

**Traffic Study  
Presented at  
Planning & Zoning  
Commission**

**March 23, 2023**

ZIEGLER-CORBETT/UNION PARK MIXED-USE  
TRANSPORTATION IMPACT STUDY

FORT COLLINS, COLORADO

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Project #2233



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## I. INTRODUCTION

This Transportation Impact Study (TIS) addresses the capacity, geometric, and control requirements for the proposed Ziegler-Corbett/Union Park Mixed-Use development. The proposed Ziegler-Corbett/Union Park Mixed-Use development is located west of Ziegler Road and south of Paddington Road in Fort Collins, Colorado. This TIS addresses both the short range (2028) and the long range (2045) futures.

During the course of this analysis, numerous contacts were made with City staff, the project developer (Landmark Homes), the project planning consultant (TB Group), and the project engineering consultant (Highland Development Services, Inc.). Since this land is within the City of Fort Collins, the traffic impact study guidelines for Fort Collins, as contained in the "Larimer County Urban Area Street Standards" (LCUASS) were used. The study involved the following steps:

- Collect physical, traffic, and development data;
- Perform trip generation, trip distribution, and trip assignment;
- Determine peak hour traffic volumes;
- Conduct capacity and operational level of service analyses on key intersections;
- Analyze signal warrants and geometric requirements.

The following intersections, as agreed to in the scoping discussions, were addressed in this traffic study: Ziegler/Council Tree-HP Access, Ziegler/Target Service Access, Ziegler/Hidden Pond-Site Access, Ziegler/Paddington-Grand Teton, Corbett/Target Service Access, and Corbett/Lowes Service Access-Site Access intersections. Appendix A contains the Transportation Impact Study Base Assumptions form and related attachments for the Ziegler-Corbett/Union Park Mixed-Use development.

The long range (2045) analysis in this TIS serves as a replacement of the "Ziegler-Corbett Mixed-Use Master Transportation Impact Study," dated January 2022. It addresses the staff comments and access changes pertaining to the previous submittal. Particularly it addresses a potential signal at the Ziegler/Hidden Pond-Site Access intersection with no connection from the site to Paddington Road. It is noted that the connection to Paddington Road was removed from the Fort Collins Master Street Plan several years ago.



## II. EXISTING CONDITIONS

The location of the Ziegler-Corbett/Union Park Mixed-Use site is shown in Figure 1. It is important that a thorough understanding of the existing conditions be presented.

### Land Use

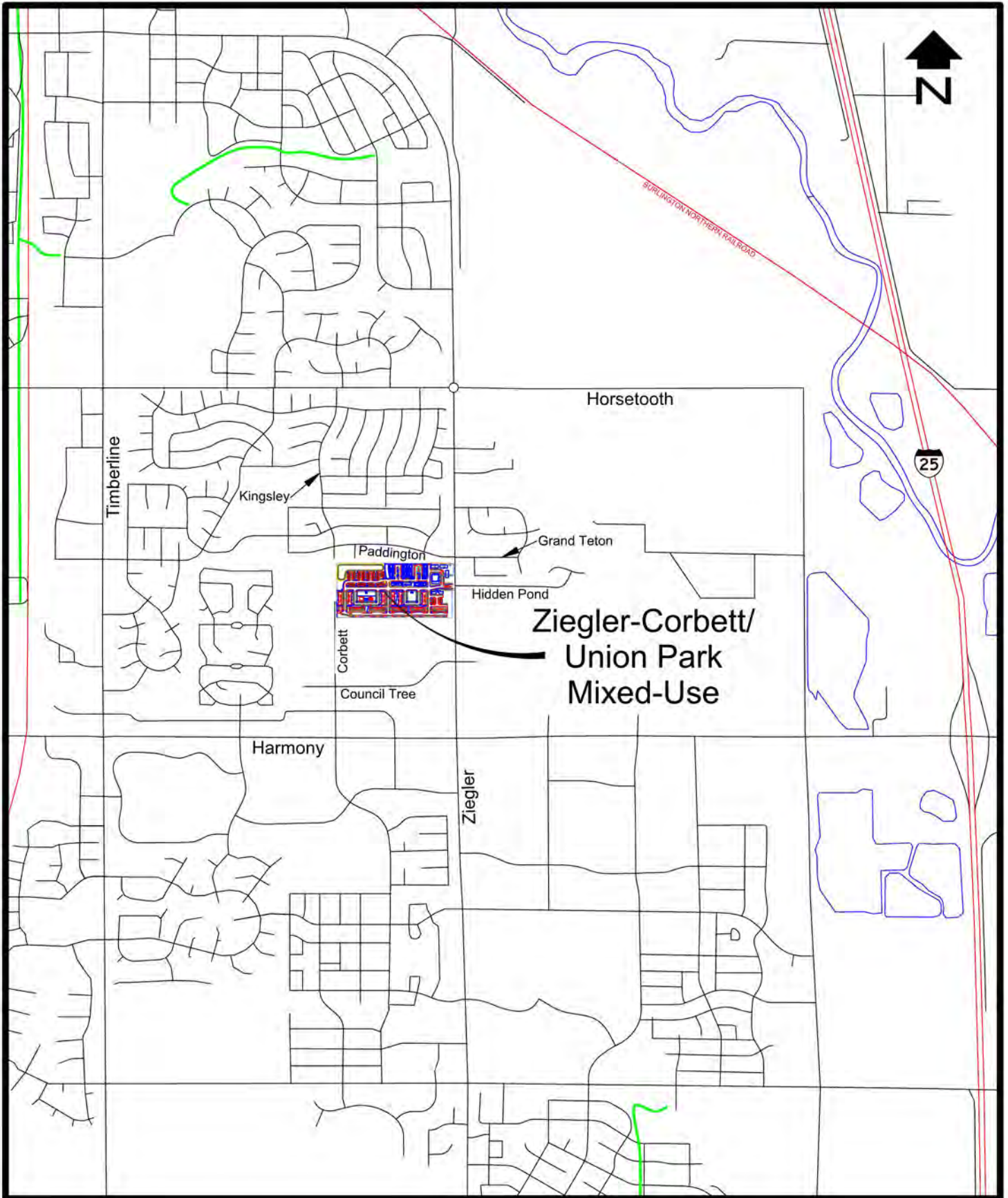
The project site is currently vacant. The land surrounding the site consists of primarily commercial and residential uses. There are commercial uses to the south (Front Range Village) and southeast (HP Campus) of the site. There are residential uses to the north, northeast, and west of the site. The center of Fort Collins lies to the northwest of the Ziegler-Corbett/Union Park Mixed-Use site.

### Roads

The primary streets near the Ziegler-Corbett/Union Park Mixed-Use site are Ziegler Road, Council Tree Avenue, Corbett Drive, Hidden Pond Drive, and Paddington Road. The existing geometry and control at the Ziegler/Council Tree-HP Access, Ziegler/Target Service Access, Ziegler/Hidden Pond, Ziegler/Paddington-Grand Teton, Corbett/Target Service Access, and Corbett/Lowes Service Access intersections is shown in Figure 2.

Ziegler Road is to the east of (adjacent to) the Ziegler-Corbett/Union Park Mixed-Use site. It is a north-south street designated as a four-lane arterial street between Horsetooth Road and Rock Creek Drive on the Fort Collins Master Street Plan. Currently, Ziegler Road has a four-lane cross section and an existing posted speed of 40 mph. At the Ziegler/Council Tree-HP Access intersection, Ziegler Road has northbound and southbound left-turn lanes, two through lanes in each direction, and northbound and southbound right-turn lanes. The Ziegler/Council Tree-HP Access intersection has signal control. At the Ziegler/Target Service Access intersection, Ziegler Road has a northbound left-turn lane and two through lanes in each direction. The Ziegler/Target Service Access intersection has stop sign control on the Target Service Access. At the Ziegler/Hidden Pond intersection, Ziegler Road has a center two-way continuous left-turn lane and two through lanes in each direction. The Ziegler/Hidden Pond intersection has stop sign control on Hidden Pond Drive. At the Ziegler/Paddington-Grand Teton intersection, Ziegler Road has northbound and southbound left-turn lanes and two through lanes in each direction. The Ziegler/Paddington-Grand Teton intersection has stop sign control on Paddington Road-Grand Teton Place.

Council Tree Avenue is an east-west street designated as a local street on the Fort Collins Master Street Plan. Currently, Council Tree Avenue provides access to the Front Range Village shopping center and has a four-lane cross section. The east leg of the Ziegler/Council Tree-HP Access intersection provides access to the HP Campus and has a four-lane cross section. At the Ziegler/Council Tree-HP Access intersection, Council Tree Avenue-HP Access has eastbound and westbound left-turn lanes, one through lane in each direction, and a westbound right-turn lane.

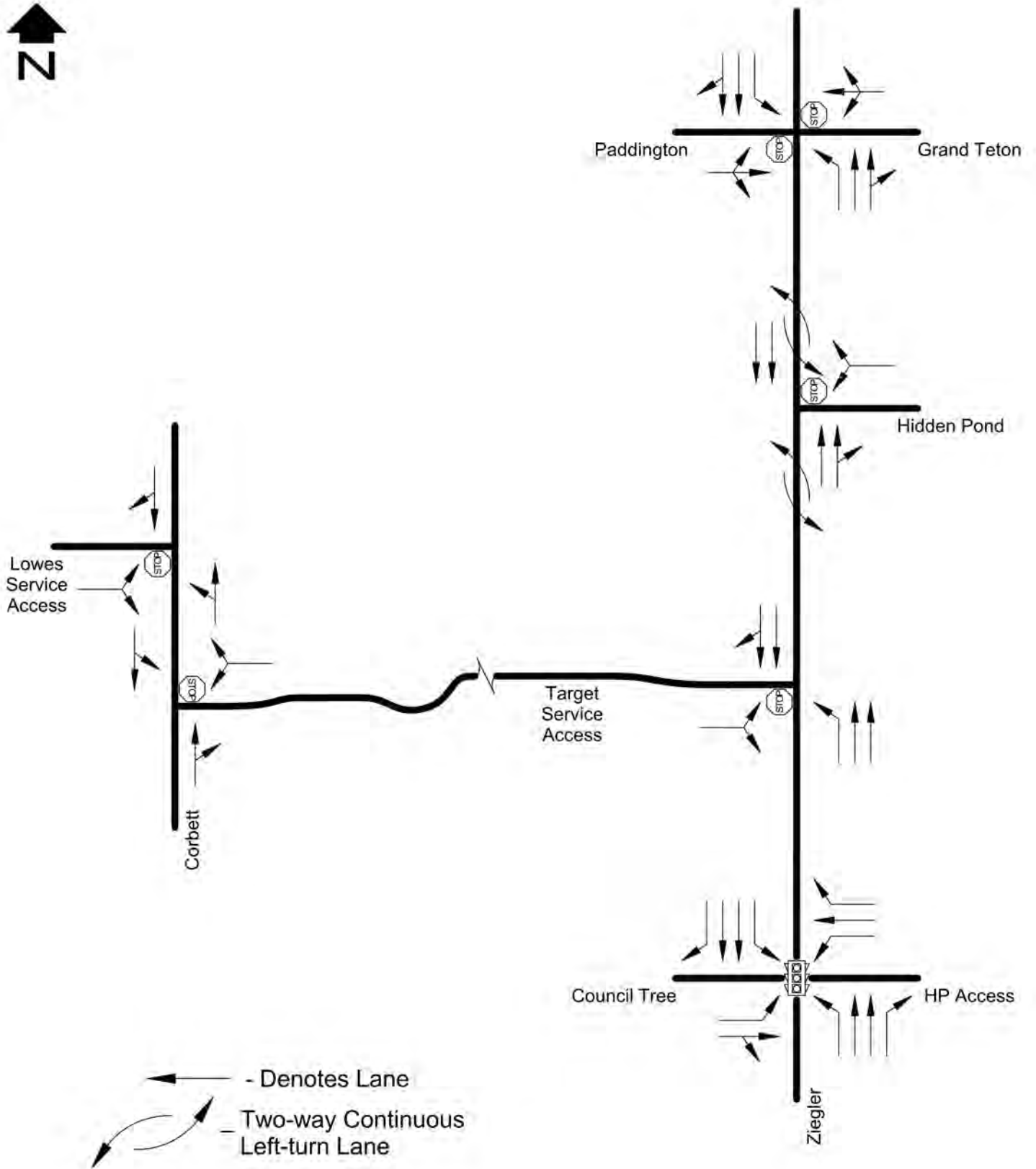


SCALE: 1"=2000'

**SITE LOCATION**

**Figure 1**





# EXISTING INTERSECTION GEOMETRY

Figure 2



Paddington Road-Grand Teton Place is to the north of the Ziegler-Corbett/Union Park Mixed-Use site. Paddington Road is designated as a collector street on the Fort Collins Master Street Plan. Paddington Road was built prior to the adoption of LCUASS. Therefore, it does not meet most of the collector street criteria (width, bike lanes, etc.). Grand Teton Place is designated as a local street. Currently, Paddington Road and Grand Teton Place have two-lane cross sections (no center lane). At the Ziegler/ Paddington-Grand Teton intersection, Paddington Road and Grand Teton Place are striped as having all eastbound and westbound movements combined into single lanes.

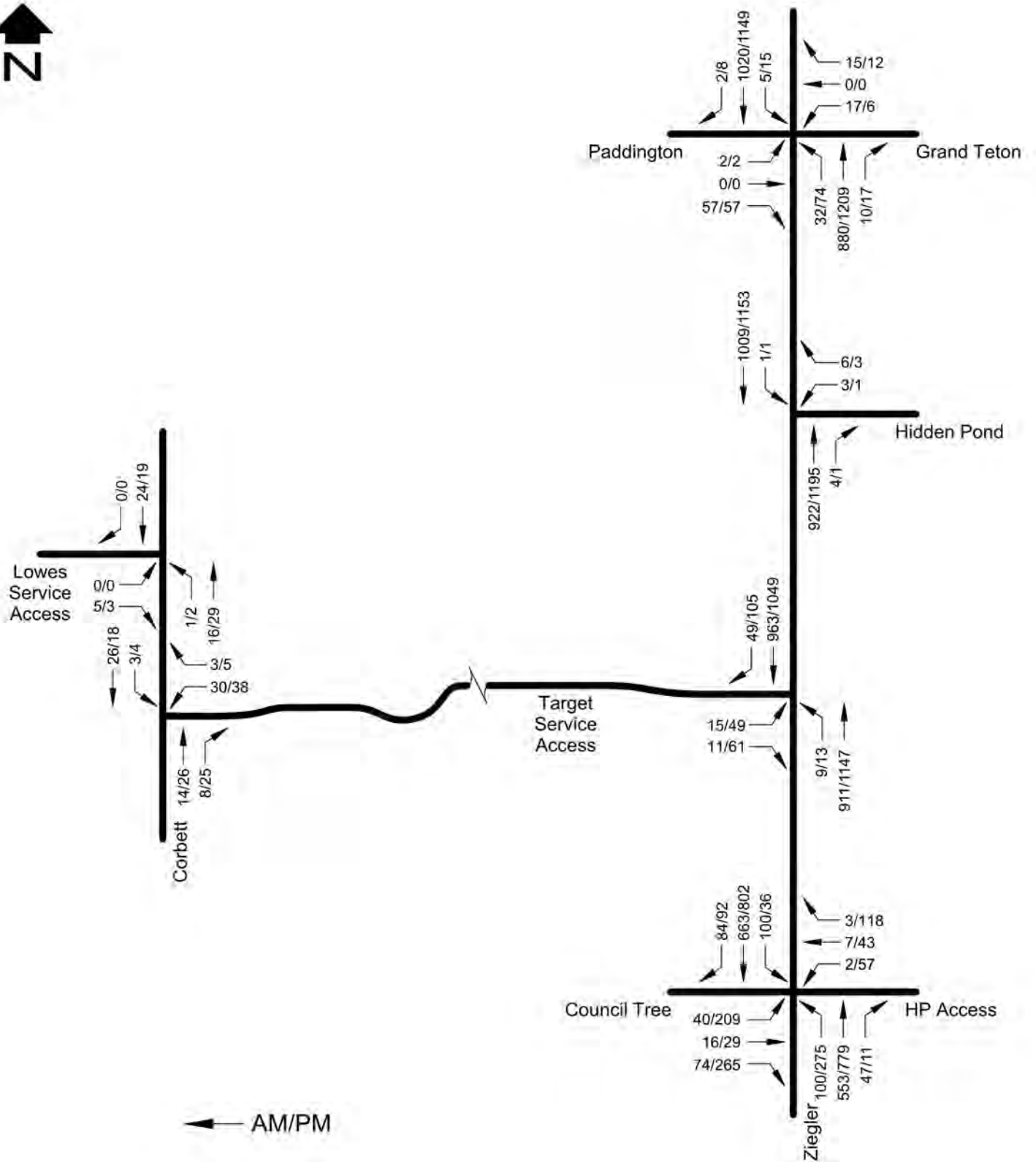
Corbett Drive is to the west of the Ziegler-Corbett/Union Park Mixed-Use site. Corbett Drive is designated as a collector street on the Fort Collins Master Street Plan. Currently, Corbett Drive has a two-lane cross sections (no center lane). At the Corbett/ Target Service Access and Corbett/Lowes Service Access intersections, Corbett Drive has all northbound and southbound movements combined into single lanes. Corbett Drive serves the Front Range Village to the south and Affinity Senior Housing to the north.

## Existing Traffic

Recent peak hour traffic volumes at the Ziegler/Council Tree-HP Access, Ziegler/ Target Service Access, Ziegler/Hidden Pond, Ziegler/Paddington-Grand Teton, Corbett/ Target Service Access, and Corbett/Lowes Service Access intersections are shown in Figure 3. The counts at the Ziegler/Council Tree-HP Access intersection were obtained in August 2019 by the City of Fort Collins. The counts at the Ziegler/Target Service Access, Ziegler/Hidden Pond, and Ziegler/Paddington-Grand Teton intersections were obtained in September 2021. The counts at the Corbett/Target Service Access, and Corbett/Lowes Service Access intersections were obtained in January 2023. Raw traffic count data is provided in Appendix B. Since counts were obtained on different days and different years, the volumes were averaged/balanced between the intersections and are shown in Figure 4.

## Existing Operation

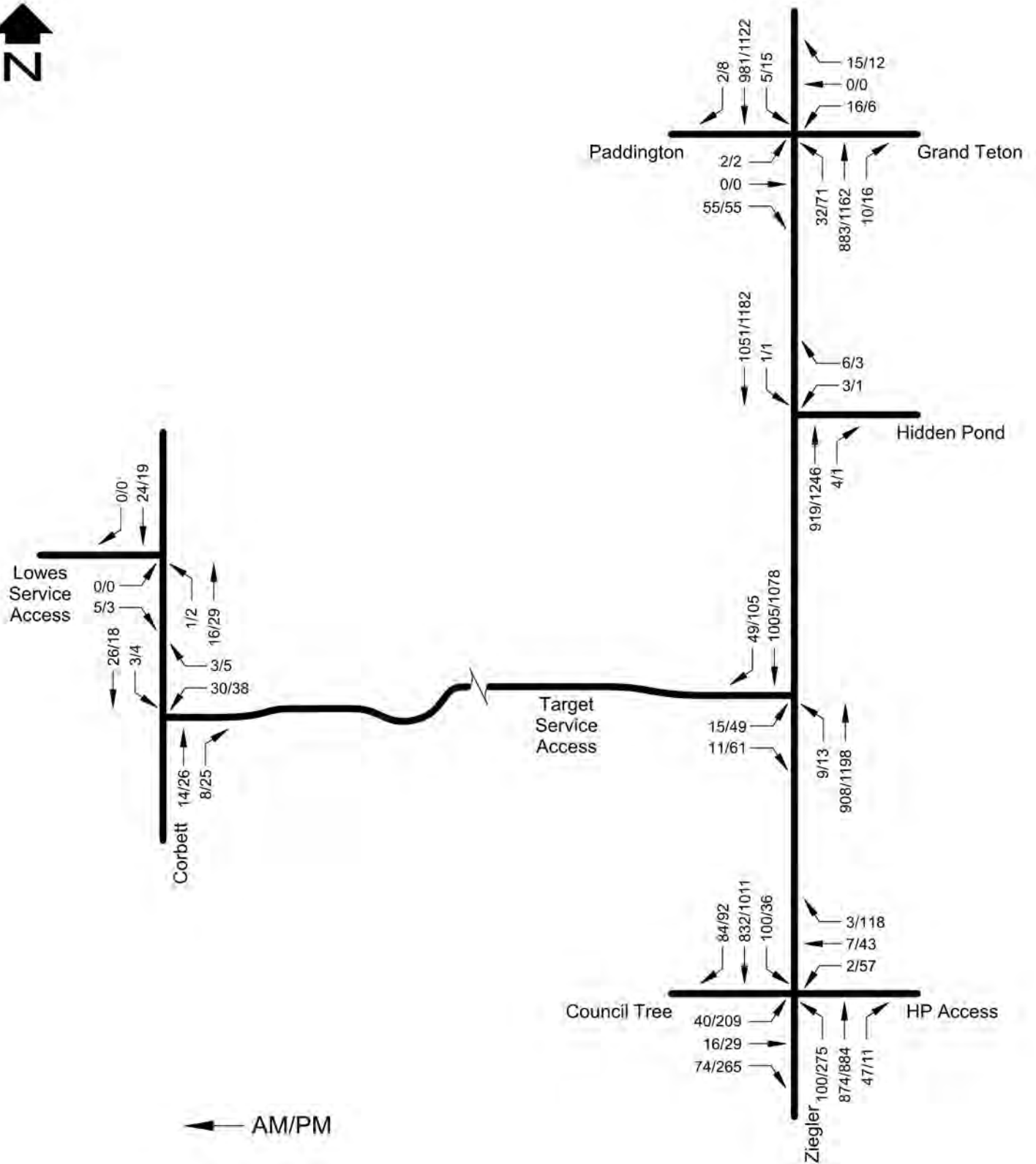
The Ziegler/Council Tree-HP Access, Ziegler/Target Service Access, Ziegler/ Hidden Pond, Ziegler/Paddington-Grand Teton, Corbett/Target Service Access, and Corbett/Lowes Service Access intersections were evaluated and the peak hour operation is displayed in Table 1. Calculation forms are provided in Appendix C. The key intersections currently meet the Fort Collins operational criteria with existing control, signal timing, and geometry. The existing signal timing was used. The intersection was evaluated using techniques provided in the Highway Capacity Manual, 6<sup>th</sup> Edition. A description of level of service for signalized and unsignalized intersections from the Highway Capacity Manual, 6<sup>th</sup> Edition and a table showing the Fort Collins Motor Vehicle LOS Standards (Intersections) are also provided in Appendix C. At signalized intersections, acceptable operation is considered to be at level of service D overall and level of service E for any approach leg or movement. Acceptable operation is considered to be



← AM/PM

# RECENT PEAK HOUR TRAFFIC

Figure 3



# AVERAGED/BALANCED RECENT PEAK HOUR TRAFFIC

Figure 4



**TABLE 1**  
**Current Peak Hour Operation**

Intersection	Movement	Level of Service	
		AM	PM
Ziegler/Council Tree-HP Access (signal)	EB T	D	D
	EB T/RT	D	D
	EB APPROACH	D	D
	WB LT	D	D
	WB T	D	D
	WB RT	D	D
	WB APPROACH	D	D
	NB LT	A	B
	NB T	A	B
	NB RT	A	A
	NB APPROACH	A	B
	SB LT	A	A
	SB T	A	B
	SB RT	A	B
	SB APPROACH	A	B
OVERALL	A	B	
Ziegler/Target Service Access (stop sign)	EB LT/RT	B	D
	NB LT	C	B
	OVERALL	A	A
Ziegler/Hidden Pond (stop sign)	WB LT/RT	C	C
	SB LT	B	B
	OVERALL	A	A
Ziegler/Paddington-Grand Teton (stop sign)	EB LT/T/RT	C	C
	WB LT/T/RT	F (54.9 secs)	F (79.2 secs)
	NB LT	B	B
	SB LT	B	B
	OVERALL	A	A
Corbett/Target Service Access (stop sign)	WB LT/RT	A	A
	SB LT/T	A	A
	OVERALL	A	A
Corbett/Lowes Service Access (stop sign)	EB LT/RT	A	A
	NB LT/T	A	A
	OVERALL	A	A



at level of service D overall and level of service F for any approach leg at unsignalized intersections. It is important to note that a southbound right-turn lane is warranted at the Ziegler/Target Service Access intersection with the existing peak hour volumes.

In the neighborhood meeting, residents in the area mentioned that there were few gaps in the traffic on Ziegler Road that made it difficult to make minor street left-turns, particularly at the Ziegler/Paddington-Grand Teton intersection. This is reflected in the level of service F conditions shown in Table 1. It is acknowledged that the calculated delay for the minor street left turns is high, especially in the afternoon peak hour. This is due to high through volumes on Ziegler Road. Based upon research (actual delay data), the calculated delay is higher than the actual delay. There is little that can be done to alleviate this condition, except signalization of the Ziegler/Paddington-Grand Teton intersection. An alternative control would be a roundabout, but that may not be possible at this intersection. The final solution is beyond the scope of a transportation impact study for a development that will not contribute any traffic to the minor street legs. With that said, the peak hour level of service F for the minor street legs meets the operational criteria of the City of Fort Collins.

### **Pedestrian Facilities**

There are sidewalks along all streets in the area of the Ziegler-Corbett/Union Park Mixed-Use site.

### **Bicycle Facilities**

There are bicycle lanes along Harmony Road, Ziegler Road, Corbett Drive, and Council Tree Avenue.

### **Transit Facilities**

Currently, this area of Fort Collins is served by Transfort Route 16 service on Harmony Road.

### **Accident Analysis**

Accident data was obtained from the City of Fort Collins for Ziegler Road from the Ziegler/Council Tree-HP Access intersection to the Ziegler/Paddington-Grand Teton intersection for five years plus nine months of 2021.

At the Ziegler/Council Tree-HP Access intersection, there were 37 reported accidents: 11 rear-end accidents, 15 accidents involving turning vehicles, five right-angle accidents, three side-swipe accidents, two involving hitting a fixed object, and one involving a bicycle. The number and type of accidents at the Ziegler/Council Tree-HP Access intersection is typical for a signalized intersection.

At the Ziegler/Paddington-Grand Teton intersection, there were four reported accidents: three right-angle accidents and one accident that was parking related. The number and type of accidents at the Ziegler/Paddington-Grand Teton intersection is typical for a stop sign controlled intersection.

There were seven mid-block accidents in this section of Ziegler Road. All were right-angle accidents.



### III. PROPOSED DEVELOPMENT

The proposed Ziegler-Corbett/Union Park Mixed-Use will consist of approximately 22,200 square feet of office, 16,825 square feet of commercial/retail, a 10,600 square foot day care center, 61 attached single-family dwelling units, and 561 apartment dwelling units. Figure 5 shows a site plan of the proposed Ziegler-Corbett/Union Park Mixed-Use site. The short range analysis (Year 2028) includes development of the proposed Ziegler-Corbett/Union Park Mixed-Use site and an appropriate increase in background traffic due to normal growth and other potential developments in the area. The long range analysis year is considered to be 2045.

Access to the Ziegler-Corbett/Union Park Mixed-Use site will be via one proposed full-movement access to/from Ziegler Road that will line up with Hidden Pond Drive. There will also be access to/from Corbett Drive on the west side of the site.

#### **Trip Generation**

Trip generation is important in considering the impact of a development on the existing and proposed street system. Trip Generation, 11<sup>th</sup> Edition, ITE was used to determine the trips that would be generated by the Ziegler-Corbett/Union Park Mixed-Use development. A trip is defined as a one-way vehicle movement from origin to destination. Table 2 shows the expected trip generation from the site on a daily and peak hour basis. The trip generation for full development of the Ziegler-Corbett/Union Park Mixed-Use site resulted in 5,390 daily trip ends, 458 morning peak hour trip ends, and 570 afternoon peak hour trip ends.

#### **Trip Distribution**

Trip distribution for the Ziegler-Corbett/Union Park Mixed-Use site was estimated using knowledge of the existing and planned street system, existing traffic patterns, development trends, and engineering judgment. Figure 6 shows the trip distribution for the short range (2028) and long range (2045) analysis futures. The trip distribution was agreed to by City of Fort Collins staff in the scoping discussions.

