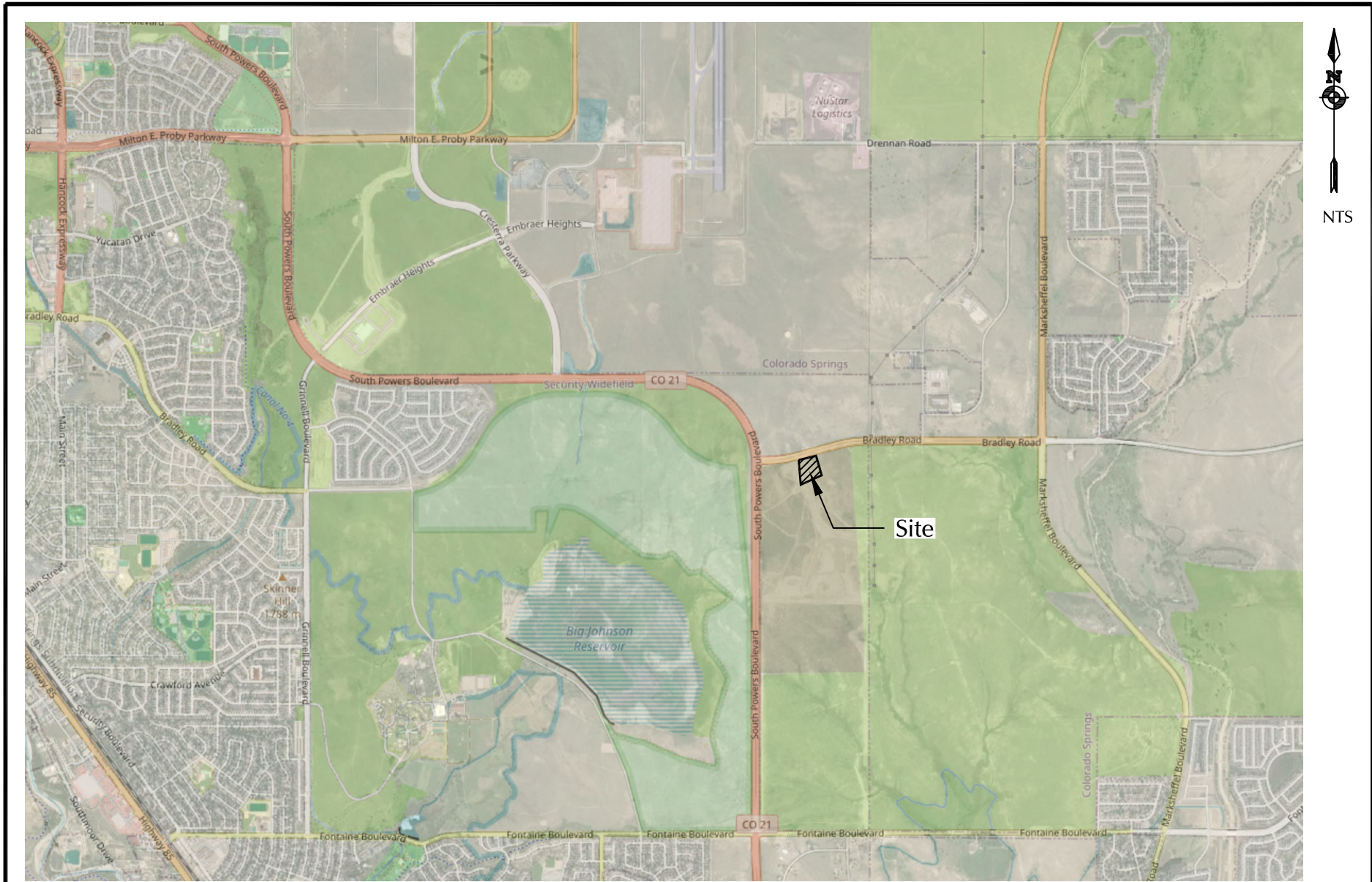


Figure 1

Vicinity Map

Villas at Aspen Trails (LSC# S234390)



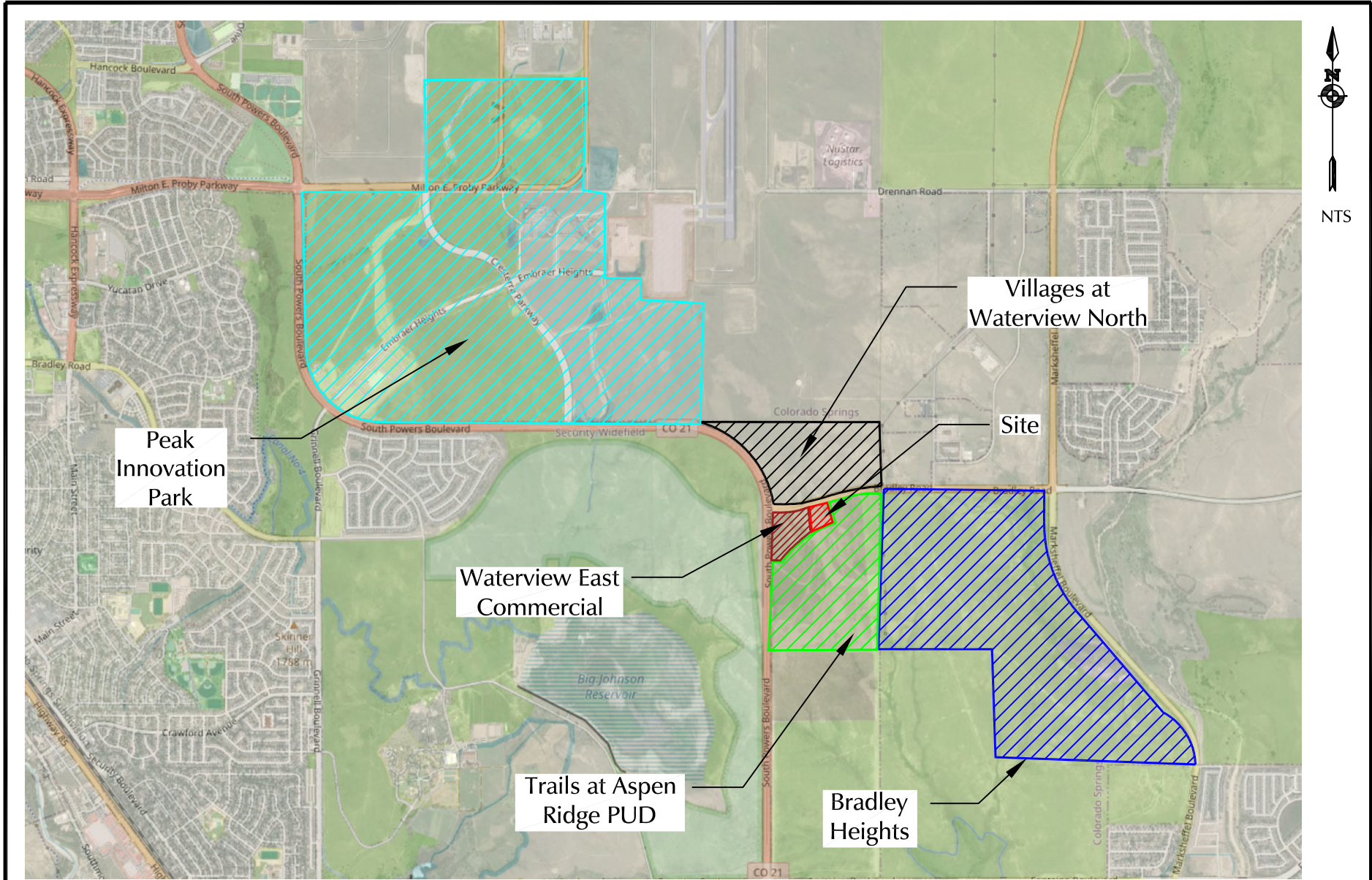
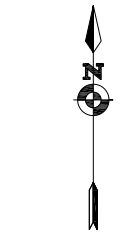
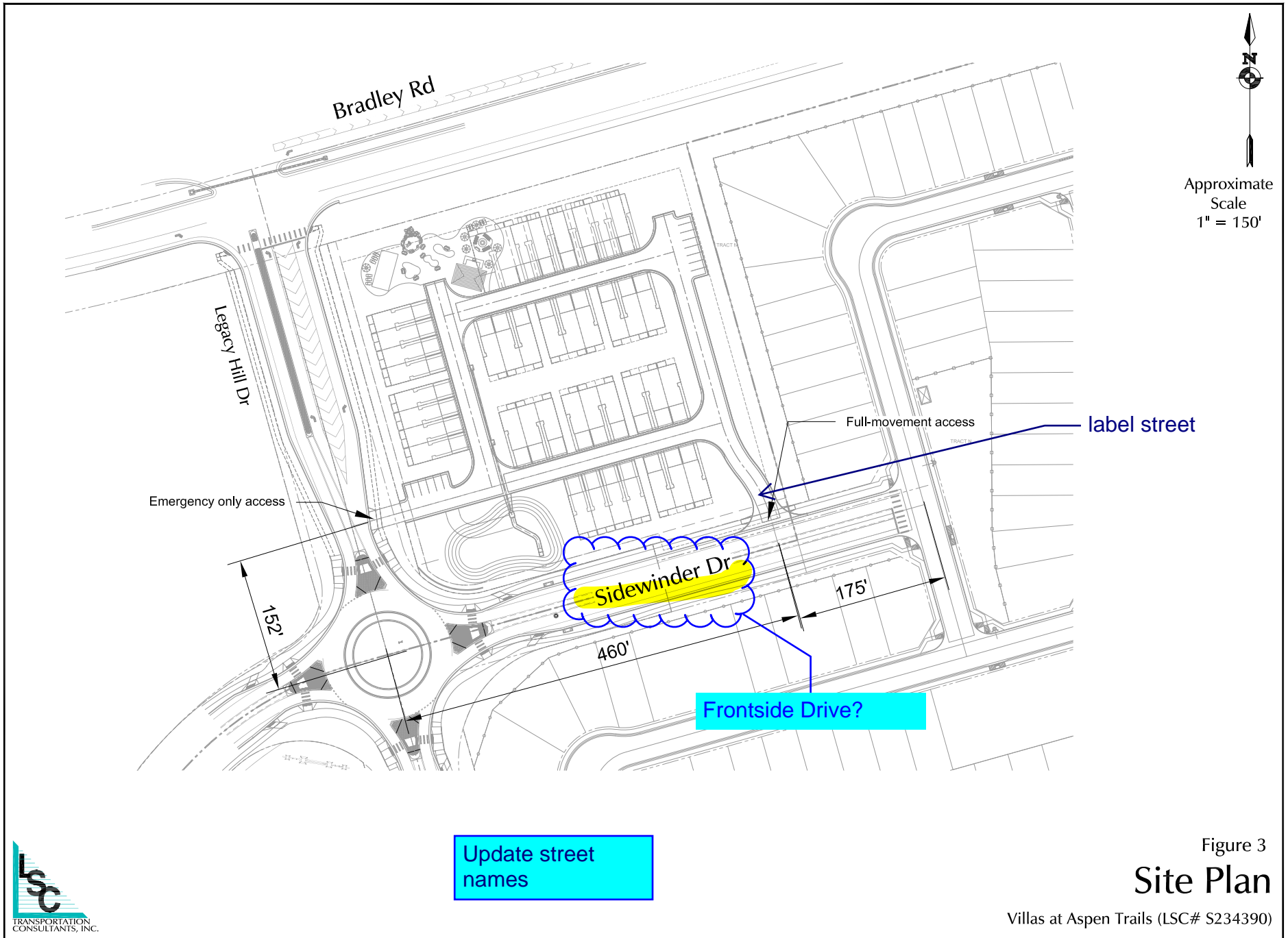


Figure 2

Context Map

Villas at Aspen Trails (LSC# S234390)





