CITY OF LOGAN
RESOLUTION 17-46

A RESOLUTION RECOMMENDING A PREFERRED ALTERNATIVE FOR IMPROVING THE TRAFFIC FLOW AT 1000 NORTH AND 1200 EAST

WHEREAS, the offset intersection located at 1000 North and 1200 East increases conflicts and challenges to both traffic flow and pedestrian crossings; and

WHEREAS, many alternatives to improve the situation have been discussed for several years; and

WHEREAS, Utah State University and the City of Logan have studied the alternatives and how each will improve safety and traffic flow at this intersection.

NOW THEREFORE, BE IT RESOLVED by the Logan Municipal Council, that:

1. The Municipal Council has reviewed the attached technical memorandum and support the preferred alternative.

2. The Municipal Council supports further work by Utah State University and the City of Logan to further identify the specific property impacts for USU and the City of Logan and to prepare conceptual designs showing a definitive layout of the preferred alternative.

PASSED BY THE LOGAN MUNICIPAL COUNCIL, STATE OF UTAH, THIS _____ DAY OF OCTOBER, 2017.

AYES:
NAYS:
ABSENT:

_____
Holly H. Daines, Chairman

ATTEST:

_____
Teresa Harris, City Recorder

FEHR PEERS

TECHNICAL MEMORANDUM

Date: August 8, 2017

To: Charles Darnell, Utah State University
Jordy Guth, Utah State University
Mark Nielsen, City of Logan

From: Seishi Yamagata, Fehr & Peers
Preston Stinger, Fehr & Peers

Subject: 1200 East/1000 North Alternatives Traffic Analysis

UT17-2049

INTRODUCTION

The purpose of this study is to evaluate traffic operations of alternatives for the 1200 East / 1000 North intersection in Logan, Utah. This memorandum summarizes the second phase of this study, which was to quantitatively evaluate four alternatives that were shortlisted upon discussion from the steering committee based on the qualitative analysis completed for the first phase of this study (memorandum attached in Appendix).

The following alternatives were evaluated in this analysis (conceptual layouts are shown in the appendix):

1. Ovalabout (oval-shaped roundabout)
2. Hi-T (northbound traffic is free flow, southbound traffic stops occasionally for eastbound left-turns, eastbound left-turns use acceleration lane to merge into northbound traffic lane)
3. Roundabout on northern end and stop controlled on southern end with restricted westbound left-turns from 1000 North to 1200 East
4. 1000 North Realigned (assumes a 50/50 split in terms of land acquisition on the east and west side of 1200 East) with a signal

STUDY AREA

This study analyzes the traffic operations at the following study intersections:

- 1200 East / 1100 North
- 1200 East / 1000 North (West Leg)
- 1200 East / 1000 North (East Leg)
- 1200 East / 900 North

DATA COLLECTION

Traffic counts at the study intersections were collected to establish a baseline of existing conditions and operations for the area. At the study intersections, AM peak period traffic counts were recorded from 7:00 AM to 9:00 AM and PM peak period traffic counts were recorded from 4:00 PM to 6:00 PM on Tuesday, January 31, 2017. Counts of pedestrians and bikes were also collected. However, due to winter conditions with snow on the roadways, the number of pedestrians and bikes counted seemed relatively low. Therefore, counts of pedestrians and bikes performed in September 2014 were used for this study.

TRAFFIC VOLUMES

For the alternatives analysis, projected volumes at the study intersections for the year 2040 was used. The projected 2040 traffic volumes were calculated based on the existing traffic volumes and growth rates derived from the travel demand model developed by the Cache Metropolitan Planning Organization (MPO). The following annual growth rates were derived from the Cache MPO model:

- 1.4% - 1200 East, North of 1000 North
- 1.0% - 1200 East, South of 1000 North

An annual growth of 0.5% was also assumed to be applicable on 900 North, 1000 North, and 1100 North for this study.

It should be noted that the Cache MPO model results used in this phase of the analysis are consistent with the traffic volume projections used in the 2016 USU Transportation Study.

ANALYSIS METHODOLOGY

Level of Service (LOS) is a term that describes the operating performance of an intersection or roadway. LOS is measured quantitatively and reported on a scale from A to F, with A representing the best performance and F the worst. **Table 1** provides a brief description of each LOS letter designation and an accompanying average delay per vehicle for unsignalized and signalized intersections. The Highway Capacity Manual 2010 (HCM 2010) methodology was used in this study to remain consistent with "state-of-the-practice" professional standards.