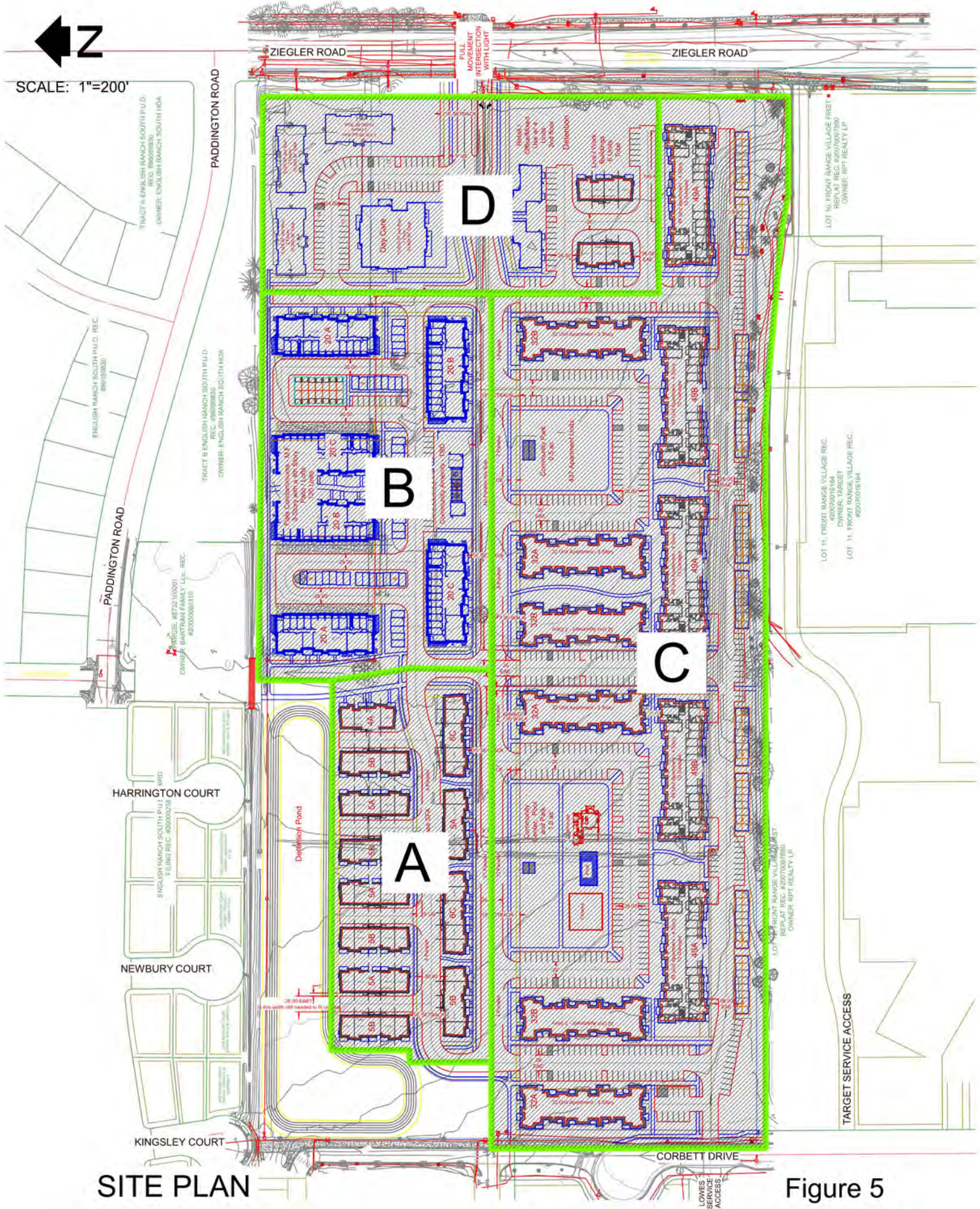
#### **Background Traffic Projections**

Background traffic projections for the short range (2028) and long range (2045) future horizons were developed by factoring the volumes on Ziegler Road by approximately two percent per year. The traffic on Council Tree Avenue and the HP Access was factored by approximately 0.5 percent per year. Figures 7 and 8 respectively show the short range (2028) and long range (2045) background weekday peak hour traffic at the Ziegler/Council Tree-HP Access, Ziegler/Target Service Access, Ziegler/Hidden Pond, Ziegler/Paddington-Grand Teton, Corbett/Target Service Access, and Corbett/Lowes Service Access intersections.





SCALE: 1"=200'



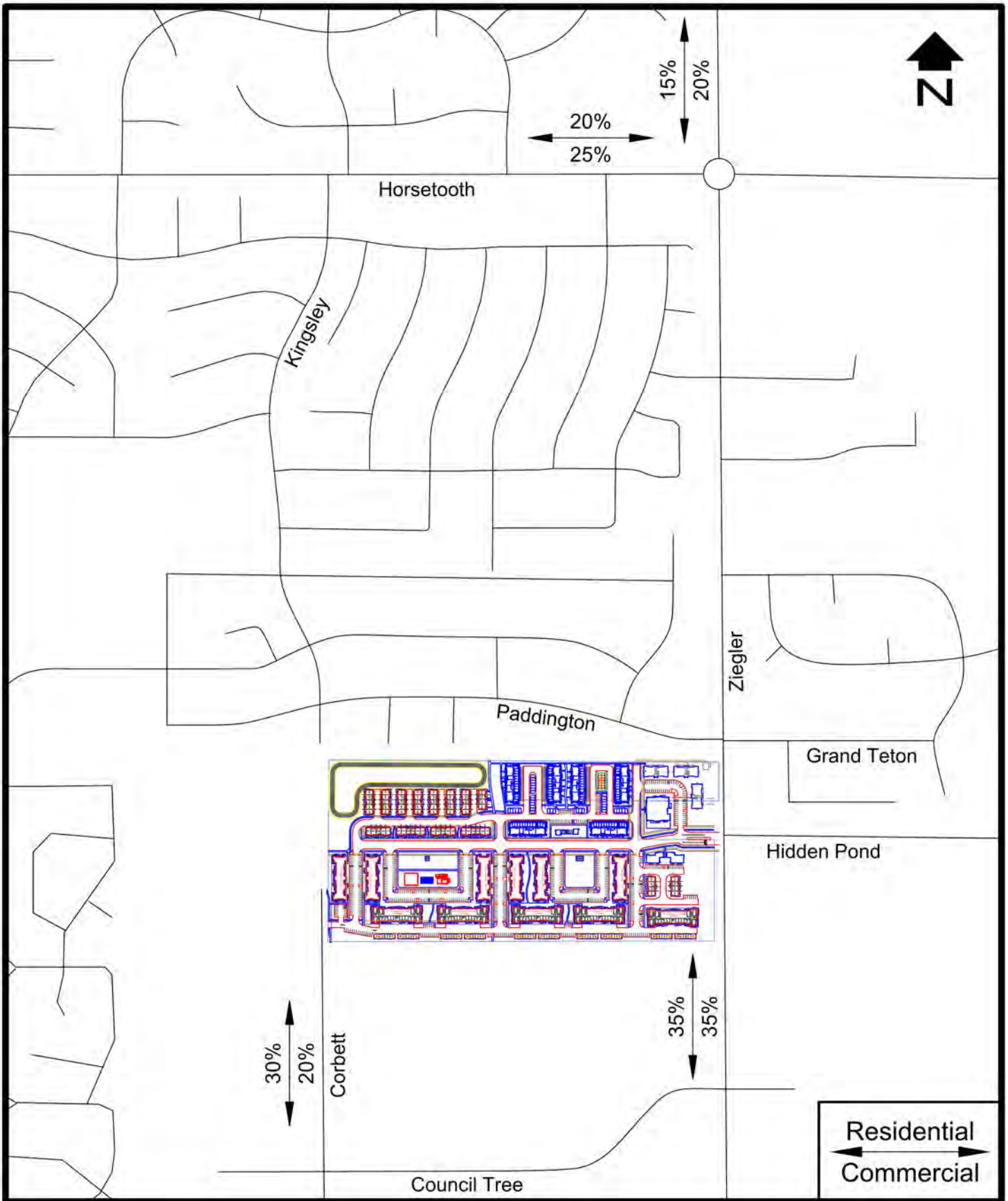
# SITE PLAN

Figure 5



**TABLE 2  
Trip Generation**

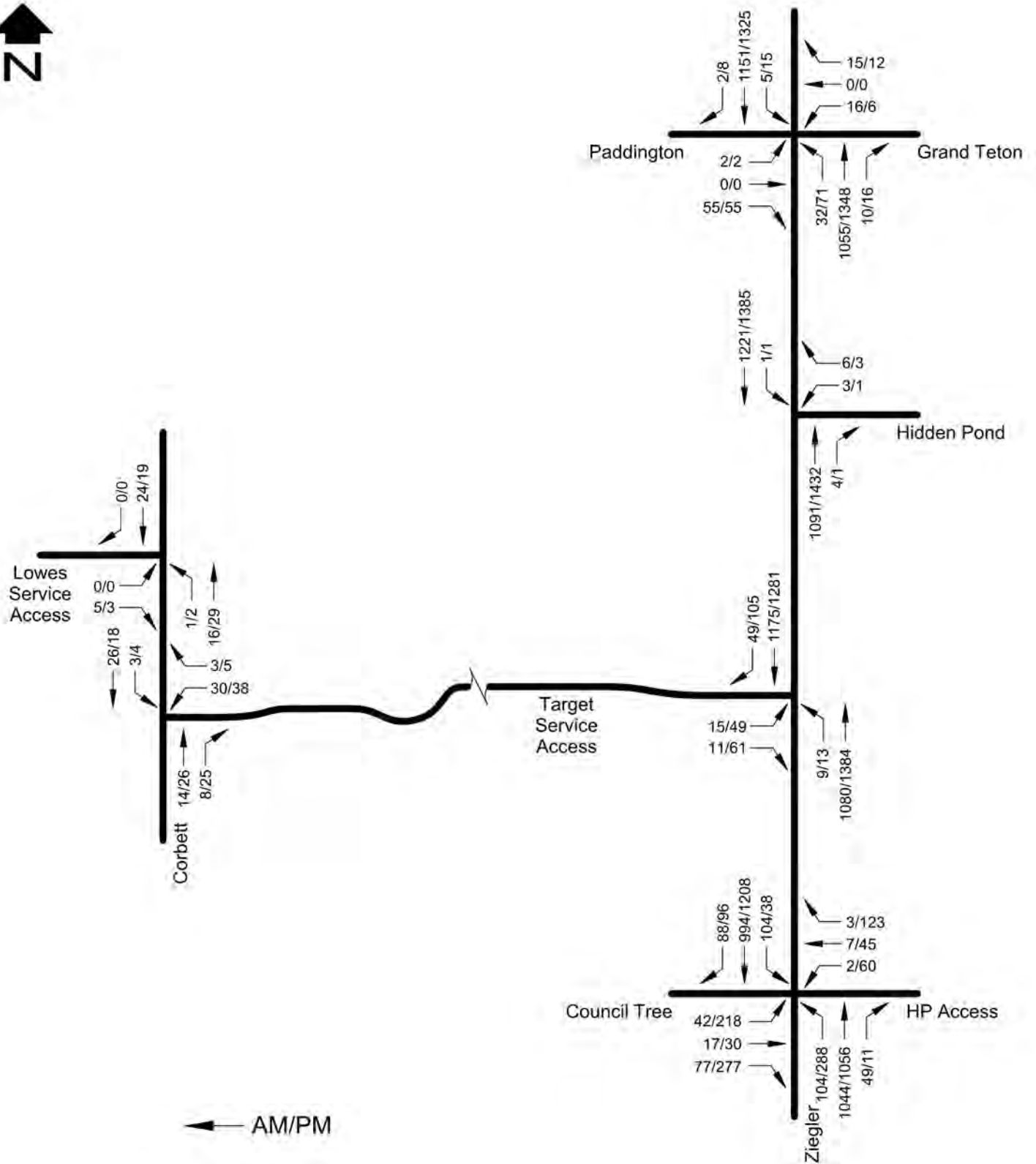
Code	Use	Size	AWDTE		AM Peak Hour				PM Peak Hour			
			Rate	Trips	Rate	In	Rate	Out	Rate	In	Rate	Out
Area A												
215	Single Family Attached	53 D.U.	EQ	354	EQ	5	EQ	17	EQ	17	EQ	11
Area B												
220	Low-Rise Multifamily	120 D.U.	EQ	844	EQ	14	EQ	46	EQ	45	EQ	27
Area C												
220	Low-Rise Multifamily	192 D.U.	EQ	1306	EQ	20	EQ	62	EQ	65	EQ	38
221	Mid-Rise Multifamily	245 D.U.	EQ	1122	EQ	22	EQ	74	EQ	58	EQ	38
Subtotal					2428		42		136		123	76
Area D South												
215	Single Family Attached	8 D.U.	7.20	58	0.12	1	0.36	3	0.34	3	0.23	2
220	Low-Rise Multifamily	4 D.U.	6.74	26	0.10	0	0.30	2	0.32	1	0.19	1
712	Small Office	5,356 KSF	14.39	78	1.37	7	0.30	2	0.73	4	1.43	8
Subtotal					162		8		7		8	11
Area D North												
822	Shopping Plaza <40 KSF	16,825 KSF	54.45	916	1.42	24	0.94	16	3.295	55	3.295	55
710	Office	16,825 KSF	10.84	182	1.34	23	0.18	3	0.24	4	1.20	20
565	Day Care Center	10.6 KSF	47.62	504	5.83	62	5.17	55	5.23	55	5.89	63
Subtotal					1602		109		74		114	138
<b>Total</b>					<b>5390</b>		<b>178</b>		<b>280</b>		<b>307</b>	<b>263</b>



SCALE: 1"=600'

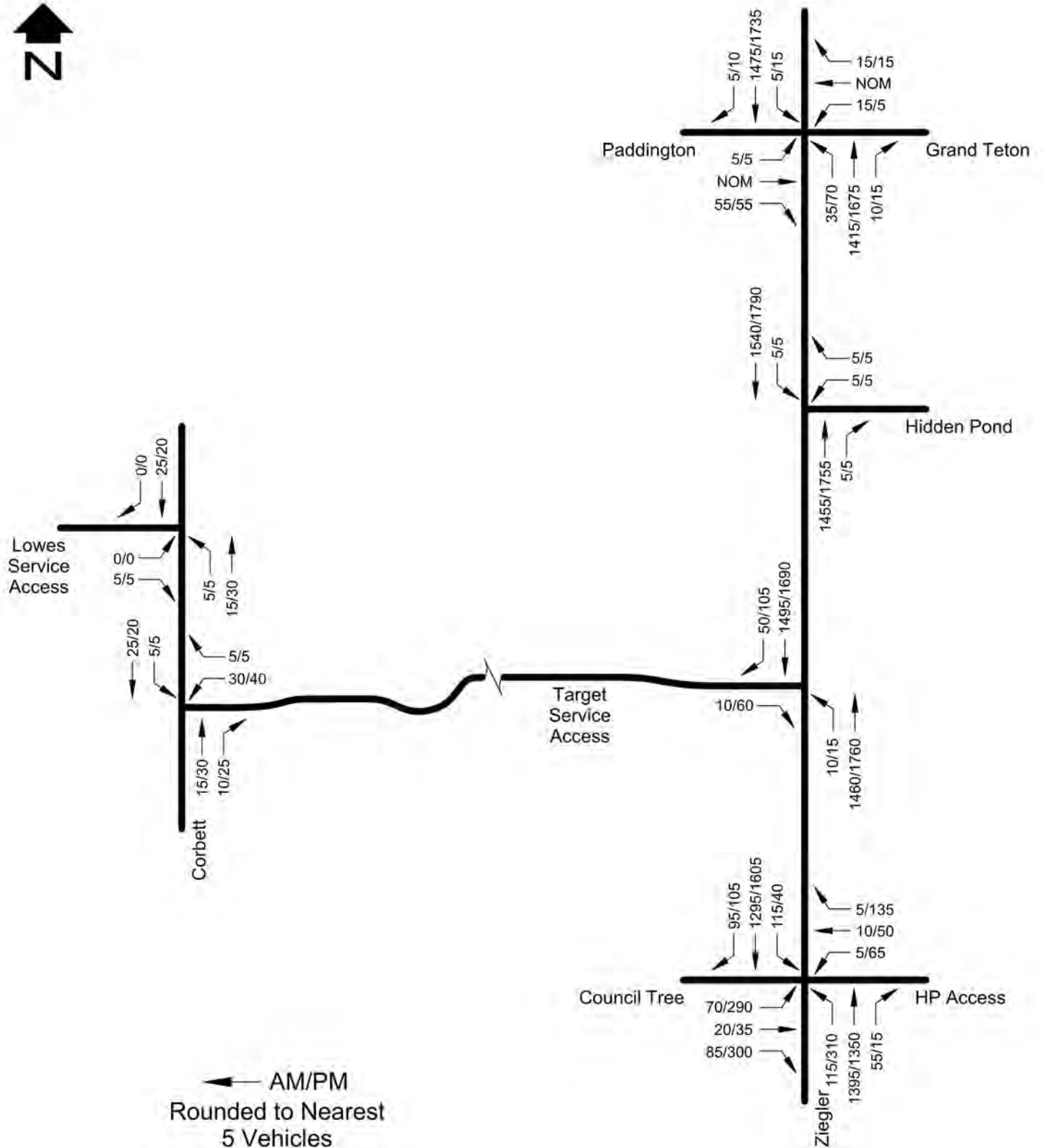
# TRIP DISTRIBUTION

Figure 6



# SHORT RANGE (2028) BACKGROUND PEAK HOUR TRAFFIC

Figure 7



# LONG RANGE (2045) BACKGROUND PEAK HOUR TRAFFIC

Figure 8



## Traffic Assignment

Trip assignment is the product of both the trip generation and trip distribution processes. Figure 9 shows the site generated weekday peak hour traffic at the Ziegler/Council Tree-HP Access, Ziegler/Target Service Access, Ziegler/Hidden Pond-Site Access, Ziegler/Paddington-Grand Teton, Corbett/Target Service Access, and Corbett/Lowes Service Access-Site Access intersections.

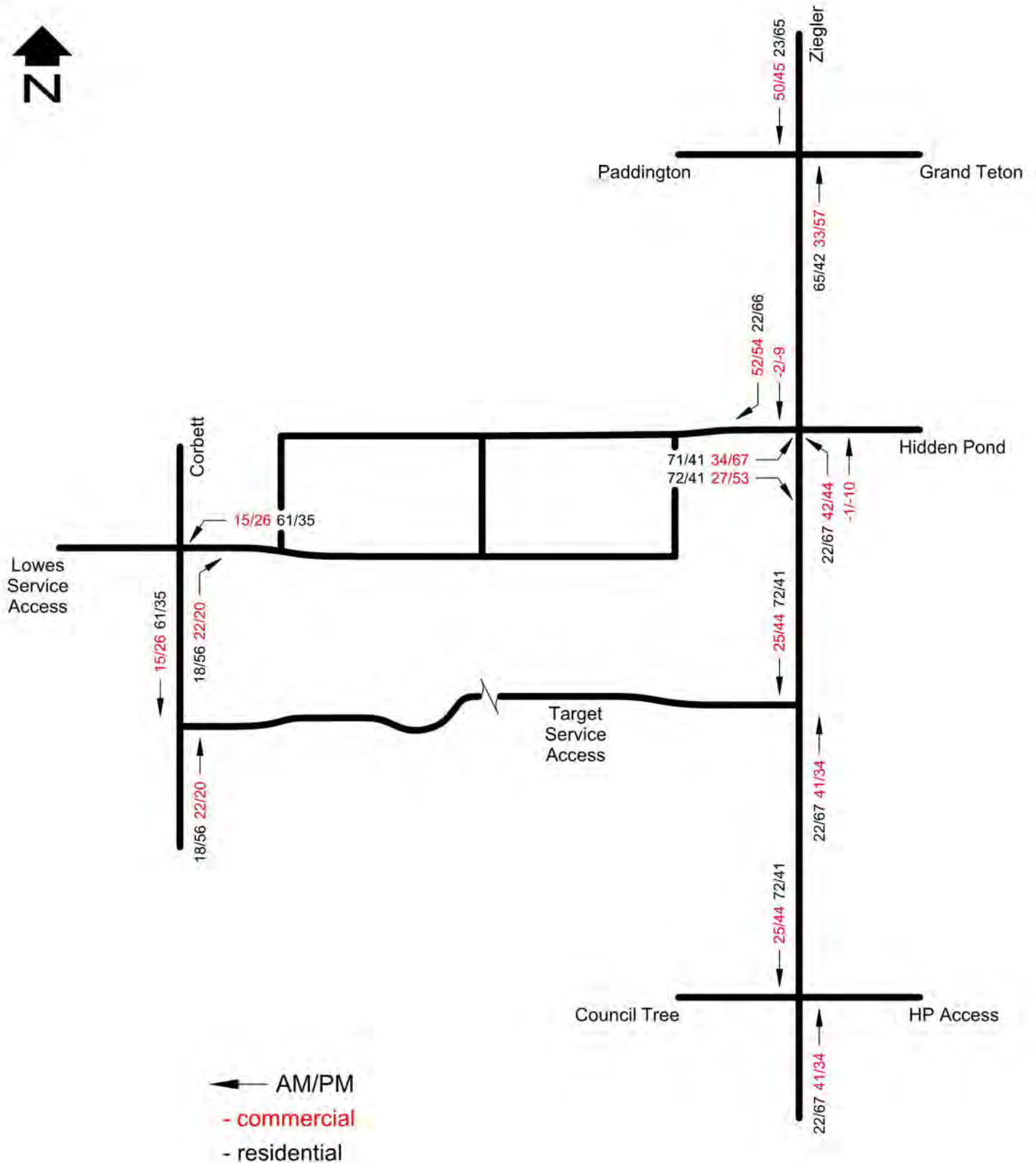
## Total Traffic

The traffic volumes generated by the proposed Ziegler-Corbett/Union Park Mixed-Use development were added to the background traffic volumes to produce the total traffic volume forecasts for the short range (2028) and long range (2045) futures. Figures 10 and 11 show the respective short range (2028) and long range (2045) total weekday peak hour traffic at the Ziegler/Council Tree-HP Access, Ziegler/Target Service Access, Ziegler/Hidden Pond-Site Access, Ziegler/Paddington-Grand Teton, Corbett/Target Service Access, and Corbett/Lowes Service Access-Site Access intersections. When the proposed signal at the Ziegler/Hidden Pond-Site Access intersection is installed, some Front Range Village and Affinity Senior Housing traffic may/will find it easier to use the newly installed signal than other routes. This adjustment in traffic volumes is reflected in the short range (2028) and long range (2045) total weekday peak hour traffic.

## Signal Warrants

As a matter of policy, traffic signals are not installed at any location until such time that signal installation warrants are met according to the Manual on Uniform Traffic Control Devices. The Ziegler/Council Tree-HP Access intersection is currently signalized. For the streets in the vicinity of the Ziegler-Corbett/Union Park Mixed-Use, four hour and/or eight hour signal warrants are applicable. These warrants require much data and are applied when the traffic is actually on the area road system. As part of discussions (mid-2022), a preliminary signal warrant evaluation of the Ziegler/Hidden Pond-Site Access intersection was conducted. The Warrant 3/Peak Hour/Category A criteria was evaluated. It was concluded that the signal would be warranted.

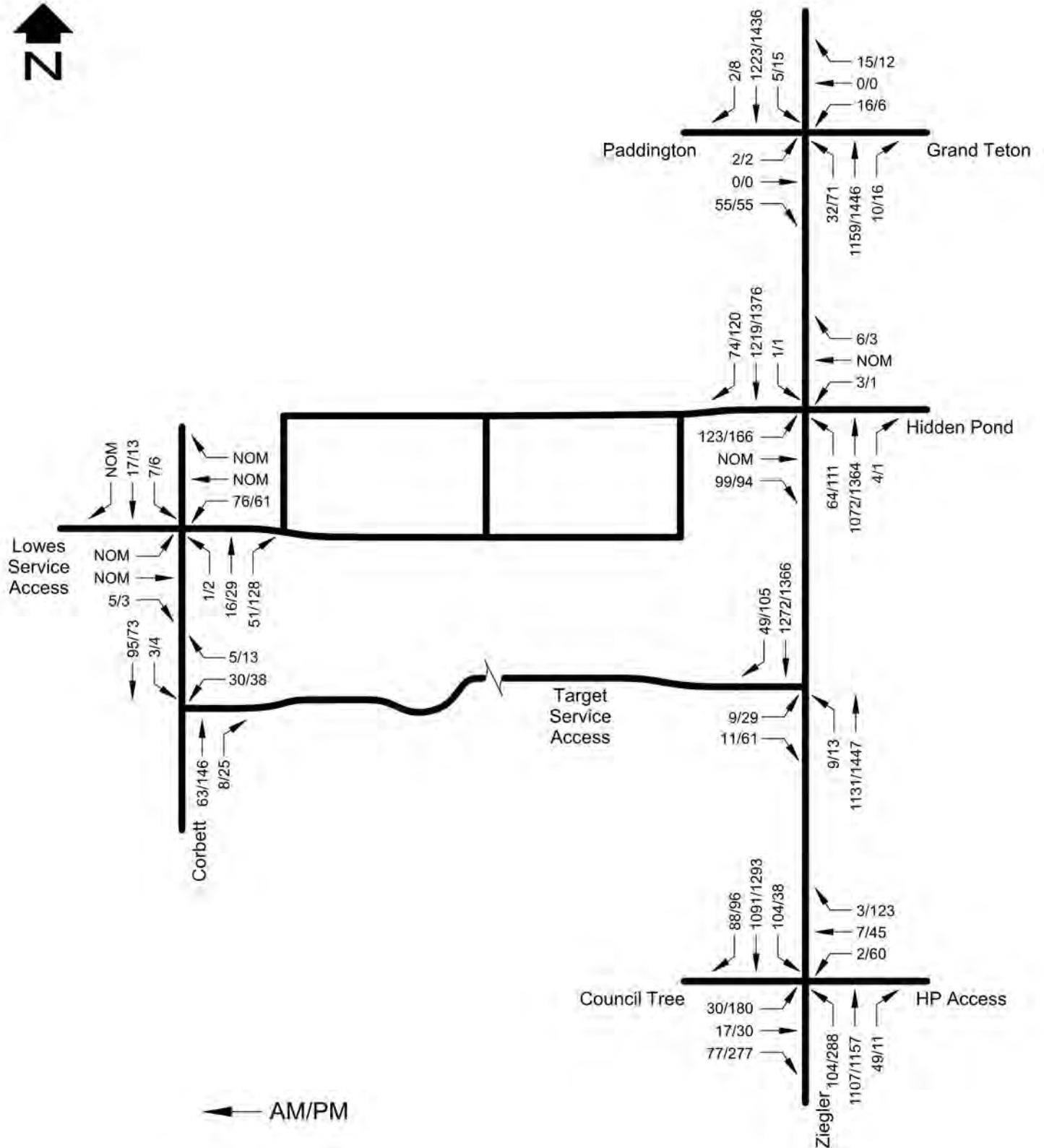
The peak hour signal warrant utilizes the major street approach volume (both directions) and the minor street approach volume (greatest on one of the minor streets). The analysis procedure is a function of the number of approach lanes on each street. Ziegler Road has two through lanes in each direction. The Site Access, approaching Ziegler Road, will have a two lane approach. Since Hidden Pond Drive has a one lane approach, the eastbound left-turn and through movement will be combined in a single lane. Therefore, only this left-turn and through movement will be used for the peak hour signal warrant. At the major street approach volumes (greater than 1,800 vehicles per hour in each peak hour), the signal warrant threshold volume is  $\geq 100$  vehicles per hour. Using the short range (2028) and long range (2045) total weekday peak hour traffic (Figures 10 and 11), the Ziegler/



# SITE GENERATED PEAK HOUR TRAFFIC

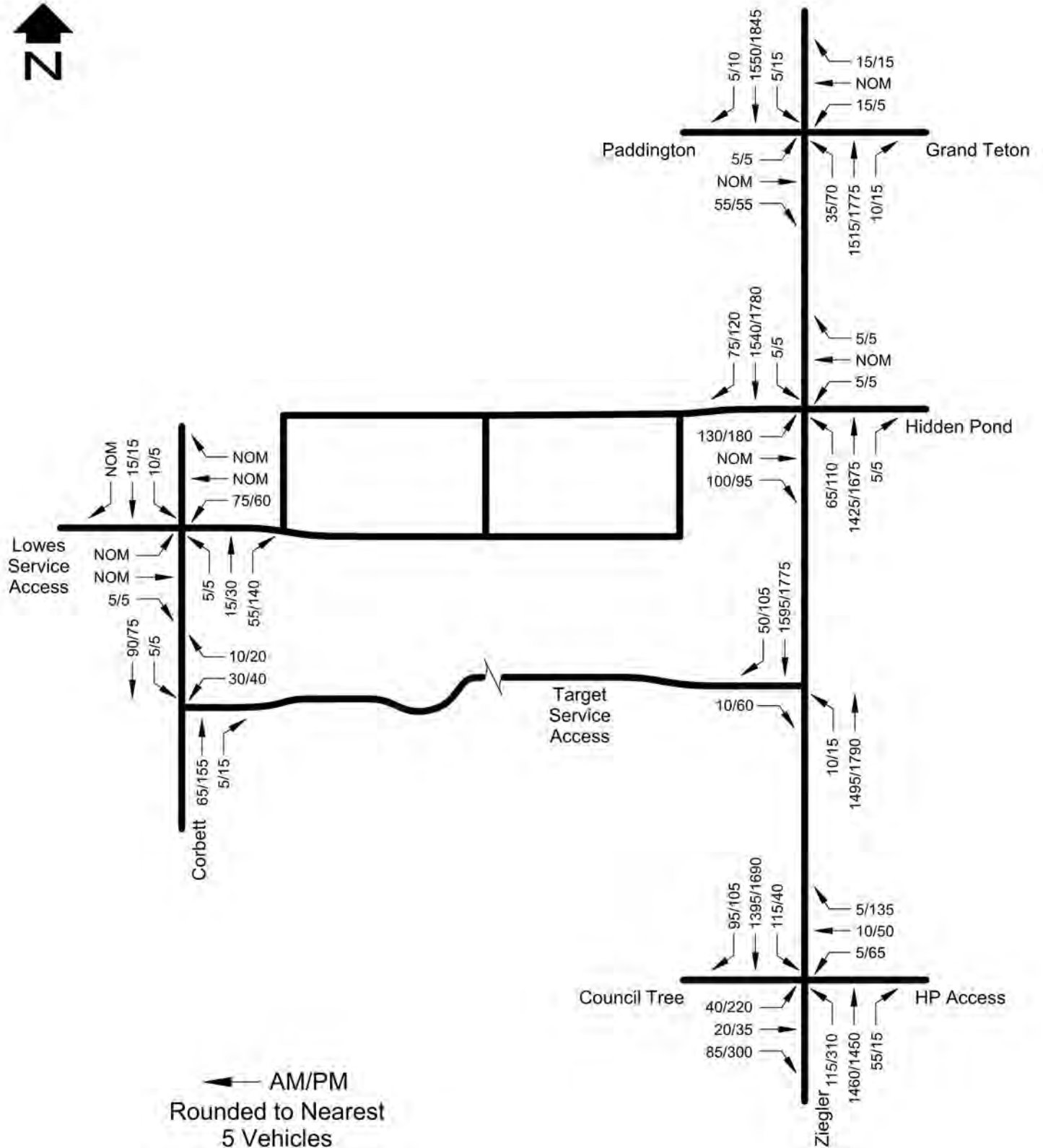
Figure 9





# SHORT RANGE (2028) TOTAL PEAK HOUR TRAFFIC

Figure 10



# LONG RANGE (2045) TOTAL PEAK HOUR TRAFFIC

Figure 11



Hidden Pond-Site Access intersection will meet peak hour signal warrants during the weekday morning and afternoon peak hours. Peak hour signal warrants are provided in Appendix D.