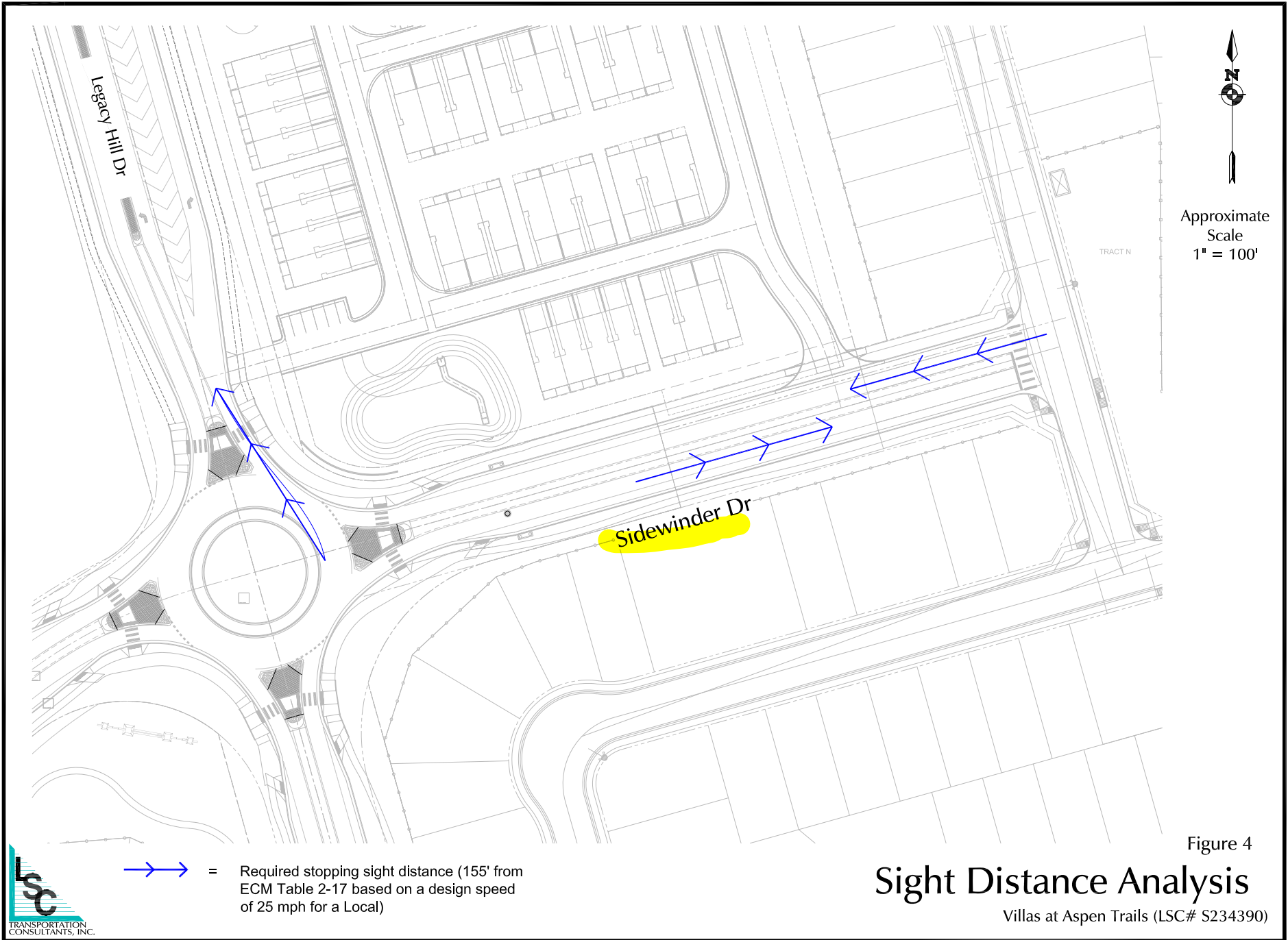
Approximate
Scale
1" = 150'

Update street
names

Figure 3
Site Plan

Villas at Aspen Trails (LSC# S234390)





Approximate
Scale
1" = 100'


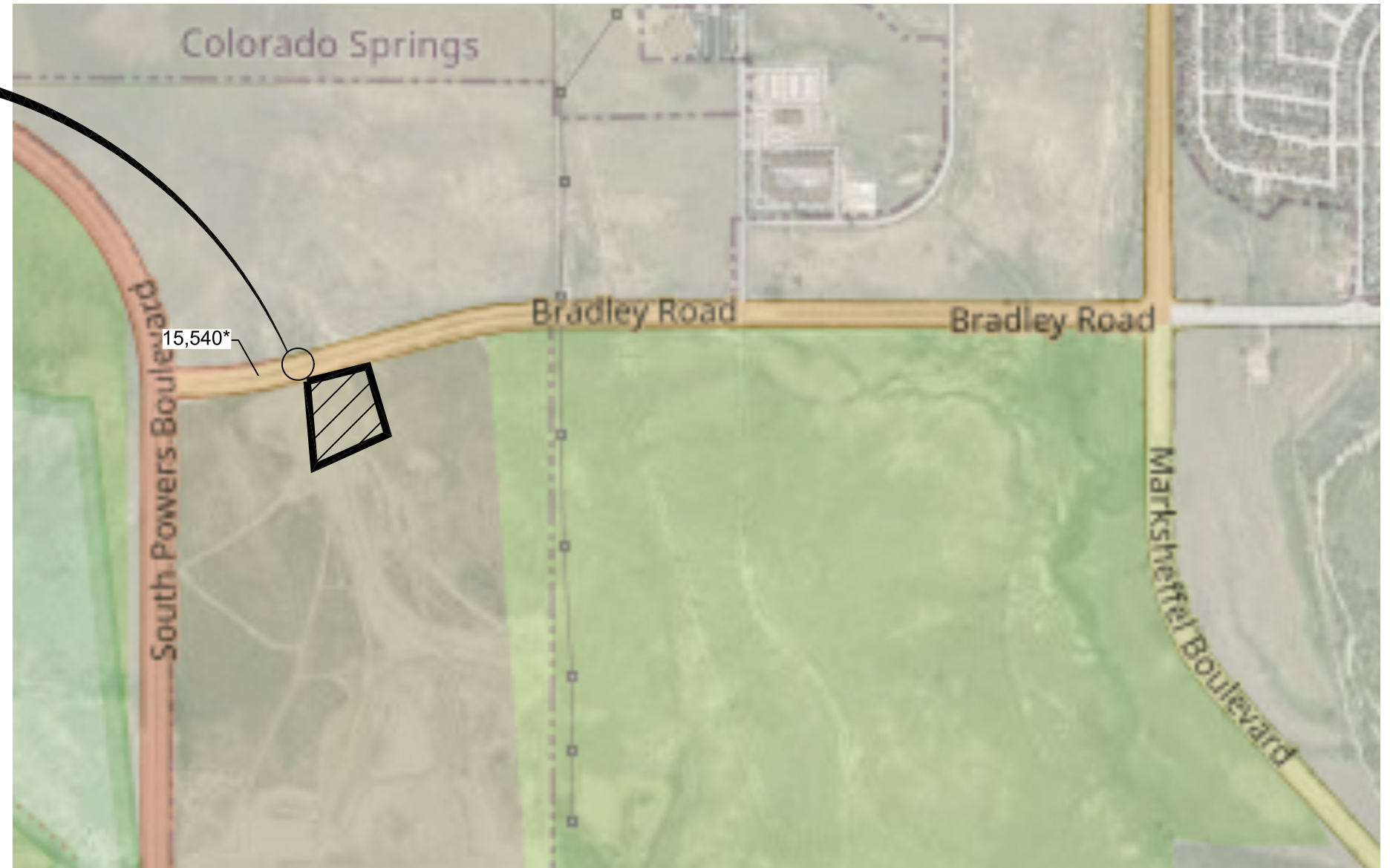
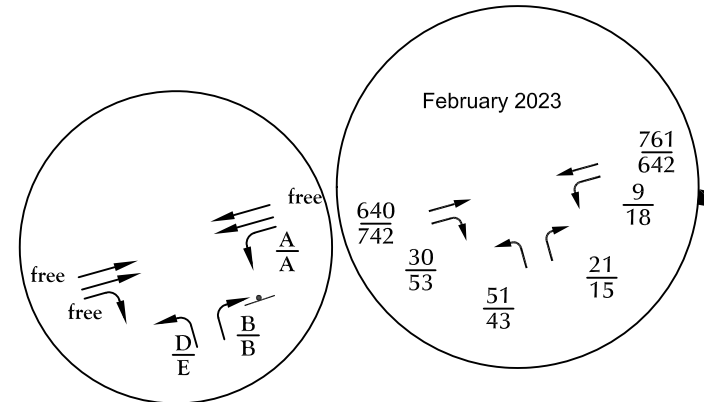
 = Required stopping sight distance (155' from ECM Table 2-17 based on a design speed of 25 mph for a Local)

Figure 4
Sight Distance Analysis
Villas at Aspen Trails (LSC# S234390)



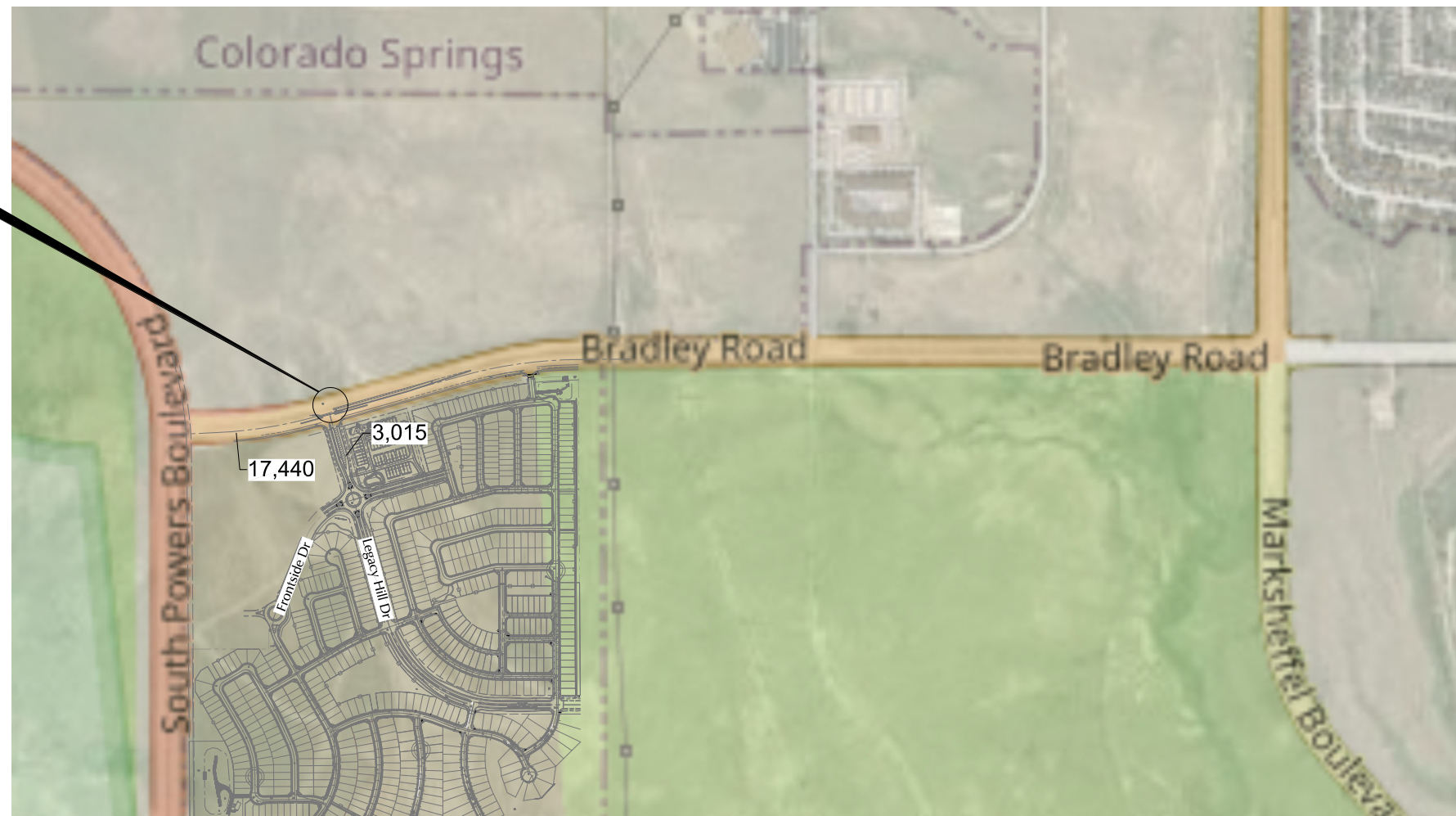
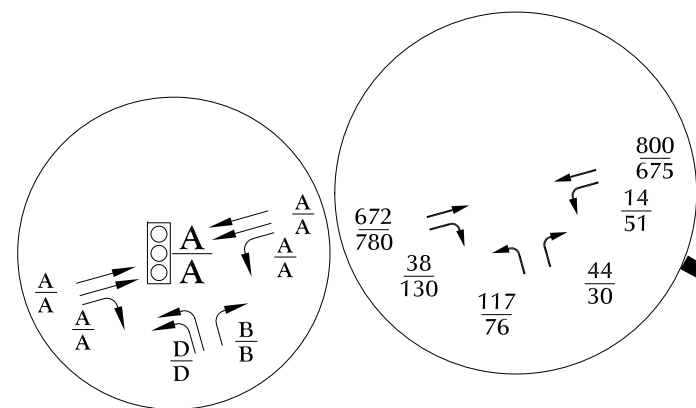
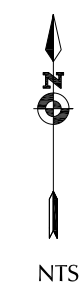


LEGEND:

- = Traffic Signal = Stop Sign
- $\frac{XX}{XX}$ = $\frac{\text{AM Weekday Peak-Hour Traffic (vehicles per hour)}}{\text{PM Weekday Peak-Hour Traffic (vehicles per hour)}}$
- $\frac{A}{B}$ = $\frac{\text{AM Individual Movement Peak-Hour Level of Service}}{\text{PM Individual Movement Peak-Hour Level of Service}}$
- $\frac{C}{C}$ = $\frac{\text{AM Entire Intersection Peak-Hour Level of Service}}{\text{PM Entire Intersection Peak-Hour Level of Service}}$
- X,XXX = Average Daily Traffic (vehicles per day) * Estimate by LSC



Figure 5
Existing Traffic, Lane Geometry,
Traffic Control, and Level of Service



LEGEND:

⊥ = Stop Sign

⊡ = Traffic Signal

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

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

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

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

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

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

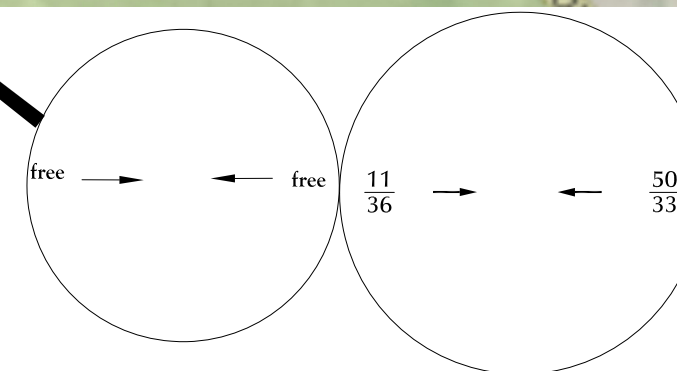
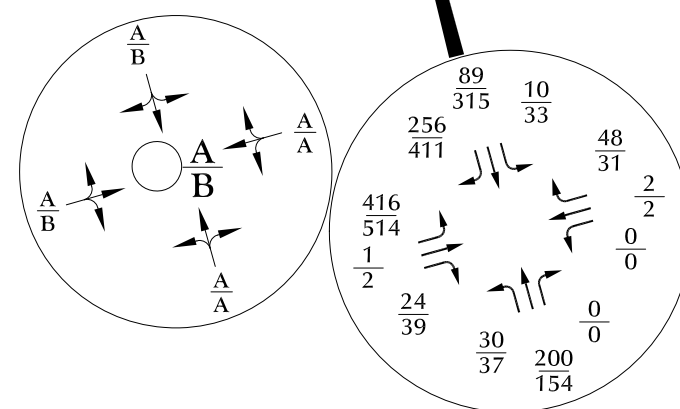
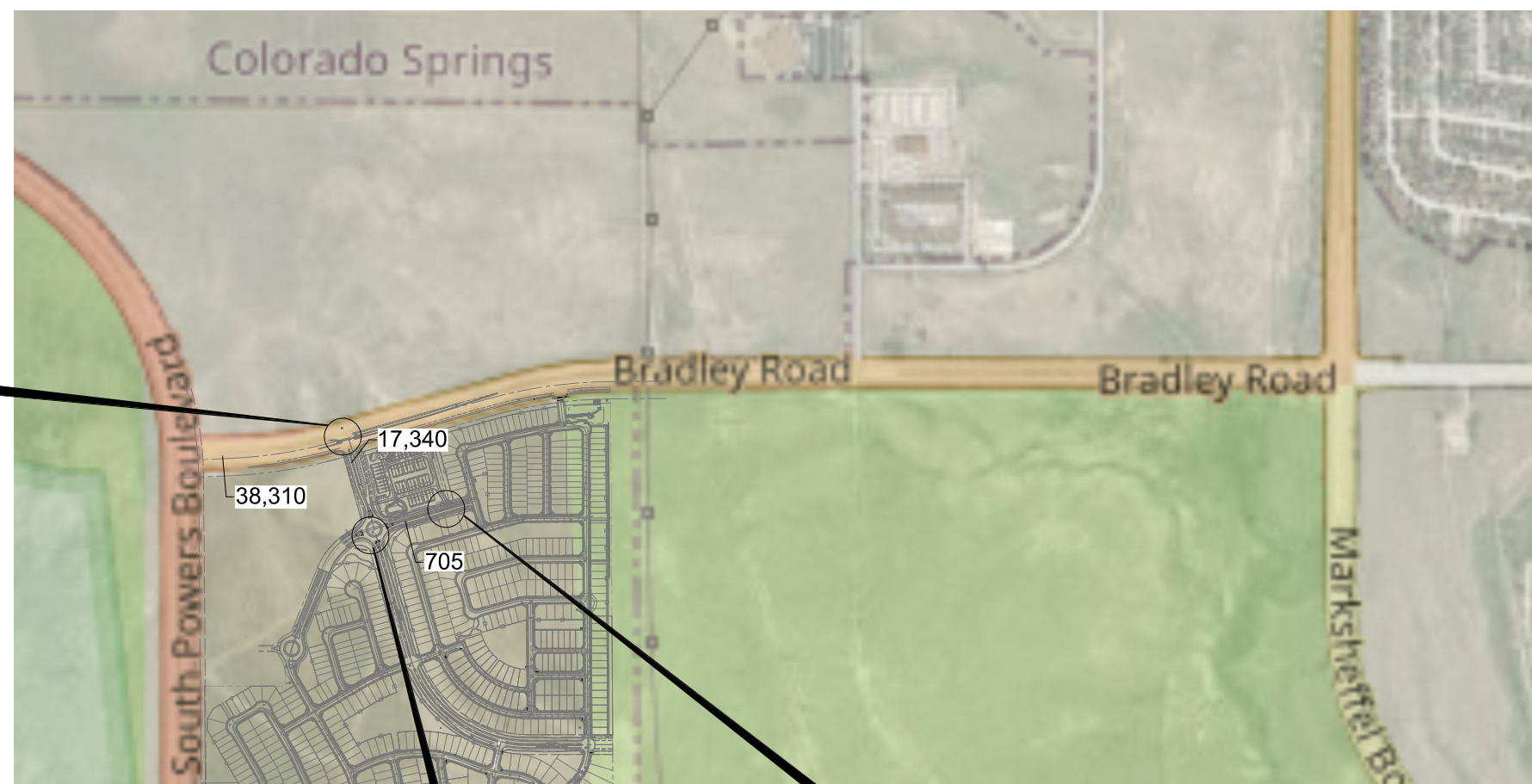
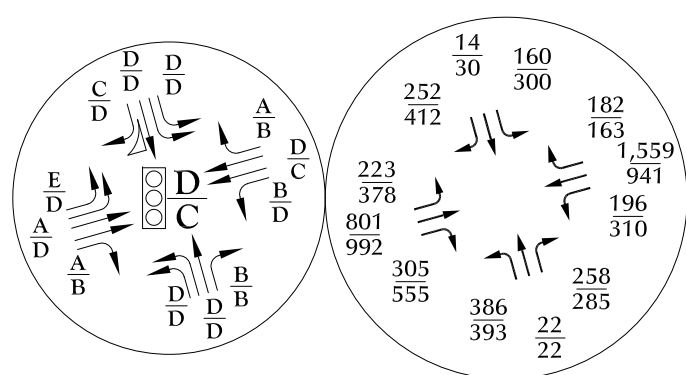
X,XXX = Average Daily Traffic (vehicles per day)



Figure 6
Short-Term Background Traffic, Lane Geometry,
Traffic Control, and Level of Service



NTS



LEGEND:

- = Stop Sign
- = Traffic Signal
- = Modern Roundabout

- $\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
- $\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)
- $\frac{A}{B}$ = AM Individual Movement Peak-Hour Level of Service
- $\frac{A}{B}$ = PM Individual Movement Peak-Hour Level of Service
- $\frac{C}{C}$ = AM Entire Intersection Peak-Hour Level of Service
- $\frac{C}{C}$ = PM Entire Intersection Peak-Hour Level of Service

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



Figure 7
2044 Background Traffic, Lane Geometry,
Traffic Control, and Level of Service

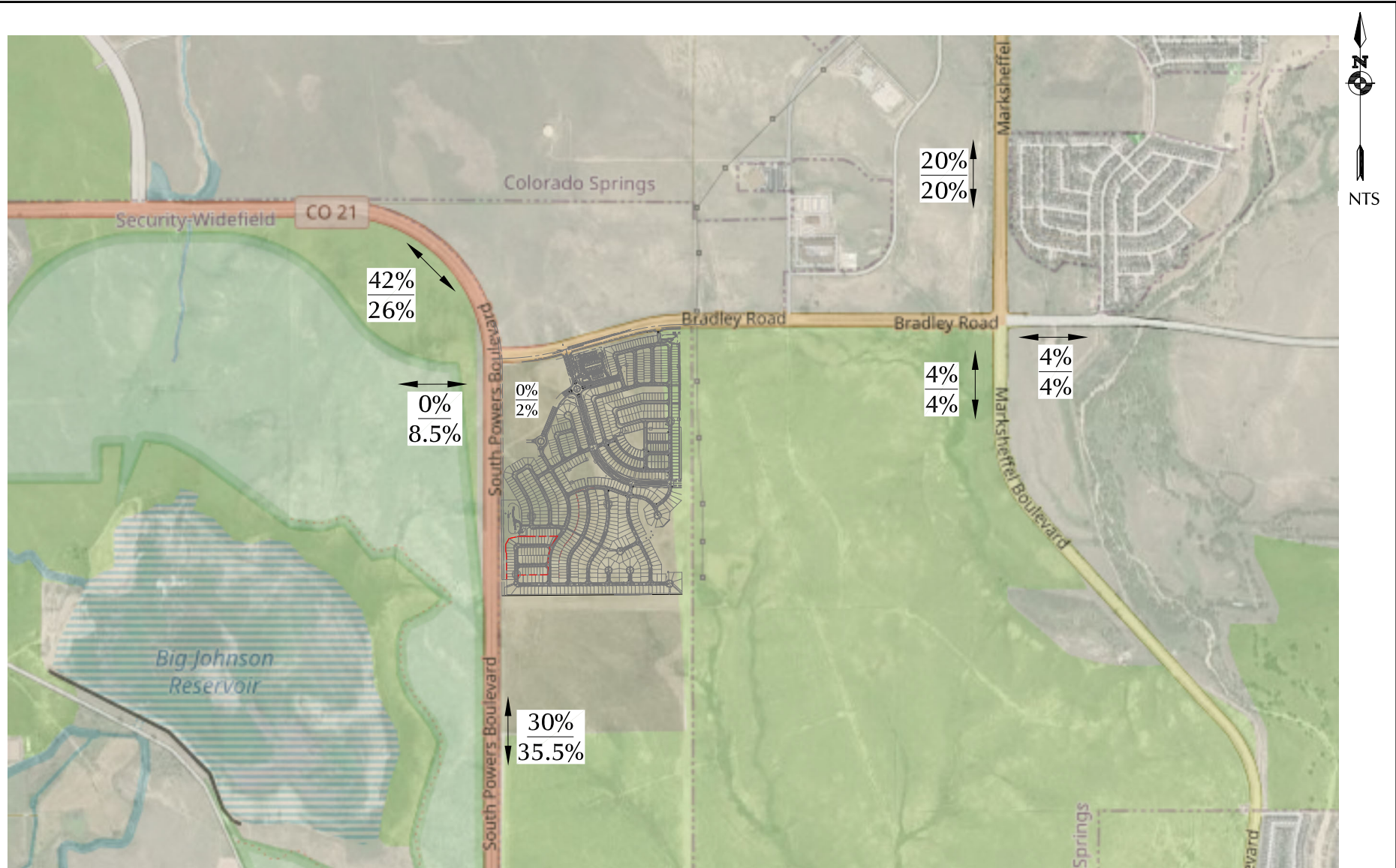


Figure 8

Directional Distribution of Residential Site-Generated Traffic

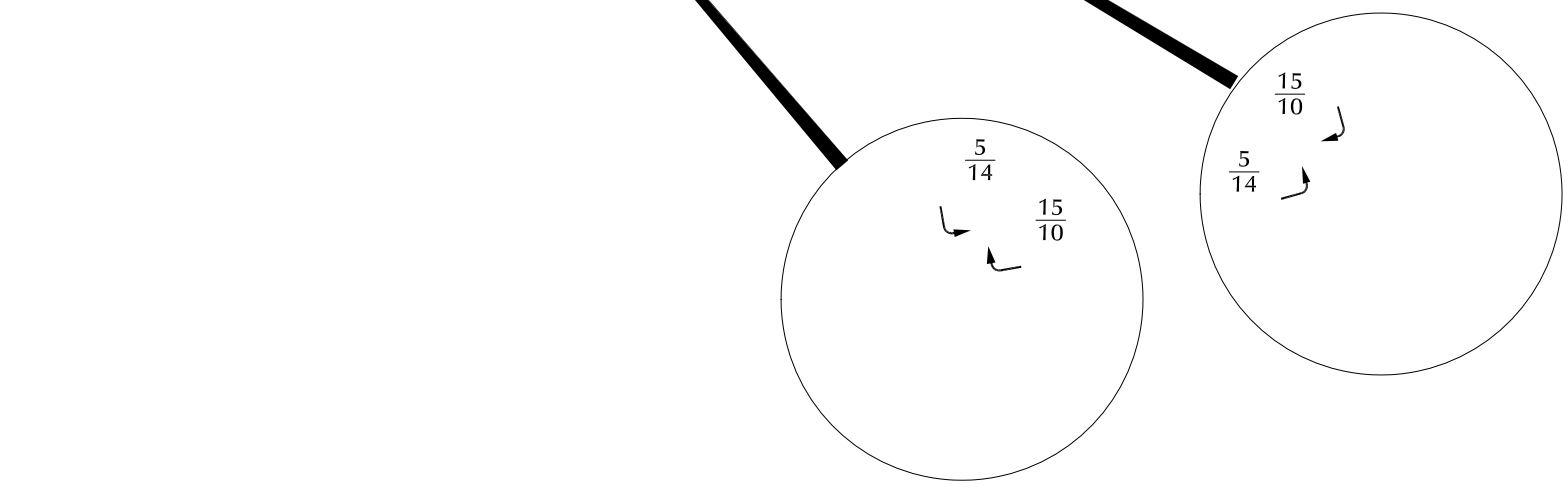
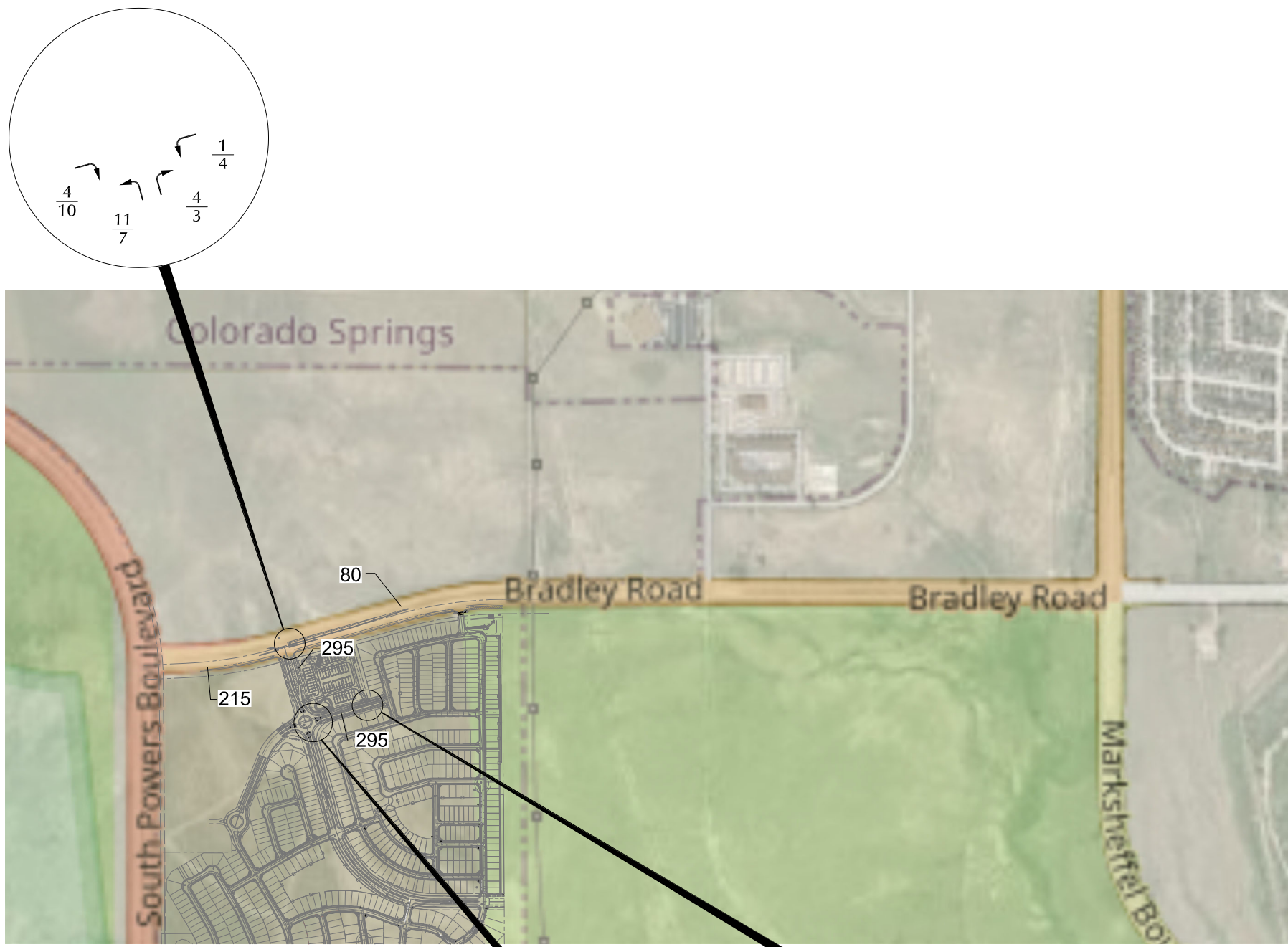
Villas at Aspen Trails (LSC# S234390)