TABLE 1 LEVEL OF SERVICE DESCRIPTIONS

LOS	Description	Signalized Intersections	Unsignalized Intersections
		Avg. Delay (sec/veh)[1]	Avg. Delay (sec/veh)[2]
A	*Free Flow / Insignificant Delay* Extremely favorable progression. Individual users are virtually unaffected by others in the traffic stream.	< 10.0	< 10.0
B	*Stable Operations / Minimum Delays* Good progression. The presence of other users in the traffic stream becomes noticeable.	> 10.0 to 20.0	> 10.0 to 15.0
C	*Stable Operations / Acceptable Delays* Fair progression. The operation of individual users is affected by interactions with others in the traffic stream	> 20.0 to 35.0	> 15.0 to 25.0
D	*Approaching Unstable Flows / Tolerable Delays* Marginal progression. Operating conditions are noticeably more constrained.	> 35.0 to 55.0	> 25.0 to 35.0
E	*Unstable Operations / Significant Delays Can Occur* Poor progression. Operating conditions are at or near capacity.	> 55.0 to 80.0	> 35.0 to 50.0
F	*Forced, Unpredictable Flows / Excessive Delays* Unacceptable progression with forced or breakdown of operating conditions.	> 80.0	> 50.0

1. Overall intersection LOS and average delay (seconds/vehicle) for all approaches.
2. Worst approach LOS and delay (seconds/vehicle) only.
3. Volume to capacity (v/c) rate, average values.

Source: Fehr & Peers descriptions, based on *2010 Highway Capacity Manual.*

EXISTING 2017 CONDITIONS

PURPOSE

The purpose of the 2017 existing conditions analysis is to study the intersections during the peak travel periods of the day under existing traffic and geometric conditions. Through this analysis, existing traffic operational deficiencies can be identified.

LEVEL OF SERVICE ANALYSIS

Using VISSIM simulation software and the HCM 2010 delay thresholds introduced above, the existing AM and PM peak hour LOS were computed for each study intersection (see appendix for detailed LOS reports). The results of this analysis are reported in **Figure 1** and **Table 2**.

As shown in **Table 2**, all study intersections operate at LOS C or better for both AM and PM peak hours.

TABLE 2 EXISTING 2017 BACKGROUND CONDITIONS PEAK HOUR LEVEL OF SERVICE

Intersection				Worst Movement[1]			Overall Intersection	
ID	Location	Period	Control	Movement[3]	Delay (sec/veh)	LOS	Avg. Delay (sec/veh)[2]	LOS
1	1200 East / 1100 North	AM	Side-Street Stop	WBL	11.7	B	-	-
		PM		WBL	12.7	B	-	-
2	1200 East / 1000 North (West Leg)	AM	Side-Street Stop	EBL	13.9	B	-	-
		PM		EBL	22.7	C	-	-
3	1200 East / 1000 North (East Leg)	AM	Side-Street Stop	WBL	12.9	B	-	-
		PM		WBL	14.2	B	-	-
4	1200 East / 900 North	AM	Side-Street Stop	WBL	12.7	B	-	-
		PM		WBL	14.2	B	-	-

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.
2. This represents the overall intersection LOS and delay (seconds/vehicle).
3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, and TH=Through

Source: Fehr & Peers.