## **Geometry**

Figures 12 and 13 respectively show schematics of the short range (2028) and long range (2045) geometry. In the short range (2028) future, the geometry at the Ziegler/Council Tree-HP Access, Ziegler/Target Service Access, and Ziegler/Paddington-Grand Teton existing intersections was assumed to remain as it exists today.

## **Operation Analysis**

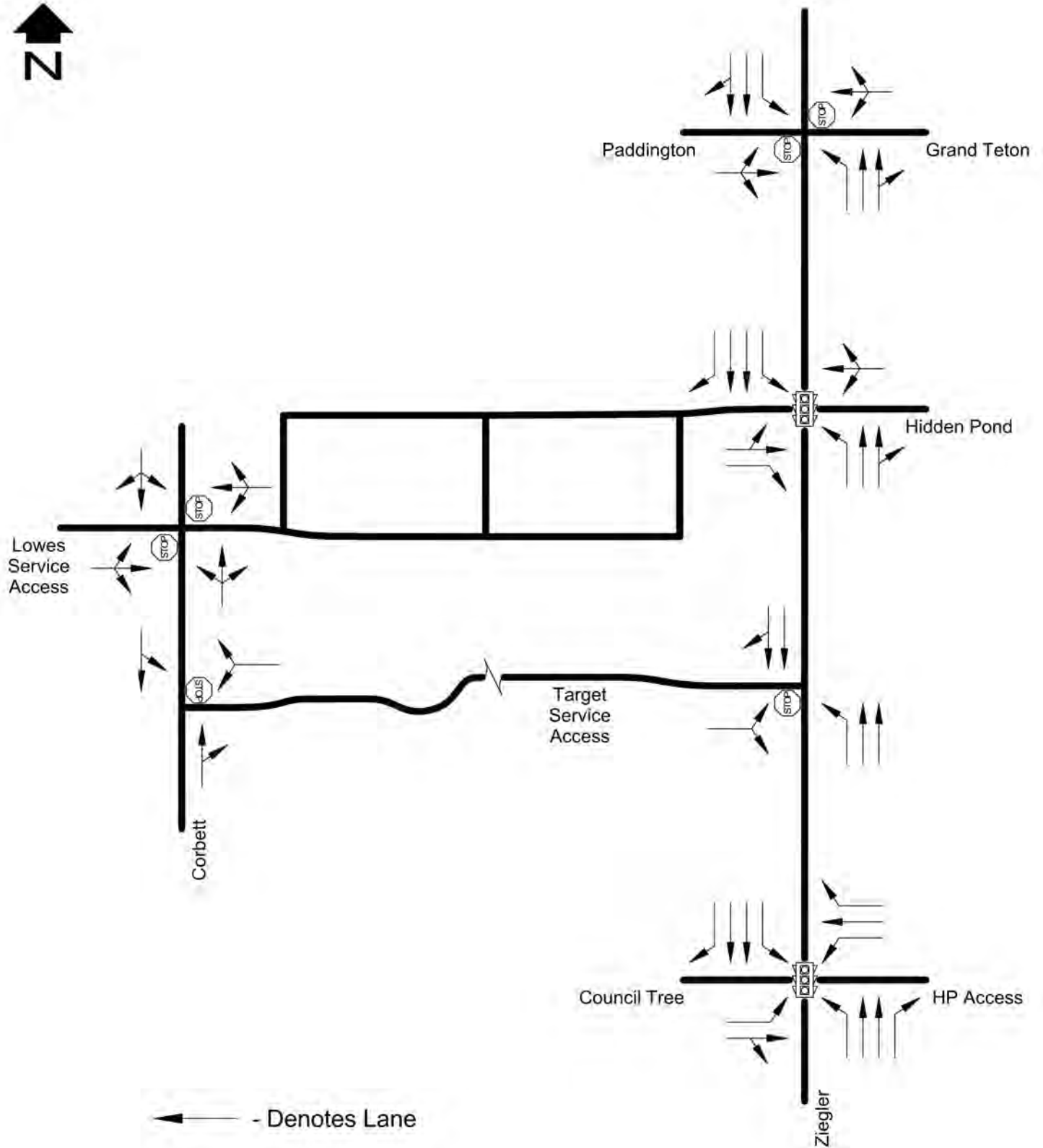
Operation analyses were performed at the Ziegler/Council Tree-HP Access, Ziegler/Target Service Access, Ziegler/Hidden Pond-Site Access, Ziegler/Paddington-Grand Teton, Corbett/Target Service Access, and Corbett/Lowes Service Access-Site Access intersections. The operations analyses were conducted for the short range future, reflecting a year 2028 condition, and the long range future, reflecting a year 2045 condition.

Table 3 shows the short range (2028) background weekday peak hour operation at the Ziegler/Council Tree-HP Access, Ziegler/Target Service Access, Ziegler/Hidden Pond, Ziegler/Paddington-Grand Teton, Corbett/Target Service Access, and Corbett/Lowes Service Access intersections. The key intersections meet the Fort Collins level of service standards in the peak hours with the existing geometry. Calculation forms for these analyses are provided in Appendix E.

Table 4 shows the long range (2045) background weekday peak hour operation at the Ziegler/Council Tree-HP Access, Ziegler/Target Service Access, Ziegler/Hidden Pond, Ziegler/Paddington-Grand Teton, Corbett/Target Service Access, and Corbett/Lowes Service Access intersections. The key intersections meet the Fort Collins level of service standards in the peak hours with the existing geometry. Calculation forms for these analyses are provided in Appendix F.

Using the traffic volumes shown in Figure 10, Table 5 shows the short range (2028) total weekday peak hour operation at the Ziegler/Council Tree-HP Access, Ziegler/Target Service Access, Ziegler/Hidden Pond-Site Access, Ziegler/Paddington-Grand Teton, Corbett/Target Service Access, and Corbett/Lowes Service Access-Site Access intersections. Calculation forms for these analyses are provided in Appendix G. The key intersections meet the Fort Collins level of service standards in the peak hours with the recommended/existing control and geometry.

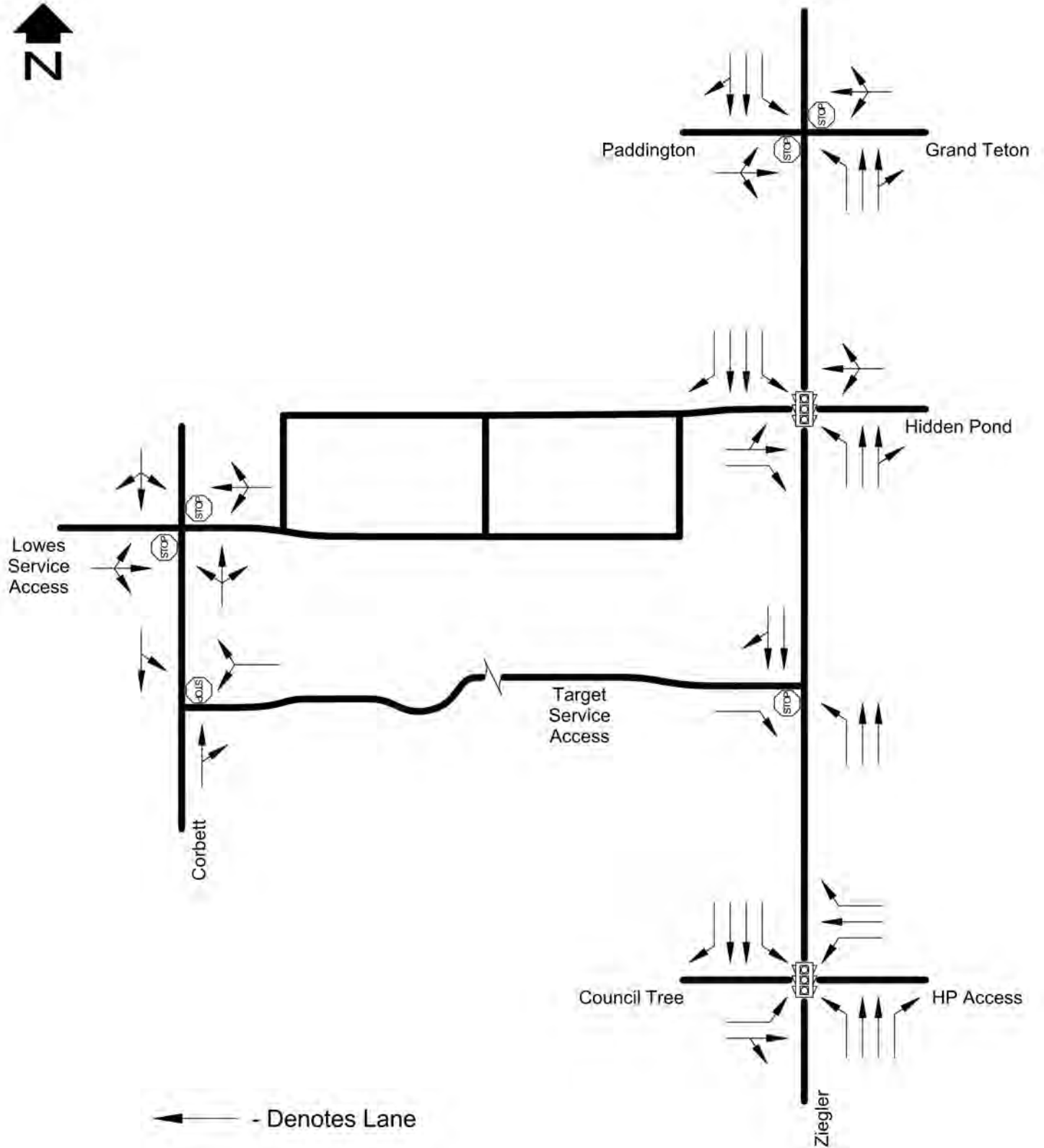
Using the traffic volumes shown in Figure 11, Table 6 shows the long range (2045) total weekday peak hour operation at the Ziegler/Council Tree-HP Access, Ziegler/Target Service Access, Ziegler/Hidden Pond-Site Access, Ziegler/Paddington-Grand Teton,



# SHORT RANGE (2028) GEOMETRY

Figure 12





# LONG RANGE (2045) GEOMETRY

Figure 13

**TABLE 3**  
**Short Range (2028) Background Peak Hour Operation**

Intersection	Movement	Level of Service	
		AM	PM
Ziegler/Council Tree-HP Access (signal)	EB T	D	D
	EB T/RT	D	D
	EB APPROACH	D	D
	WB LT	D	D
	WB T	D	D
	WB RT	D	D
	WB APPROACH	D	D
	NB LT	A	D
	NB T	A	B
	NB RT	A	A
	NB APPROACH	A	B
	SB LT	A	B
	SB T	A	C
	SB RT	A	B
	SB APPROACH	A	C
OVERALL	A	C	
Ziegler/Target Service Access (stop sign)	EB LT/RT	D	E (43.2 secs)
	NB LT	B	B
	OVERALL	A	A
Ziegler/Hidden Pond (stop sign)	WB LT/RT	C	C
	SB LT	B	B
	OVERALL	A	A
Ziegler/Paddington-Grand Teton (stop sign)	EB LT/T/RT	C	D
	WB LT/T/RT	F (109.9 secs)	F (166.9 secs)
	NB LT	B	B
	SB LT	B	B
	OVERALL	A	A
Corbett/Target Service Access (stop sign)	WB LT/RT	A	A
	SB LT/T	A	A
	OVERALL	A	A
Corbett/Lowes Service Access (stop sign)	EB LT/RT	A	A
	NB LT/T	A	A
	OVERALL	A	A



**TABLE 4**  
**Long Range (2045) Background Peak Hour Operation**

Intersection	Movement	Level of Service	
		AM	PM
Ziegler/Council Tree-HP Access (signal)	EB T	D	E (72.8 secs)
	EB T/RT	D	D
	EB APPROACH	D	E (66.6 secs)
	WB LT	D	D
	WB T	D	E (59.6 secs)
	WB RT	D	D
	WB APPROACH	D	D
	NB LT	A	E (63.2 secs)
	NB T	A	B
	NB RT	A	A
	NB APPROACH	A	C
	SB LT	A	B
	SB T	A	C
	SB RT	A	B
	SB APPROACH	A	C
OVERALL	A	C	
Ziegler/Target Service Access (stop sign)	EB RT	C	C
	NB LT	B	C
	OVERALL	A	A
Ziegler/Hidden Pond (stop sign)	WB LT/RT	D	E (35.3 secs)
	SB LT	B	C
	OVERALL	A	A
Ziegler/Paddington-Grand Teton (stop sign)	EB LT/T/RT	F (59.3 secs)	F (255.3 secs)
	WB LT/T/RT	F (396.6 secs)	F (518.4 secs)
	NB LT	B	C
	SB LT	B	C
	OVERALL	A	A
Corbett/Target Service Access (stop sign)	WB LT/RT	A	A
	SB LT/T	A	A
	OVERALL	A	A
Corbett/Lowes Service Access (stop sign)	EB LT/RT	A	A
	NB LT/T	A	A
	OVERALL	A	A

**TABLE 5**  
**Short Range (2028) Total Peak Hour Operation**

Intersection	Movement	Level of Service	
		AM	PM
Ziegler/Council Tree-HP Access (signal)	EB T	D	D
	EB T/RT	D	D
	EB APPROACH	D	D
	WB LT	D	D
	WB T	D	D
	WB RT	D	D
	WB APPROACH	D	D
	NB LT	A	D
	NB T	A	B
	NB RT	A	A
	NB APPROACH	A	C
	SB LT	A	B
	SB T	B	D
	SB RT	A	C
	SB APPROACH	B	D
OVERALL	A	C	
Ziegler/Target Service Access (stop sign)	EB RT	C	D
	NB LT	B	B
	OVERALL	A	A
Ziegler/Hidden Pond-Site Access (signal)	EB LT/T	D	D
	EB RT	D	D
	EB APPROACH	D	D
	WB LT/T/RT	D	D
	NB LT	A	B
	NB T	C	C
	NB T/RT	C	C
	NB APPROACH	C	C
	SB LT	A	B
	SB T	A	B
	SB RT	A	A
	SB APPROACH	A	B
OVERALL	B	C	
Ziegler/Paddington-Grand Teton (stop sign)	EB LT/T/RT	C	E (38.9 secs)
	WB LT/T/RT	F (182.7 secs)	F (275.8 secs)
	NB LT	B	C
	SB LT	B	B
	OVERALL	A	A
Corbett/Target Service Access (stop sign)	WB LT/RT	A	B
	SB LT/T	A	A
	OVERALL	A	A
Corbett/Lowes Service Access (stop sign)	EB LT/T/RT	A	A
	WB LT/T/RT	A	A
	NB LT/T/RT	A	A
	SB LT/T/RT	A	A
	OVERALL	A	A

**TABLE 6  
Long Range (2045) Total Peak Hour Operation**

Intersection	Movement	Level of Service	
		AM	PM
Ziegler/Council Tree-HP Access (signal)	EB T	D	E (63.4 secs)
	EB T/RT	D	E (72.9 secs)
	EB APPROACH	D	E (67.4 secs)
	WB LT	D	D
	WB T	D	D
	WB RT	D	D
	WB APPROACH	D	D
	NB LT	A	E (72.0 secs)
	NB T	A	B
	NB RT	A	A
	NB APPROACH	A	C
	SB LT	A	B
	SB T	A	D
	SB RT	A	C
	SB APPROACH	A	D
OVERALL	A	D	
Ziegler/Target Service Access (stop sign)	EB LT/RT	C	C
	NB LT	C	C
	OVERALL	A	A
Ziegler/Hidden Pond-Site Access (signal)	EB LT/T	D	D
	EB RT	D	D
	EB APPROACH	D	D
	WB LT/T/RT	D	D
	NB LT	A	C
	NB T	A	C
	NB T/RT	A	C
	NB APPROACH	A	C
	SB LT	A	B
	SB T	A	B
	SB RT	A	A
	SB APPROACH	A	B
OVERALL	A	B	
Ziegler/Paddington-Grand Teton (stop sign)	EB LT/T/RT	F (85.7 secs)	F (476.9 secs)
	WB LT/T/RT	F (648.7 secs)	F (723.7 secs)
	NB LT	C	C
	SB LT	B	C
	OVERALL	A	B
Corbett/Target Service Access (stop sign)	WB LT/RT	A	B
	SB LT/T	A	A
	OVERALL	A	A
Corbett/Lowes Service Access (stop sign)	EB LT/T/RT	A	A
	WB LT/T/RT	A	A
	NB LT/T/RT	A	A
	SB LT/T/RT	A	A
	OVERALL	A	A



Corbett/Target Service Access, and Corbett/Lowes Service Access-Site Access intersections. Calculation forms for these analyses are provided in Appendix H. The key intersections meet the Fort Collins level of service standards in the peak hours with the recommended/existing control and geometry.

## Pedestrian Level of Service

Appendix I shows a map of the area that is within 1320 feet of the Ziegler-Corbett/Union Park Mixed-Use site. The Ziegler-Corbett/Union Park Mixed-Use site is located within an area termed as "other," which sets the level of service threshold at LOS C for all measured factors. There are four destination areas within 1320 feet of the proposed Ziegler-Corbett/Union Park Mixed-Use site: 1) the residential area to the north and northwest of the site, 2) the commercial uses (Front Range Village) to the south and southwest of the site, 3) the HP Campus, and 4) the residential area to the east and northeast of the site. There are sidewalks along all streets in the area of the Ziegler-Corbett/Union Park Mixed-Use site. Sidewalks will be built throughout and adjacent to the development that will connect to existing nearby sidewalks along Ziegler Road and Corbett Road. A pedestrian/bike connection will be provided, connecting to the sidewalks along Paddington Road at Edmonds Road. There is no sidewalk on the south side of Paddington Road (Ziegler Road to Edmonds Road). This sidewalk should have been built with the English Ranch development. It is not the responsibility of the Ziegler-Corbett/Union Park Mixed-Use development to build this sidewalk since the Ziegler-Corbett/Union Park Mixed-Use development will not contribute pedestrian traffic along this segment of Paddington Road. As noted below, if the City of Fort Collins decides to signalize the Ziegler/Hidden Pond-Site Access intersection, there will be a safe, convenient pedestrian crossing at that intersection.

- **Directness** – The distance ratio to all pedestrian destinations is less than 1.2 (LOS A), except destination 4. The directness for destination 4 can be improved to LOS A with a traffic signal at the Ziegler/Hidden Pond-Site Access intersection.
- **Continuity** – The continuity to all pedestrian destinations will be acceptable at LOS B, since there are existing sidewalks adjacent to all the destination areas.
- **Street Crossings** – The street crossings will be acceptable at LOS B for destination areas 1 and 2. For destination areas 3 and 4, the LOS will be C crossing Ziegler Road at the Ziegler/Council Tree-HP Access signalized intersection and at the Ziegler/Hidden Pond-Site Access intersection, if the City decides to signalize it.
- **Visual Interest and Amenity** – The visual interest and amenity will be acceptable at LOS B for destination areas 1 and 2. For destination areas 3 and 4, the LOS will be C.
- **Security** – The security is acceptable at LOS B for destination areas 1 and 2. For destination areas 3 and 4, the LOS will be C.

## **Bicycle Level of Service**

Appendix I shows a map of the area that is within 1320 feet of the Ziegler-Corbett/Union Park Mixed-Use site. Based upon Fort Collins bicycle LOS criteria, there is one destination area within 1320 feet of the Ziegler-Corbett/Union Park Mixed-Use site: 1) the commercial uses (Front Range Village) to the south and southwest of the site. The bicycle level of service is acceptable. The bicycle LOS Worksheet is provided in Appendix I. There are bicycle lanes along Harmony Road, Ziegler Road, Corbett Drive, and Council Tree Avenue. Bicycle lanes are not required on local streets.

## **Transit Level of Service**

Currently, this area of Fort Collins is served by Transfort Route 16 service on Harmony Road.



#### IV. CONCLUSIONS/RECOMMENDATIONS

This study assessed the transportation impacts associated with the development of the Ziegler-Corbett/Union Park Mixed-Use in Fort Collins, Colorado. This study analyzed the transportation impacts in the short range (2028) and long range (2045) futures. As a result of these analyses, the following is concluded:

- Development of the Ziegler-Corbett/Union Park Mixed-Use site is feasible from a traffic engineering standpoint. The trip generation for full development of the Ziegler-Corbett/Union Park Mixed-Use site resulted in 5,390 daily trip ends, 458 morning peak hour trip ends, and 570 afternoon peak hour trip ends.
- Current operation at the Ziegler/Council Tree-HP Access, Ziegler/Target Service Access, Ziegler/Hidden Pond, Ziegler/Paddington-Grand Teton, Corbett/Target Service Access, and Corbett/Lowes Service Access intersections is acceptable based upon City of Fort Collins evaluation criteria.
- As part of discussions (mid-2022), a preliminary signal warrant evaluation of the Ziegler/Hidden Pond-Site Access intersection was conducted. The Warrant 3/Peak Hour/Category A criteria was evaluated. It was concluded that the signal would be warranted.
- Figures 12 and 13 respectively show schematics of the short range (2028) and long range (2045) geometry.
- With short range (2028) traffic and the Ziegler-Corbett/Union Park Mixed-Use development, the key intersections meet the Fort Collins level of service standards in the peak hours with the recommended/existing control and geometry.
- With long range (2045) traffic and the key intersections will meet the Fort Collins level of service standards in the peak hours using the recommended/existing control and geometry.
- With signalization of the Ziegler/Hidden Pond-Site Access intersection the pedestrian level of service will be acceptable. The bicycle level of service will be acceptable. Transfort Route 16 provides service on Harmony Road.



# APPENDIX A

**Attachment A  
Transportation Impact Study Base Assumptions**

<b>Project Information</b>		
Project Name <u>ZIEGLER-CORBETT MIXED-USE</u>		
Project Location <u>WEST OF ZIEGLER, NORTH OF FRONT RANGE VILLAGE</u>		
<b>TIS Assumptions</b>		
Type of Study	Full: <u>YES</u>	Intermediate: <u>NO</u>
	MTIS: <u>NO</u>	Memo: <u>NO</u>
Study Area Boundaries	North: <u>PADDINGTON</u>	South: <u>COUNCIL TREE</u>
	East: <u>ZIEGLER</u>	West: <u>CORBETT</u>
Study Years	Short Range: <u>2028 (5%)</u> Long Range: <u>2045</u>	
Future Traffic Growth Rate	<u>2% / YEAR</u>	
Study Intersections	1. All access drives ( <u>ZIEGLER</u> ) <sup>5.</sup>	Corbett- access drive
	2. <u>ZIEGLER/PADDINGTON</u> <sup>6.</sup>	
	3. <u>ZIEGLER/SITE- HIDDEN POND</u> <sup>7.</sup>	
	4. <u>ZIEGLER/COUNCIL TREE</u> <sup>8.</sup>	
Time Period for Study	<u>AM: 7:00-9:00</u> <u>PM: 4:00-6:00</u>	Sat Noon: <u>NO</u>
Trip Generation Rates	<u>PER ITE (LIMITED)</u>	
Trip Adjustment Factors	Passby: <u>N/A</u>	Captive Market: <u>N/A CONSERVATIVE</u>
Overall Trip Distribution	SEE ATTACHED SKETCH	
Mode Split Assumptions	<u>ALL MOTOR VEHICLE (CONSERVATIVE)</u>	
Design Vehicle Information	<u>PASSENGER CAR</u>	
Committed Roadway Improvements	<u>NOT AWARE OF ANY (CITY PROVIDED)</u>	
Other Traffic Studies	<u>NOT AWARE OF ANY (CITY PROVIDED)</u>	
Areas Requiring Special Study	<u>SIGNAL WARRANT AT ZIEGLER/SITE- HIDDEN POND</u>	

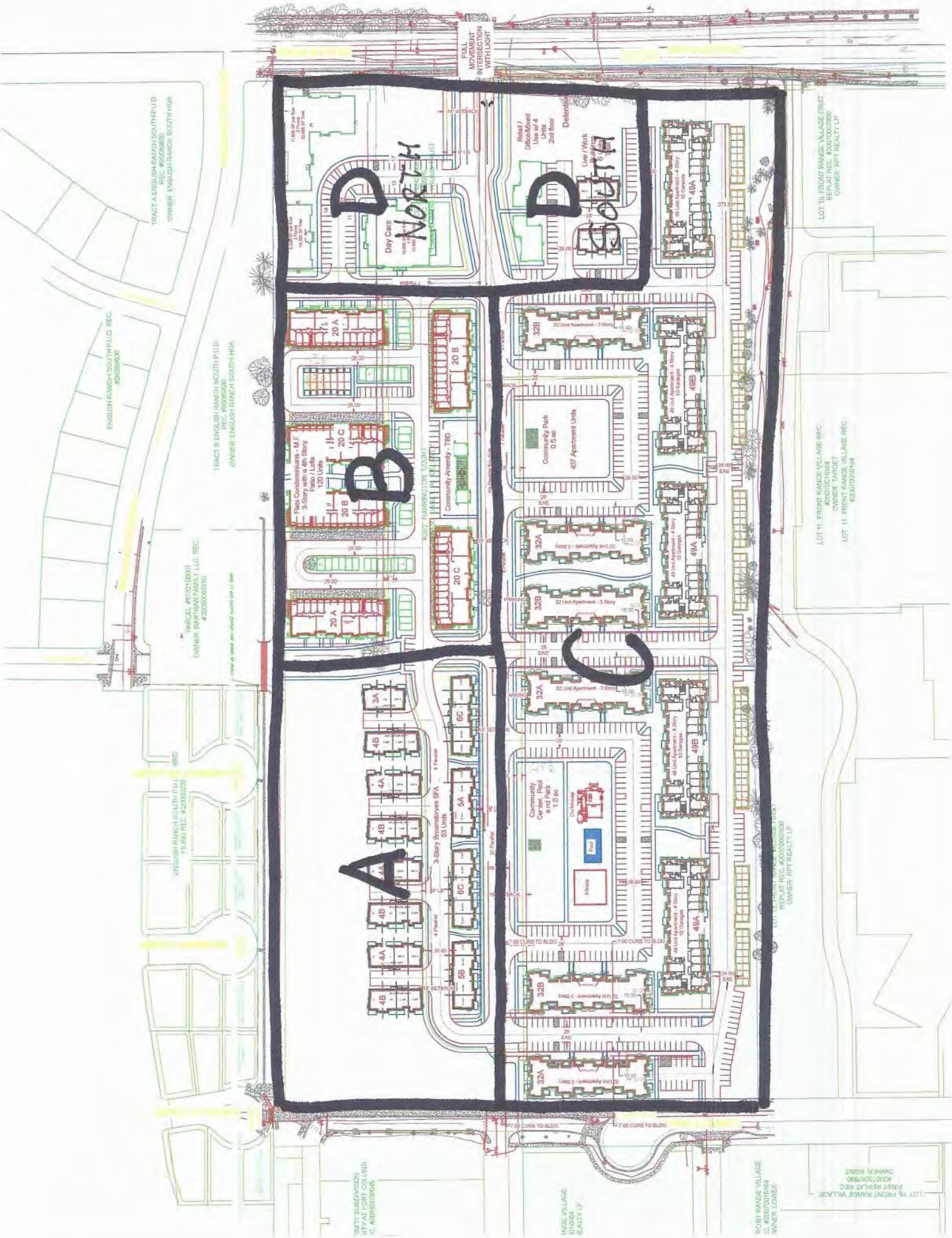
Date: JANUARY 16, 2023

Traffic Engineer: DELICH ASSOCIATES

Local Entity Engineer: Steven Gilchrist 01/23/2023

**2233 BAF**





TRACT A ENGLISH RANCH SOUTH PUD  
REC. #20000280  
OWNER: ENGLISH RANCH SOUTH HOA

ENGLISH RANCH SOUTH PUD REC.  
#20000280

TRACT B ENGLISH RANCH SOUTH PUD  
REC. #20000280  
OWNER: ENGLISH RANCH SOUTH HOA

PARCEL #20250001  
OWNER: BARRANT FAMILY LTD REC.  
#20000280

TRACT A ENGLISH RANCH SOUTH PUD  
REC. #20000280

UNITY SUBDIVISION  
MAYAL CRT COLINS  
C. #20000280

EDGE VILLAGE  
KINGA  
EATLY LP

FRONT RANGE VILLAGE  
S. #20000164  
OWNER: LOWES

LOT 16 FRONT RANGE VILLAGE  
REPLAT REC. #20000280  
OWNER: BARRANT

LOT 11 FRONT RANGE VILLAGE REC.  
#20000164  
OWNER: TARGET

LOT 11 FRONT RANGE VILLAGE REC.  
#20000164  
OWNER: TARGET

LOT 10 FRONT RANGE VILLAGE REC.  
REPLAT REC. #20000280  
OWNER: RPT REALTY LP

FULL MOVEMENT  
INTERSECTION  
WITH LIGHT

**D**  
NORTH  
Dry Care

**D**  
SOUTH  
Retail /  
Office/Store  
Units  
4  
Units  
2nd floor  
Detached  
Live /Mick  
6 Units

**B**  
RIDGE TRANSDORION LOOKOUT  
Community Amenities - TBD  
Community Park  
0.5 ac  
437 Apartment Units

**C**  
Community Center, Pool  
and Park  
1.0 ac  
Chickadee  
Playhouse  
Playset

**A**  
3-Story Rowtownhome SFA  
53 Units

11.95 ac Site Area  
2.71 ac Impervious  
10.24 ac Total Area

11.95 ac Site Area  
2.71 ac Impervious  
10.24 ac Total Area

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**TABLE 2  
Trip Generation**

Code	Use	Size	AWDTE		AM Peak Hour				PM Peak Hour			
			Rate	Trips	Rate	In	Rate	Out	Rate	In	Rate	Out
Area A												
215	Single Family Attached	53 D.U.	EQ	354	EQ	5	EQ	17	EQ	17	EQ	11
Area B												
220	Low-Rise Multifamily	120 D.U.	EQ	844	EQ	14	EQ	46	EQ	45	EQ	27
Area C												
220	Low-Rise Multifamily	192 D.U.	EQ	1306	EQ	20	EQ	62	EQ	65	EQ	38
221	Mid-Rise Multifamily	245 D.U.	EQ	1122	EQ	22	EQ	74	EQ	58	EQ	38
Subtotal				2428		42		136		123		76
Area D South												
215	Single Family Attached	8 D.U.	7.20	58	0.12	1	0.36	3	0.34	3	0.23	2
220	Low-Rise Multifamily	4 D.U.	6.74	26	0.10	0	0.30	2	0.32	1	0.19	1
712	Small Office	5.356 KSF	14.39	78	1.37	7	0.30	2	0.73	4	1.43	8
Subtotal				162		8		7		8		11
Area D North												
822	Shopping Plaza <40 KSF	16.825 KSF	54.45	916	1.42	24	0.94	16	3.295	55	3.295	55
710	Office	16.825 KSF	10.84	182	1.34	23	0.18	3	0.24	4	1.20	20
565	Day Care Center	10.6 KSF	47.62	504	5.83	62	5.17	55	5.23	55	5.89	63
Subtotal				1602		109		74		114		138
<b>Total (High)</b>				<b>5390</b>		<b>178</b>		<b>280</b>		<b>307</b>		<b>263</b>



Untitled Map  
Write a description for your map.