LEGEND:



Short-Term Percent Directional Distribution
Long-Term Percent Directional Distribution

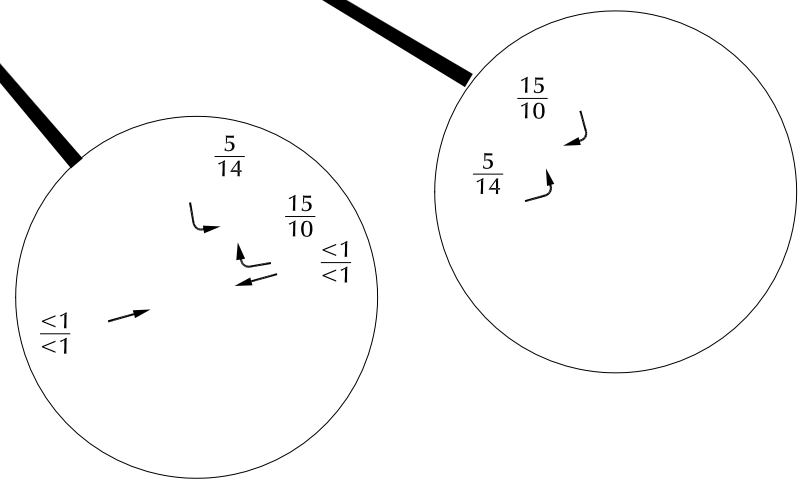
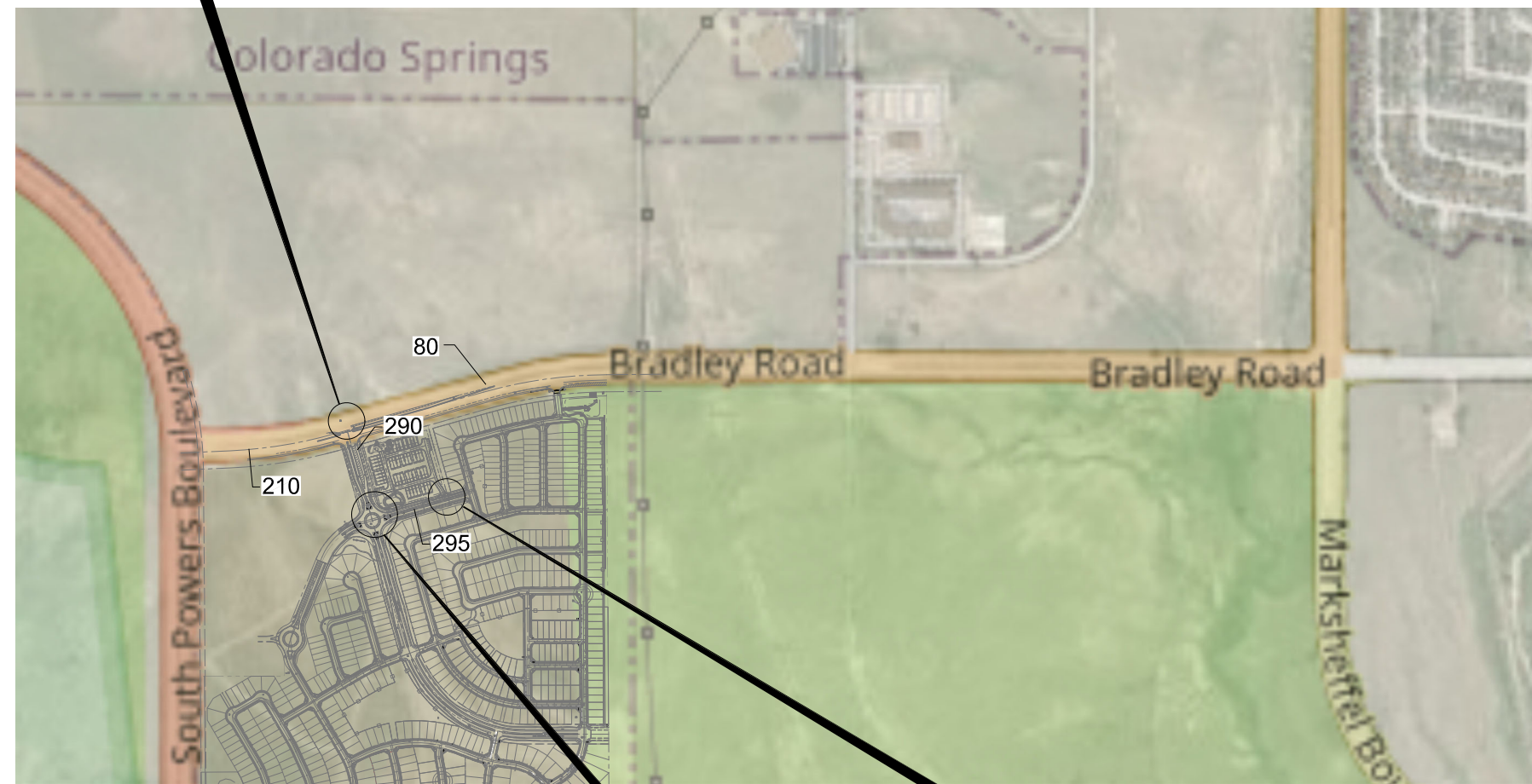
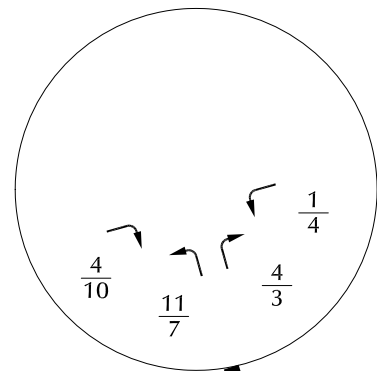
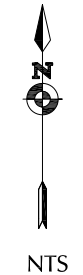


LEGEND:
 $\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
 $\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)
 X,XXX= Average Daily Traffic (vehicles per day)

Figure 9
Short-Term Site-Generated Traffic

Villas at Aspen Trails (LSC# S234390)

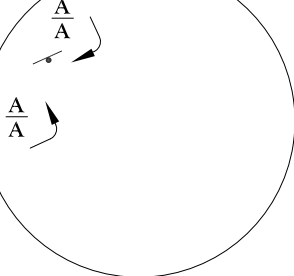
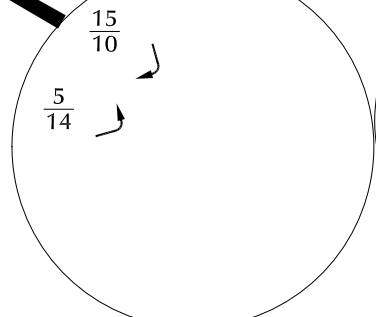
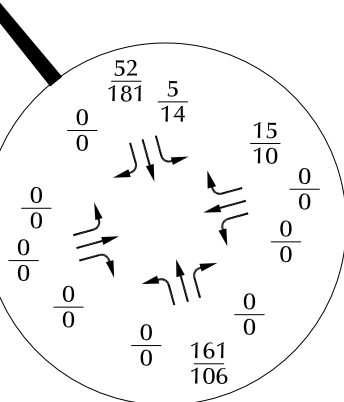
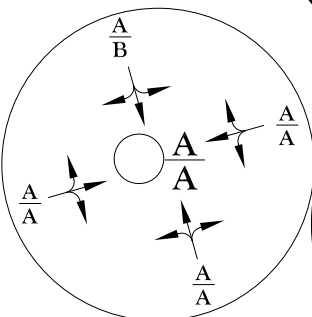
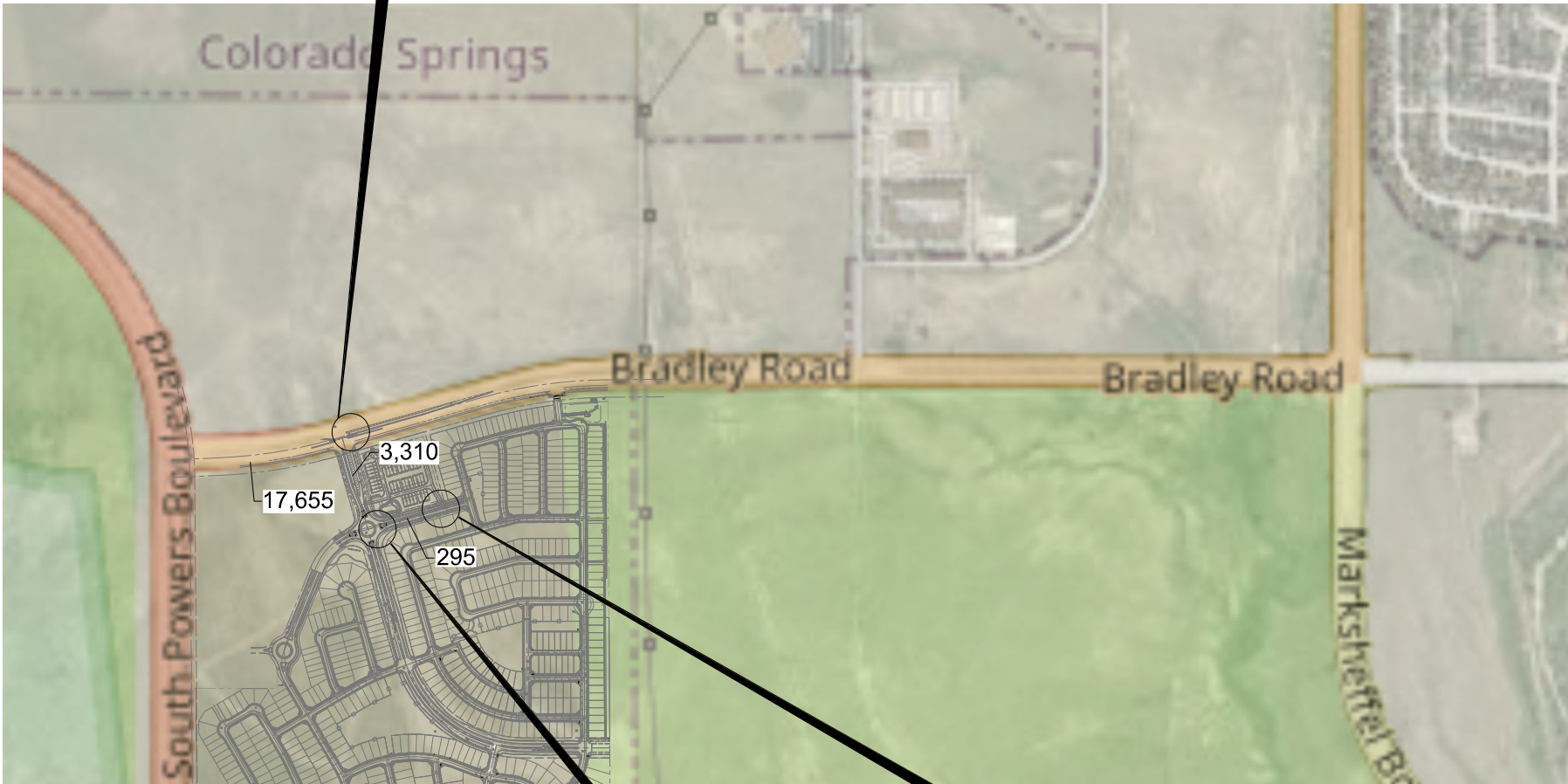
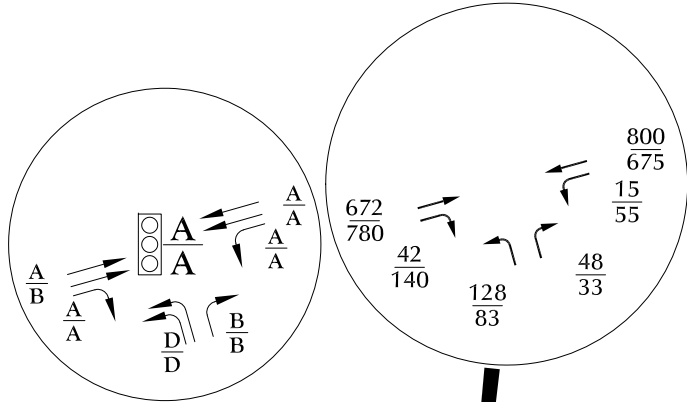