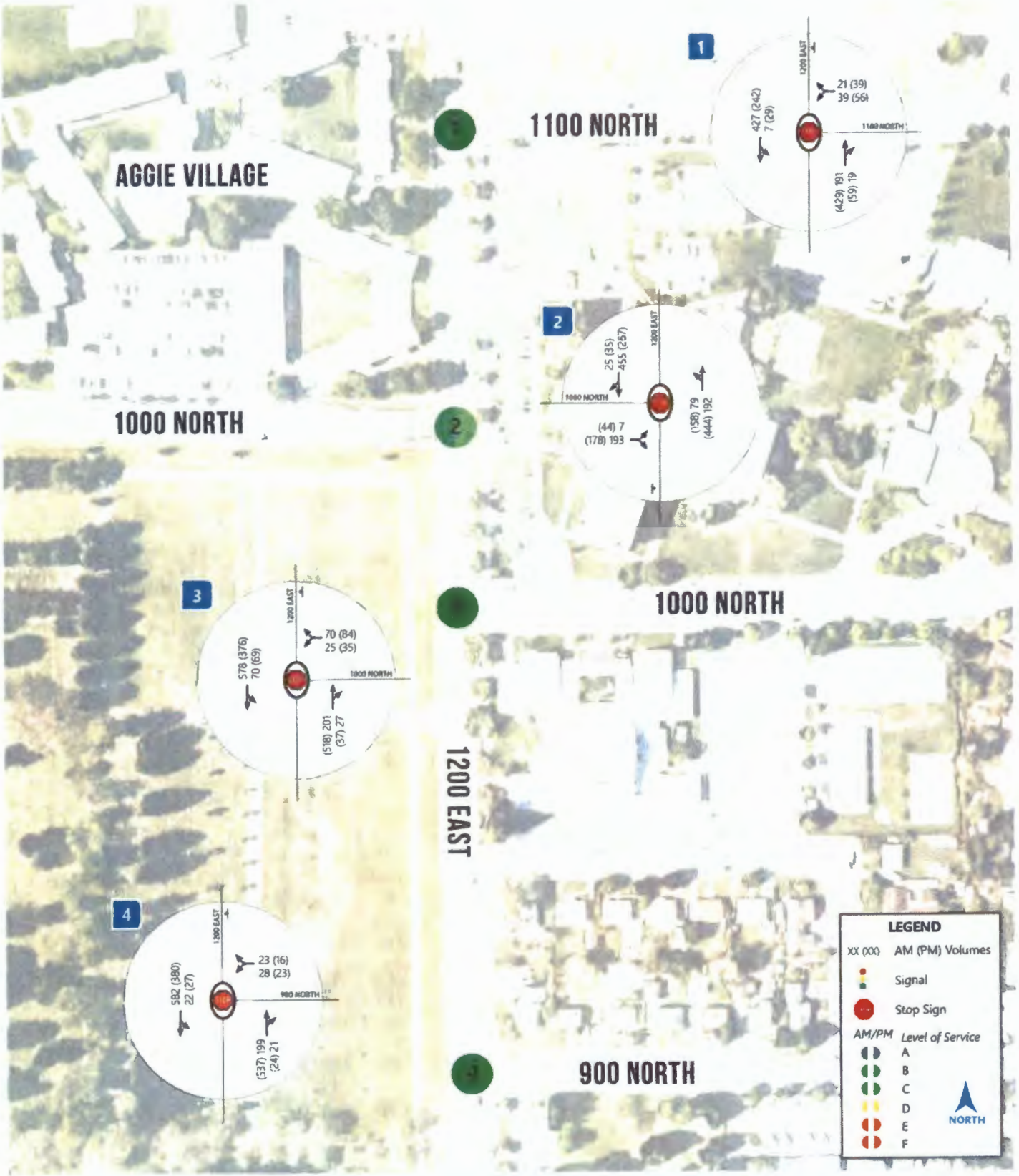

FIGURE 1

EXISTING CONDITIONS

FUTURE 2040 BACKGROUND CONDITIONS

PURPOSE

The purpose of the future 2040 background conditions analysis is to study the intersections during the peak travel periods of the day under projected 2040 traffic volumes. This analysis provides a baseline condition for the year 2040, which can be used to determine impacts of the alternatives.

LEVEL OF SERVICE ANALYSIS

Using VISSIM simulation software and the HCM 2010 delay thresholds introduced above, the future 2040 background AM and PM peak hour LOS were computed for each study intersection (see appendix for detailed LOS reports). The results of this analysis are reported in **Figure 2** and **Table 3**.

As shown in **Table 3**, under projected 2040 volumes, the 1200 East / 1000 North (West Leg) intersection operates at LOS F for both AM and PM peak hours. This is due to the high delay experienced by eastbound left vehicles turning onto heavy volume on 1200 East with increased traffic. The 1200 East / 1000 North (East Leg) intersection also operates at LOS E in the PM peak hour.

TABLE 3 FUTURE 2040 BACKGROUND CONDITIONS PEAK HOUR LEVEL OF SERVICE

Intersection				Worst Movement[1]			Overall Intersection	
ID	Location	Period	Control	Movement[3]	Delay (sec/veh)	LOS	Avg. Delay (sec/veh)[2]	LOS
1	1200 East / 1100 North	AM	Side-Street Stop	WBL	13.7	B	-	-
		PM		WBL	18.2	C	-	-
2	1200 East / 1000 North (West Leg)	AM	Side-Street Stop	EBL	72.6	F	-	-
		PM		EBL	135.8	F	-	-
3	1200 East / 1000 North (East Leg)	AM	Side-Street Stop	WBL	16.9	C	-	-
		PM		WBL	45.9	E	-	-
4	1200 East / 900 North	AM	Side-Street Stop	WBL	14.3	B	-	-
		PM		WBL	21.9	C	-	-

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.
2. This represents the overall intersection LOS and delay (seconds/vehicle).
3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, and TH=Through
Source: Fehr & Peers.