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SITE

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TRIP DISTRIBUTION  
RESIDENTIAL/COMMERCIAL

Google Earth

© 2021 Google

2000 ft



E Harmony Rd

E Horsetooth Rd

ENGLISH RANCH

Paddington Rd

Ziegler Rd

Ziegler Rd

WOODLAND PARK

Technology Parkway



## APPENDIX B



**DELICH ASSOCIATES**  
 2272 GLEN HAVEN DRIVE  
 LOVELAND, CO 80538  
 Phone: (970) 669-2061

## TABULAR SUMMARY OF VEHICLE COUNTS

Date: 8/13/2019                      Observer: City of Fort Collins

Day: Tuesday                              Jurisdiction: Fort Collins

**Intersection:      Ziegler/Council Tree-HP Access**

R = right turn  
 S = straight  
 L = left turn

Time Begins	Northbound: Ziegler				Southbound: Ziegler				Total north/south	Eastbound: Council Tree				Westbound: HP Access				Total east/west	Total All
	L	S	R	Total	L	S	R	Total		L	S	R	Total	L	S	R	Total		
7:30	18	150	9	177	15	196	10	221	398	8	5	22	35	0	0	0	0	35	433
7:45	28	148	10	186	34	178	29	241	427	9	2	18	29	1	3	2	6	35	462
8:00	28	122	11	161	22	150	24	196	357	13	4	20	37	1	2	1	4	41	398
8:15	26	133	17	176	29	139	21	189	365	10	5	14	29	0	2	0	2	31	396

7:30-8:30	100	553	47	700	100	663	84	847	1547	40	16	74	130	2	7	3	12	142	1689
PHF	0.89	0.92	0.69	0.94	0.74	0.85	0.72	0.88		0.77	0.8	0.84	0.88	0.5	0.58	0.38	0.5		0.91

4:30	80	198	2	280	7	174	22	203	483	52	4	68	124	10	7	26	43	167	650
4:45	62	194	2	258	10	218	17	245	503	58	16	79	153	16	23	32	71	224	727
5:00	82	227	3	312	12	231	22	265	577	41	2	67	110	16	8	40	64	174	751
5:15	51	160	4	215	7	179	31	217	432	58	7	51	116	15	5	20	40	156	588

4:30-5:30	275	779	11	1065	36	802	92	930	1995	209	29	265	503	57	43	118	218	721	2716
PHF	0.84	0.86	0.69	0.85	0.75	0.87	0.74	0.88		0.9	0.45	0.84	0.82	0.89	0.47	0.74	0.77		0.9

**DELICH ASSOCIATES**  
 2272 GLEN HAVEN DRIVE  
 LOVELAND, CO 80538  
 Phone: (970) 669-2061

## TABULAR SUMMARY OF VEHICLE COUNTS

Date: 9/28/2021

Observer: Vickie

Day: Tuesday

Jurisdiction: Fort Collins

**Intersection: Ziegler/Target Service Access**

R = right turn  
 S = straight  
 L = left turn

Time Begins	Northbound: Ziegler				Southbound: Ziegler				Total north/south	Eastbound: Service Access				Westbound:				Total east/west	Total All
	L	S	R	Total	L	S	R	Total		L	S	R	Total	L	S	R	Total		
7:30	0	259		259		264	14	278	537	3		2	5				0	5	542
7:45	2	219		221		280	18	298	519	5		3	8				0	8	527
8:00	3	219		222		220	9	229	451	2		2	4				0	4	455
8:15	4	214		218		199	8	207	425	5		4	9				0	9	434

7:30-8:30	9	911	0	920	0	963	49	1012	1932	15	0	11	26	0	0	0	0	26	1958
PHF	0.56	0.88	n/a	0.89	n/a	0.86	0.68	0.85		0.75	n/a	0.69	0.72	n/a	n/a	n/a	n/a		0.9

4:30	5	278		283		236	25	261	544	15		20	35				0	35	579
4:45	2	258		260		268	29	297	557	7		11	18				0	18	575
5:00	1	311		312		263	21	284	596	15		18	33				0	33	629
5:15	5	300		305		282	30	312	617	12		12	24				0	24	641

4:30-5:30	13	1147	0	1160	0	1049	105	1154	2314	49	0	61	110	0	0	0	0	110	2424
PHF	0.65	0.92	n/a	0.93	n/a	0.93	0.88	0.92		0.82	n/a	0.76	0.79	n/a	n/a	n/a	n/a		0.95



**DELICH ASSOCIATES**  
 2272 GLEN HAVEN DRIVE  
 LOVELAND, CO 80538  
 Phone: (970) 669-2061

## TABULAR SUMMARY OF VEHICLE COUNTS

Date: 9/28/2021

Observer: Vickie

Day: Tuesday

Jurisdiction: Fort Collins

**Intersection: Ziegler/Hidden Pond**

R = right turn  
 S = straight  
 L = left turn

Time Begins	Northbound: Ziegler				Southbound: Ziegler				Total north/south	Eastbound:				Westbound: Hidden Pond				Total east/west	Total All
	L	S	R	Total	L	S	R	Total		L	S	R	Total	L	S	R	Total		
7:30		262	0	262	1	278		279	541				0	0		4	4	4	545
7:45		223	1	224	0	298		298	522				0	0		1	1	1	523
8:00		219	2	221	0	226		226	447				0	3		1	4	4	451
8:15		218	1	219	0	207		207	426				0	0		0	0	0	426

7:30-8:30	0	922	4	926	1	1009	0	1010	1936	0	0	0	0	3	0	6	9	9	1945
PHF	n/a	0.88	0.5	0.88	0.25	0.85	n/a	0.85		n/a	n/a	n/a	n/a	0.25	n/a	0.38	0.56		0.89

4:30		293	0	293	0	261		261	554				0	0		0	0	0	554
4:45		265	0	265	1	297		298	563				0	0		2	2	2	565
5:00		326	0	326	0	283		283	609				0	1		0	1	1	610
5:15		311	1	312	0	312		312	624				0	0		1	1	1	625

4:30-5:30	0	1195	1	1196	1	1153	0	1154	2350	0	0	0	0	1	0	3	4	4	2354
PHF	n/a	0.92	0.25	0.92	0.25	0.92	n/a	0.92		n/a	n/a	n/a	n/a	0.25	n/a	0.38	0.5		0.94

**DELICH ASSOCIATES**  
 2272 GLEN HAVEN DRIVE  
 LOVELAND, CO 80538  
 Phone: (970) 669-2061

## TABULAR SUMMARY OF VEHICLE COUNTS

Date: 9/29/2021                      Observer: Vickie  
 Day: Wednesday                      Jurisdiction: Fort Collins

**Intersection:      Ziegler/Paddington-Grand Teton**

R = right turn  
 S = straight  
 L = left turn

Time Begins	Northbound: Ziegler				Southbound: Ziegler				Total north/south	Eastbound: Paddington				Westbound: Grand Teton				Total east/west	Total All
	L	S	R	Total	L	S	R	Total		L	S	R	Total	L	S	R	Total		
7:30	4	233	1	238	1	251	0	252	490	0	0	21	21	3	0	3	6	27	517
7:45	12	223	4	239	3	293	0	296	535	1	0	17	18	4	0	5	9	27	562
8:00	6	207	3	216	1	277	1	279	495	0	0	8	8	2	0	3	5	13	508
8:15	10	217	2	229	0	199	1	200	429	1	0	11	12	8	0	4	12	24	453

7:30-8:30	32	880	10	922	5	1020	2	1027	1949	2	0	57	59	17	0	15	32	91	2040
PHF	0.67	0.94	0.63	0.96	0.42	0.87	0.5	0.87		0.5	n/a	0.68	0.7	0.53	n/a	0.75	0.67		0.91

4:30	14	276	2	292	0	282	2	284	576	0	0	15	15	1	0	2	3	18	594
4:45	21	302	6	329	5	266	2	273	602	1	0	9	10	1	0	1	2	12	614
5:00	18	327	6	351	5	305	2	312	663	1	0	15	16	2	0	4	6	22	685
5:15	21	304	3	328	5	296	2	303	631	0	0	18	18	2	0	5	7	25	656

4:30-5:30	74	1209	17	1300	15	1149	8	1172	2472	2	0	57	59	6	0	12	18	77	2549
PHF	0.88	0.92	0.71	0.93	0.75	0.94	1	0.94		0.5	n/a	0.79	0.82	0.75	n/a	0.6	0.64		0.93



DELICH ASSOCIATES  
 2272 GLEN HAVEN DRIVE  
 LOVELAND, CO 80538  
 Phone: (970) 669-2061

**TABULAR SUMMARY OF VEHICLE COUNTS**

Date: 1/25/2023 Observer: Vickie  
 Day: Wednesday Jurisdiction: Fort Collins

Intersection: Corbett/Target Service Drive

R = right turn  
 S = straight  
 L = left turn

Time Begins	Northbound: Corbett				Southbound: Corbett				Total north/south	Eastbound:				Westbound: Target Service				Total east/west	Total All
	L	S	R	Total	L	S	R	Total		L	S	R	Total	L	S	R	Total		
7:00		2	0	2	0	1		1	3				0	2		0	2	2	5
7:15		1	1	2	1	3		4	6				0	2		0	2	2	8
7:30		2	3	5	1	2		3	8				0	6		0	6	6	14
7:45		3	1	4	1	2		3	7				0	7		0	7	7	14
8:00		4	2	6	1	6		7	13				0	8		0	8	8	21
8:15		5	1	6	0	9		9	15				0	6		0	6	6	21
8:30		1	2	3	0	5		5	8				0	10		1	11	11	19
8:45		4	3	7	2	6		8	15				0	6		2	8	8	23

8:00-9:00	0	14	8	22	3	26	0	29	51	0	0	0	0	30	0	3	33	33	84
PHF	n/a	0.7	0.67	0.79	0.38	0.72	n/a	0.81	0.85	n/a	n/a	n/a	n/a	0.75	n/a	0.38	0.75	0.75	0.91

4:00		10	7	17	0	4		4	21				0	6		0	6	6	27
4:15		7	6	13	2	5		7	20				0	15		1	16	16	36
4:30		7	8	15	1	5		6	21				0	8		2	10	10	31
4:45		2	4	6	1	4		5	11				0	9		2	11	11	22
5:00		5	6	11	0	2		2	13				0	8		0	8	8	21
5:15		4	5	9	1	3		4	13				0	4		0	4	4	17
5:30		2	1	3	1	4		5	8				0	7		2	9	9	17
5:45		3	6	9	0	3		3	12				0	3		0	3	3	15

4:00-5:00	0	26	25	51	4	18	0	22	73	0	0	0	0	38	0	5	43	43	116
PHF	n/a	0.65	0.78	0.75	0.5	0.9	n/a	0.79	0.87	n/a	n/a	n/a	n/a	0.63	n/a	0.63	0.67	0.67	0.81

DELICH ASSOCIATES  
 2272 GLEN HAVEN DRIVE  
 LOVELAND, CO 80538  
 Phone: (970) 669-2061

**TABULAR SUMMARY OF VEHICLE COUNTS**

Date: 1/25/2023 Observer: Vickie  
 Day: Wednesday Jurisdiction: Fort Collins

Intersection: Corbett/Lowes Service Drive

R = right turn  
 S = straight  
 L = left turn

Time Begins	Northbound: Corbett				Southbound: Corbett				Total north/south	Eastbound: Lowes Service				Westbound:				Total east/west	Total All
	L	S	R	Total	L	S	R	Total		L	S	R	Total	L	S	R	Total		
7:00	0	2		2		1	0	1	3	0		0	0				0	0	3
7:15	1	0		1		4	0	4	5	0		0	0				0	0	5
7:30	0	2		2		3	0	3	5	0		0	0				0	0	5
7:45	1	2		3		2	0	2	5	0		1	1				0	1	6
8:00	1	3		4		6	0	6	10	0		1	1				0	1	11
8:15	0	5		5		8	0	8	13	0		1	1				0	1	14
8:30	0	2		2		4	0	4	6	0		1	1				0	1	7
8:45	0	6		6		6	0	6	12	0		2	2				0	2	14

8:00-9:00	1	16	0	17	0	24	0	24	41	0	0	5	5	0	0	0	0	5	46
PHF	0.25	0.67	n/a	0.71	n/a	0.75	n/a	0.75	0.79	n/a	n/a	0.63	0.63	n/a	n/a	n/a	n/a	0.63	0.82

4:00	1	9		10		4	0	4	14	0		0	0				0	0	14
4:15	1	7		8		6	0	6	14	0		1	1				0	1	15
4:30	0	9		9		5	0	5	14	0		1	1				0	1	15
4:45	0	4		4		4	0	4	8	0		1	1				0	1	9
5:00	0	5		5		2	0	2	7	0		0	0				0	0	7
5:15	0	4		4		4	0	4	8	0		0	0				0	0	8
5:30	0	4		4		4	0	4	8	0		1	1				0	1	9
5:45	1	2		3		2	0	2	5	0		1	1				0	1	6
























4:00-5:00	2	29	0	31	0	19	0	19	50	0	0	3	3	0	0	0	0	3	53
PHF	0.5	0.81	n/a	0.78	n/a	0.79	n/a	0.79	0.89	n/a	n/a	0.75	0.75	n/a	n/a	n/a	n/a	0.75	0.88

# APPENDIX C



HCM 6th Signalized Intersection Summary  
9: Ziegler & Council Tree/Broadcom

Recent AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	16	74	2	7	3	100	874	47	100	832	84
Future Volume (veh/h)	40	16	74	2	7	3	100	874	47	100	832	84
Initial Q(Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	44	18	2	2	8	1	110	960	15	110	914	60
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	141	96	11	131	108	92	547	2755	1229	543	2755	1229
Arrive On Green	0.06	0.06	0.05	0.06	0.06	0.06	0.04	0.78	0.78	0.04	0.78	0.78
Sat Flow, veh/h	1406	1654	184	1392	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	44	0	20	2	8	1	110	960	15	110	914	60
Grp Sat Flow(s),veh/h/ln	1406	0	1837	1392	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.4	0.0	1.1	0.2	0.4	0.1	1.3	9.1	0.2	1.3	8.6	1.0
Cycle Q Clear(g_c), s	3.8	0.0	1.1	1.3	0.4	0.1	1.3	9.1	0.2	1.3	8.6	1.0
Prop In Lane	1.00		0.10	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	141	0	106	131	108	92	547	2755	1229	543	2755	1229
V/C Ratio(X)	0.31	0.00	0.19	0.02	0.07	0.01	0.20	0.35	0.01	0.20	0.33	0.05
Avail Cap(c_a), veh/h	405	0	451	393	459	389	598	2755	1229	805	2755	1229
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.8	0.0	49.4	50.0	49.0	48.9	2.3	3.8	2.8	2.4	3.7	2.9
Incr Delay (d2), s/veh	1.2	0.0	0.8	0.0	0.3	0.0	0.2	0.3	0.0	0.2	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.5	0.1	0.2	0.0	0.3	2.3	0.1	0.3	2.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.1	0.0	50.3	50.0	49.3	48.9	2.5	4.2	2.8	2.6	4.1	3.0
LnGrp LOS	D	A	D	D	D	D	A	A	A	A	A	A
Approach Vol, veh/h		64			11			1085			1084	
Approach Delay, s/veh		51.5			49.4			4.0			3.8	
Approach LOS		D			D			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.9	90.8		11.4	7.9	90.8		11.4				
Change Period (Y+Rc), s	4.0	6.5		6.0	4.0	6.5		6.0				
Max Green Setting (Gmax), s	7.0	60.5		26.0	20.0	47.5		26.0				
Max Q Clear Time (g_c+1), s	3.3	10.6		5.8	3.3	11.1		3.3				
Green Ext Time (p_c), s	0.1	7.3		0.1	0.2	7.4		0.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				5.5								
HCM 6th LOS				A								

Timing Report, Sorted By Phase  
 9: Ziegler & Council Tree/Broadcom

Recent AM

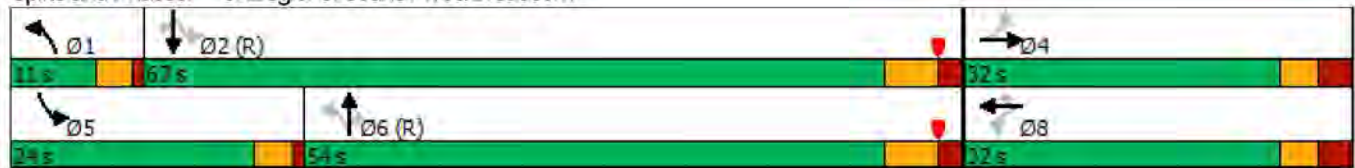


Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	EBTL	SBL	NBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	11	67	32	24	54	32
Maximum Split (%)	10.0%	60.9%	29.1%	21.8%	49.1%	29.1%
Minimum Split (s)	11	28.5	32	11	29.5	32
Yellow Time (s)	3	4.5	3	3	4.5	3
All-Red Time (s)	1	2	3	1	2	3
Minimum Initial (s)	4	7	4	4	7	4
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		14	19		16	19
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	36	47	4	36	60	4
End Time (s)	47	4	36	60	4	36
Yield/Force Off (s)	43	107.5	30	56	107.5	30
Yield/Force Off 170(s)	43	93.5	11	56	91.5	11
Local Start Time (s)	32	43	0	32	56	0
Local Yield (s)	39	103.5	26	52	103.5	26
Local Yield 170(s)	39	89.5	7	52	87.5	7

Intersection Summary

Cycle Length 110  
 Control Type Actuated-Coordinated  
 Natural Cycle 75  
 Offset: 4 (4%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red












Splits and Phases: 9: Ziegler & Council Tree/Broadcom



## Queues

Recent AM
























## 9: Ziegler &amp; Council Tree/Broadcom

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	44	99	2	8	3	110	960	52	110	914	92
v/c Ratio	0.28	0.38	0.01	0.04	0.01	0.22	0.39	0.05	0.23	0.37	0.08
Control Delay	45.6	16.5	37.0	38.1	0.0	4.2	9.2	0.1	4.3	8.5	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
Total Delay	45.6	16.5	37.0	38.1	0.0	4.2	9.2	0.1	4.3	8.5	2.2
Queue Length 50th (ft)	30	12	1	5	0	10	120	0	10	112	0
Queue Length 95th (ft)	55	53	8	17	0	42	272	0	42	241	22
Internal Link Dist (ft)		262		234			488			523	
Turn Bay Length (ft)	100		150		40	420		340	400		400
Base Capacity (vph)	343	462	299	457	474	508	2440	1125	645	2457	1127
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.21	0.01	0.02	0.01	0.22	0.39	0.05	0.17	0.37	0.08
Intersection Summary											



HCM 6th Signalized Intersection Summary  
9: Ziegler & Council Tree/Broadcom

Recent PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	209	29	265	57	43	118	275	884	11	36	1011	92
Future Volume (veh/h)	209	29	265	57	43	118	275	884	11	36	1011	92
Initial Q(Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	232	32	80	63	48	14	306	982	1	40	1123	52
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	322	102	255	263	404	342	410	2270	1013	405	2053	916
Arrive On Green	0.22	0.22	0.21	0.22	0.22	0.22	0.09	0.64	0.64	0.03	0.58	0.58
Sat Flow, veh/h	1340	474	1184	1281	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	232	0	112	63	48	14	306	982	1	40	1123	52
Grp Sat Flow(s),veh/h/ln	1340	0	1657	1281	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	20.2	0.0	6.9	5.2	2.5	0.8	7.8	16.6	0.0	1.1	23.4	1.7
Cycle Q Clear(g_c), s	22.7	0.0	6.9	12.1	2.5	0.8	7.8	16.6	0.0	1.1	23.4	1.7
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	322	0	358	263	404	342	410	2270	1013	405	2053	916
V/C Ratio(X)	0.72	0.00	0.31	0.24	0.12	0.04	0.75	0.43	0.00	0.10	0.55	0.06
Avail Cap(c_a), veh/h	334	0	373	275	421	357	510	2270	1013	465	2053	916
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.0	0.0	39.9	44.7	37.9	37.2	14.5	10.8	7.8	9.7	15.6	11.1
Incr Delay (d2), s/veh	7.2	0.0	0.5	0.5	0.1	0.0	4.6	0.6	0.0	0.1	1.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	0.0	2.9	1.7	1.2	0.3	3.5	5.9	0.0	0.4	8.9	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.2	0.0	40.4	45.1	38.0	37.3	19.2	11.4	7.8	9.8	16.7	11.2
LnGrp LOS	D	A	D	D	D	D	B	B	A	A	B	B
Approach Vol, veh/h		344			125			1289			1215	
Approach Delay, s/veh		49.7			41.5			13.3			16.2	
Approach LOS		D			D			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.3	74.8		30.9	6.9	82.2		30.9				
Change Period (Y+Rc), s	4.0	6.5		6.0	4.0	6.5		6.0				
Max Green Setting (Gmax), s	17.0	60.5		26.0	7.0	70.5		26.0				
Max Q Clear Time (g_c+1), s	9.8	25.4		24.7	3.1	18.6		14.1				
Green Ext Time (p_c), s	0.5	9.3		0.2	0.0	7.9		0.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				19.9								
HCM 6th LOS				B								

Timing Report, Sorted By Phase  
 9: Ziegler & Council Tree/Broadcom

Recent PM

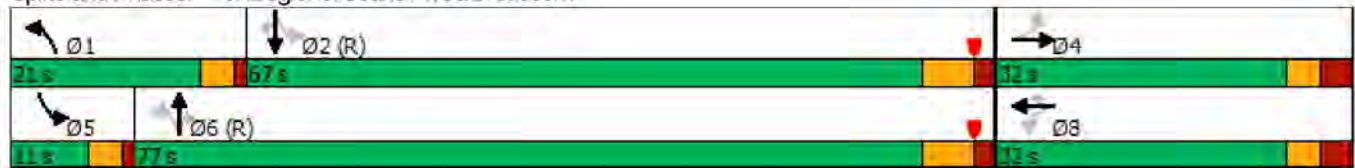


Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	EBTL	SBL	NBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	21	67	32	11	77	32
Maximum Split (%)	17.5%	55.8%	26.7%	9.2%	64.2%	26.7%
Minimum Split (s)	11	28.5	32	11	29.5	32
Yellow Time (s)	3	4.5	3	3	4.5	3
All-Red Time (s)	1	2	3	1	2	3
Minimum Initial (s)	4	7	4	4	7	4
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		14	19		16	19
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	36	57	4	36	47	4
End Time (s)	57	4	36	47	4	36
Yield/Force Off (s)	53	117.5	30	43	117.5	30
Yield/Force Off 170(s)	53	103.5	11	43	101.5	11
Local Start Time (s)	32	53	0	32	43	0
Local Yield (s)	49	113.5	26	39	113.5	26
Local Yield 170(s)	49	99.5	7	39	97.5	7

Intersection Summary

Cycle Length 120  
 Control Type Actuated-Coordinated  
 Natural Cycle 80  
 Offset: 4 (3%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red












Splits and Phases: 9: Ziegler & Council Tree/Broadcom



## Queues

Recent PM

## 9: Ziegler &amp; Council Tree/Broadcom

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	232	326	63	48	131	306	982	12	40	1123	102
v/c Ratio	0.84	0.63	0.86	0.13	0.31	0.75	0.43	0.01	0.10	0.56	0.11
Control Delay	71.3	17.3	117.9	38.5	8.4	22.4	12.5	0.0	6.4	19.3	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.3	17.3	117.9	38.5	8.4	22.4	12.5	0.0	6.4	19.3	3.1
Queue Length 50th (ft)	169	54	46	30	0	75	207	0	8	298	0
Queue Length 95th (ft)	#290	152	#131	63	51	172	260	0	18	386	28
Internal Link Dist (ft)		262		234			488			523	
Turn Bay Length (ft)	100		150		40	420		340	400		400
Base Capacity (vph)	304	549	81	419	457	449	2259	1033	416	1988	934
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.59	0.78	0.11	0.29	0.68	0.43	0.01	0.10	0.56	0.11

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.



Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		Y	↑↑	↑↑	
Traffic Vol, veh/h	15	11	9	908	1005	49
Future Vol, veh/h	15	11	9	908	1005	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	12	10	1009	1117	54

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	1669	586	1171	0	0
Stage 1	1144	-	-	-	-
Stage 2	525	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-
Pot Cap-1 Maneuver	87	454	592	-	-
Stage 1	266	-	-	-	-
Stage 2	558	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	86	454	592	-	-
Mov Cap-2 Maneuver	195	-	-	-	-
Stage 1	261	-	-	-	-
Stage 2	558	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.8	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	592	-	257	-	-
HCM Lane V/C Ratio	0.017	-	0.112	-	-
HCM Control Delay (s)	11.2	-	20.8	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘		↘	↑↑	↑↑	
Traffic Vol, veh/h	49	61	13	1198	1078	105
Future Vol, veh/h	49	61	13	1198	1078	105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	64	14	1261	1135	111

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	1850	623	1246	0	0
Stage 1	1191	-	-	-	-
Stage 2	659	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-
Pot Cap-1 Maneuver	66	429	554	-	-
Stage 1	251	-	-	-	-
Stage 2	476	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	64	429	554	-	-
Mov Cap-2 Maneuver	173	-	-	-	-
Stage 1	245	-	-	-	-
Stage 2	476	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	29.7	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	554	-	259	-	-
HCM Lane V/C Ratio	0.025	-	0.447	-	-
HCM Control Delay (s)	11.7	-	29.7	-	-
HCM Lane LOS	B	-	D	-	-
HCM 95th %tile Q(veh)	0.1	-	2.2	-	-

Intersection

Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘		↕		↘	↕
Traffic Vol, veh/h	3	6	919	4	1	1051
Future Vol, veh/h	3	6	919	4	1	1051
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	7	1033	4	1	1181

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1628	519	0	0	1037
Stage 1	1035	-	-	-	-
Stage 2	593	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	93	502	-	-	666
Stage 1	303	-	-	-	-
Stage 2	515	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	93	502	-	-	666
Mov Cap-2 Maneuver	213	-	-	-	-
Stage 1	303	-	-	-	-
Stage 2	514	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	346	666
HCM Lane V/C Ratio	-	-	0.029	0.002
HCM Control Delay (s)	-	-	15.7	10.4
HCM Lane LOS	-	-	C	B
HCM 95th %tile Q(veh)	-	-	0.1	0



HCM 6th TWSC  
18: Ziegler & Hidden Pond

Recent PM

Intersection

Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑↓		↘	↑↑
Traffic Vol, veh/h	1	3	1246	1	1	1182
Future Vol, veh/h	1	3	1246	1	1	1182
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	3	1326	1	1	1257

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1958	664	0	0	1327
Stage 1	1327	-	-	-	-
Stage 2	631	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	56	403	-	-	516
Stage 1	212	-	-	-	-
Stage 2	492	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	56	403	-	-	516
Mov Cap-2 Maneuver	156	-	-	-	-
Stage 1	212	-	-	-	-
Stage 2	491	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	289	516
HCM Lane V/C Ratio	-	-	0.015	0.002
HCM Control Delay (s)	-	-	17.6	12
HCM Lane LOS	-	-	C	B
HCM 95th %tile Q(veh)	-	-	0	0

HCM 6th TWSC  
15: Ziegler & Paddington/Grand Teton

Recent AM

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	2	0	55	16	0	15	32	883	10	5	981	2
Future Vol, veh/h	2	0	55	16	0	15	32	883	10	5	981	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	60	18	0	16	35	970	11	5	1078	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1644	2140	540	1595	2136	491	1080	0	0	981	0	0
Stage 1	1089	1089	-	1046	1046	-	-	-	-	-	-	-
Stage 2	555	1051	-	549	1090	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	66	48	486	72	49	523	641	-	-	699	-	-
Stage 1	230	290	-	244	304	-	-	-	-	-	-	-
Stage 2	484	302	-	488	289	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	61	45	486	60	46	523	641	-	-	699	-	-
Mov Cap-2 Maneuver	61	45	-	60	46	-	-	-	-	-	-	-
Stage 1	217	288	-	231	287	-	-	-	-	-	-	-
Stage 2	443	285	-	424	287	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16	54.9	0.4	0.1
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	641	-	-	391	105	699	-	-
HCM Lane V/C Ratio	0.055	-	-	0.16	0.324	0.008	-	-
HCM Control Delay (s)	10.9	-	-	16	54.9	10.2	-	-
HCM Lane LOS	B	-	-	C	F	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.6	1.3	0	-	-

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	2	0	55	6	0	12	71	1162	16	15	1122	8
Future Vol, veh/h	2	0	55	6	0	12	71	1162	16	15	1122	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	59	6	0	13	76	1249	17	16	1206	9

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2020	2661	608	2045	2657	633	1215	0	0	1266	0	0
Stage 1	1243	1243	-	1410	1410	-	-	-	-	-	-	-
Stage 2	777	1418	-	635	1247	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	34	22	439	33	22	422	570	-	-	545	-	-
Stage 1	185	245	-	145	203	-	-	-	-	-	-	-
Stage 2	356	201	-	433	244	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	29	19	439	25	19	422	570	-	-	545	-	-
Mov Cap-2 Maneuver	29	19	-	25	19	-	-	-	-	-	-	-
Stage 1	160	238	-	126	176	-	-	-	-	-	-	-
Stage 2	299	174	-	364	237	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	20.5		79.2		0.7		0.2	
HCM LOS	C		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	570	-	-	293	67	545	-	-
HCM Lane V/C Ratio	0.134	-	-	0.209	0.289	0.03	-	-
HCM Control Delay (s)	12.3	-	-	20.5	79.2	11.8	-	-
HCM Lane LOS	B	-	-	C	F	B	-	-
HCM 95th %tile Q(veh)	0.5	-	-	0.8	1	0.1	-	-



Intersection

Int Delay, s/veh 3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	30	3	14	8	3	26
Future Vol, veh/h	30	3	14	8	3	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	3	15	9	3	29

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	55	20	0
Stage 1	20	-	-
Stage 2	35	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	953	1058	-
Stage 1	1003	-	-
Stage 2	987	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	951	1058	-
Mov Cap-2 Maneuver	951	-	-
Stage 1	1003	-	-
Stage 2	985	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	960	1591
HCM Lane V/C Ratio	-	-	0.038	0.002
HCM Control Delay (s)	-	-	8.9	7.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th TWSC  
4: Corbett & Target Service Access

Recent PM

Intersection

Int Delay, s/veh 3.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	38	5	26	25	4	18
Future Vol, veh/h	38	5	26	25	4	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	6	31	29	5	21

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	77	46	0
Stage 1	46	-	-
Stage 2	31	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	926	1023	-
Stage 1	976	-	-
Stage 2	992	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	923	1023	-
Mov Cap-2 Maneuver	923	-	-
Stage 1	976	-	-
Stage 2	989	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	1.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	934	1544
HCM Lane V/C Ratio	-	-	0.054	0.003
HCM Control Delay (s)	-	-	9.1	7.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	0	5	1	16	24	0
Future Vol, veh/h	0	5	1	16	24	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	6	1	19	28	0

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	49	28	28	0	0
Stage 1	28	-	-	-	-
Stage 2	21	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	960	1047	1585	-	-
Stage 1	995	-	-	-	-
Stage 2	1002	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	959	1047	1585	-	-
Mov Cap-2 Maneuver	959	-	-	-	-
Stage 1	994	-	-	-	-
Stage 2	1002	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1585	-	1047	-	-
HCM Lane V/C Ratio	0.001	-	0.006	-	-
HCM Control Delay (s)	7.3	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-



Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	0	3	2	29	19	0
Future Vol, veh/h	0	3	2	29	19	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	2	34	22	0

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	60	22	22	0	0
Stage 1	22	-	-	-	-
Stage 2	38	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	947	1055	1593	-	-
Stage 1	1001	-	-	-	-
Stage 2	984	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	946	1055	1593	-	-
Mov Cap-2 Maneuver	946	-	-	-	-
Stage 1	1000	-	-	-	-
Stage 2	984	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.4	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1593	-	1055	-	-
HCM Lane V/C Ratio	0.001	-	0.003	-	-
HCM Control Delay (s)	7.3	0	8.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

## UNSIGNALIZED INTERSECTIONS

Level-of-Service	Average Total Delay sec/veh
A	$\leq 10$
B	$> 10$ and $\leq 15$
C	$> 15$ and $\leq 25$
D	$> 25$ and $\leq 35$
E	$> 35$ and $\leq 50$
F	$> 50$

## SIGNALIZED INTERSECTIONS

Level-of-Service	Average Total Delay sec/veh
A	$\leq 10$
B	$> 10$ and $\leq 20$
C	$> 20$ and $\leq 35$
D	$> 35$ and $\leq 55$
E	$> 55$ and $\leq 80$
F	$> 80$

**Table 4-2  
Fort Collins (GMA and City Limits)  
Motor Vehicle LOS Standards (Intersections)**

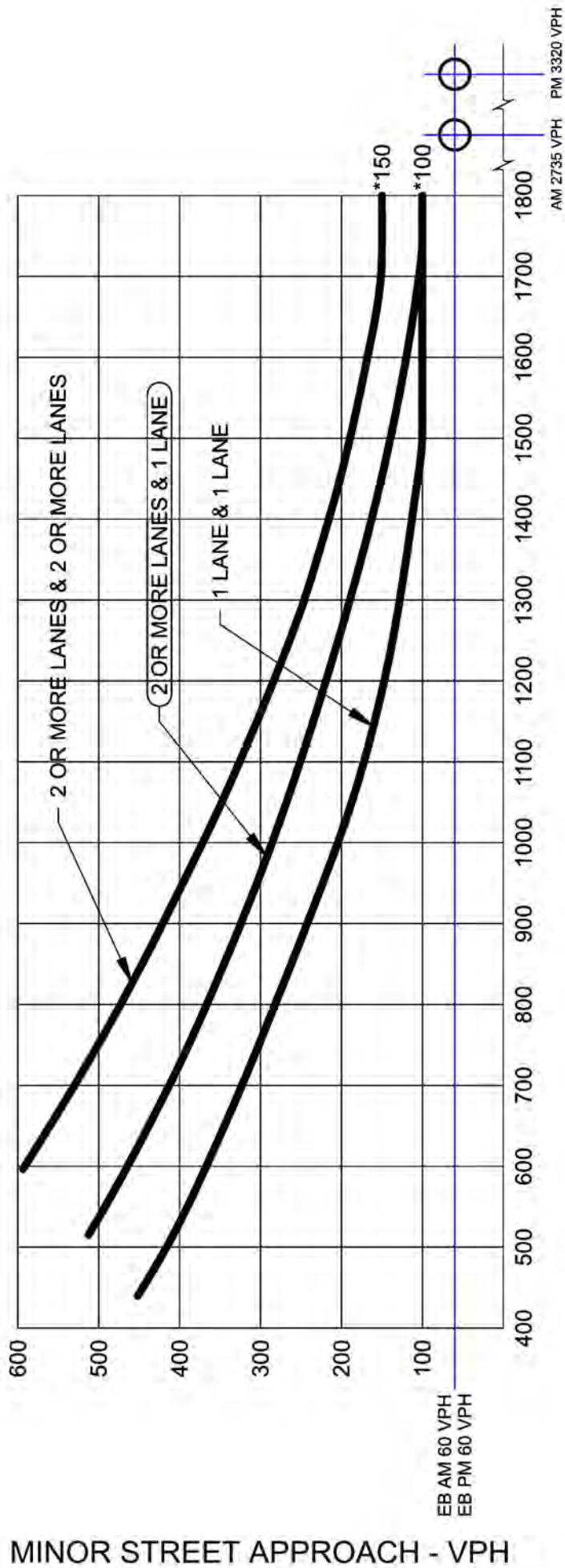
	Overall	Any Approach Leg	Any Movement
Signalized	D <sup>1</sup>	E	E <sup>2</sup>
Unsignalized Arterial/Arterial Collector/Collector	E <sup>3</sup>	F <sup>4</sup>	
Unsignalized Arterial/Collector Arterial/Local Collector/Local Local/Local	D <sup>3</sup>	F <sup>4</sup>	
Roundabout	E <sup>3,5</sup>	E <sup>5,4</sup>	E <sup>5</sup>
<sup>1</sup> In mixed use district including downtown as defined by structure plan, overall LOS E is acceptable <sup>2</sup> Applicable with at least 5% of total entering volume <sup>3</sup> Use weighed average to identify overall delay <sup>4</sup> Mitigation may be required <sup>5</sup> Apply unsignalized delay value thresholds to determine LOS			



# APPENDIX D

# FIGURE 4C-3. WARRANT 3, PEAK HOUR

MUTCD, 2003 EDITION, PAGE 4C-7



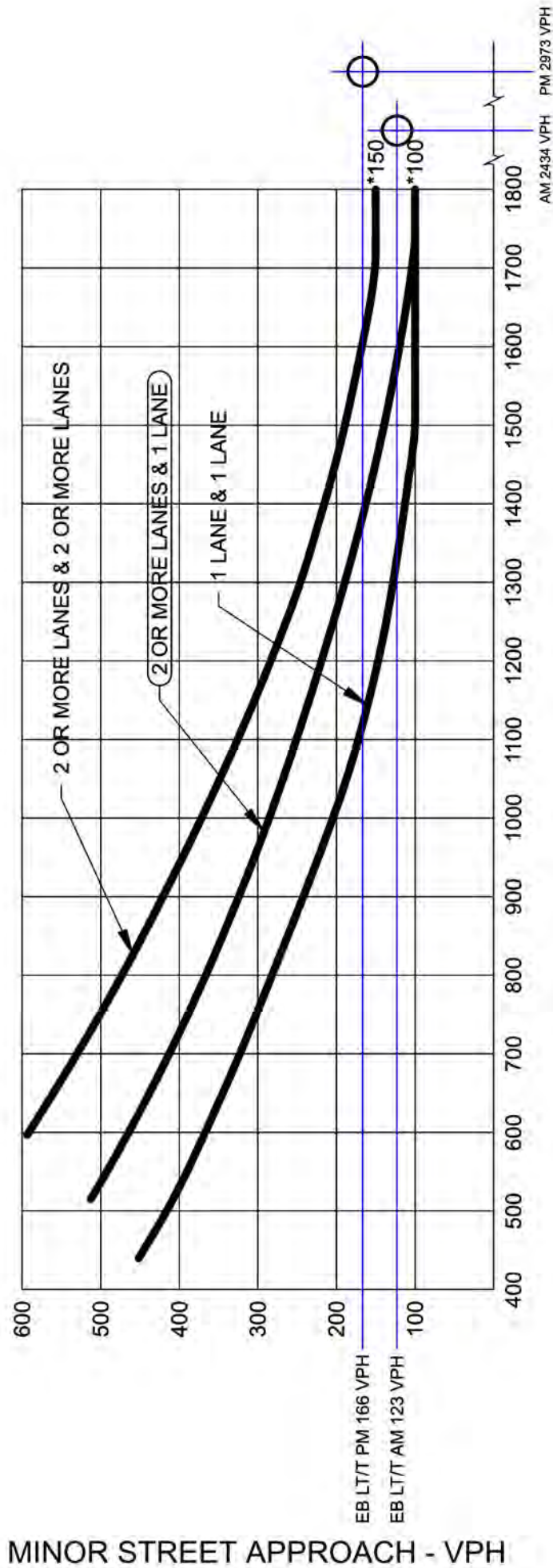
## MAJOR STREET - TOTAL OF BOTH APPROACH - VEHICLES PER HOUR (VPH)

\*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

LONG RANGE (2040) TOTAL PEAK HOUR WARRANT AT ZIEGLER/PADDINGTON-GRAND TETON INTERSECTION WITHOUT A CONNECTION TO PADDINGTON ROAD

# FIGURE 4C-3. WARRANT 3, PEAK HOUR

MUTCD, 2003 EDITION, PAGE 4C-7



## MAJOR STREET - TOTAL OF BOTH APPROACH - VEHICLES PER HOUR (VPH)

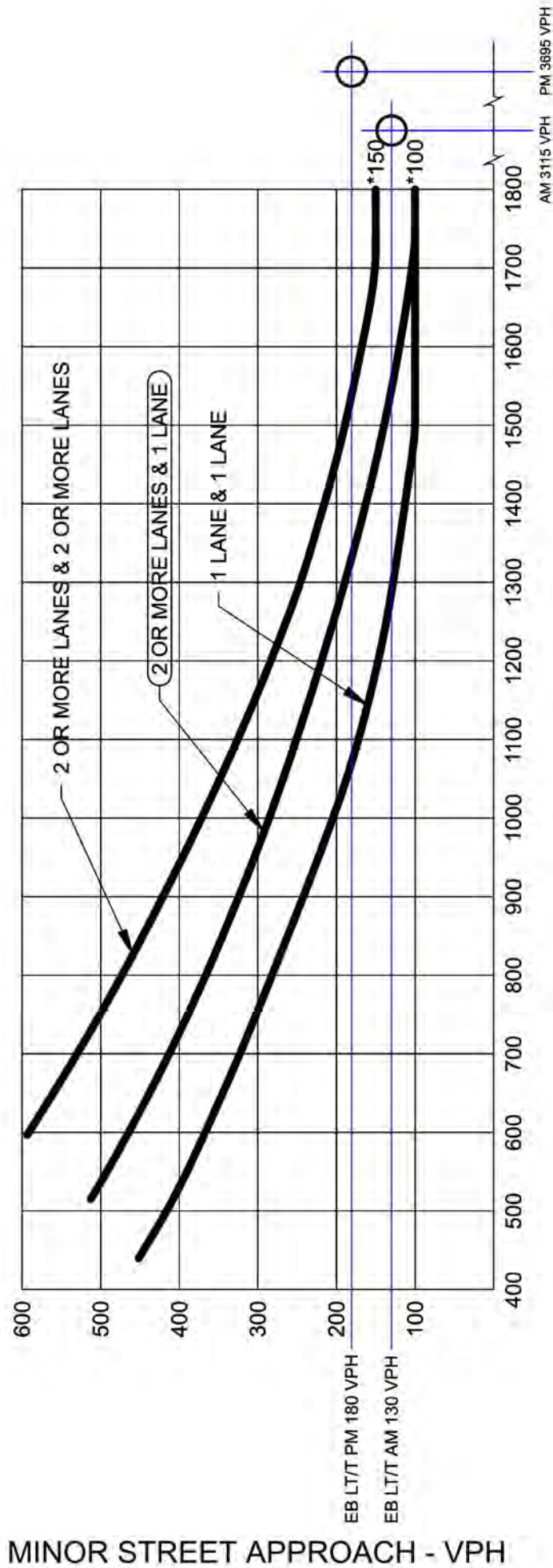
\*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

## SHORT RANGE (2028) TOTAL PEAK HOUR WARRANT AT ZIEGLER/HIDDEN POND-SITE ACCESS INTERSECTION



# FIGURE 4C-3. WARRANT 3, PEAK HOUR

MUTCD, 2003 EDITION, PAGE 4C-7



## MAJOR STREET - TOTAL OF BOTH APPROACH - VEHICLES PER HOUR (VPH)

\*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

## LONG RANGE (2045) TOTAL PEAK HOUR WARRANT AT ZIEGLER/HIDDEN POND-SITE ACCESS INTERSECTION

# APPENDIX E

HCM 6th Signalized Intersection Summary  
 9: Ziegler & Council Tree/Broadcom

Short Bkgrd AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	17	77	2	7	3	104	1044	49	104	994	88
Future Volume (veh/h)	42	17	77	2	7	3	104	1044	49	104	994	88
Initial Q(Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	46	19	3	2	8	1	114	1147	17	114	1092	64
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	144	94	15	133	112	95	471	2748	1226	465	2748	1226
Arrive On Green	0.06	0.06	0.05	0.06	0.06	0.06	0.04	0.77	0.77	0.04	0.77	0.77
Sat Flow, veh/h	1406	1577	249	1390	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	46	0	22	2	8	1	114	1147	17	114	1092	64
Grp Sat Flow(s),veh/h/ln	1406	0	1826	1390	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.5	0.0	1.3	0.2	0.4	0.1	1.4	11.9	0.3	1.4	11.1	1.0
Cycle Q Clear(g_c), s	4.0	0.0	1.3	1.4	0.4	0.1	1.4	11.9	0.3	1.4	11.1	1.0
Prop In Lane	1.00		0.14	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	144	0	109	133	112	95	471	2748	1226	465	2748	1226
V/C Ratio(X)	0.32	0.00	0.20	0.02	0.07	0.01	0.24	0.42	0.01	0.25	0.40	0.05
Avail Cap(c_a), veh/h	405	0	448	391	459	389	522	2748	1226	726	2748	1226
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.7	0.0	49.3	49.9	48.8	48.7	2.7	4.2	2.9	2.8	4.1	2.9
Incr Delay (d2), s/veh	1.3	0.0	0.9	0.0	0.3	0.0	0.3	0.5	0.0	0.3	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.6	0.1	0.2	0.0	0.3	3.0	0.1	0.3	2.8	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.0	0.0	50.2	49.9	49.1	48.7	2.9	4.6	2.9	3.1	4.5	3.0
LnGrp LOS	D	A	D	D	D	D	A	A	A	A	A	A
Approach Vol, veh/h		68			11			1278			1270	
Approach Delay, s/veh		51.4			49.2			4.5			4.3	
Approach LOS		D			D			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.9	90.5		11.6	7.9	90.5		11.6				
Change Period (Y+Rc), s	4.0	6.5		6.0	4.0	6.5		6.0				
Max Green Setting (Gmax), s	7.0	60.5		26.0	20.0	47.5		26.0				
Max Q Clear Time (g_c+1), s	3.4	13.1		6.0	3.4	13.9		3.4				
Green Ext Time (p_c), s	0.1	9.4		0.2	0.2	9.3		0.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				5.8								
HCM 6th LOS				A								



Timing Report, Sorted By Phase  
 9: Ziegler & Council Tree/Broadcom

Short Bkgrd AM

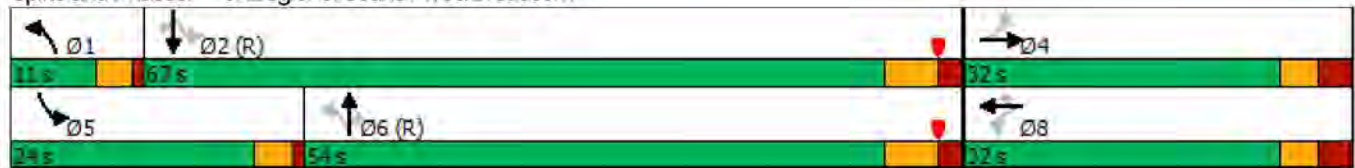


Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	EBTL	SBL	NBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	11	67	32	24	54	32
Maximum Split (%)	10.0%	60.9%	29.1%	21.8%	49.1%	29.1%
Minimum Split (s)	11	28.5	32	11	29.5	32
Yellow Time (s)	3	4.5	3	3	4.5	3
All-Red Time (s)	1	2	3	1	2	3
Minimum Initial (s)	4	7	4	4	7	4
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		14	19		16	19
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	36	47	4	36	60	4
End Time (s)	47	4	36	60	4	36
Yield/Force Off (s)	43	107.5	30	56	107.5	30
Yield/Force Off 170(s)	43	93.5	11	56	91.5	11
Local Start Time (s)	32	43	0	32	56	0
Local Yield (s)	39	103.5	26	52	103.5	26
Local Yield 170(s)	39	89.5	7	52	87.5	7

Intersection Summary












Cycle Length 110  
 Control Type Actuated-Coordinated  
 Natural Cycle 75  
 Offset: 4 (4%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 9: Ziegler & Council Tree/Broadcom


























Queues  
9: Ziegler & Council Tree/Broadcom

Short Bkgrd AM

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	46	104	2	8	3	114	1147	54	114	1092	97
v/c Ratio	0.29	0.40	0.01	0.04	0.01	0.27	0.47	0.05	0.28	0.45	0.09
Control Delay	45.8	16.5	37.0	38.0	0.0	4.8	10.1	0.1	4.9	9.3	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.8	16.5	37.0	38.0	0.0	4.8	10.1	0.1	4.9	9.3	2.1
Queue Length 50th (ft)	31	13	1	5	0	10	156	0	10	145	0
Queue Length 95th (ft)	57	54	8	17	0	44	347	1	44	305	23
Internal Link Dist (ft)		262		234			488			523	
Turn Bay Length (ft)	100		150		40	420		340	400		400
Base Capacity (vph)	343	465	291	457	474	430	2435	1123	578	2452	1126
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.22	0.01	0.02	0.01	0.27	0.47	0.05	0.20	0.45	0.09
Intersection Summary											

HCM 6th Signalized Intersection Summary  
9: Ziegler & Council Tree/Broadcom

Short Bkgrd PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	30	277	60	45	123	288	1056	11	38	1208	96
Future Volume (veh/h)	218	30	277	60	45	123	288	1056	11	38	1208	96
Initial Q(Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	242	33	116	67	50	17	320	1173	1	42	1342	51
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	330	81	285	240	418	354	362	2241	999	334	1980	883
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.11	0.63	0.63	0.03	0.56	0.56
Sat Flow, veh/h	1334	363	1277	1239	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	242	0	149	67	50	17	320	1173	1	42	1342	51
Grp Sat Flow(s),veh/h/ln	1334	0	1640	1239	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	21.2	0.0	9.4	5.9	2.6	1.0	9.4	21.8	0.0	1.2	32.2	1.8
Cycle Q Clear(g_c), s	23.8	0.0	9.4	15.2	2.6	1.0	9.4	21.8	0.0	1.2	32.2	1.8
Prop In Lane	1.00		0.78	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	330	0	367	240	418	354	362	2241	999	334	1980	883
V/C Ratio(X)	0.73	0.00	0.41	0.28	0.12	0.05	0.88	0.52	0.00	0.13	0.68	0.06
Avail Cap(c_a), veh/h	332	0	369	242	421	357	439	2241	999	393	1980	883
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.7	0.0	40.1	46.3	37.2	36.6	22.9	12.2	8.2	11.1	18.9	12.2
Incr Delay (d2), s/veh	8.1	0.0	0.7	0.6	0.1	0.1	16.5	0.9	0.0	0.2	1.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	0.0	3.9	1.9	1.2	0.4	6.6	7.9	0.0	0.4	12.6	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.8	0.0	40.9	46.9	37.3	36.6	39.4	13.1	8.2	11.2	20.8	12.3
LnGrp LOS	D	A	D	D	D	D	D	B	A	B	C	B
Approach Vol, veh/h		391			134			1494			1435	
Approach Delay, s/veh		49.5			42.0			18.7			20.2	
Approach LOS		D			D			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.8	72.4		31.8	7.0	81.2		31.8				
Change Period (Y+Rc), s	4.0	6.5		6.0	4.0	6.5		6.0				
Max Green Setting (Gmax), s	17.0	60.5		26.0	7.0	70.5		26.0				
Max Q Clear Time (g_c+1), s	11.4	34.2		25.8	3.2	23.8		17.2				
Green Ext Time (p_c), s	0.5	10.8		0.0	0.0	10.2		0.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				23.7								
HCM 6th LOS				C								



Timing Report, Sorted By Phase  
 9: Ziegler & Council Tree/Broadcom

Short Bkgrd PM

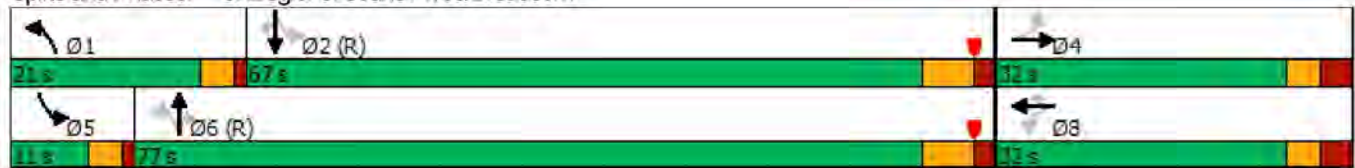


Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	EBTL	SBL	NBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	21	67	32	11	77	32
Maximum Split (%)	17.5%	55.8%	26.7%	9.2%	64.2%	26.7%
Minimum Split (s)	11	28.5	32	11	29.5	32
Yellow Time (s)	3	4.5	3	3	4.5	3
All-Red Time (s)	1	2	3	1	2	3
Minimum Initial (s)	4	7	4	4	7	4
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		14	19		16	19
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	36	57	4	36	47	4
End Time (s)	57	4	36	47	4	36
Yield/Force Off (s)	53	117.5	30	43	117.5	30
Yield/Force Off 170(s)	53	103.5	11	43	101.5	11
Local Start Time (s)	32	53	0	32	43	0
Local Yield (s)	49	113.5	26	39	113.5	26
Local Yield 170(s)	49	99.5	7	39	97.5	7

Intersection Summary












Cycle Length 120  
 Control Type Actuated-Coordinated  
 Natural Cycle 90  
 Offset: 4 (3%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 9: Ziegler & Council Tree/Broadcom



Queues  
9: Ziegler & Council Tree/Broadcom

Short Bkgrd PM

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	242	341	67	50	137	320	1173	12	42	1342	107
v/c Ratio	0.86	0.67	0.99	0.13	0.31	0.87	0.52	0.01	0.13	0.71	0.12
Control Delay	73.0	21.9	153.5	38.3	8.2	48.4	14.0	0.0	6.9	24.5	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.0	21.9	153.5	38.3	8.2	48.4	14.0	0.0	6.9	24.5	3.1
Queue Length 50th (ft)	178	82	51	31	0	154	268	0	9	415	0
Queue Length 95th (ft)	#310	187	#146	66	52	#314	332	0	19	502	28
Internal Link Dist (ft)		262		234			488			523	
Turn Bay Length (ft)	100		150		40	420		340	400		400
Base Capacity (vph)	303	532	73	419	462	377	2240	1025	341	1880	891
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.64	0.92	0.12	0.30	0.85	0.52	0.01	0.12	0.71	0.12

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		Y	↑↑	↑↑	
Traffic Vol, veh/h	15	11	9	1080	1175	49
Future Vol, veh/h	15	11	9	1080	1175	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	12	10	1200	1306	54

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1953	680	1360	0	-	0
Stage 1	1333	-	-	-	-	-
Stage 2	620	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	56	393	501	-	-	-
Stage 1	211	-	-	-	-	-
Stage 2	499	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	55	393	501	-	-	-
Mov Cap-2 Maneuver	154	-	-	-	-	-
Stage 1	207	-	-	-	-	-
Stage 2	499	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.2	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	501	-	207	-	-
HCM Lane V/C Ratio	0.02	-	0.14	-	-
HCM Control Delay (s)	12.3	-	25.2	-	-
HCM Lane LOS	B	-	D	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	-	-



Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	YY		Y	↑↑	↑↑	
Traffic Vol, veh/h	49	61	13	1384	1281	105
Future Vol, veh/h	49	61	13	1384	1281	105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	64	14	1457	1348	111

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2161	730	1459
Stage 1	1404	-	-
Stage 2	757	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	~40	365	459
Stage 1	193	-	-
Stage 2	424	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	~39	365	459
Mov Cap-2 Maneuver	133	-	-
Stage 1	187	-	-
Stage 2	424	-	-

Approach	EB	NB	SB
HCM Control Delay, s	43.2	0.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	459	-	205	-	-
HCM Lane V/C Ratio	0.03	-	0.565	-	-
HCM Control Delay (s)	13.1	-	43.2	-	-
HCM Lane LOS	B	-	E	-	-
HCM 95th %tile Q(veh)	0.1	-	3.1	-	-

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection

Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↕↔		↘	↕↕
Traffic Vol, veh/h	3	6	1091	4	1	1221
Future Vol, veh/h	3	6	1091	4	1	1221
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	7	1226	4	1	1372

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1916	615	0	0	1230
Stage 1	1228	-	-	-	-
Stage 2	688	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	59	434	-	-	562
Stage 1	240	-	-	-	-
Stage 2	460	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	59	434	-	-	562
Mov Cap-2 Maneuver	168	-	-	-	-
Stage 1	240	-	-	-	-
Stage 2	459	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	284	562
HCM Lane V/C Ratio	-	-	0.036	0.002
HCM Control Delay (s)	-	-	18.1	11.4
HCM Lane LOS	-	-	C	B
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection

Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↘		↑↑		↘	↑↑
Traffic Vol, veh/h	1	3	1432	1	1	1385
Future Vol, veh/h	1	3	1432	1	1	1385
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	3	1523	1	1	1473

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2263	762	0	0	1524
Stage 1	1524	-	-	-	-
Stage 2	739	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	34	347	-	-	434
Stage 1	166	-	-	-	-
Stage 2	433	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	34	347	-	-	434
Mov Cap-2 Maneuver	122	-	-	-	-
Stage 1	166	-	-	-	-
Stage 2	432	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	237	434
HCM Lane V/C Ratio	-	-	0.018	0.002
HCM Control Delay (s)	-	-	20.5	13.3
HCM Lane LOS	-	-	C	B
HCM 95th %tile Q(veh)	-	-	0.1	0



Intersection

Int Delay, s/veh 2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	2	0	55	16	0	15	32	1055	10	5	1151	2
Future Vol, veh/h	2	0	55	16	0	15	32	1055	10	5	1151	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	60	18	0	16	35	1159	11	5	1265	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1926	2516	634	1878	2512	585	1267	0	0	1170	0	0
Stage 1	1276	1276	-	1235	1235	-	-	-	-	-	-	-
Stage 2	650	1240	-	643	1277	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	40	28	422	44	28	454	544	-	-	593	-	-
Stage 1	176	236	-	187	247	-	-	-	-	-	-	-
Stage 2	424	245	-	428	236	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	36	26	422	36	26	454	544	-	-	593	-	-
Mov Cap-2 Maneuver	36	26	-	36	26	-	-	-	-	-	-	-
Stage 1	165	234	-	175	231	-	-	-	-	-	-	-
Stage 2	382	229	-	364	234	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.7	109.9	0.4	0
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	544	-	-	307	65	593	-	-
HCM Lane V/C Ratio	0.065	-	-	0.204	0.524	0.009	-	-
HCM Control Delay (s)	12.1	-	-	19.7	109.9	11.1	-	-
HCM Lane LOS	B	-	-	C	F	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.8	2.1	0	-	-