LEGEND:
 $\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
 $\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)
 X,XXX = Average Daily Traffic (vehicles per day)



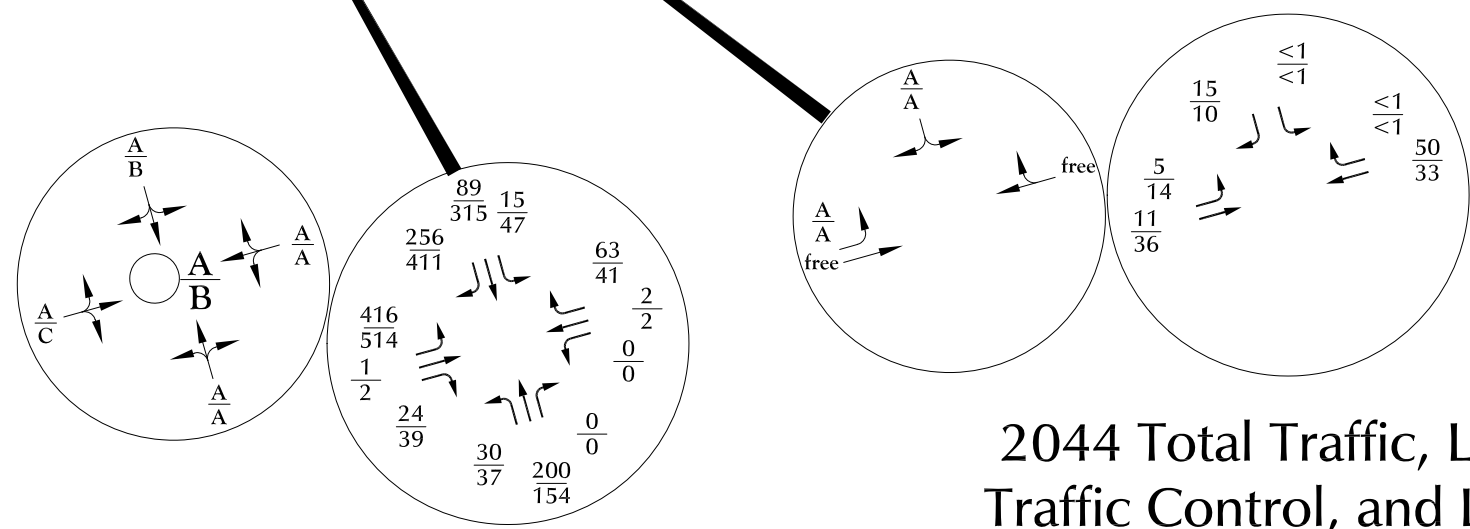
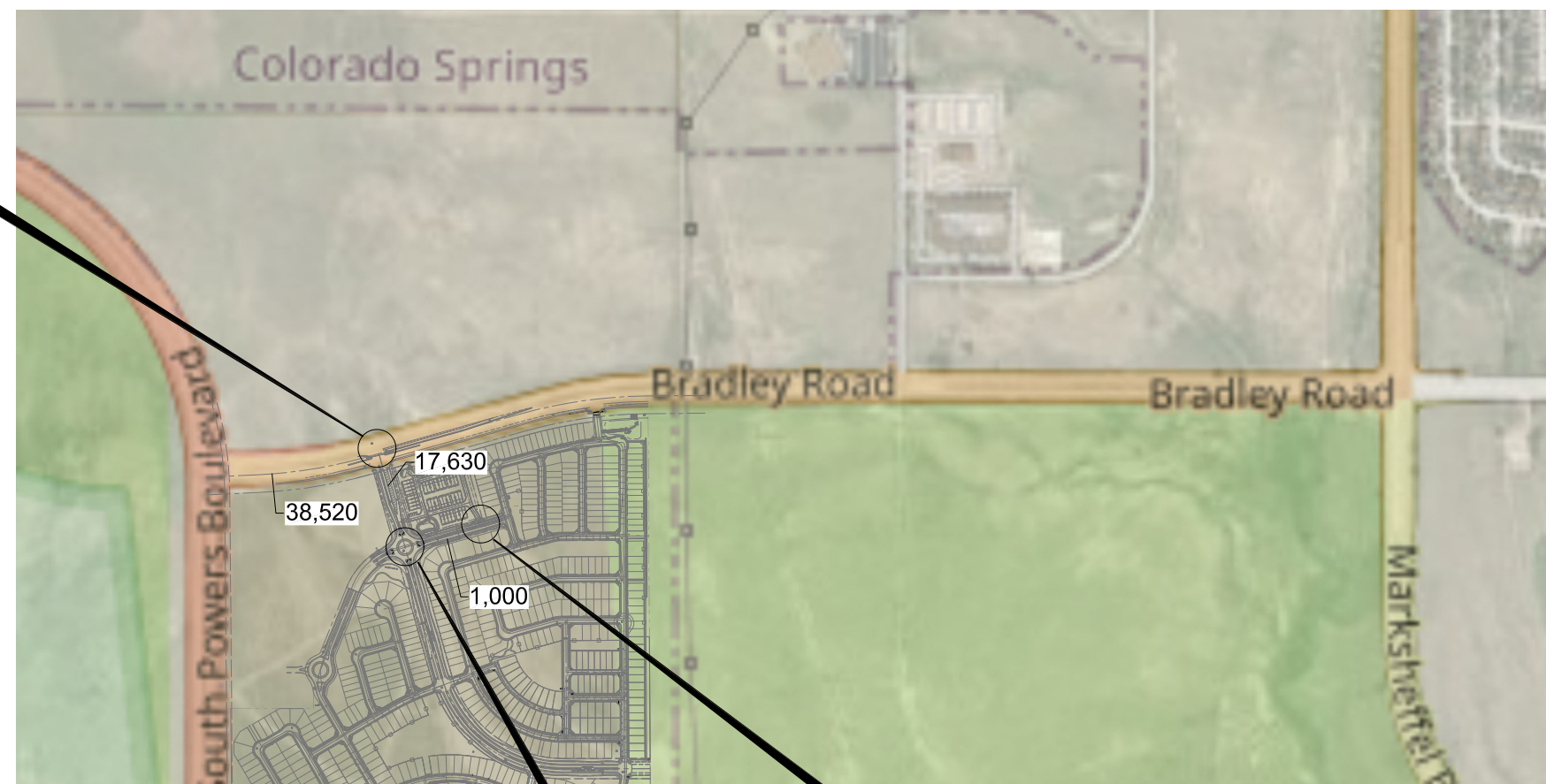
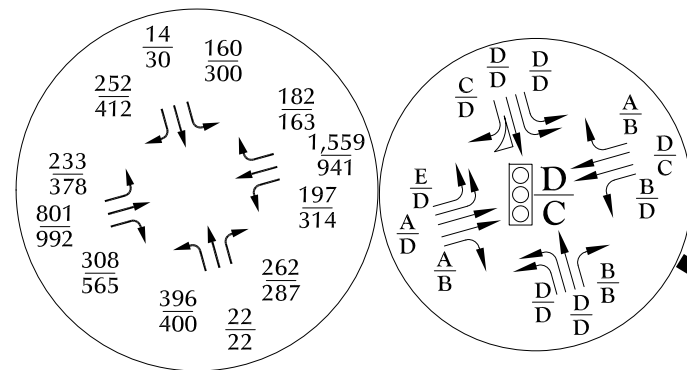
Figure 10
Long-Term Site-Generated Traffic
 Villas at Aspen Trails (LSC# S234390)



- 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 11
Short-Term Total Traffic, Lane Geometry,
Traffic Control, and Level of Service





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 12
2044 Total Traffic, Lane Geometry,
Traffic Control, and Level of Service

Villas at Aspen Trails (LSC# S234390)



Traffic Counts



LSC Transportation Consultants, Inc.

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

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

Groups Printed- Unshifted

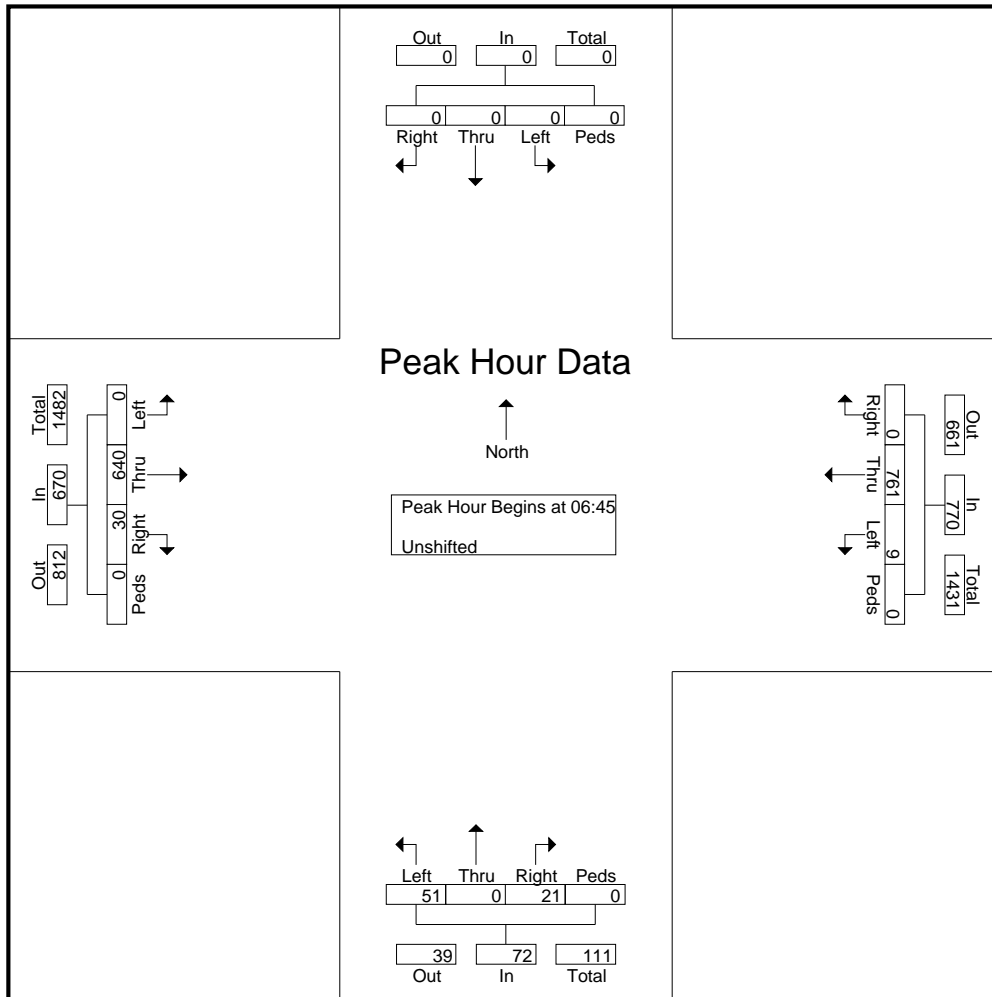
Start Time	Southbound					Westbound					Northbound					Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
06:30	0	0	0	0	0	0	143	5	0	148	5	0	12	0	17	11	131	0	0	142	307
06:45	0	0	0	0	0	0	190	2	0	192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

LSC Transportation Consultants, Inc.

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

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

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



LSC Transportation Consultants, Inc.

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

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

Groups Printed- Unshifted

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

LSC Transportation Consultants, Inc.