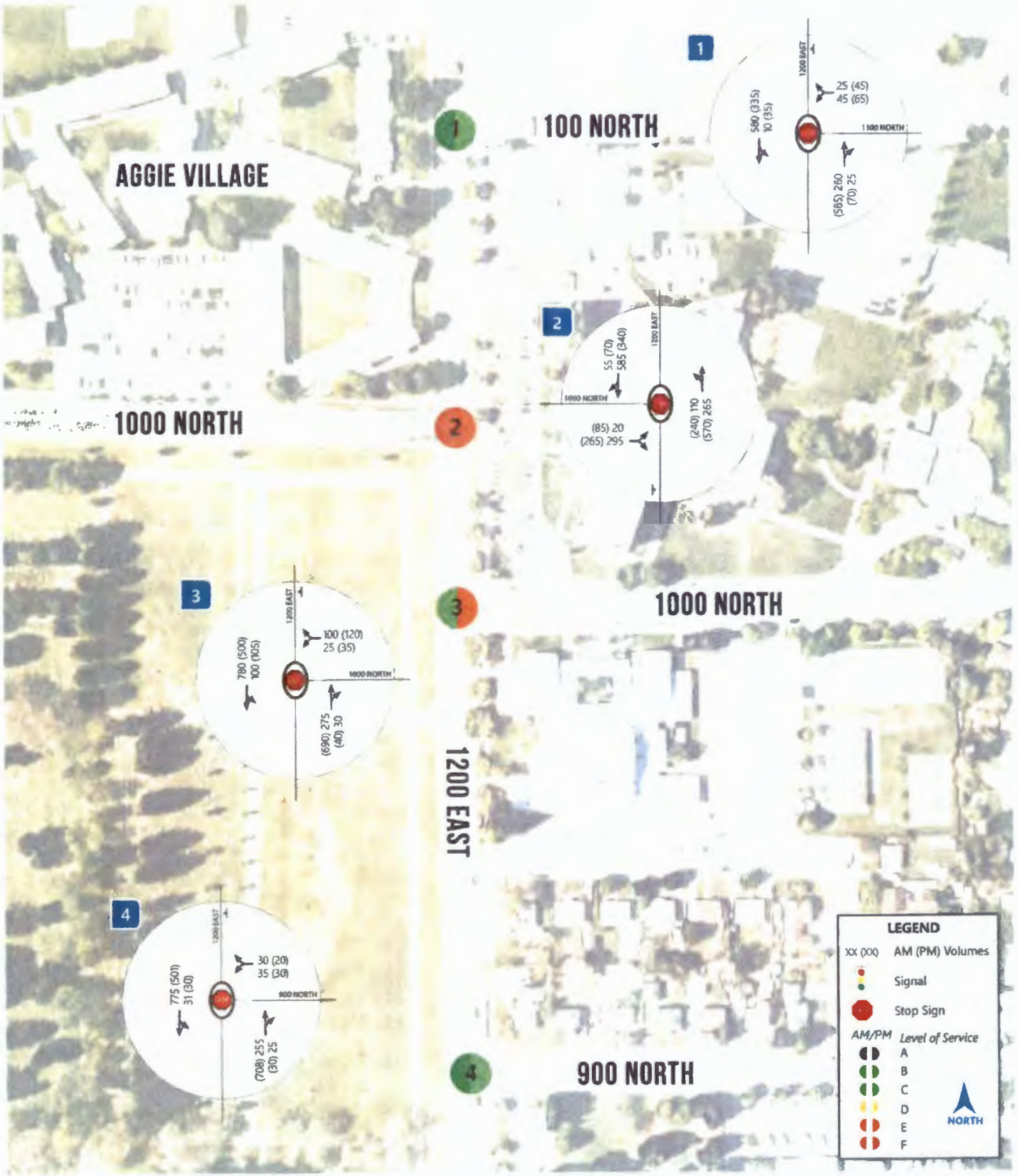

FIGURE 2

FUTURE 2040 BACKGROUND CONDITIONS

FUTURE 2040 ALTERNATIVE CONDITIONS - OVALABOUT

PURPOSE

The purpose of the future 2040 alternative conditions analysis is to study the intersections during the peak travel periods of the day under projected 2040 traffic volumes and an alternative geometric change to the 1200 East / 1000 North (West Leg) and 1200 East / 1000 North (East Leg) intersections.

ALTERNATIVE

This alternative proposes an ovalabout (oval-shaped roundabout) to replace both legs of 1000 North. Left turns out of the west and east legs of 1000 North will be restricted, and instead travel around the ovalabout. Traffic entering the ovalabout will yield to oncoming traffic already in the ovalabout.

LEVEL OF SERVICE ANALYSIS

Using VISSIM simulation software and the HCM 2010 delay thresholds introduced above, the future 2040 ovalabout AM and PM peak hour LOS were computed for each study intersection (see appendix for detailed LOS reports). The results of this analysis are reported in **Figure 3** and **Table 4**.

As shown in **Table 4**, under projected 2040 volumes and with an ovalabout at 1200 East / 1000 North, all intersections operate at LOS C or better for both AM and PM peak hours. It should be noted that the ovalabout at 1200 East / 1000 North was analyzed as a roundabout and therefore the overall intersection delay and LOS was reported. The westbound left movement at the 1200 East / 1000 North ovalabout still experienced higher delays, but still operates at an acceptable LOS C.