Intersection

Int Delay, s/veh 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	2	0	55	6	0	12	71	1348	16	15	1325	8
Future Vol, veh/h	2	0	55	6	0	12	71	1348	16	15	1325	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	59	6	0	13	76	1449	17	16	1425	9

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2339	3080	717	2355	3076	733	1434	0	0	1466	0	0
Stage 1	1462	1462	-	1610	1610	-	-	-	-	-	-	-
Stage 2	877	1618	-	745	1466	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	19	12	372	19	12	363	470	-	-	456	-	-
Stage 1	135	192	-	109	162	-	-	-	-	-	-	-
Stage 2	310	161	-	372	191	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	16	10	372	14	10	363	470	-	-	456	-	-
Mov Cap-2 Maneuver	16	10	-	14	10	-	-	-	-	-	-	-
Stage 1	113	185	-	91	136	-	-	-	-	-	-	-
Stage 2	251	135	-	302	184	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	29.2		166.9		0.7		0.1	
HCM LOS	D		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	470	-	-	209	39	456	-	-
HCM Lane V/C Ratio	0.162	-	-	0.293	0.496	0.035	-	-
HCM Control Delay (s)	14.1	-	-	29.2	166.9	13.2	-	-
HCM Lane LOS	B	-	-	D	F	B	-	-
HCM 95th %tile Q(veh)	0.6	-	-	1.2	1.7	0.1	-	-

Intersection

Int Delay, s/veh 3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	30	3	14	8	3	26
Future Vol, veh/h	30	3	14	8	3	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	3	15	9	3	29

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	55	20	0
Stage 1	20	-	-
Stage 2	35	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	953	1058	-
Stage 1	1003	-	-
Stage 2	987	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	951	1058	-
Mov Cap-2 Maneuver	951	-	-
Stage 1	1003	-	-
Stage 2	985	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	960	1591
HCM Lane V/C Ratio	-	-	0.038	0.002
HCM Control Delay (s)	-	-	8.9	7.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0



Intersection

Int Delay, s/veh 3.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	38	5	26	25	4	18
Future Vol, veh/h	38	5	26	25	4	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	6	31	29	5	21

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	77	46	0
Stage 1	46	-	-
Stage 2	31	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	926	1023	-
Stage 1	976	-	-
Stage 2	992	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	923	1023	-
Mov Cap-2 Maneuver	923	-	-
Stage 1	976	-	-
Stage 2	989	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	1.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	934	1544
HCM Lane V/C Ratio	-	-	0.054	0.003
HCM Control Delay (s)	-	-	9.1	7.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	0	5	1	16	24	0
Future Vol, veh/h	0	5	1	16	24	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	6	1	19	28	0

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	49	28	28	0	0
Stage 1	28	-	-	-	-
Stage 2	21	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	960	1047	1585	-	-
Stage 1	995	-	-	-	-
Stage 2	1002	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	959	1047	1585	-	-
Mov Cap-2 Maneuver	959	-	-	-	-
Stage 1	994	-	-	-	-
Stage 2	1002	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1585	-	1047	-	-
HCM Lane V/C Ratio	0.001	-	0.006	-	-
HCM Control Delay (s)	7.3	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	0	3	2	29	19	0
Future Vol, veh/h	0	3	2	29	19	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	2	34	22	0

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	60	22	22	0	0
Stage 1	22	-	-	-	-
Stage 2	38	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	947	1055	1593	-	-
Stage 1	1001	-	-	-	-
Stage 2	984	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	946	1055	1593	-	-
Mov Cap-2 Maneuver	946	-	-	-	-
Stage 1	1000	-	-	-	-
Stage 2	984	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.4	0.5	0
HCM LOS	A		
























Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1593	-	1055	-	-
HCM Lane V/C Ratio	0.001	-	0.003	-	-
HCM Control Delay (s)	7.3	0	8.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-



# APPENDIX F









HCM 6th Signalized Intersection Summary  
9: Ziegler & Council Tree/Broadcom

Long Bkgrd AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	20	85	5	10	5	115	1395	55	115	1295	95
Future Volume (veh/h)	70	20	85	5	10	5	115	1395	55	115	1295	95
Initial Q(Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	74	21	4	5	11	1	121	1468	21	121	1363	63
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	214	122	23	142	66	56	344	2523	1125	324	2523	1125
Arrive On Green	0.06	0.08	0.07	0.02	0.04	0.04	0.04	0.71	0.71	0.04	0.71	0.71
Sat Flow, veh/h	1781	1527	291	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	74	0	25	5	11	1	121	1468	21	121	1363	63
Grp Sat Flow(s),veh/h/ln	1781	0	1818	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.2	0.0	1.4	0.3	0.6	0.1	2.0	22.5	0.4	2.0	19.9	1.3
Cycle Q Clear(g_c), s	4.2	0.0	1.4	0.3	0.6	0.1	2.0	22.5	0.4	2.0	19.9	1.3
Prop In Lane	1.00		0.16	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	214	0	145	142	66	56	344	2523	1125	324	2523	1125
V/C Ratio(X)	0.35	0.00	0.17	0.04	0.17	0.02	0.35	0.58	0.02	0.37	0.54	0.06
Avail Cap(c_a), veh/h	220	0	314	228	323	274	394	2523	1125	374	2523	1125
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.1	0.0	47.3	49.7	51.5	51.2	6.2	7.9	4.7	7.0	7.5	4.8
Incr Delay (d2), s/veh	1.0	0.0	0.6	0.1	1.2	0.1	0.6	1.0	0.0	0.7	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.7	0.1	0.3	0.0	0.6	7.0	0.1	0.6	6.2	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.1	0.0	47.9	49.8	52.6	51.3	6.8	8.9	4.7	7.7	8.3	4.9
LnGrp LOS	D	A	D	D	D	D	A	A	A	A	A	A
Approach Vol, veh/h		99			17			1610			1547	
Approach Delay, s/veh		46.6			51.7			8.7			8.2	
Approach LOS		D			D			A			A	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.9	83.6	4.7	13.8	7.9	83.6	9.6	8.9				
Change Period (Y+Rc), s	4.0	6.5	4.0	6.0	4.0	6.5	4.0	6.0				
Max Green Setting (Gmax), s	7.0	58.5	6.0	18.0	7.0	58.5	6.0	18.0				
Max Q Clear Time (g_c+1), s	4.0	21.9	2.3	3.4	4.0	24.5	6.2	2.6				
Green Ext Time (p_c), s	0.1	12.6	0.0	0.0	0.1	13.5	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			9.8									
HCM 6th LOS			A									

Timing Report, Sorted By Phase  
 9: Ziegler & Council Tree/Broadcom

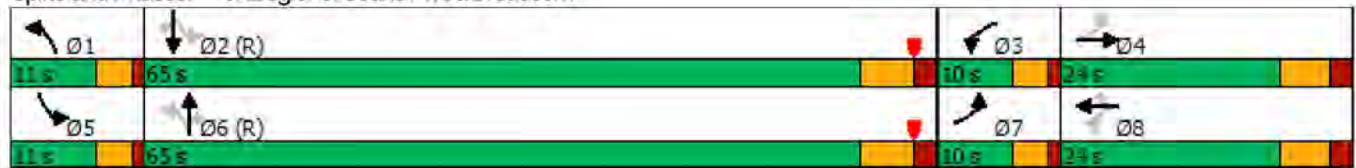
Long Bkgrd AM

								
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	WBL	EBTL	SBL	NBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize			Yes	Yes			Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	11	65	10	24	11	65	10	24
Maximum Split (%)	10.0%	59.1%	9.1%	21.8%	10.0%	59.1%	9.1%	21.8%
Minimum Split (s)	11	28.5	9.5	24	11	29.5	9.5	24
Yellow Time (s)	3	4.5	3	4	3	4.5	3	4
All-Red Time (s)	1	2	1	2	1	2	1	2
Minimum Initial (s)	4	7	5	4	4	7	5	4
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7				7		
Flash Dont Walk (s)		14				16		
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	34	45	0	10	34	45	0	10
End Time (s)	45	0	10	34	45	0	10	34
Yield/Force Off (s)	41	103.5	6	28	41	103.5	6	28
Yield/Force Off 170(s)	41	89.5	6	28	41	87.5	6	28
Local Start Time (s)	34	45	0	10	34	45	0	10
Local Yield (s)	41	103.5	6	28	41	103.5	6	28
Local Yield 170(s)	41	89.5	6	28	41	87.5	6	28

Intersection Summary

Cycle Length 110  
 Control Type Actuated-Coordinated  
 Natural Cycle 90  
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red












Splits and Phases: 9: Ziegler & Council Tree/Broadcom





Queues  
9: Ziegler & Council Tree/Broadcom

Long Bkgrd AM

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	74	110	5	11	5	121	1468	58	121	1363	100
v/c Ratio	0.42	0.47	0.03	0.08	0.02	0.36	0.61	0.05	0.40	0.57	0.09
Control Delay	48.1	20.3	36.8	46.8	0.2	6.0	12.5	0.3	7.1	12.0	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	20.3	36.8	46.8	0.2	6.0	12.5	0.3	7.1	12.0	2.0
Queue Length 50th (ft)	50	14	3	7	0	9	211	0	9	194	0
Queue Length 95th (ft)	83	66	13	25	0	40	495	3	40	438	21
Internal Link Dist (ft)		262		234			488			523	
Turn Bay Length (ft)	100		150		40	420		340	400		400
Base Capacity (vph)	176	356	174	321	367	343	2420	1117	310	2408	1112
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.31	0.03	0.03	0.01	0.35	0.61	0.05	0.39	0.57	0.09
Intersection Summary											

HCM 6th Signalized Intersection Summary  
9: Ziegler & Council Tree/Broadcom

Long Bkgrd PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	290	35	300	65	50	135	310	1350	15	40	1605	105
Future Volume (veh/h)	290	35	300	65	50	135	310	1350	15	40	1605	105
Initial Q(Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	299	36	116	67	52	1	320	1392	1	41	1655	12
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	332	51	165	210	99	84	351	2285	1019	279	1900	847
Arrive On Green	0.13	0.13	0.12	0.05	0.05	0.05	0.14	0.64	0.64	0.03	0.53	0.53
Sat Flow, veh/h	1781	389	1255	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	299	0	152	67	52	1	320	1392	1	41	1655	12
Grp Sat Flow(s),veh/h/ln	1781	0	1644	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	16.0	0.0	10.6	4.2	3.3	0.1	14.5	27.6	0.0	1.2	48.7	0.4
Cycle Q Clear(g_c), s	16.0	0.0	10.6	4.2	3.3	0.1	14.5	27.6	0.0	1.2	48.7	0.4
Prop In Lane	1.00		0.76	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	332	0	217	210	99	84	351	2285	1019	279	1900	847
V/C Ratio(X)	0.90	0.00	0.70	0.32	0.53	0.01	0.91	0.61	0.00	0.15	0.87	0.01
Avail Cap(c_a), veh/h	332	0	329	217	234	198	351	2285	1019	339	1900	847
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.8	0.0	50.2	49.7	55.4	53.9	35.9	12.6	7.6	12.5	24.3	13.1
Inc Delay (d2), s/veh	26.0	0.0	4.1	0.9	4.3	0.1	27.2	1.2	0.0	0.2	5.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	4.6	1.9	1.7	0.0	11.7	9.9	0.0	0.5	20.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.8	0.0	54.3	50.6	59.6	53.9	63.2	13.8	7.6	12.7	30.1	13.1
LnGrp LOS	E	A	D	D	E	D	E	B	A	B	C	B
Approach Vol, veh/h		451			120			1713			1708	
Approach Delay, s/veh		66.6			54.5			23.0			29.6	
Approach LOS		E			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.0	69.7	9.5	20.8	7.0	82.7	19.0	11.3				
Change Period (Y+Rc), s	4.0	6.5	4.0	6.0	4.0	6.5	4.0	6.0				
Max Green Setting (Gmax), s	16.0	54.5	6.0	23.0	7.0	63.5	15.0	14.0				
Max Q Clear Time (g_c+1), s	16.5	50.7	6.2	12.6	3.2	29.6	18.0	5.3				
Green Ext Time (p_c), s	0.0	3.1	0.0	0.5	0.0	12.3	0.0	0.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			31.7									
HCM 6th LOS			C									

Timing Report, Sorted By Phase  
9: Ziegler & Council Tree/Broadcom

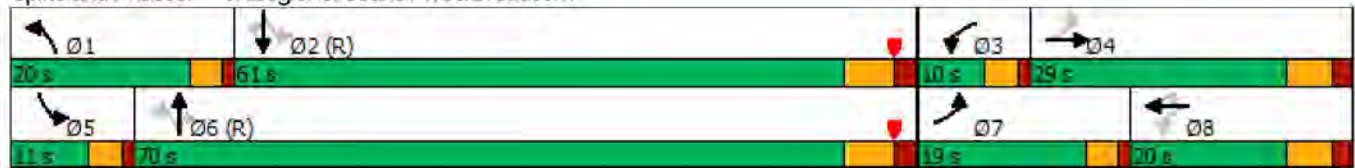
Long Bkgrd PM

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	WBL	EBTL	SBL	NBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize			Yes	Yes			Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	20	61	10	29	11	70	19	20
Maximum Split (%)	16.7%	50.8%	8.3%	24.2%	9.2%	58.3%	15.8%	16.7%
Minimum Split (s)	11	28.5	9.5	20	11	29.5	9.5	20
Yellow Time (s)	3	4.5	3	4	3	4.5	3	4
All-Red Time (s)	1	2	1	2	1	2	1	2
Minimum Initial (s)	4	7	5	4	4	7	5	4
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7				7		
Flash Dont Walk (s)		14				16		
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	39	59	0	10	39	50	0	19
End Time (s)	59	0	10	39	50	0	19	39
Yield/Force Off (s)	55	113.5	6	33	46	113.5	15	33
Yield/Force Off 170(s)	55	99.5	6	33	46	97.5	15	33
Local Start Time (s)	39	59	0	10	39	50	0	19
Local Yield (s)	55	113.5	6	33	46	113.5	15	33
Local Yield 170(s)	55	99.5	6	33	46	97.5	15	33

Intersection Summary

Cycle Length 120  
 Control Type Actuated-Coordinated  
 Natural Cycle 100  
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red












Splits and Phases: 9: Ziegler & Council Tree/Broadcom





Queues  
9: Ziegler & Council Tree/Broadcom

Long Bkgrd PM

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	299	345	67	52	139	320	1392	15	41	1655	108
v/c Ratio	0.80	0.73	0.39	0.33	0.47	0.84	0.66	0.01	0.17	1.01	0.13
Control Delay	56.6	25.6	40.5	55.6	8.3	52.3	19.0	0.0	9.5	56.5	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
Total Delay	56.6	25.6	40.5	55.6	8.3	52.3	19.0	0.0	9.5	56.5	0.6
Queue Length 50th (ft)	208	87	40	39	0	182	365	0	9	~678	0
Queue Length 95th (ft)	289	191	74	76	31	#392	502	0	23	#849	4
Internal Link Dist (ft)		262		234			488			523	
Turn Bay Length (ft)	100		150		40	420		340	400		400
Base Capacity (vph)	372	508	171	232	352	381	2115	1000	249	1643	828
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.68	0.39	0.22	0.39	0.84	0.66	0.01	0.16	1.01	0.13

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘	↕	↕	
Traffic Vol, veh/h	0	10	10	1460	1495	50
Future Vol, veh/h	0	10	10	1460	1495	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	100	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	11	1537	1574	53

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	814	1627
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	4.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	2.22
Pot Cap-1 Maneuver	0	321	396
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	321	396
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.6	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	396	-	321	-	-
HCM Lane V/C Ratio	0.027	-	0.033	-	-
HCM Control Delay (s)	14.3	-	16.6	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘	↕	↕	
Traffic Vol, veh/h	0	60	15	1760	1690	105
Future Vol, veh/h	0	60	15	1760	1690	105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	100	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	62	15	1814	1742	108

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	925	1850
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	4.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	2.22
Pot Cap-1 Maneuver	0	271	324
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	271	324
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.2	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	324	-	271	-	-
HCM Lane V/C Ratio	0.048	-	0.228	-	-
HCM Control Delay (s)	16.7	-	22.2	-	-
HCM Lane LOS	C	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.9	-	-



Intersection

Int Delay, s/veh 0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘		↑↑		↘	↑↑
Traffic Vol, veh/h	5	5	1455	5	5	1540
Future Vol, veh/h	5	5	1455	5	5	1540
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	5	1532	5	5	1621

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	2356	769	0
Stage 1	1535	-	-
Stage 2	821	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	30	344	-
Stage 1	164	-	-
Stage 2	393	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	30	344	-
Mov Cap-2 Maneuver	116	-	-
Stage 1	164	-	-
Stage 2	388	-	-

Approach	WB	NB	SB
HCM Control Delay, s	27.2	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	173	429
HCM Lane V/C Ratio	-	-	0.061	0.012
HCM Control Delay (s)	-	-	27.2	13.5
HCM Lane LOS	-	-	D	B
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection

Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↕↔		↘↗	↕↔
Traffic Vol, veh/h	5	5	1755	5	5	1790
Future Vol, veh/h	5	5	1755	5	5	1790
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	5	1809	5	5	1845

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2745	907	0	0	1814
Stage 1	1812	-	-	-	-
Stage 2	933	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	16	279	-	-	335
Stage 1	115	-	-	-	-
Stage 2	343	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	16	279	-	-	335
Mov Cap-2 Maneuver	84	-	-	-	-
Stage 1	115	-	-	-	-
Stage 2	338	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	35.3	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	129	335
HCM Lane V/C Ratio	-	-	0.08	0.015
HCM Control Delay (s)	-	-	35.3	15.9
HCM Lane LOS	-	-	E	C
HCM 95th %tile Q(veh)	-	-	0.3	0

Intersection

Int Delay, s/veh 5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	5	0	55	15	0	15	35	1415	10	5	1475	5
Future Vol, veh/h	5	0	55	15	0	15	35	1415	10	5	1475	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	58	16	0	16	37	1489	11	5	1553	5

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2385	3140	779	2356	3137	750	1558	0	0	1500	0	0
Stage 1	1566	1566	-	1569	1569	-	-	-	-	-	-	-
Stage 2	819	1574	-	787	1568	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	18	11	339	19	11	354	421	-	-	443	-	-
Stage 1	116	170	-	116	170	-	-	-	-	-	-	-
Stage 2	336	169	-	351	170	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	16	10	339	~15	10	354	421	-	-	443	-	-
Mov Cap-2 Maneuver	16	10	-	~15	10	-	-	-	-	-	-	-
Stage 1	106	168	-	106	155	-	-	-	-	-	-	-
Stage 2	293	154	-	288	168	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	59.3	\$ 396.6	0.3	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	421	-	-	126	29	443	-	-
HCM Lane V/C Ratio	0.088	-	-	0.501	1.089	0.012	-	-
HCM Control Delay (s)	14.4	-	-	59.3	\$ 396.6	13.2	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.3	-	-	2.3	3.6	0	-	-

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon



Intersection

Int Delay, s/veh	7.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	5	0	55	5	0	15	70	1675	15	15	1735	10
Future Vol, veh/h	5	0	55	5	0	15	70	1675	15	15	1735	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	57	5	0	15	72	1727	15	15	1789	10

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2832	3710	900	2804	3708	871	1799	0	0	1742	0	0
Stage 1	1824	1824	-	1879	1879	-	-	-	-	-	-	-
Stage 2	1008	1886	-	925	1829	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	8	4	282	8	4	294	339	-	-	357	-	-
Stage 1	80	127	-	74	119	-	-	-	-	-	-	-
Stage 2	258	118	-	290	126	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	6	3	282	~5	3	294	339	-	-	357	-	-
Mov Cap-2 Maneuver	6	3	-	~5	3	-	-	-	-	-	-	-
Stage 1	63	122	-	58	94	-	-	-	-	-	-	-
Stage 2	193	93	-	222	121	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	255.3		\$ 518.4		0.7		0.1	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	339	-	-	58	19	357	-	-
HCM Lane V/C Ratio	0.213	-	-	1.066	1.085	0.043	-	-
HCM Control Delay (s)	18.5	-	-	255.3	\$ 518.4	15.5	-	-
HCM Lane LOS	C	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	0.8	-	-	5.1	2.9	0.1	-	-

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

HCM 6th TWSC  
4: Corbett & Target Service Access

Long Bkgrd AM

Intersection

Int Delay, s/veh	3.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	30	5	15	10	5	25
Future Vol, veh/h	30	5	15	10	5	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	5	16	11	5	26

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	58	22	0	0	27
Stage 1	22	-	-	-	-
Stage 2	36	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	949	1055	-	-	1587
Stage 1	1001	-	-	-	-
Stage 2	986	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	946	1055	-	-	1587
Mov Cap-2 Maneuver	946	-	-	-	-
Stage 1	1001	-	-	-	-
Stage 2	983	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	1.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	960	1587
HCM Lane V/C Ratio	-	-	0.038	0.003
HCM Control Delay (s)	-	-	8.9	7.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th TWSC  
 4: Corbett & Target Service Access

Long Bkgrd PM

Intersection

Int Delay, s/veh 3.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	40	5	30	25	5	20
Future Vol, veh/h	40	5	30	25	5	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	5	32	26	5	21

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	76	45	0
Stage 1	45	-	-
Stage 2	31	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	927	1025	-
Stage 1	977	-	-
Stage 2	992	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	924	1025	-
Mov Cap-2 Maneuver	924	-	-
Stage 1	977	-	-
Stage 2	989	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	1.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	934	1546
HCM Lane V/C Ratio	-	-	0.051	0.003
HCM Control Delay (s)	-	-	9.1	7.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0



Intersection

Int Delay, s/veh 1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	0	5	5	15	25	0
Future Vol, veh/h	0	5	5	15	25	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	5	16	26	0

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	52	26	26	0	0
Stage 1	26	-	-	-	-
Stage 2	26	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	957	1050	1588	-	-
Stage 1	997	-	-	-	-
Stage 2	997	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	954	1050	1588	-	-
Mov Cap-2 Maneuver	954	-	-	-	-
Stage 1	994	-	-	-	-
Stage 2	997	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.4	1.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1588	-	1050	-	-
HCM Lane V/C Ratio	0.003	-	0.005	-	-
HCM Control Delay (s)	7.3	0	8.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	0	5	5	30	20	0
Future Vol, veh/h	0	5	5	30	20	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	5	32	21	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	63	21	21	0	-	0
Stage 1	21	-	-	-	-	-
Stage 2	42	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	943	1056	1595	-	-	-
Stage 1	1002	-	-	-	-	-
Stage 2	980	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	940	1056	1595	-	-	-
Mov Cap-2 Maneuver	940	-	-	-	-	-
Stage 1	999	-	-	-	-	-
Stage 2	980	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.4	1	0
HCM LOS	A		
























Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1595	-	1056	-	-
HCM Lane V/C Ratio	0.003	-	0.005	-	-
HCM Control Delay (s)	7.3	0	8.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

# APPENDIX G



HCM 6th Signalized Intersection Summary  
9: Ziegler & Council Tree/Broadcom

Short Total AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	17	77	2	7	3	104	1107	49	104	1091	88
Future Volume (veh/h)	30	17	77	2	7	3	104	1107	49	104	1091	88
Initial Q(Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	19	1	2	8	1	114	1216	17	114	1199	65
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	128	86	5	119	91	77	398	2786	1243	448	2786	1243
Arrive On Green	0.05	0.05	0.04	0.05	0.05	0.05	0.04	0.78	0.78	0.03	0.53	0.53
Sat Flow, veh/h	1406	1761	93	1392	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	33	0	20	2	8	1	114	1216	17	114	1199	65
Grp Sat Flow(s),veh/h/ln	1406	0	1854	1392	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	2.5	0.0	1.1	0.2	0.4	0.1	1.3	12.4	0.3	1.3	22.8	2.2
Cycle Q Clear(g_c), s	3.0	0.0	1.1	1.3	0.4	0.1	1.3	12.4	0.3	1.3	22.8	2.2
Prop In Lane	1.00		0.05	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	128	0	91	119	91	77	398	2786	1243	448	2786	1243
V/C Ratio(X)	0.26	0.00	0.22	0.02	0.09	0.01	0.29	0.44	0.01	0.25	0.43	0.05
Avail Cap(c_a), veh/h	405	0	455	393	459	389	448	2786	1243	709	2786	1243
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.4	0.0	50.3	50.9	50.0	49.8	4.9	3.9	2.6	2.7	11.0	6.2
Incr Delay (d2), s/veh	1.0	0.0	1.2	0.1	0.4	0.1	0.4	0.5	0.0	0.3	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.6	0.1	0.2	0.0	0.5	3.0	0.1	0.2	9.6	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.4	0.0	51.5	51.0	50.4	49.9	5.3	4.4	2.6	3.0	11.5	6.2
LnGrp LOS	D	A	D	D	D	D	A	A	A	A	B	A
Approach Vol, veh/h		53			11			1347			1378	
Approach Delay, s/veh		52.1			50.4			4.5			10.6	
Approach LOS		D			D			A			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.9	91.7		10.4	7.9	91.7		10.4				
Change Period (Y+Rc), s	4.0	6.5		6.0	4.0	6.5		6.0				
Max Green Setting (Gmax), s	7.0	60.5		26.0	20.0	47.5		26.0				
Max Q Clear Time (g_c+1), s	3.3	24.8		5.0	3.3	14.4		3.3				
Green Ext Time (p_c), s	0.1	10.3		0.1	0.2	10.1		0.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				8.6								
HCM 6th LOS				A								

Timing Report, Sorted By Phase  
 9: Ziegler & Council Tree/Broadcom

Short Total AM

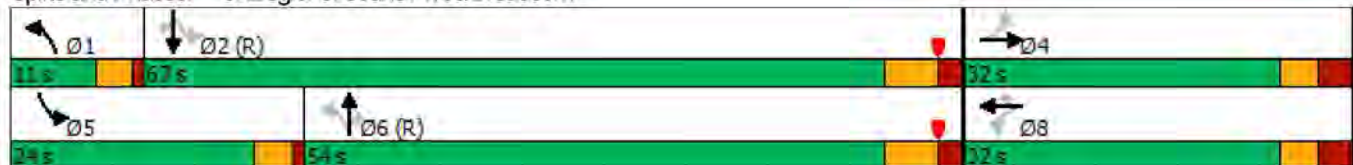


Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	EBTL	SBL	NBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	11	67	32	24	54	32
Maximum Split (%)	10.0%	60.9%	29.1%	21.8%	49.1%	29.1%
Minimum Split (s)	11	28.5	32	11	29.5	32
Yellow Time (s)	3	4.5	3	3	4.5	3
All-Red Time (s)	1	2	3	1	2	3
Minimum Initial (s)	4	7	4	4	7	4
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		14	19		16	19
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	36	47	4	36	60	4
End Time (s)	47	4	36	60	4	36
Yield/Force Off (s)	43	107.5	30	56	107.5	30
Yield/Force Off 170(s)	43	93.5	11	56	91.5	11
Local Start Time (s)	32	43	0	32	56	0
Local Yield (s)	39	103.5	26	52	103.5	26
Local Yield 170(s)	39	89.5	7	52	87.5	7

Intersection Summary












Cycle Length 110  
 Control Type Actuated-Coordinated  
 Natural Cycle 80  
 Offset: 4 (4%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 9: Ziegler & Council Tree/Broadcom



Queues  
9: Ziegler & Council Tree/Broadcom

Short Total AM

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	33	104	2	8	3	114	1216	54	114	1199	97
v/c Ratio	0.21	0.41	0.02	0.04	0.01	0.30	0.50	0.05	0.29	0.49	0.09
Control Delay	44.3	17.0	37.5	38.6	0.0	5.2	10.4	0.1	4.0	13.4	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.3	17.0	37.5	38.6	0.0	5.2	10.4	0.1	4.0	13.4	3.9
Queue Length 50th (ft)	22	13	1	5	0	9	163	0	4	313	13
Queue Length 95th (ft)	44	54	8	17	0	44	389	1	47	518	m49
Internal Link Dist (ft)		262		234			488			523	
Turn Bay Length (ft)	100		150		40	420		340	400		400
Base Capacity (vph)	343	465	289	457	474	394	2446	1128	558	2472	1135
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.22	0.01	0.02	0.01	0.29	0.50	0.05	0.20	0.49	0.09

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



HCM 6th Signalized Intersection Summary  
 9: Ziegler & Council Tree/Broadcom

Short Total PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	30	277	60	45	123	288	1157	11	38	1293	96
Future Volume (veh/h)	180	30	277	60	45	123	288	1157	11	38	1293	96
Initial Q(Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	200	33	119	67	50	15	320	1286	1	42	1437	51
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	294	70	253	202	369	312	359	2335	1041	318	1981	884
Arrive On Green	0.20	0.20	0.19	0.20	0.20	0.20	0.13	0.66	0.66	0.01	0.18	0.18
Sat Flow, veh/h	1337	356	1283	1235	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	200	0	152	67	50	15	320	1286	1	42	1437	51
Grp Sat Flow(s),veh/h/ln	1337	0	1639	1235	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	17.4	0.0	9.9	6.1	2.6	0.9	12.7	23.3	0.0	1.2	45.7	3.2
Cycle Q Clear(g_c), s	20.1	0.0	9.9	16.0	2.6	0.9	12.7	23.3	0.0	1.2	45.7	3.2
Prop In Lane	1.00		0.78	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	294	0	323	202	369	312	359	2335	1041	318	1981	884
V/C Ratio(X)	0.68	0.00	0.47	0.33	0.14	0.05	0.89	0.55	0.00	0.13	0.73	0.06
Avail Cap(c_a), veh/h	331	0	369	236	421	357	390	2335	1041	377	1981	884
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.0	0.0	43.0	49.7	39.7	39.1	32.7	11.1	7.1	11.1	40.3	23.0
Incr Delay (d2), s/veh	4.8	0.0	1.1	1.0	0.2	0.1	20.7	0.9	0.0	0.2	2.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	0.0	4.1	1.9	1.2	0.4	11.1	8.2	0.0	0.5	22.2	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.8	0.0	44.1	50.7	39.9	39.1	53.3	12.0	7.1	11.3	42.7	23.1
LnGrp LOS	D	A	D	D	D	D	D	B	A	B	D	C
Approach Vol, veh/h		352			132			1607			1530	
Approach Delay, s/veh		49.0			45.3			20.2			41.1	
Approach LOS		D			D			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	18.9	72.4		28.6	7.0	84.3		28.6				
Change Period (Y+Rc), s	4.0	6.5		6.0	4.0	6.5		6.0				
Max Green Setting (Gmax), s	17.0	60.5		26.0	7.0	70.5		26.0				
Max Q Clear Time (g_c+1), s	14.7	47.7		22.1	3.2	25.3		18.0				
Green Ext Time (p_c), s	0.2	7.7		0.6	0.0	11.7		0.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			32.8									
HCM 6th LOS			C									

Timing Report, Sorted By Phase  
 9: Ziegler & Council Tree/Broadcom

Short Total PM

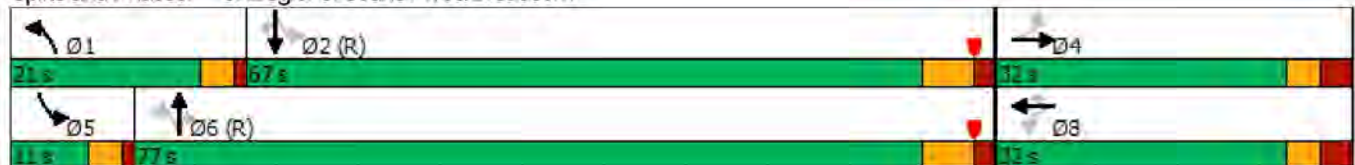


Phase Number	1	2	4	5	6	8
Movement	NBL	SBTL	EBTL	SBL	NBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	21	67	32	11	77	32
Maximum Split (%)	17.5%	55.8%	26.7%	9.2%	64.2%	26.7%
Minimum Split (s)	11	28.5	32	11	29.5	32
Yellow Time (s)	3	4.5	3	3	4.5	3
All-Red Time (s)	1	2	3	1	2	3
Minimum Initial (s)	4	7	4	4	7	4
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		14	19		16	19
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	36	57	4	36	47	4
End Time (s)	57	4	36	47	4	36
Yield/Force Off (s)	53	117.5	30	43	117.5	30
Yield/Force Off 170(s)	53	103.5	11	43	101.5	11
Local Start Time (s)	32	53	0	32	43	0
Local Yield (s)	49	113.5	26	39	113.5	26
Local Yield 170(s)	49	99.5	7	39	97.5	7

Intersection Summary












Cycle Length 120  
 Control Type Actuated-Coordinated  
 Natural Cycle 90  
 Offset: 4 (3%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 9: Ziegler & Council Tree/Broadcom



Queues  
9: Ziegler & Council Tree/Broadcom

Short Total PM

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	200	341	67	50	137	320	1286	12	42	1437	107
v/c Ratio	0.75	0.69	1.10	0.13	0.32	0.89	0.57	0.01	0.14	0.76	0.12
Control Delay	62.0	23.7	188.6	38.6	8.4	56.5	14.4	0.0	7.9	39.2	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.0	23.7	188.6	38.6	8.4	56.5	14.4	0.0	7.9	39.2	9.5
Queue Length 50th (ft)	142	87	52	31	0	177	308	0	15	614	27
Queue Length 95th (ft)	227	192	#148	66	52	#352	381	0	m13	690	m56
Internal Link Dist (ft)		262		234			488			523	
Turn Bay Length (ft)	100		150		40	420		340	400		400
Base Capacity (vph)	303	527	69	419	462	361	2276	1041	310	1883	892
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.65	0.97	0.12	0.30	0.89	0.57	0.01	0.14	0.76	0.12

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.



Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘		↘	↑↑	↑↑	
Traffic Vol, veh/h	9	11	9	1131	1272	49
Future Vol, veh/h	9	11	9	1131	1272	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	12	10	1257	1413	54

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2089	734	1467
Stage 1	1440	-	-
Stage 2	649	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	45	363	456
Stage 1	184	-	-
Stage 2	482	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	44	363	456
Mov Cap-2 Maneuver	135	-	-
Stage 1	180	-	-
Stage 2	482	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.6	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT EBLn1	SBT	SBR
Capacity (veh/h)	456	-	206	-
HCM Lane V/C Ratio	0.022	-	0.108	-
HCM Control Delay (s)	13.1	-	24.6	-
HCM Lane LOS	B	-	C	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘		↘	↑↑	↑↑	
Traffic Vol, veh/h	29	61	13	1447	1366	105
Future Vol, veh/h	29	61	13	1447	1366	105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	31	64	14	1523	1438	111

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	2284	775	1549	0	0
Stage 1	1494	-	-	-	-
Stage 2	790	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-
Pot Cap-1 Maneuver	33	341	424	-	-
Stage 1	172	-	-	-	-
Stage 2	408	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	32	341	424	-	-
Mov Cap-2 Maneuver	119	-	-	-	-
Stage 1	166	-	-	-	-
Stage 2	408	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	34.8	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	424	-	213	-	-
HCM Lane V/C Ratio	0.032	-	0.445	-	-
HCM Control Delay (s)	13.8	-	34.8	-	-
HCM Lane LOS	B	-	D	-	-
HCM 95th %tile Q(veh)	0.1	-	2.1	-	-

HCM 6th Signalized Intersection Summary  
18: Ziegler & Site Access/Hidden Pond

Short Total AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	0	99	3	0	6	64	1072	4	1	1219	74
Future Volume (veh/h)	123	0	99	3	0	6	64	1072	4	1	1219	74
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	138	0	5	3	0	1	72	1204	4	1	1370	53
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	243	0	197	82	9	11	351	2713	9	300	2515	1122
Arrive On Green	0.12	0.00	0.12	0.12	0.00	0.12	0.02	0.25	0.24	0.01	0.71	0.71
Sat Flow, veh/h	1426	0	1585	196	71	89	1781	3633	12	1781	3554	1585
Grp Volume(v), veh/h	138	0	5	4	0	0	72	589	619	1	1370	53
Grp Sat Flow(s),veh/h/ln	1426	0	1585	355	0	0	1781	1777	1868	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	0.3	0.0	0.0	0.0	1.0	30.8	30.8	0.0	20.2	1.1
Cycle Q Clear(g_c), s	10.4	0.0	0.3	10.4	0.0	0.0	1.0	30.8	30.8	0.0	20.2	1.1
Prop In Lane	1.00		1.00	0.75		0.25	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	230	0	197	98	0	0	351	1327	1395	300	2515	1122
V/C Ratio(X)	0.60	0.00	0.03	0.04	0.00	0.00	0.20	0.44	0.44	0.00	0.54	0.05
Avail Cap(c_a), veh/h	350	0	331	221	0	0	393	1327	1395	395	2515	1122
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.2	0.0	42.3	43.1	0.0	0.0	5.9	22.1	22.1	7.6	7.6	4.9
Incr Delay (d2), s/veh	2.5	0.0	0.1	0.2	0.0	0.0	0.3	1.1	1.0	0.0	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.0	0.1	0.1	0.0	0.0	0.3	14.9	15.6	0.0	6.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.7	0.0	42.3	43.3	0.0	0.0	6.2	23.2	23.1	7.6	8.5	4.9
LnGrp LOS	D	A	D	D	A	A	A	C	C	A	A	A
Approach Vol, veh/h		143			4			1280			1424	
Approach Delay, s/veh		49.4			43.3			22.2			8.4	
Approach LOS		D			D			C			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.2	87.2		18.7	8.4	82.9		18.7				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	6.0	66.0		22.0	7.0	65.0		22.0				
Max Q Clear Time (g_c+1), s	2.0	32.8		12.4	3.0	22.2		12.4				
Green Ext Time (p_c), s	0.0	8.8		0.4	0.0	13.1		0.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			16.7									
HCM 6th LOS			B									



Timing Report, Sorted By Phase  
 18: Ziegler & Site Access/Hidden Pond

Short Total AM

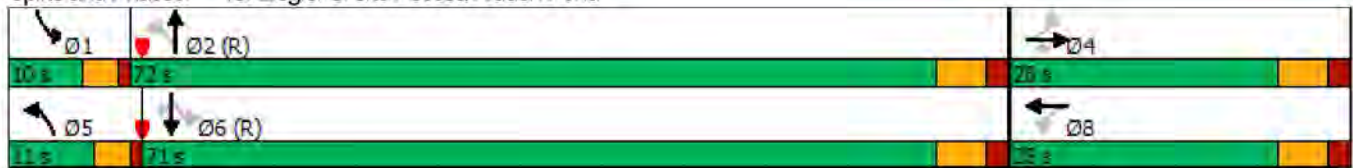


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	10	72	28	11	71	28
Maximum Split (%)	9.1%	65.5%	25.5%	10.0%	64.5%	25.5%
Minimum Split (s)	9.5	24	24	9.5	24	24
Yellow Time (s)	3	4	4	3	4	4
All-Red Time (s)	1	2	2	1	2	2
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		11	11		11	11
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	99	109	71	99	0	71
End Time (s)	109	71	99	0	71	99
Yield/Force Off (s)	105	65	93	106	65	93
Yield/Force Off 170(s)	105	54	82	106	54	82
Local Start Time (s)	99	109	71	99	0	71
Local Yield (s)	105	65	93	106	65	93
Local Yield 170(s)	105	54	82	106	54	82

Intersection Summary

Cycle Length 110  
 Control Type Actuated-Coordinated  
 Natural Cycle 65  
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green









Splits and Phases: 18: Ziegler & Site Access/Hidden Pond



## Queues

Short Total AM

## 18: Ziegler &amp; Site Access/Hidden Pond

								
Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	138	111	10	72	1208	1	1370	83
v/c Ratio	0.64	0.33	0.03	0.24	0.46	0.00	0.57	0.08
Control Delay	56.6	9.8	0.2	8.1	13.0	4.0	11.8	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.6	9.8	0.2	8.1	13.0	4.0	11.8	2.1
Queue Length 50th (ft)	92	0	0	10	136	0	258	0
Queue Length 95th (ft)	149	45	0	0	542	2	374	18
Internal Link Dist (ft)	339		254		1		370	
Turn Bay Length (ft)		200		350		100		350
Base Capacity (vph)	292	418	379	312	2610	376	2397	1099
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.27	0.03	0.23	0.46	0.00	0.57	0.08
Intersection Summary								

HCM 6th Signalized Intersection Summary  
 18: Ziegler & Site Access/Hidden Pond

Short Total PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	0	94	1	0	3	111	1364	1	1	1376	120
Future Volume (veh/h)	166	0	94	1	0	3	111	1364	1	1	1376	120
Initial Q(Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	177	0	12	1	0	1	118	1451	1	1	1464	79
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	267	0	332	59	15	29	274	2451	2	214	2250	1004
Arrive On Green	0.20	0.00	0.21	0.20	0.00	0.20	0.03	0.45	0.45	0.01	0.63	0.63
Sat Flow, veh/h	990	0	1585	66	71	137	1781	3644	3	1781	3554	1585
Grp Volume(v), veh/h	177	0	12	2	0	0	118	707	745	1	1464	79
Grp Sat Flow(s),veh/h/ln	990	0	1585	274	0	0	1781	1777	1870	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	0.7	0.0	0.0	0.0	2.5	35.8	35.8	0.0	30.8	2.3
Cycle Q Clear(g_c), s	22.0	0.0	0.7	22.0	0.0	0.0	2.5	35.8	35.8	0.0	30.8	2.3
Prop In Lane	1.00		1.00	0.50		0.50	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	0	332	100	0	0	274	1195	1258	214	2250	1004
V/C Ratio(X)	0.68	0.00	0.04	0.02	0.00	0.00	0.43	0.59	0.59	0.00	0.65	0.08
Avail Cap(c_a), veh/h	281	0	357	123	0	0	350	1195	1258	301	2250	1004
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.7	0.0	37.8	39.6	0.0	0.0	13.0	20.6	20.6	11.7	13.7	8.5
Incr Delay (d2), s/veh	6.0	0.0	0.0	0.1	0.0	0.0	1.1	2.2	2.1	0.0	1.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	0.0	0.3	0.1	0.0	0.0	1.1	16.1	16.9	0.0	11.3	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.7	0.0	37.8	39.7	0.0	0.0	14.1	22.8	22.7	11.7	15.2	8.7
LnGrp LOS	D	A	D	D	A	A	B	C	C	B	B	A
Approach Vol, veh/h		189			2			1570			1544	
Approach Delay, s/veh		51.8			39.7			22.1			14.9	
Approach LOS		D			D			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.2	85.7		30.1	8.9	81.0		30.1				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	6.0	72.0		26.0	10.0	68.0		26.0				
Max Q Clear Time (g_c+1), s	2.0	37.8		24.0	4.5	32.8		24.0				
Green Ext Time (p_c), s	0.0	11.9		0.2	0.1	13.9		0.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			20.4									
HCM 6th LOS			C									



Timing Report, Sorted By Phase  
 18: Ziegler & Site Access/Hidden Pond

Short Total PM

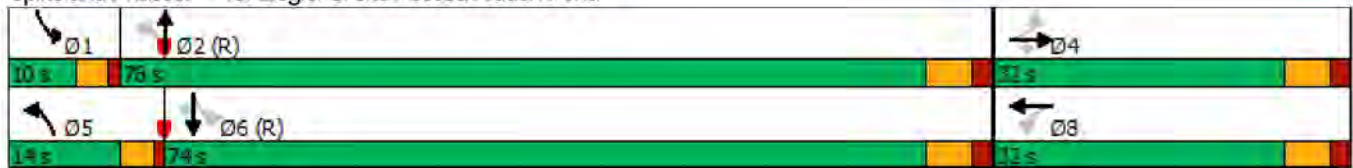


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	10	78	32	14	74	32
Maximum Split (%)	8.3%	65.0%	26.7%	11.7%	61.7%	26.7%
Minimum Split (s)	9.5	24	24	9	24	24
Yellow Time (s)	3	4	4	3	4	4
All-Red Time (s)	1	2	2	1	2	2
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		11	11		11	11
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	106	116	74	106	0	74
End Time (s)	116	74	106	0	74	106
Yield/Force Off (s)	112	68	100	116	68	100
Yield/Force Off 170(s)	112	57	89	116	57	89
Local Start Time (s)	106	116	74	106	0	74
Local Yield (s)	112	68	100	116	68	100
Local Yield 170(s)	112	57	89	116	57	89

Intersection Summary

Cycle Length 120  
 Control Type Actuated-Coordinated  
 Natural Cycle 70  
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green









Splits and Phases: 18: Ziegler & Site Access/Hidden Pond



## Queues

Short Total PM

## 18: Ziegler &amp; Site Access/Hidden Pond

								
Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	177	100	4	118	1452	1	1464	128
v/c Ratio	0.73	0.28	0.01	0.43	0.56	0.00	0.64	0.12
Control Delay	63.2	9.5	0.0	14.3	18.8	5.0	15.6	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.2	9.5	0.0	14.3	18.8	5.0	15.6	2.1
Queue Length 50th (ft)	130	0	0	44	427	0	335	0
Queue Length 95th (ft)	199	45	0	m89	603	2	496	26
Internal Link Dist (ft)	234		254		1		370	
Turn Bay Length (ft)		150		350		100		350
Base Capacity (vph)	316	433	406	302	2572	284	2282	1066
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.23	0.01	0.39	0.56	0.00	0.64	0.12

## Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th TWSC  
15: Ziegler & Paddington/Grand Teton

Short Total AM

Intersection

Int Delay, s/veh 2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	2	0	55	16	0	15	32	1159	10	5	1223	2
Future Vol, veh/h	2	0	55	16	0	15	32	1159	10	5	1223	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	60	18	0	16	35	1274	11	5	1344	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2062	2710	673	2032	2706	643	1346	0	0	1285	0	0
Stage 1	1355	1355	-	1350	1350	-	-	-	-	-	-	-
Stage 2	707	1355	-	682	1356	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	32	21	398	33	21	416	508	-	-	536	-	-
Stage 1	157	216	-	159	217	-	-	-	-	-	-	-
Stage 2	392	216	-	406	216	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	29	19	398	26	19	416	508	-	-	536	-	-
Mov Cap-2 Maneuver	29	19	-	26	19	-	-	-	-	-	-	-
Stage 1	146	214	-	148	202	-	-	-	-	-	-	-
Stage 2	351	201	-	341	214	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	21.9		182.7		0.3		0	
HCM LOS	C		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	508	-	-	275	48	536	-	-
HCM Lane V/C Ratio	0.069	-	-	0.228	0.71	0.01	-	-
HCM Control Delay (s)	12.6	-	-	21.9	182.7	11.8	-	-
HCM Lane LOS	B	-	-	C	F	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.9	2.8	0	-	-



HCM 6th TWSC  
15: Ziegler & Paddington/Grand Teton

Short Total PM

Intersection

Int Delay, s/veh 2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	2	0	55	6	0	12	71	1446	16	15	1436	8
Future Vol, veh/h	2	0	55	6	0	12	71	1446	16	15	1436	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	59	6	0	13	76	1555	17	16	1544	9

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2511	3305	777	2520	3301	786	1553	0	0	1572	0	0
Stage 1	1581	1581	-	1716	1716	-	-	-	-	-	-	-
Stage 2	930	1724	-	804	1585	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	14	8	340	14	8	335	422	-	-	415	-	-
Stage 1	114	167	-	93	143	-	-	-	-	-	-	-
Stage 2	287	142	-	343	167	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	11	6	340	10	6	335	422	-	-	415	-	-
Mov Cap-2 Maneuver	11	6	-	10	6	-	-	-	-	-	-	-
Stage 1	93	160	-	76	117	-	-	-	-	-	-	-
Stage 2	226	116	-	272	160	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	38.9		275.8		0.7		0.1	
HCM LOS	E		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	422	-	-	166	28	415	-	-
HCM Lane V/C Ratio	0.181	-	-	0.369	0.691	0.039	-	-
HCM Control Delay (s)	15.4	-	-	38.9	275.8	14	-	-
HCM Lane LOS	C	-	-	E	F	B	-	-
HCM 95th %tile Q(veh)	0.7	-	-	1.6	2.2	0.1	-	-

HCM 6th TWSC  
4: Corbett & Target Service Access

Short Total AM

Intersection

Int Delay, s/veh	1.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	30	5	63	8	3	95
Future Vol, veh/h	30	5	63	8	3	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	5	69	9	3	104

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	184	74	0	0	78
Stage 1	74	-	-	-	-
Stage 2	110	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3,518	3,318	-	-	2,218
Pot Cap-1 Maneuver	805	988	-	-	1520
Stage 1	949	-	-	-	-
Stage 2	915	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	803	988	-	-	1520
Mov Cap-2 Maneuver	803	-	-	-	-
Stage 1	949	-	-	-	-
Stage 2	913	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	825	1520
HCM Lane V/C Ratio	-	-	0.047	0.002
HCM Control Delay (s)	-	-	9.6	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th TWSC  
4: Corbett & Target Service Access

Short Total PM

Intersection

Int Delay, s/veh	1.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T			T
Traffic Vol, veh/h	38	13	146	25	4	73
Future Vol, veh/h	38	13	146	25	4	73
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	15	172	29	5	86

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	283	187	0	0	201
Stage 1	187	-	-	-	-
Stage 2	96	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3,518	3,318	-	-	2,218
Pot Cap-1 Maneuver	707	855	-	-	1,371
Stage 1	845	-	-	-	-
Stage 2	928	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	704	855	-	-	1,371
Mov Cap-2 Maneuver	704	-	-	-	-
Stage 1	845	-	-	-	-
Stage 2	924	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	737	1371
HCM Lane V/C Ratio	-	-	0.081	0.003
HCM Control Delay (s)	-	-	10.3	7.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0



Intersection

Int Delay, s/veh 4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	5	76	0	0	1	16	51	7	17	0
Future Vol, veh/h	0	0	5	76	0	0	1	16	51	7	17	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	91	85	91	91	91	85	85	91	91	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	6	84	0	0	1	19	56	8	20	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	85	113	20	88	85	47	20	0	0	75	0	0
Stage 1	36	36	-	49	49	-	-	-	-	-	-	-
Stage 2	49	77	-	39	36	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	901	777	1058	897	805	1022	1596	-	-	1524	-	-
Stage 1	980	865	-	964	854	-	-	-	-	-	-	-
Stage 2	964	831	-	976	865	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	896	772	1058	888	800	1022	1596	-	-	1524	-	-
Mov Cap-2 Maneuver	896	772	-	888	800	-	-	-	-	-	-	-
Stage 1	979	861	-	963	853	-	-	-	-	-	-	-
Stage 2	963	830	-	966	861	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.4	9.5	0.1	2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1596	-	-	1058	888	1524	-	-
HCM Lane V/C Ratio	0.001	-	-	0.006	0.094	0.005	-	-
HCM Control Delay (s)	7.3	0	-	8.4	9.5	7.4	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0	-	-

Intersection

Int Delay, s/veh 2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	3	61	0	0	2	29	128	6	13	0
Future Vol, veh/h	0	0	3	61	0	0	2	29	128	6	13	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	90	85	90	90	90	85	85	90	90	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	4	68	0	0	2	34	142	7	15	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	138	209	15	140	138	105	15	0	0	176	0	0
Stage 1	29	29	-	109	109	-	-	-	-	-	-	-
Stage 2	109	180	-	31	29	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	833	688	1065	830	753	949	1603	-	-	1400	-	-
Stage 1	988	871	-	896	805	-	-	-	-	-	-	-
Stage 2	896	750	-	986	871	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	829	684	1065	823	748	949	1603	-	-	1400	-	-
Mov Cap-2 Maneuver	829	684	-	823	748	-	-	-	-	-	-	-
Stage 1	987	867	-	895	804	-	-	-	-	-	-	-
Stage 2	895	749	-	978	867	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.4	9.8	0.1	2.3
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1603	-	-	1065	823	1400	-	-
HCM Lane V/C Ratio	0.001	-	-	0.003	0.082	0.005	-	-
HCM Control Delay (s)	7.2	0	-	8.4	9.8	7.6	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0	-	-

# APPENDIX H



HCM 6th Signalized Intersection Summary  
 9: Ziegler & Council Tree/Broadcom

Long Total AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	20	85	5	10	5	115	1460	55	115	1395	95
Future Volume (veh/h)	40	20	85	5	10	5	115	1460	55	115	1395	95
Initial Q(Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	42	21	4	5	11	1	121	1537	21	121	1468	63
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	182	94	18	142	66	56	382	2588	1154	317	2588	1154
Arrive On Green	0.04	0.06	0.05	0.02	0.04	0.04	0.04	0.73	0.73	0.06	0.97	0.97
Sat Flow, veh/h	1781	1527	291	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	42	0	25	5	11	1	121	1537	21	121	1468	63
Grp Sat Flow(s),veh/h/ln	1781	0	1818	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	2.4	0.0	1.4	0.3	0.6	0.1	1.8	22.8	0.4	1.8	3.2	0.1
Cycle Q Clear(g_c), s	2.4	0.0	1.4	0.3	0.6	0.1	1.8	22.8	0.4	1.8	3.2	0.1
Prop In Lane	1.00		0.16	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	182	0	112	142	66	56	382	2588	1154	317	2588	1154
V/C Ratio(X)	0.23	0.00	0.22	0.04	0.17	0.02	0.32	0.59	0.02	0.38	0.57	0.05
Avail Cap(c_a), veh/h	220	0	314	228	323	274	432	2588	1154	367	2588	1154
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.2	0.0	49.2	49.7	51.5	51.2	3.1	7.2	4.1	6.6	0.5	0.5
Incr Delay (d2), s/veh	0.6	0.0	1.0	0.1	1.2	0.1	0.5	1.0	0.0	0.8	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.7	0.1	0.3	0.0	0.5	6.8	0.1	0.6	0.8	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.8	0.0	50.2	49.8	52.6	51.3	3.6	8.2	4.1	7.4	1.4	0.6
LnGrp LOS	D	A	D	D	D	D	A	A	A	A	A	A
Approach Vol, veh/h		67			17			1679			1652	
Approach Delay, s/veh		48.1			51.7			7.8			1.8	
Approach LOS		D			D			A			A	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.9	85.6	4.7	11.8	7.9	85.6	7.6	8.9				
Change Period (Y+Rc), s	4.0	6.5	4.0	6.0	4.0	6.5	4.0	6.0				
Max Green Setting (Gmax), s	7.0	58.5	6.0	18.0	7.0	58.5	6.0	18.0				
Max Q Clear Time (g_c+1), s	3.8	5.2	2.3	3.4	3.8	24.8	4.4	2.6				
Green Ext Time (p_c), s	0.1	15.6	0.0	0.0	0.1	14.4	0.0	0.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			5.9									
HCM 6th LOS			A									

Timing Report, Sorted By Phase  
 9: Ziegler & Council Tree/Broadcom

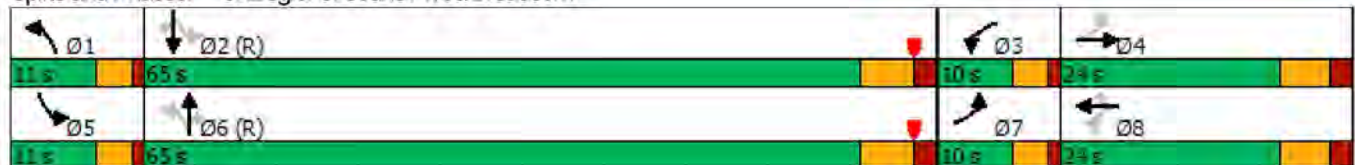
Long Total AM

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	WBL	EBTL	SBL	NBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize			Yes	Yes			Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	11	65	10	24	11	65	10	24
Maximum Split (%)	10.0%	59.1%	9.1%	21.8%	10.0%	59.1%	9.1%	21.8%
Minimum Split (s)	11	28.5	9.5	24	11	29.5	9.5	24
Yellow Time (s)	3	4.5	3	4	3	4.5	3	4
All-Red Time (s)	1	2	1	2	1	2	1	2
Minimum Initial (s)	4	7	5	4	4	7	5	4
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7				7		
Flash Dont Walk (s)		14				16		
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	34	45	0	10	34	45	0	10
End Time (s)	45	0	10	34	45	0	10	34
Yield/Force Off (s)	41	103.5	6	28	41	103.5	6	28
Yield/Force Off 170(s)	41	89.5	6	28	41	87.5	6	28
Local Start Time (s)	34	45	0	10	34	45	0	10
Local Yield (s)	41	103.5	6	28	41	103.5	6	28
Local Yield 170(s)	41	89.5	6	28	41	87.5	6	28

Intersection Summary












Cycle Length 110  
 Control Type Actuated-Coordinated  
 Natural Cycle 90  
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 9: Ziegler & Council Tree/Broadcom



Queues  
9: Ziegler & Council Tree/Broadcom

Long Total AM

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	42	110	5	11	5	121	1537	58	121	1468	100
v/c Ratio	0.24	0.47	0.03	0.08	0.02	0.39	0.64	0.05	0.42	0.61	0.09
Control Delay	42.4	20.3	36.8	46.8	0.2	7.0	13.5	0.3	10.2	13.5	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.4	20.3	36.8	46.8	0.2	7.0	13.5	0.3	10.2	13.5	2.4
Queue Length 50th (ft)	28	14	3	7	0	9	231	0	12	376	4
Queue Length 95th (ft)	54	66	13	25	0	40	541	3	m20	641	m26
Internal Link Dist (ft)		262		234			488			523	
Turn Bay Length (ft)	100		150		40	420		340	400		400
Base Capacity (vph)	178	356	177	321	367	313	2407	1111	295	2408	1112
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.31	0.03	0.03	0.01	0.39	0.64	0.05	0.41	0.61	0.09
























Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



HCM 6th Signalized Intersection Summary  
 9: Ziegler & Council Tree/Broadcom

Long Total PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	35	300	65	50	135	310	1450	15	40	1690	105
Future Volume (veh/h)	220	35	300	65	50	135	310	1450	15	40	1690	105
Initial Q(Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	227	36	127	67	52	10	320	1495	1	41	1742	40
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	286	44	156	184	217	184	342	2327	1038	261	1912	853
Arrive On Green	0.06	0.12	0.11	0.05	0.12	0.12	0.15	0.65	0.65	0.01	0.18	0.18
Sat Flow, veh/h	1781	362	1278	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	227	0	163	67	52	10	320	1495	1	41	1742	40
Grp Sat Flow(s),veh/h/ln	1781	0	1640	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	7.0	0.0	11.6	3.9	3.0	0.7	16.2	30.1	0.0	1.2	57.7	2.5
Cycle Q Clear(g_c), s	7.0	0.0	11.6	3.9	3.0	0.7	16.2	30.1	0.0	1.2	57.7	2.5
Prop In Lane	1.00		0.78	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	286	0	201	184	217	184	342	2327	1038	261	1912	853
V/C Ratio(X)	0.79	0.00	0.81	0.36	0.24	0.05	0.93	0.64	0.00	0.16	0.91	0.05
Avail Cap(c_a), veh/h	286	0	205	195	234	198	342	2327	1038	321	1912	853
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.1	0.0	51.7	43.6	48.2	47.2	39.8	12.3	7.2	12.8	46.5	23.8
Incr Delay (d2), s/veh	14.3	0.0	21.2	1.2	0.6	0.1	32.2	1.4	0.0	0.3	8.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	6.0	1.8	1.5	0.3	12.2	10.7	0.0	0.5	29.4	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.4	0.0	72.9	44.8	48.8	47.3	72.0	13.7	7.2	13.1	54.6	23.9
LnGrp LOS	E	A	E	D	D	D	E	B	A	B	D	C
Approach Vol, veh/h		390			129			1816			1823	
Approach Delay, s/veh		67.4			46.6			24.0			53.0	
Approach LOS		E			D			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.0	70.1	9.3	19.7	7.0	84.1	10.0	18.9				
Change Period (Y+Rc), s	4.0	6.5	4.0	6.0	4.0	6.5	4.0	6.0				
Max Green Setting (Gmax), s	17.0	62.5	6.0	14.0	7.0	72.5	6.0	14.0				
Max Q Clear Time (g_c+1), s	18.2	59.7	5.9	13.6	3.2	32.1	9.0	5.0				
Green Ext Time (p_c), s	0.0	2.4	0.0	0.0	0.0	14.6	0.0	0.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			41.5									
HCM 6th LOS			D									

Timing Report, Sorted By Phase  
9: Ziegler & Council Tree/Broadcom

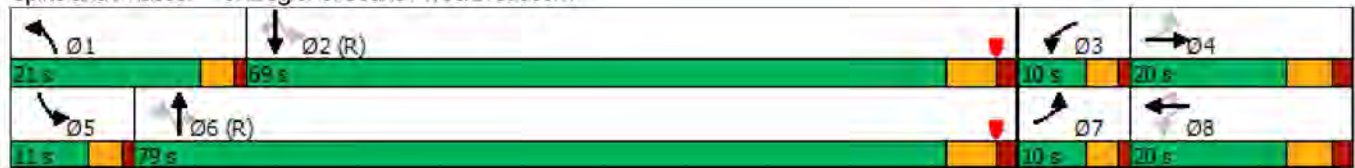
Long Total PM

Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	WBL	EBTL	SBL	NBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize			Yes	Yes			Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	21	69	10	20	11	79	10	20
Maximum Split (%)	17.5%	57.5%	8.3%	16.7%	9.2%	65.8%	8.3%	16.7%
Minimum Split (s)	11	28.5	9.5	20	11	29.5	9.5	20
Yellow Time (s)	3	4.5	3	4	3	4.5	3	4
All-Red Time (s)	1	2	1	2	1	2	1	2
Minimum Initial (s)	4	7	5	4	4	7	5	4
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7				7		
Flash Dont Walk (s)		14				16		
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	30	51	0	10	30	41	0	10
End Time (s)	51	0	10	30	41	0	10	30
Yield/Force Off (s)	47	113.5	6	24	37	113.5	6	24
Yield/Force Off 170(s)	47	99.5	6	24	37	97.5	6	24
Local Start Time (s)	30	51	0	10	30	41	0	10
Local Yield (s)	47	113.5	6	24	37	113.5	6	24
Local Yield 170(s)	47	99.5	6	24	37	97.5	6	24

Intersection Summary












Cycle Length 120  
 Control Type Actuated-Coordinated  
 Natural Cycle 100  
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 9: Ziegler & Council Tree/Broadcom



Queues  
9: Ziegler & Council Tree/Broadcom

Long Total PM

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	227	345	67	52	139	320	1495	15	41	1742	108
v/c Ratio	0.85	0.88	0.39	0.25	0.46	0.95	0.65	0.01	0.17	0.91	0.12
Control Delay	72.2	42.3	44.9	50.8	12.9	72.9	15.6	0.0	5.0	36.3	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.2	42.3	44.9	50.8	12.9	72.9	15.6	0.0	5.0	36.3	3.5
Queue Length 50th (ft)	157	100	42	37	0	195	376	0	4	757	13
Queue Length 95th (ft)	#288	#271	83	76	58	#381	462	0	m5	#848	m18
Internal Link Dist (ft)		262		234			488			523	
Turn Bay Length (ft)	100		150		40	420		340	400		400
Base Capacity (vph)	268	394	170	232	321	338	2296	1062	254	1907	916
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.88	0.39	0.22	0.43	0.95	0.65	0.01	0.16	0.91	0.12

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.



Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘	↕	↕	
Traffic Vol, veh/h	0	10	10	1505	1595	50
Future Vol, veh/h	0	10	10	1505	1595	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	100	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	11	1584	1679	53

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	866	1732
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	4.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	2.22
Pot Cap-1 Maneuver	0	297	360
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	297	360
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.6	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	360	-	297	-	-
HCM Lane V/C Ratio	0.029	-	0.035	-	-
HCM Control Delay (s)	15.3	-	17.6	-	-
HCM Lane LOS	C	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘	↕	↕	
Traffic Vol, veh/h	0	60	15	1795	1775	105
Future Vol, veh/h	0	60	15	1795	1775	105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	100	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	62	15	1851	1830	108

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	969	1938
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	4.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	2.22
Pot Cap-1 Maneuver	0	253	299
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	253	299
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.8	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	299	-	253	-	-
HCM Lane V/C Ratio	0.052	-	0.244	-	-
HCM Control Delay (s)	17.7	-	23.8	-	-
HCM Lane LOS	C	-	C	-	-
HCM 95th %tile Q(veh)	0.2	-	0.9	-	-

HCM 6th Signalized Intersection Summary  
 18: Ziegler & Site Access/Hidden Pond

Long Total AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	0	100	5	0	5	65	1435	5	5	1540	75
Future Volume (veh/h)	130	0	100	5	0	5	65	1435	5	5	1540	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	137	0	11	5	0	1	68	1511	5	5	1621	53
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	243	0	183	87	6	7	295	2728	9	340	2550	1138
Arrive On Green	0.11	0.00	0.12	0.11	0.00	0.11	0.06	1.00	0.99	0.02	0.72	0.72
Sat Flow, veh/h	1543	0	1585	235	52	57	1781	3633	12	1781	3554	1585
Grp Volume(v), veh/h	137	0	11	6	0	0	68	739	777	5	1621	53
Grp Sat Flow(s),veh/h/ln	1543	0	1585	344	0	0	1781	1777	1868	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	0.7	0.0	0.0	0.0	0.9	0.1	0.1	0.1	26.0	1.1
Cycle Q Clear(g_c), s	9.4	0.0	0.7	9.4	0.0	0.0	0.9	0.1	0.1	0.1	26.0	1.1
Prop In Lane	1.00		1.00	0.83		0.17	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	229	0	183	97	0	0	295	1334	1403	340	2550	1138
V/C Ratio(X)	0.60	0.00	0.06	0.06	0.00	0.00	0.23	0.55	0.55	0.01	0.64	0.05
Avail Cap(c_a), veh/h	336	0	303	205	0	0	321	1334	1403	426	2550	1138
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.7	0.0	43.3	44.0	0.0	0.0	7.1	0.0	0.0	3.9	8.1	4.5
Incr Delay (d2), s/veh	2.5	0.0	0.1	0.3	0.0	0.0	0.4	1.7	1.6	0.0	1.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.0	0.3	0.2	0.0	0.0	0.4	0.6	0.6	0.0	8.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.2	0.0	43.5	44.3	0.0	0.0	7.5	1.7	1.6	3.9	9.3	4.6
LnGrp LOS	D	A	D	D	A	A	A	A	A	A	A	A
Approach Vol, veh/h		148			6			1584			1679	
Approach Delay, s/veh		49.7			44.3			1.9			9.1	
Approach LOS		D			D			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	87.6		17.7	8.4	83.9		17.7				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	6.0	68.0		20.0	6.0	68.0		20.0				
Max Q Clear Time (g_c+1), s	2.1	2.1		11.4	2.9	28.0		11.4				
Green Ext Time (p_c), s	0.0	14.8		0.4	0.0	16.9		0.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			7.6									
HCM 6th LOS			A									



Timing Report, Sorted By Phase  
 18: Ziegler & Site Access/Hidden Pond

Long Total AM

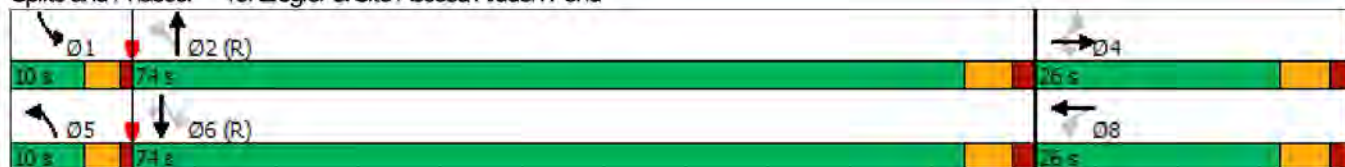


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	10	74	26	10	74	26
Maximum Split (%)	9.1%	67.3%	23.6%	9.1%	67.3%	23.6%
Minimum Split (s)	9.5	24	24	9	24	24
Yellow Time (s)	3	4	4	3	4	4
All-Red Time (s)	1	2	2	1	2	2
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		11	11		11	11
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	100	0	74	100	0	74
End Time (s)	0	74	100	0	74	100
Yield/Force Off (s)	106	68	94	106	68	94
Yield/Force Off 170(s)	106	57	83	106	57	83
Local Start Time (s)	100	0	74	100	0	74
Local Yield (s)	106	68	94	106	68	94
Local Yield 170(s)	106	57	83	106	57	83

Intersection Summary

Cycle Length 110  
 Control Type Actuated-Coordinated  
 Natural Cycle 75  
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green









Splits and Phases: 18: Ziegler & Site Access/Hidden Pond



## Queues

Long Total AM

## 18: Ziegler &amp; Site Access/Hidden Pond

								
Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	137	105	10	68	1516	5	1621	79
v/c Ratio	0.66	0.32	0.04	0.28	0.58	0.02	0.67	0.07
Control Delay	58.4	10.3	0.2	9.7	15.0	3.8	13.2	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.4	10.3	0.2	9.7	15.0	3.8	13.2	2.0
Queue Length 50th (ft)	92	0	0	9	195	1	344	0
Queue Length 95th (ft)	152	46	0	m38	599	4	468	17
Internal Link Dist (ft)	234		254		1		370	
Turn Bay Length (ft)		150		350		100		350
Base Capacity (vph)	267	387	343	240	2624	283	2421	1108
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.27	0.03	0.28	0.58	0.02	0.67	0.07

## Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary  
 18: Ziegler & Site Access/Hidden Pond

Long Total PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	0	95	5	0	5	110	1680	5	5	1780	120
Future Volume (veh/h)	170	0	95	5	0	5	110	1680	5	5	1780	120
Initial Q(Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	175	0	13	5	0	2	113	1732	5	5	1835	81
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	0	247	73	9	12	230	2622	8	186	2442	1089
Arrive On Green	0.15	0.00	0.16	0.15	0.00	0.15	0.03	0.48	0.48	0.01	0.69	0.69
Sat Flow, veh/h	1352	0	1585	136	58	78	1781	3635	10	1781	3554	1585
Grp Volume(v), veh/h	175	0	13	7	0	0	113	846	891	5	1835	81
Grp Sat Flow(s),veh/h/ln	1352	0	1585	272	0	0	1781	1777	1868	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	0.8	0.1	0.0	0.0	2.0	43.4	43.4	0.1	40.1	2.0
Cycle Q Clear(g_c), s	15.3	0.0	0.8	15.4	0.0	0.0	2.0	43.4	43.4	0.1	40.1	2.0
Prop In Lane	1.00		1.00	0.71		0.29	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	259	0	247	91	0	0	230	1282	1348	186	2442	1089
V/C Ratio(X)	0.68	0.00	0.05	0.08	0.00	0.00	0.49	0.66	0.66	0.03	0.75	0.07
Avail Cap(c_a), veh/h	310	0	304	144	0	0	261	1282	1348	264	2442	1089
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.7	0.0	43.1	44.3	0.0	0.0	18.8	19.8	19.9	11.9	12.2	6.2
Incr Delay (d2), s/veh	4.5	0.0	0.1	0.4	0.0	0.0	1.6	2.7	2.6	0.1	2.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.0	0.3	0.2	0.0	0.0	1.9	19.4	20.4	0.0	13.8	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.2	0.0	43.2	44.6	0.0	0.0	20.4	22.5	22.4	12.0	14.3	6.3
LnGrp LOS	D	A	D	D	A	A	C	C	C	B	B	A
Approach Vol, veh/h		188			7			1850			1921	
Approach Delay, s/veh		53.4			44.6			22.3			14.0	
Approach LOS		D			D			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.8	91.6		23.7	8.9	87.4		23.7				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	6.0	76.0		22.0	7.0	75.0		22.0				
Max Q Clear Time (g_c+1), s	2.1	45.4		17.3	4.0	42.1		17.4				
Green Ext Time (p_c), s	0.0	15.3		0.4	0.1	18.7		0.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			19.8									
HCM 6th LOS			B									



Timing Report, Sorted By Phase  
 18: Ziegler & Site Access/Hidden Pond

Long Total PM

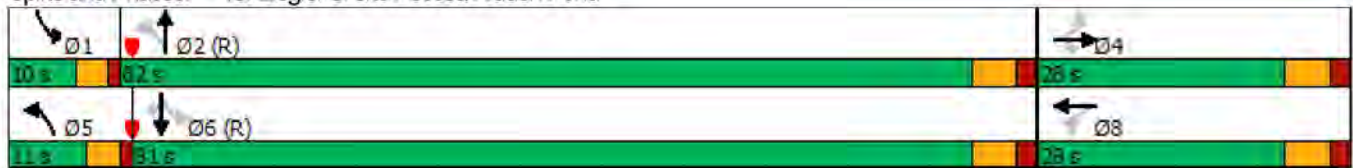


Phase Number	1	2	4	5	6	8
Movement	SBL	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	10	82	28	11	81	28
Maximum Split (%)	8.3%	68.3%	23.3%	9.2%	67.5%	23.3%
Minimum Split (s)	9.5	24	24	9	24	24
Yellow Time (s)	3	4	4	3	4	4
All-Red Time (s)	1	2	2	1	2	2
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		11	11		11	11
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	109	119	81	109	0	81
End Time (s)	119	81	109	0	81	109
Yield/Force Off (s)	115	75	103	116	75	103
Yield/Force Off 170(s)	115	64	92	116	64	92
Local Start Time (s)	109	119	81	109	0	81
Local Yield (s)	115	75	103	116	75	103
Local Yield 170(s)	115	64	92	116	64	92

Intersection Summary

Cycle Length 120  
 Control Type Actuated-Coordinated  
 Natural Cycle 80  
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green









Splits and Phases: 18: Ziegler & Site Access/Hidden Pond



## Queues

Long Total PM

## 18: Ziegler &amp; Site Access/Hidden Pond

								
Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	175	98	10	113	1737	5	1835	124
v/c Ratio	0.76	0.29	0.03	0.59	0.67	0.02	0.78	0.11
Control Delay	68.9	10.3	0.2	24.7	15.4	4.2	18.2	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.9	10.3	0.2	24.7	15.4	4.2	18.2	1.7
Queue Length 50th (ft)	129	0	0	46	413	1	522	0
Queue Length 95th (ft)	207	46	0	m81	604	4	638	22
Internal Link Dist (ft)	234		254		1		370	
Turn Bay Length (ft)		150		350		100		350
Base Capacity (vph)	268	382	340	194	2605	220	2338	1088
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.26	0.03	0.58	0.67	0.02	0.78	0.11

## Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Intersection

Int Delay, s/veh 7.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	5	0	55	15	0	15	35	1515	10	5	1550	5
Future Vol, veh/h	5	0	55	15	0	15	35	1515	10	5	1550	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	58	16	0	16	37	1595	11	5	1632	5

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2517	3325	819	2501	3322	803	1637	0	0	1606	0	0
Stage 1	1645	1645	-	1675	1675	-	-	-	-	-	-	-
Stage 2	872	1680	-	826	1647	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	14	8	319	~15	8	326	392	-	-	403	-	-
Stage 1	104	156	-	99	150	-	-	-	-	-	-	-
Stage 2	312	150	-	332	155	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	12	7	319	~11	7	326	392	-	-	403	-	-
Mov Cap-2 Maneuver	12	7	-	~11	7	-	-	-	-	-	-	-
Stage 1	94	154	-	90	136	-	-	-	-	-	-	-
Stage 2	269	136	-	268	153	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	85.7	\$ 648.7	0.3	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	392	-	-	102	21	403	-	-
HCM Lane V/C Ratio	0.094	-	-	0.619	1.504	0.013	-	-
HCM Control Delay (s)	15.1	-	-	85.7	\$ 648.7	14.1	-	-
HCM Lane LOS	C	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.3	-	-	3	4.2	0	-	-

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon



Intersection

Int Delay, s/veh 11.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	5	0	55	5	0	15	70	1775	15	15	1845	10
Future Vol, veh/h	5	0	55	5	0	15	70	1775	15	15	1845	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	57	5	0	15	72	1830	15	15	1902	10

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2996	3926	956	2963	3924	923	1912	0	0	1845	0	0
Stage 1	1937	1937	-	1982	1982	-	-	-	-	-	-	-
Stage 2	1059	1989	-	981	1942	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	6	3	258	6	3	272	306	-	-	325	-	-
Stage 1	68	111	-	63	105	-	-	-	-	-	-	-
Stage 2	240	105	-	268	110	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	~4	2	258	~4	2	272	306	-	-	325	-	-
Mov Cap-2 Maneuver	~4	2	-	~4	2	-	-	-	-	-	-	-
Stage 1	52	106	-	48	80	-	-	-	-	-	-	-
Stage 2	173	80	-	199	105	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s\$	476.9	\$ 723.7	0.8	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	306	-	-	41	15	325	-	-
HCM Lane V/C Ratio	0.236	-	-	1.509	1.375	0.048	-	-
HCM Control Delay (s)	20.4	-	-	\$ 476.9	\$ 723.7	16.6	-	-
HCM Lane LOS	C	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	0.9	-	-	6.3	3.2	0.1	-	-

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection

Int Delay, s/veh 2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	30	10	65	5	5	90
Future Vol, veh/h	30	10	65	5	5	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	11	68	5	5	95

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	176	71	0
Stage 1	71	-	-
Stage 2	105	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	814	991	-
Stage 1	952	-	-
Stage 2	919	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	812	991	-
Mov Cap-2 Maneuver	812	-	-
Stage 1	952	-	-
Stage 2	916	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	850	1527
HCM Lane V/C Ratio	-	-	0.05	0.003
HCM Control Delay (s)	-	-	9.5	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection

Int Delay, s/veh 2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	40	20	155	15	5	75
Future Vol, veh/h	40	20	155	15	5	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	21	163	16	5	79

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	260	171	0
Stage 1	171	-	-
Stage 2	89	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3,518	3,318	-
Pot Cap-1 Maneuver	729	873	-
Stage 1	859	-	-
Stage 2	934	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	726	873	-
Mov Cap-2 Maneuver	726	-	-
Stage 1	859	-	-
Stage 2	930	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	769	1397
HCM Lane V/C Ratio	-	-	0.082	0.004
HCM Control Delay (s)	-	-	10.1	7.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0



Intersection

Int Delay, s/veh 4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	5	75	0	0	5	15	55	10	15	0
Future Vol, veh/h	0	0	5	75	0	0	5	15	55	10	15	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	5	79	0	0	5	16	58	11	16	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	93	122	16	96	93	45	16	0	0	74	0	0
Stage 1	38	38	-	55	55	-	-	-	-	-	-	-
Stage 2	55	84	-	41	38	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	891	768	1063	887	797	1025	1602	-	-	1526	-	-
Stage 1	977	863	-	957	849	-	-	-	-	-	-	-
Stage 2	957	825	-	974	863	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	884	760	1063	875	789	1025	1602	-	-	1526	-	-
Mov Cap-2 Maneuver	884	760	-	875	789	-	-	-	-	-	-	-
Stage 1	974	857	-	954	846	-	-	-	-	-	-	-
Stage 2	954	823	-	962	857	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.4	9.5	0.5	2.9
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1602	-	-	1063	875	1526	-	-
HCM Lane V/C Ratio	0.003	-	-	0.005	0.09	0.007	-	-
HCM Control Delay (s)	7.3	0	-	8.4	9.5	7.4	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0	-	-

Intersection

Int Delay, s/veh 2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	5	60	0	0	5	30	140	5	15	0
Future Vol, veh/h	0	0	5	60	0	0	5	30	140	5	15	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	5	63	0	0	5	32	147	5	16	0

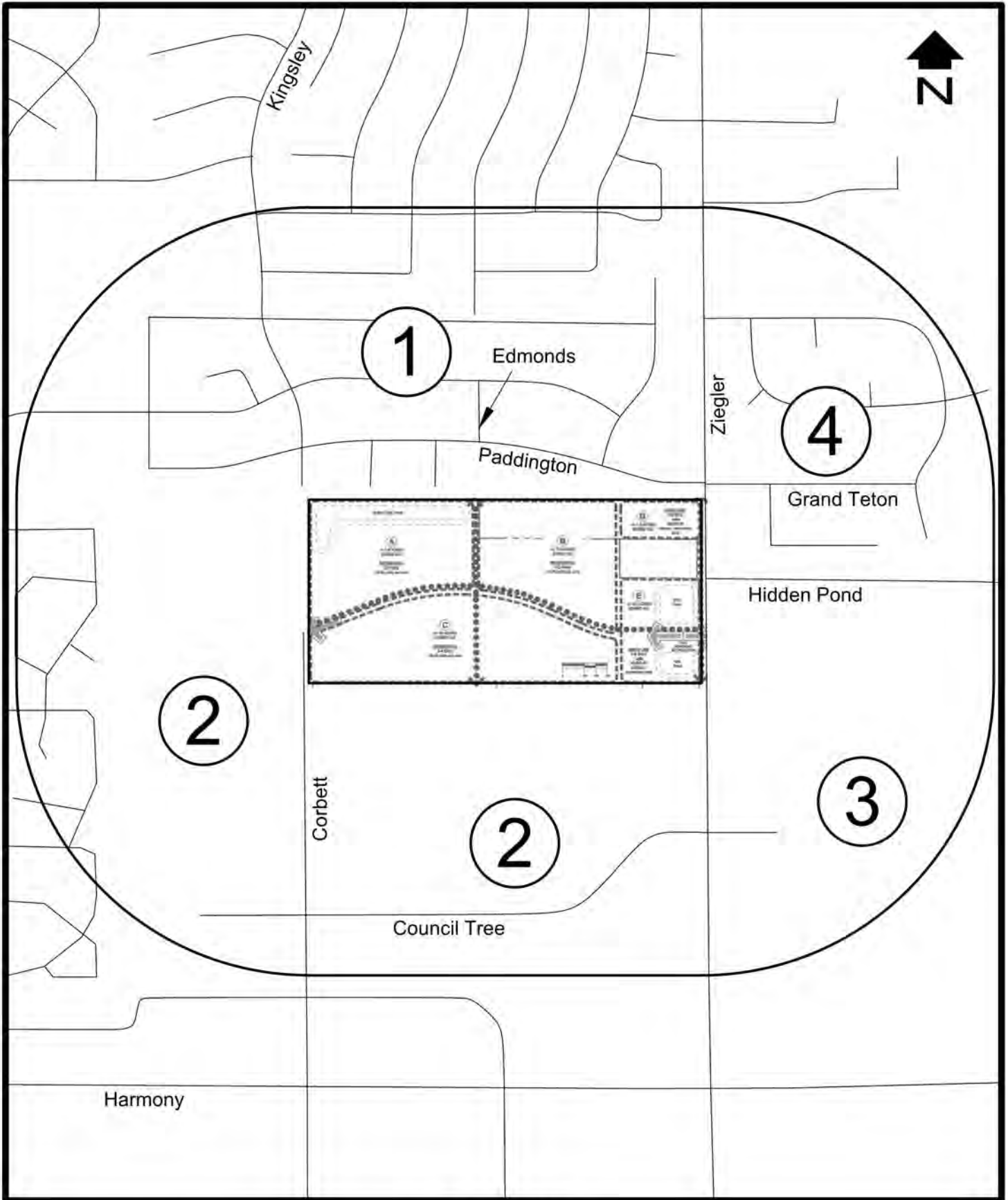
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	142	215	16	145	142	106	16	0	0	179	0	0
Stage 1	26	26	-	116	116	-	-	-	-	-	-	-
Stage 2	116	189	-	29	26	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	828	683	1063	824	749	948	1602	-	-	1397	-	-
Stage 1	992	874	-	889	800	-	-	-	-	-	-	-
Stage 2	889	744	-	988	874	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	823	678	1063	815	743	948	1602	-	-	1397	-	-
Mov Cap-2 Maneuver	823	678	-	815	743	-	-	-	-	-	-	-
Stage 1	988	871	-	885	797	-	-	-	-	-	-	-
Stage 2	885	741	-	979	871	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.4	9.8	0.2	1.9
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1602	-	-	1063	815	1397	-	-
HCM Lane V/C Ratio	0.003	-	-	0.005	0.077	0.004	-	-
HCM Control Delay (s)	7.3	0	-	8.4	9.8	7.6	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0	-	-

# APPENDIX I





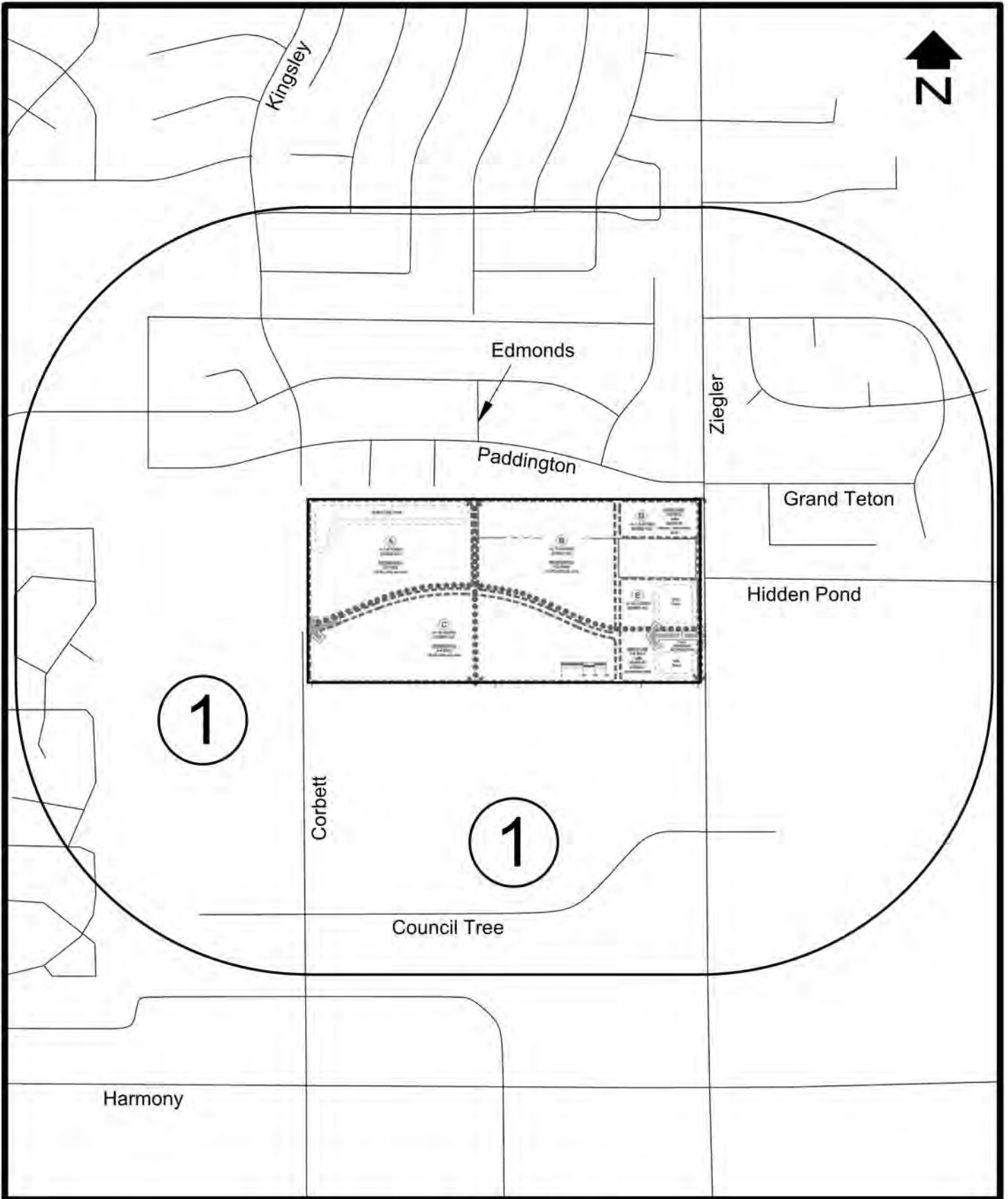
SCALE: 1"=600'

## PEDESTRIAN INFLUENCE AREA

## Pedestrian LOS Worksheet

Project Location Classification: Other

	Description of Applicable Destination Area Within 1320'	Destination Area Classification	Level of Service (minimum based on project location classification)					
			Directness	Continuity	Street Crossings	Visual Interest & Amenities	Security	
1	The residential neighborhood to the north and northwest of the site	Residential	Minimum	C	C	C	C	C
			Actual	A	B	B	B	B
			Proposed	A	B	B	B	B
2	Commercial uses to the south and southwest of the site (Front Range Village)	Commercial	Minimum	C	C	C	C	C
			Actual	A	B	B	B	B
			Proposed	A	B	B	B	B
3	HP Campus	Industrial	Minimum	C	C	C	C	C
			Actual	A	B	C	C	C
			Proposed	A	B	C	C	C
4	The residential neighborhood to the east and northeast of the site	Residential	Minimum	C	C	C	C	C
			Actual	F	B	C	C	C
			Proposed	See Text	B	C	C	C
5			Minimum					
			Actual					
			Proposed					
6			Minimum					
			Actual					
			Proposed					
7			Minimum					
			Actual					
			Proposed					
8			Minimum					
			Actual					
			Proposed					
9			Minimum					
			Actual					
			Proposed					
10			Minimum					
			Actual					
			Proposed					



SCALE: 1"=600'

## BICYCLE INFLUENCE AREA



## Bicycle LOS Worksheet

		Level of Service – Connectivity				
		Minimum	Actual	Proposed		
		Base Connectivity:	C	B	B	
		Specific connections to priority sites:				
		Description of Applicable Destination Area Within 1320'	Destination Area Classification			
1		Commercial uses to the south and southwest of the site (Front Range Village)	Commercial	C	B	B
2						
3						
4						
5						
6						
7						
8						