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

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

Groups Printed- Unshifted

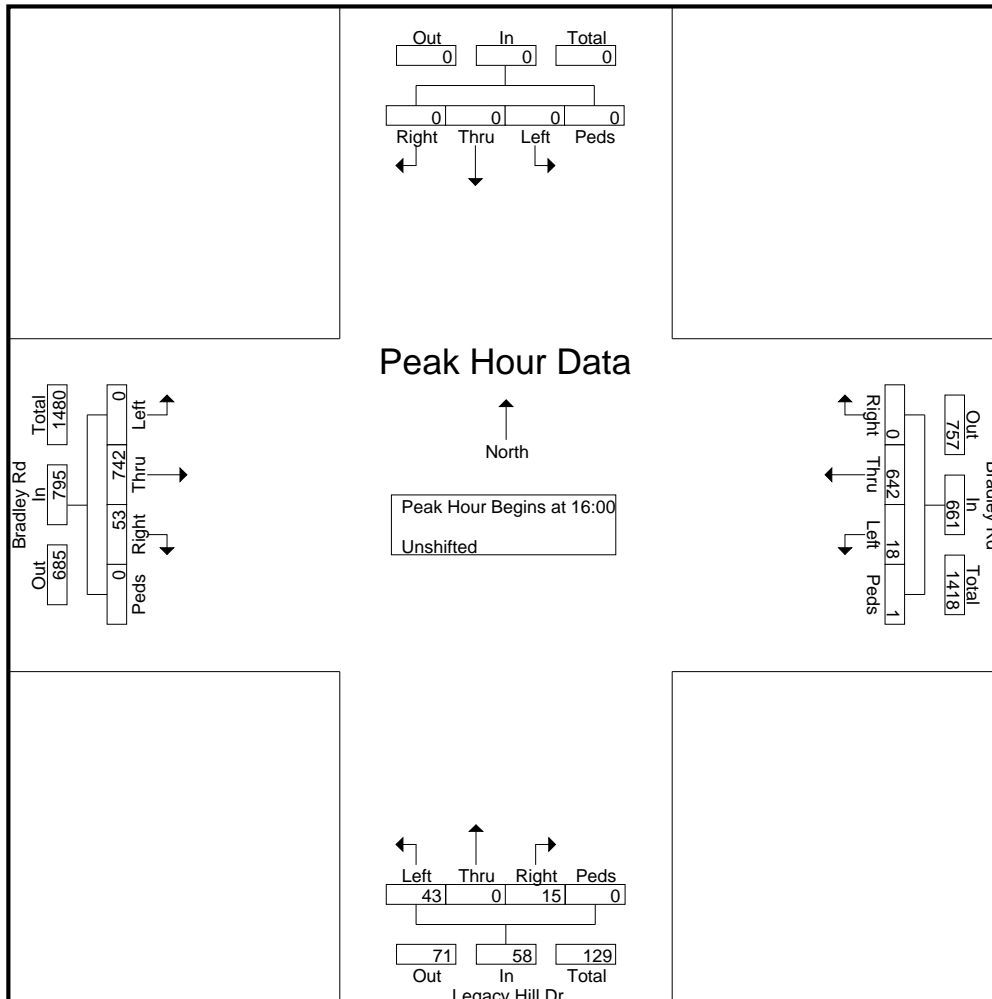
Start Time	Southbound					Bradley Rd Westbound					Legacy Hill Dr Northbound					Bradley Rd Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
15:00	0	0	0	0	0	0	117	3	0	120	7	0	14	0	21	10	121	0	0	131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

LSC Transportation Consultants, Inc.

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

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

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



Level of Service Reports



HCM 6th TWSC
2: Legacy Hill Dr & Bradley Rd.

Existing Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑	↑
Traffic Vol, veh/h	640	30	9	761	51	21
Future Vol, veh/h	640	30	9	761	51	21
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	415	-	300	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	91	91	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	696	33	10	836	65	27

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	729	0	1134
Stage 1	-	-	-	-	696
Stage 2	-	-	-	-	438
Critical Hdwy	-	-	4.14	-	6.84
Critical Hdwy Stg 1	-	-	-	-	5.84
Critical Hdwy Stg 2	-	-	-	-	5.84
Follow-up Hdwy	-	-	2.22	-	3.52
Pot Cap-1 Maneuver	-	-	871	-	196
Stage 1	-	-	-	-	456
Stage 2	-	-	-	-	618
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	871	-	194
Mov Cap-2 Maneuver	-	-	-	-	194
Stage 1	-	-	-	-	456
Stage 2	-	-	-	-	611

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	26.3
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	194	648	-	-	871	-
HCM Lane V/C Ratio	0.337	0.042	-	-	0.011	-
HCM Control Delay (s)	32.7	10.8	-	-	9.2	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	1.4	0.1	-	-	0	-

HCM 6th TWSC
2: Legacy Hill Dr & Bradley Rd.

Existing Traffic
PM Peak Hour

Intersection

Int Delay, s/veh 1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑	↑
Traffic Vol, veh/h	742	53	18	642	43	15
Future Vol, veh/h	742	53	18	642	43	15
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	415	-	300	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	91	91	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	807	58	20	705	55	19

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	865
Stage 1	-	-	807
Stage 2	-	-	393
Critical Hdwy	-	4.14	6.84
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	-	2.22	3.52
Pot Cap-1 Maneuver	-	774	178
Stage 1	-	-	399
Stage 2	-	-	651
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	774	173
Mov Cap-2 Maneuver	-	-	173
Stage 1	-	-	399
Stage 2	-	-	634

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	29.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	173	596	-	-	774	-
HCM Lane V/C Ratio	0.319	0.032	-	-	0.026	-
HCM Control Delay (s)	35.3	11.2	-	-	9.8	-
HCM Lane LOS	E	B	-	-	A	-
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0.1	-

Timings 2: Legacy Hill Dr & Bradley Rd.

Short-Term Background Traffic
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘↗	↘
Traffic Volume (vph)	672	38	14	800	117	44
Future Volume (vph)	672	38	14	800	117	44
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	1	6	8	8
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)	63.0	63.0	12.0	75.0	25.0	25.0
Total Split (%)	63.0%	63.0%	12.0%	75.0%	25.0%	25.0%
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	C-Max	C-Max	None	C-Max	None	None
Act Effct Green (s)	76.6	76.6	80.9	80.9	9.1	9.1
Actuated g/C Ratio	0.77	0.77	0.81	0.81	0.09	0.09
v/c Ratio	0.27	0.03	0.03	0.31	0.41	0.26
Control Delay	4.5	1.8	2.2	2.8	46.4	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.5	1.8	2.2	2.8	46.4	15.8
LOS	A	A	A	A	D	B
Approach Delay	4.4			2.8	38.0	
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: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.41
 Intersection Signal Delay: 6.8
 Intersection LOS: A
 Intersection Capacity Utilization 34.6%
 ICU Level of Service A
 Analysis Period (min) 15

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



Timings 2: Legacy Hill Dr & Bradley Rd.

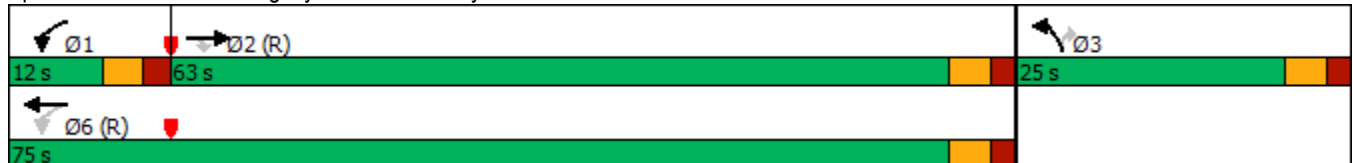
Short-Term Background Traffic
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↖	↑↑	↖↗	↖
Traffic Volume (vph)	780	130	51	675	76	30
Future Volume (vph)	780	130	51	675	76	30
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2	6			3
Detector Phase	2	2	1	6	3	3
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	10.0	10.0
Total Split (s)	63.0	63.0	12.0	75.0	25.0	25.0
Total Split (%)	63.0%	63.0%	12.0%	75.0%	25.0%	25.0%
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	C-Max	C-Max	None	C-Max	None	None
Act Effect Green (s)	76.4	76.4	84.4	85.4	7.8	7.8
Actuated g/C Ratio	0.76	0.76	0.84	0.85	0.08	0.08
v/c Ratio	0.31	0.11	0.10	0.25	0.31	0.22
Control Delay	5.4	1.1	2.2	2.1	46.1	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.4	1.1	2.2	2.1	46.1	18.0
LOS	A	A	A	A	D	B
Approach Delay	4.8			2.1	38.1	
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: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.31
 Intersection Signal Delay: 5.7
 Intersection Capacity Utilization 42.4%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

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



Timings 2: Legacy Hill Dr & Bradley Rd.

Short-Term Total Traffic
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘↗	↘
Traffic Volume (vph)	672	42	15	800	128	48
Future Volume (vph)	672	42	15	800	128	48
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	1	6	8	8
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)	63.0	63.0	12.0	75.0	25.0	25.0
Total Split (%)	63.0%	63.0%	12.0%	75.0%	25.0%	25.0%
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	C-Max	C-Max	None	C-Max	None	None
Act Effct Green (s)	76.2	76.2	80.6	80.6	9.4	9.4
Actuated g/C Ratio	0.76	0.76	0.81	0.81	0.09	0.09
v/c Ratio	0.27	0.04	0.03	0.31	0.43	0.27
Control Delay	4.7	1.7	2.3	2.9	46.5	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.7	1.7	2.3	2.9	46.5	15.2
LOS	A	A	A	A	D	B
Approach Delay	4.5			2.9	38.0	
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: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.43
 Intersection Signal Delay: 7.2
 Intersection LOS: A
 Intersection Capacity Utilization 34.6%
 ICU Level of Service A
 Analysis Period (min) 15

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



HCM 6th Roundabout
5: Legacy Hill Dr & Frontside Dr

Short-Term Total Traffic
AM Peak Hour

Intersection				
Intersection Delay, s/veh	3.5			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	0	16	175	62
Demand Flow Rate, veh/h	0	16	178	63
Vehicles Circulating, veh/h	63	178	5	0
Vehicles Exiting, veh/h	0	5	58	194
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	0.0	3.2	3.7	3.0
Approach LOS	-	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	0	16	178	63
Cap Entry Lane, veh/h	1294	1151	1373	1380
Entry HV Adj Factor	1.000	1.000	0.980	0.982
Flow Entry, veh/h	0	16	175	62
Cap Entry, veh/h	1294	1151	1346	1355
V/C Ratio	0.000	0.014	0.130	0.046
Control Delay, s/veh	2.8	3.2	3.7	3.0
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0

HCM 6th TWSC
12: Frontside Dr/Sidewinder Dr

Short-Term Total Traffic
AM Peak Hour

Intersection

Int Delay, s/veh 7.7

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations	↘	↑	↗		↘	
Traffic Vol, veh/h	5	0	0	0	0	15
Future Vol, veh/h	5	0	0	0	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	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	5	0	0	0	0	16

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	1	0	-	0	11	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	10	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1622	-	-	-	1009	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1013	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1622	-	-	-	1006	1084
Mov Cap-2 Maneuver	-	-	-	-	922	-
Stage 1	-	-	-	-	1019	-
Stage 2	-	-	-	-	1013	-

Approach EB WB SB

HCM Control Delay, s	7.2	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	1622	-	-	-	1084
HCM Lane V/C Ratio	0.003	-	-	-	0.015
HCM Control Delay (s)	7.2	-	-	-	8.4
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Timings 2: Legacy Hill Dr & Bradley Rd.

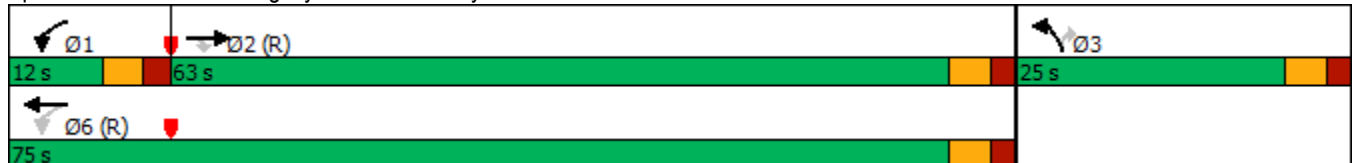
Short-Term Total Traffic
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘↗	↘
Traffic Volume (vph)	780	140	55	675	83	33
Future Volume (vph)	780	140	55	675	83	33
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2	6			3
Detector Phase	2	2	1	6	3	3
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	10.0	10.0
Total Split (s)	63.0	63.0	12.0	75.0	25.0	25.0
Total Split (%)	63.0%	63.0%	12.0%	75.0%	25.0%	25.0%
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	C-Max	C-Max	None	C-Max	None	None
Act Effct Green (s)	76.1	76.1	84.2	85.2	8.0	8.0
Actuated g/C Ratio	0.76	0.76	0.84	0.85	0.08	0.08
v/c Ratio	0.31	0.12	0.11	0.25	0.33	0.23
Control Delay	5.5	1.1	2.3	2.1	46.2	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.5	1.1	2.3	2.1	46.2	17.5
LOS	A	A	A	A	D	B
Approach Delay	4.9			2.2	38.0	
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: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.33
 Intersection Signal Delay: 5.9
 Intersection Capacity Utilization 42.4%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

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



HCM 6th Roundabout
5: Legacy Hill Dr & Frontside Dr

Short-Term Total Traffic
PM Peak Hour

Intersection				
Intersection Delay, s/veh	3.7			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	0	11	115	212
Demand Flow Rate, veh/h	0	11	117	216
Vehicles Circulating, veh/h	216	117	15	0
Vehicles Exiting, veh/h	0	15	201	128
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	0.0	3.0	3.4	3.9
Approach LOS	-	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	0	11	117	216
Cap Entry Lane, veh/h	1107	1225	1359	1380
Entry HV Adj Factor	1.000	1.000	0.980	0.982
Flow Entry, veh/h	0	11	115	212
Cap Entry, veh/h	1107	1225	1332	1355
V/C Ratio	0.000	0.009	0.086	0.157
Control Delay, s/veh	3.3	3.0	3.4	3.9
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	1

HCM 6th TWSC
12: Frontside Dr/Sidewinder Dr

Short-Term Total Traffic
PM Peak Hour

Intersection

Int Delay, s/veh 7.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↑	↘		↘	
Traffic Vol, veh/h	14	0	0	0	0	10
Future Vol, veh/h	14	0	0	0	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	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	15	0	0	0	0	11

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1	0	31
Stage 1	-	-	1
Stage 2	-	-	30
Critical Hdwy	4.12	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.218	-	3.518
Pot Cap-1 Maneuver	1622	-	983
Stage 1	-	-	1022
Stage 2	-	-	993
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1622	-	974
Mov Cap-2 Maneuver	-	-	901
Stage 1	-	-	1013
Stage 2	-	-	993