TABLE 4 FUTURE 2040 OVALABOUT CONDITIONS PEAK HOUR LEVEL OF SERVICE

Intersection				Worst Movement[1]			Overall Intersection	
ID	Location	Period	Control	Movement[3]	Delay (sec/veh)	LOS	Avg. Delay (sec/veh)[2]	LOS
1	1200 East / 1100 North	AM	Side-Street Stop	WBL	14.2	B	-	-
		PM		WBL	18.3	C	-	-
2	N/A[4]	-	-	-	-	-	-	-
		-		-	-	-	-	-
3	1200 East / 1000 North	AM	Roundabout	-	-	-	8.5	A
		PM		-	-	-	12.8	B
4	1200 East / 900 North	AM	Side-Street Stop	WBL	14.4	B	-	-
		PM		WBL	20.4	C	-	-

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.
2. This represents the overall intersection LOS and delay (seconds/vehicle).
3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, and TH=Through
4. The east and west legs of 1000 North were analyzed as one roundabout.

Source: Fehr & Peers.

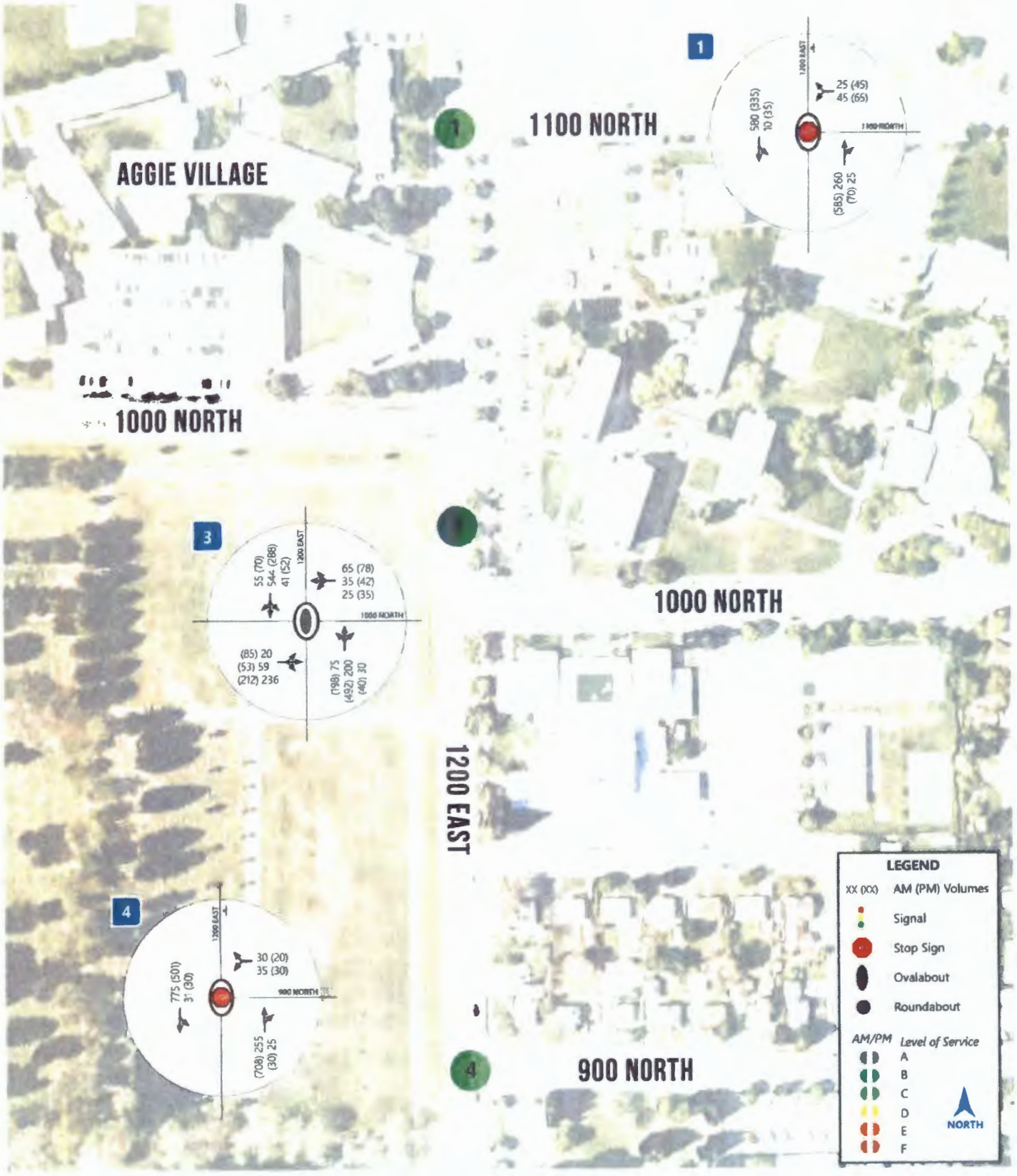

FIGURE 3

FUTURE 2040 ALTERNATIVE CONDITIONS - OVALABOUT

FUTURE 2040 ALTERNATIVE CONDITIONS – HI-T

PURPOSE

The purpose of the future 2040 alternative conditions analysis is to study the intersections during the peak travel periods of the day under projected 2040 traffic volumes and an alternative geometric change to the 1200 East / 1000 North (West Leg) and 1200 East / 1000 North (East Leg) intersections.

ALTERNATIVE

This alternative proposes a signalized Hi-T to be installed at the 1200 East / 1000 North (West Leg) intersection. This will allow northbound through vehicles to have a free movement, but the southbound, northbound left, and eastbound movements will be signalized. Vehicles making an eastbound left will turn into an acceleration lane on 1200 East, and eventually merge into the northbound travel lane.

LEVEL OF SERVICE ANALYSIS

Using VISSIM simulation software and the HCM 2010 delay thresholds introduced above, the future 2040 Hi-T AM and PM peak hour LOS were computed for each study intersection (see appendix for detailed LOS reports). The results of this analysis are reported in **Figure 4** and **Table 5**.

As shown in **Table 5**, under projected 2040 volumes and with a signalized Hi-T at 1200 East / 1000 North (West Leg), all intersections operate at LOS C or better except for 1200 East / 1100 North in the AM peak hour (LOS E), and 1200 East / 1000 North (East Leg) in the PM peak hour (LOS E). The signalized Hi-T helps mitigate the conditions at the 1200 East / 1000 North (West Leg) intersection, but the queues created by the new signal spills back into adjacent intersections, causing the LOS E at the 1200 East / 1100 North and 1200 East / 1000 North (East Leg) intersections. The northbound through vehicles have a free movement at the Hi-T; however, the storage length for the northbound left movement, which is controlled by the signal, is not adequate, causing queueing vehicles to spill into the northbound through lane. This causes the queue length to spill into the 1200 East / 1000 North (East Leg) intersection.

This alternative is the least pedestrian friendly compared to the other alternatives.

TABLE 5 FUTURE 2040 HI-T CONDITIONS PEAK HOUR LEVEL OF SERVICE

	Intersection			Worst Movement[1]			Overall Intersection	
ID	Location	Period	Control	Movement[3]	Delay (sec/veh)	LOS	Avg. Delay (sec/veh)[2]	LOS
1	1200 East / 1100 North	AM	Side-Street Stop	WBL	45.3	E	-	-
		PM		WBL	30.4	D	-	-
2	1200 East / 1000 North (West Leg)	AM	Signal	-	-	-	22.7	C
		PM		-	-	-	20.7	C
3	1200 East / 1000 North (East Leg)	AM	Side-Street Stop	WBL	17.6	C	-	-
		PM		WBL	35.1	E	-	-
4	1200 East / 900 North	AM	Side-Street Stop	WBL	16.9	C	-	-
		PM		WBL	25.7	D	-	-

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.
2. This represents the overall intersection LOS and delay (seconds/vehicle).
3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, and TH=Through
Source: Fehr & Peers.