Approach	EB	WB	SB
HCM Control Delay, s	7.2	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1622	-	-	-	1084
HCM Lane V/C Ratio	0.009	-	-	-	0.01
HCM Control Delay (s)	7.2	-	-	-	8.4
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Timings 2: Legacy Dr & Bradley Rd

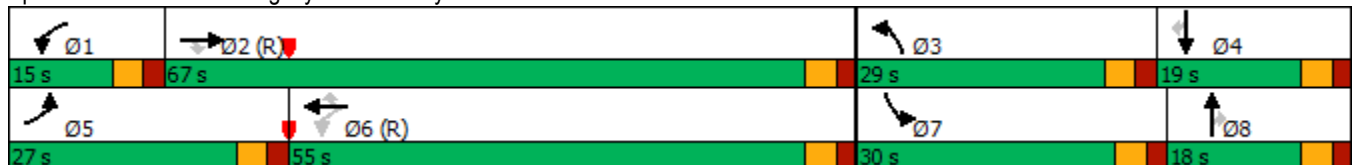
2043 Background Traffic
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	233	801	305	196	1559	182	386	22	258	160	14	252
Future Volume (vph)	233	801	305	196	1559	182	386	22	258	160	14	252
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)	15.0	5.0	5.0	5.0	5.0	5.0	24.0	5.0	5.0	18.0	7.0	7.0
Minimum Split (s)	20.0	10.0	10.0	10.0	10.0	10.0	30.0	10.0	10.0	30.0	15.0	15.0
Total Split (s)	27.0	67.0	67.0	15.0	55.0	55.0	29.0	18.0	18.0	30.0	19.0	19.0
Total Split (%)	20.8%	51.5%	51.5%	11.5%	42.3%	42.3%	22.3%	13.8%	13.8%	23.1%	14.6%	14.6%
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)	15.9	65.5	65.5	69.8	59.7	59.7	24.0	16.4	16.4	18.0	10.4	10.4
Actuated g/C Ratio	0.12	0.50	0.50	0.54	0.46	0.46	0.18	0.13	0.13	0.14	0.08	0.08
v/c Ratio	0.58	0.47	0.34	0.55	1.01	0.24	0.64	0.10	0.62	0.35	0.10	0.81
Control Delay	76.2	8.9	0.7	13.1	53.8	5.1	54.3	49.5	12.3	53.1	54.9	31.4
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	76.2	8.9	0.7	13.1	53.8	5.1	54.3	49.5	12.3	53.1	54.9	31.4
LOS	E	A	A	B	D	A	D	D	B	D	D	C
Approach Delay		18.7			45.1			37.9			40.3	
Approach LOS		B			D			D			D	

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: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 35.5
 Intersection LOS: D
 Intersection Capacity Utilization 85.8%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 2: Legacy Dr & Bradley Rd



HCM 6th Roundabout
5: Legacy Hill Dr & Frontside Dr/Sidewinder Dr

2043 Background Traffic
AM Peak Hour

Intersection				
Intersection Delay, s/veh	6.5			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	479	54	250	386
Demand Flow Rate, veh/h	489	55	255	394
Vehicles Circulating, veh/h	110	716	473	36
Vehicles Exiting, veh/h	320	12	126	735
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.9	6.4	7.6	5.4
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	489	55	255	394
Cap Entry Lane, veh/h	1233	665	852	1330
Entry HV Adj Factor	0.980	0.981	0.979	0.980
Flow Entry, veh/h	479	54	250	386
Cap Entry, veh/h	1208	652	834	1303
V/C Ratio	0.396	0.083	0.299	0.296
Control Delay, s/veh	6.9	6.4	7.6	5.4
LOS	A	A	A	A
95th %tile Queue, veh	2	0	1	1

Timings 2: Legacy Dr & Bradley Rd

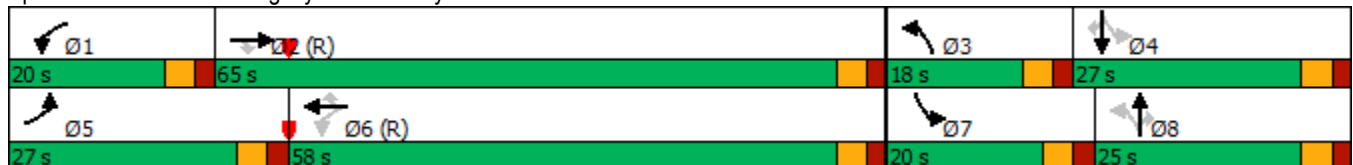
2043 Background Traffic
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	378	992	555	310	941	163	393	22	285	300	30	412
Future Volume (vph)	378	992	555	310	941	163	393	22	285	300	30	412
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	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	27.0	65.0	65.0	20.0	58.0	58.0	18.0	25.0	25.0	20.0	27.0	27.0
Total Split (%)	20.8%	50.0%	50.0%	15.4%	44.6%	44.6%	13.8%	19.2%	19.2%	15.4%	20.8%	20.8%
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)	19.5	61.8	61.8	74.0	58.2	58.2	31.4	18.4	18.4	33.2	19.3	19.3
Actuated g/C Ratio	0.15	0.48	0.48	0.57	0.45	0.45	0.24	0.14	0.14	0.26	0.15	0.15
v/c Ratio	0.77	0.62	0.55	0.90	0.63	0.22	0.57	0.09	0.67	0.42	0.12	0.94
Control Delay	54.4	39.0	10.4	42.2	32.3	10.2	41.3	48.2	17.0	37.8	47.2	51.2
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	54.4	39.0	10.4	42.2	32.3	10.2	41.3	48.2	17.0	37.8	47.2	51.2
LOS	D	D	B	D	C	B	D	D	B	D	D	D
Approach Delay		33.8			31.9			31.6			45.6	
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: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 34.8
 Intersection LOS: C
 Intersection Capacity Utilization 75.2%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 2: Legacy Dr & Bradley Rd



HCM 6th Roundabout
5: Legacy Hill Dr & Frontside Dr/Sidewinder Dr

2043 Background Traffic
PM Peak Hour

Intersection				
Intersection Delay, s/veh	11.7			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	603	36	207	825
Demand Flow Rate, veh/h	615	37	211	842
Vehicles Circulating, veh/h	386	781	609	43
Vehicles Exiting, veh/h	499	39	392	775
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	14.6	6.6	8.3	10.7
Approach LOS	B	A	A	B
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	615	37	211	842
Cap Entry Lane, veh/h	931	622	741	1321
Entry HV Adj Factor	0.980	0.972	0.979	0.980
Flow Entry, veh/h	603	36	207	825
Cap Entry, veh/h	913	605	726	1294
V/C Ratio	0.661	0.059	0.285	0.638
Control Delay, s/veh	14.6	6.6	8.3	10.7
LOS	B	A	A	B
95th %tile Queue, veh	5	0	1	5

Timings

2: Legacy Dr & Bradley Rd

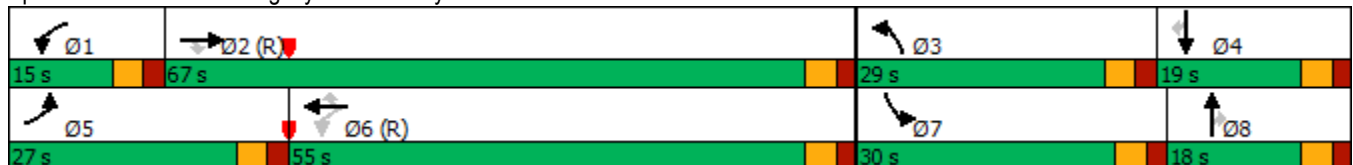
2043 Total Traffic
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	233	801	308	197	1559	182	396	22	262	160	14	252
Future Volume (vph)	233	801	308	197	1559	182	396	22	262	160	14	252
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)	15.0	5.0	5.0	5.0	5.0	5.0	24.0	5.0	5.0	18.0	7.0	7.0
Minimum Split (s)	20.0	10.0	10.0	10.0	10.0	10.0	30.0	10.0	10.0	30.0	15.0	15.0
Total Split (s)	27.0	67.0	67.0	15.0	55.0	55.0	29.0	18.0	18.0	30.0	19.0	19.0
Total Split (%)	20.8%	51.5%	51.5%	11.5%	42.3%	42.3%	22.3%	13.8%	13.8%	23.1%	14.6%	14.6%
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)	15.9	65.5	65.5	69.8	59.7	59.7	24.0	16.4	16.4	18.0	10.4	10.4
Actuated g/C Ratio	0.12	0.50	0.50	0.54	0.46	0.46	0.18	0.13	0.13	0.14	0.08	0.08
v/c Ratio	0.58	0.47	0.34	0.55	1.01	0.24	0.66	0.10	0.63	0.35	0.10	0.81
Control Delay	76.2	8.9	0.8	13.1	53.9	5.1	54.9	49.5	12.3	53.1	54.9	31.8
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	76.2	8.9	0.8	13.1	53.9	5.1	54.9	49.5	12.3	53.1	54.9	31.8
LOS	E	A	A	B	D	A	D	D	B	D	D	C
Approach Delay		18.7			45.2			38.3			40.5	
Approach LOS		B			D			D			D	

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: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 35.6
 Intersection LOS: D
 Intersection Capacity Utilization 86.1%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 2: Legacy Dr & Bradley Rd



**HCM 6th Roundabout
5: Legacy Hill Dr & Frontside Dr**

**2043 Total Traffic
AM Peak Hour**

Intersection				
Intersection Delay, s/veh	6.6			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	479	70	250	391
Demand Flow Rate, veh/h	489	71	255	399
Vehicles Circulating, veh/h	115	716	478	36
Vehicles Exiting, veh/h	320	17	126	751
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.0	6.7	7.7	5.4
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	489	71	255	399
Cap Entry Lane, veh/h	1227	665	847	1330
Entry HV Adj Factor	0.980	0.985	0.979	0.980
Flow Entry, veh/h	479	70	250	391
Cap Entry, veh/h	1202	655	830	1304
V/C Ratio	0.398	0.107	0.301	0.300
Control Delay, s/veh	7.0	6.7	7.7	5.4
LOS	A	A	A	A
95th %tile Queue, veh	2	0	1	1

HCM 6th TWSC
12: Frontside Dr/Sidewinder Dr

2043 Total Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↑	↘		↙	
Traffic Vol, veh/h	5	11	50	0	0	15
Future Vol, veh/h	5	11	50	0	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	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	5	12	54	0	0	16

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	54	0	-	0	76 54
Stage 1	-	-	-	-	54 -
Stage 2	-	-	-	-	22 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1551	-	-	-	927 1013
Stage 1	-	-	-	-	969 -
Stage 2	-	-	-	-	1001 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1551	-	-	-	924 1013
Mov Cap-2 Maneuver	-	-	-	-	868 -
Stage 1	-	-	-	-	966 -
Stage 2	-	-	-	-	1001 -

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1551	-	-	-	1013
HCM Lane V/C Ratio	0.004	-	-	-	0.016
HCM Control Delay (s)	7.3	-	-	-	8.6
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Timings 2: Legacy Dr & Bradley Rd

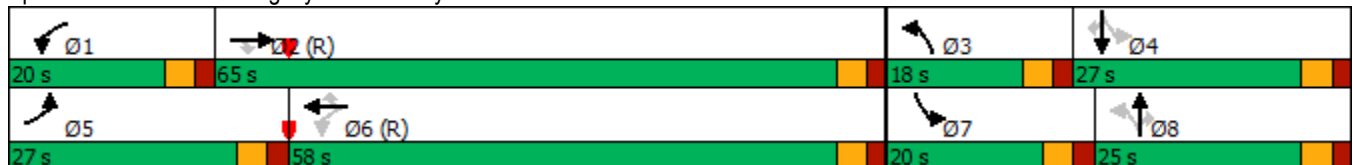
2043 Total Traffic
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	378	992	565	314	941	163	400	22	287	300	30	412
Future Volume (vph)	378	992	565	314	941	163	400	22	287	300	30	412
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	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	27.0	65.0	65.0	20.0	58.0	58.0	18.0	25.0	25.0	20.0	27.0	27.0
Total Split (%)	20.8%	50.0%	50.0%	15.4%	44.6%	44.6%	13.8%	19.2%	19.2%	15.4%	20.8%	20.8%
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)	19.5	61.4	61.4	74.3	58.1	58.1	31.5	18.5	18.5	33.3	19.4	19.4
Actuated g/C Ratio	0.15	0.47	0.47	0.57	0.45	0.45	0.24	0.14	0.14	0.26	0.15	0.15
v/c Ratio	0.77	0.62	0.56	0.91	0.63	0.22	0.58	0.09	0.67	0.42	0.12	0.94
Control Delay	54.4	39.3	10.5	44.1	32.4	10.3	41.5	48.2	17.3	37.7	47.2	51.4
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	54.4	39.3	10.5	44.1	32.4	10.3	41.5	48.2	17.3	37.7	47.2	51.4
LOS	D	D	B	D	C	B	D	D	B	D	D	D
Approach Delay		33.8			32.4			31.9			45.7	
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: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 35.0
 Intersection LOS: C
 Intersection Capacity Utilization 75.4%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 2: Legacy Dr & Bradley Rd