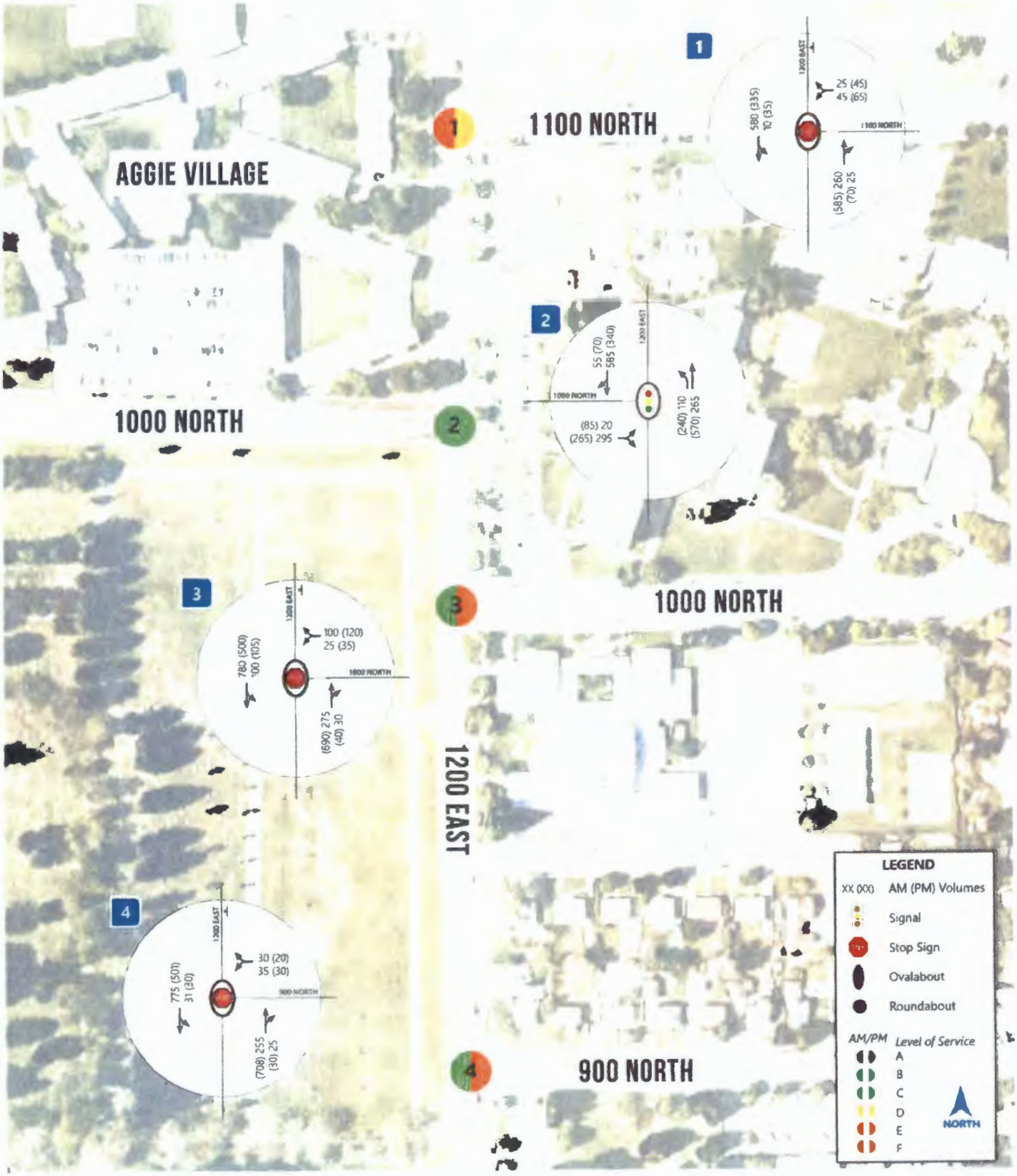

FIGURE 4

FUTURE 2040 BACKGROUND CONDITIONS - HI - T

FUTURE 2040 ALTERNATIVE CONDITIONS – ROUNDABOUT

PURPOSE

The purpose of the future 2040 alternative conditions analysis is to study the intersections during the peak travel periods of the day under projected 2040 traffic volumes and an alternative geometric change to the 1200 East / 1000 North (West Leg) and 1200 East / 1000 North (East Leg) intersections.

ALTERNATIVE

This alternative proposes a roundabout to replace the 1200 East / 1000 North (West Leg) intersection, and also to restrict westbound left turns from 1000 North (East Leg) onto 1200 East. Vehicles making a westbound left at 1200 East / 1000 North (East Leg) will instead make a right turn, and then make a U-turn at the roundabout at 1200 East / 1000 North (West Leg).

LEVEL OF SERVICE ANALYSIS

Using VISSIM simulation software and the HCM 2010 delay thresholds introduced above, the future 2040 roundabout AM and PM peak hour LOS were computed for each study intersection (see appendix for detailed LOS reports). The results of this analysis are reported in **Figure 5** and **Table 6**.

As shown in **Table 6**, under projected 2040 volumes and with a roundabout at 1200 East / 1000 North (West Leg) and restricted westbound left turns at 1200 East / 1000 North (East Leg), all intersections operate at LOS C or better for both AM and PM peak hours except for the 1200 East / 1000 North (East Leg) intersection in the PM peak hour, which operates at a LOS F. This is caused by the northbound queue at the roundabout at 1200 East / 1000 North (West Leg) spilling back to the 1200 East / 1000 North (East Leg) intersection, causing difficulty for the westbound vehicles to turn onto 1200 East.