**HCM 6th Roundabout
5: Legacy Hill Dr & Frontside Dr**

**2043 Total Traffic
PM Peak Hour**

Intersection				
Intersection Delay, s/veh	12.0			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	603	47	207	840
Demand Flow Rate, veh/h	615	48	211	857
Vehicles Circulating, veh/h	401	781	624	43
Vehicles Exiting, veh/h	499	54	392	786
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	15.1	6.8	8.5	11.0
Approach LOS	C	A	A	B
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	615	48	211	857
Cap Entry Lane, veh/h	917	622	730	1321
Entry HV Adj Factor	0.980	0.978	0.979	0.980
Flow Entry, veh/h	603	47	207	840
Cap Entry, veh/h	899	609	715	1295
V/C Ratio	0.671	0.077	0.289	0.649
Control Delay, s/veh	15.1	6.8	8.5	11.0
LOS	C	A	A	B
95th %tile Queue, veh	5	0	1	5

HCM 6th TWSC
12: Frontside Dr/Sidewinder Dr

2043 Total Traffic
PM Peak Hour

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	36	33	0	0	10
Future Vol, veh/h	14	36	33	0	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	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	15	39	36	0	0	11

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	36	0	-	0	105 36
Stage 1	-	-	-	-	36 -
Stage 2	-	-	-	-	69 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1575	-	-	-	893 1037
Stage 1	-	-	-	-	986 -
Stage 2	-	-	-	-	954 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1575	-	-	-	884 1037
Mov Cap-2 Maneuver	-	-	-	-	843 -
Stage 1	-	-	-	-	976 -
Stage 2	-	-	-	-	954 -

Approach	EB	WB	SB
HCM Control Delay, s	2	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1575	-	-	-	1037
HCM Lane V/C Ratio	0.01	-	-	-	0.01
HCM Control Delay (s)	7.3	-	-	-	8.5
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Appendix Table 1

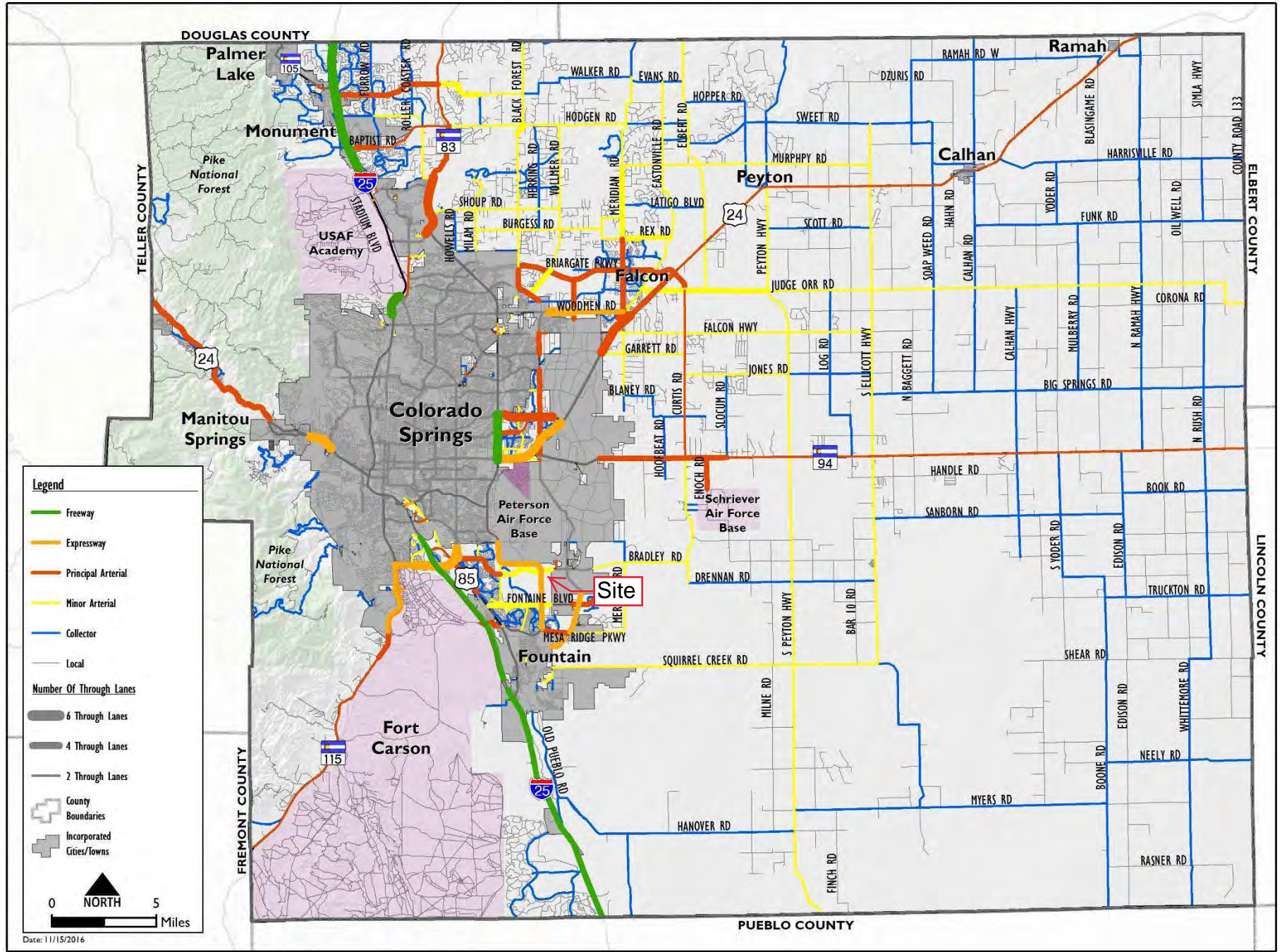


**Appendix Table 1
Area Traffic Impact Studies
Villas at Aspen Trails**

Study	PCD File Number	Consultant	Date
Springs at Waterview East Preliminary Plan Traffic Impact and Access Analysis	SP17010	LSC Transportation Consultants, Inc.	August 24, 2018
Trails at Aspen Ridge Filing No. 1 and PUD Updated Traffic Impact and Access	SF192	LSC Transportation Consultants, Inc.	December 12, 2019
Redemption Hill Church Traffic Impact Study	OAR209	LSC Transportation Consultants, Inc.	April 13, 2020
Peak Innovation Park	OAR2328	Kimley Horn and Associates, Inc.	April 2020
Bradley Heights Filing #1 Traffic Impact Analysis	OAR2184	LSC Transportation Consultants, Inc.	May 19, 2021
Waterview North Sketch Plan Amendment and RM-12 Rezone Master Traffic Impact Analysis	SKP202 P202	LSC Transportation Consultants, Inc.	October 11, 2021
Trails at Aspen Ridge Planned Unit Development and Site Plan Major Amendment Traffic Impact Study	PUDSP213	Matrix	April 16, 2021
Trails at Aspen Ridge Filing No. 2 - Traffic Impact and Access Analysis	SF1927	Matrix	May 7, 2021
Trails at Aspen Ridge Filing No. 3 - Trip Generation Comparison Letter	SF2122	Matrix	June 20, 2022
Trails at Aspen Ridge Filing No. 5 - Trip Generation Comparison Letter	SF2138	Matrix	September 19, 2022
Trails at Aspen Ridge Filing No. 4 - Trip Generation Comparison Letter	SF2124	Matrix	January 6, 2023
Villages at Waterview North Preliminary Plan Traffic Impact Analysis	ANX2214	LSC Transportation Consultants, Inc.	October 27, 2022
Waterview East Commercial Traffic Impact and Access Analysis	SP229	LSC Transportation Consultants, Inc.	September 12, 2023
<i>Source: LSC Transportation Consultants, Inc. (October 2023)</i>			

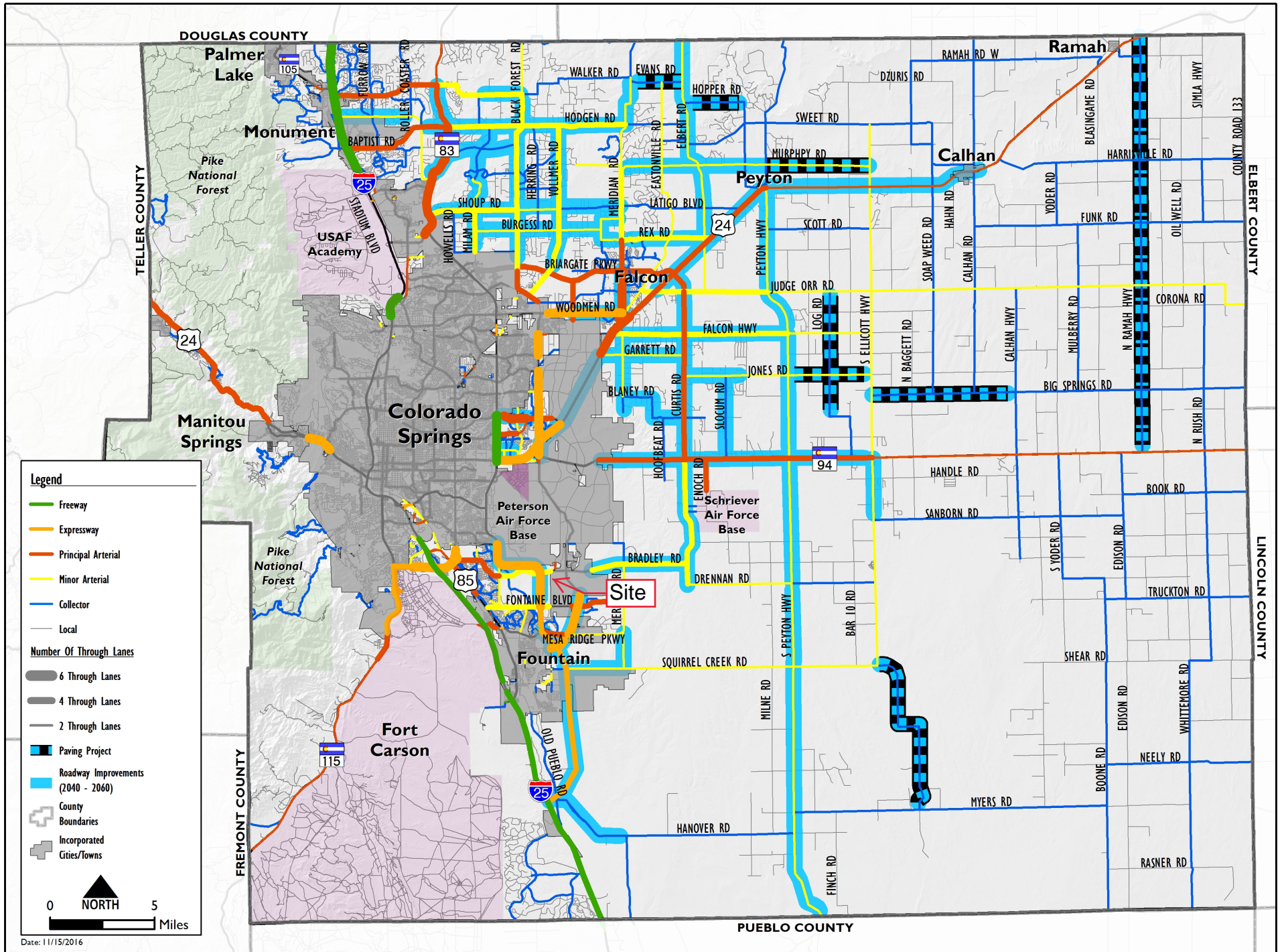
MTCP Maps





Map 14: 2040 Roadway Plan (Classification and Lanes)

Map 17: 2060 Corridor Preservation



Road Impact Fee Advisory Committee Meeting Minutes





Department of Public Works
Engineering ~ Highway Division ~ Fleet Services

ROAD IMPACT FEE ADVISORY COMMITTEE
MEETING MINUTES

Date: April 23, 2019 (1:30 PM – 3:30 PM)

Where: Remote meeting

Members Present: Jeff Mark, Jennifer Irvine, Craig Dossey, Ryan Watson, Randy Case, Steve Hicks, Joan Lucia-Treese, Jerry Novak, Nikki Simmons

Others Present: Victoria Chavez, Lori Seago, Jason Alwine, Tim Buschar, Jeff Hodsdon, Matt Dunston, Duncan Bremer, Brian Long

1. Call to order

Mr. Case called the meeting to order at 1:39 PM.

2. Introductions

3. Fee Advisory Committee Approved the Agenda

The Fee Committee unanimously approved the agenda with the date corrected for the meeting notes.

4. Approval of minutes, January 30 Meeting – Vote

Mr. Dossey moved, and Ms. Irvine seconded the motion to approve the January meeting minutes as amended. The vote was unanimous.

5. Eligible Improvements Requests – Discussion/Vote

It was determined that the Furrow Road extension was already included in the fee program as potentially eligible. There may or may not be potentially eligible improvements at the intersection of Furrow and Higby. There may be potentially eligible improvements on Walker Road. However, it is likely that the roundabout as the access to the school is not eligible. As listed improvements, there is no role for the committee at this time. The applicants and staff should work together to develop a preliminary credit agreement. After construction and acceptance of the improvements by EPC, the applicant can apply for credits per the process outlined in the Implementation Document.

6. Signal Request for Bradley Road and Legacy Hill Drive – Discussion/Vote



Mr. Alwine described the Trails at Aspen Ridge Filing 2. As part of the filing is built, it is likely that a signal will be needed on Bradley Road and Legacy Hill Drive. There are many acres of vacant land both north and south of Bradley Roads that may develop. Mr. Alwine presented the percent of traffic from nearby developments that will contribute to the need for the signal at this location. Mr. Dossey moved that the signal meets the criteria in the Implementation Document and recommends that the signal be included as an eligible improvement. Ms. Lucia-Treese seconded the motion and it passed unanimously.

7. Public comments on items not on the agenda
There were no public comments.

8. Items for Future Agendas
The committee would like to discuss a format for presentation of improvement requests to the committee, reimbursement requests, bringing credit agreements to the committee as an information item and reevaluating the unit cost prices.

9. Adjourn
Mr. Case closed the meeting.