TABLE 6 FUTURE 2040 ROUNDABOUT CONDITIONS PEAK HOUR LEVEL OF SERVICE

	Intersection			Worst Movement[1]			Overall Intersection	
ID	Location	Period	Control	Movement[3]	Delay (sec/veh)	LOS	Avg. Delay (sec/veh)[2]	LOS
1	1200 East / 1100 North	AM	Side-Street Stop	WBL	12.8	B	-	-
		PM		WBL	17.8	C	-	-
2	1200 East / 1000 North (West Leg)	AM	Roundabout	-	-	-	9.0	A
		PM		-	-	-	10.6	B
3	1200 East / 1000 North (East Leg)	AM	Side-Street Stop	WBR	8.0	A	-	-
		PM		WBR	82.9	F	-	-
4	1200 East / 900 North	AM	Side-Street Stop	WBL	15.9	C	-	-
		PM		WBL	19.7	C	-	-

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.
2. This represents the overall intersection LOS and delay (seconds/vehicle).
3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, and TH=Through
Source: Fehr & Peers.

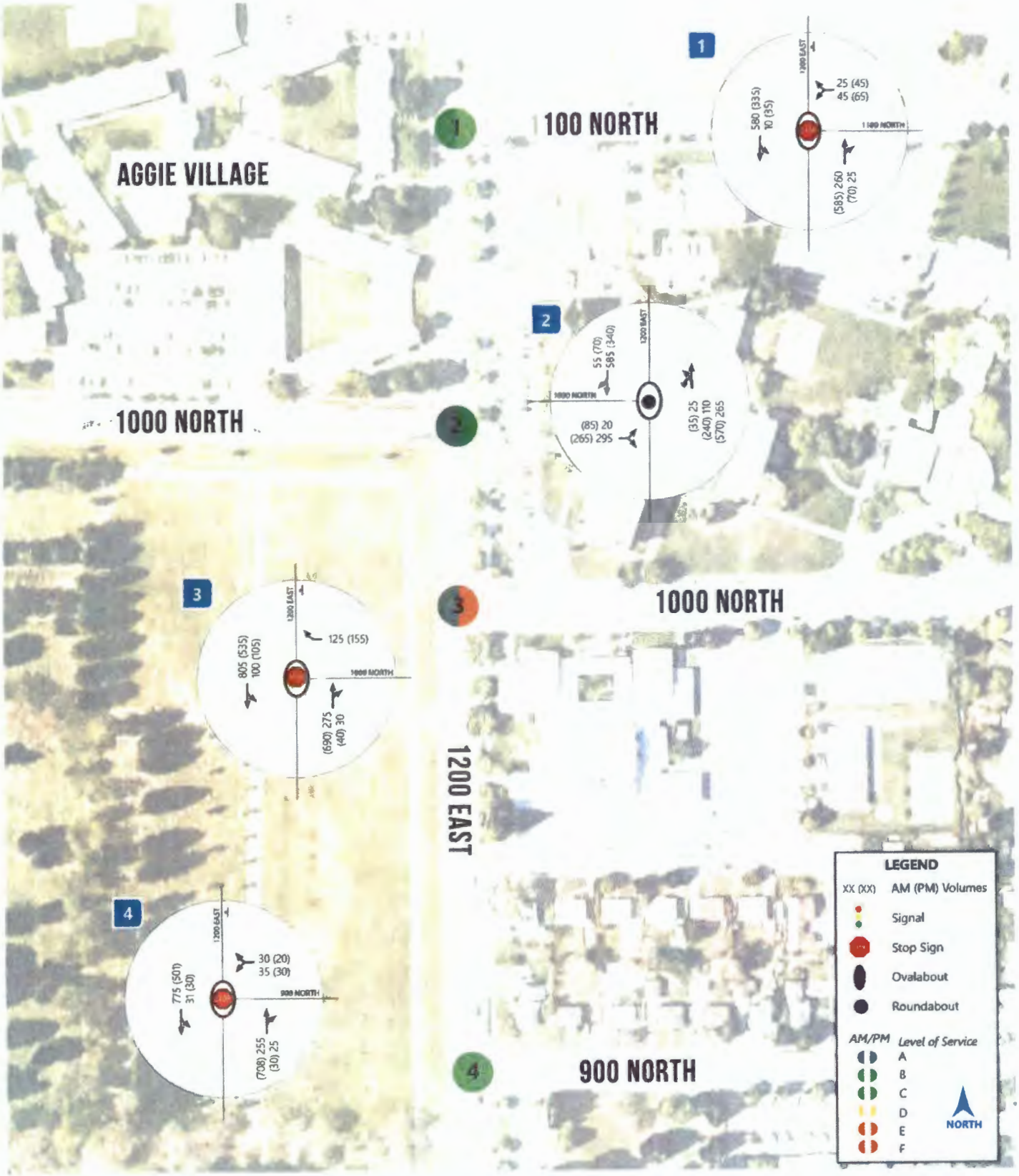

FIGURE 5

FUTURE 2040 BACKGROUND CONDITIONS - ROUNDABOUT

FUTURE 2040 ALTERNATIVE CONDITIONS - SIGNAL

PURPOSE

The purpose of the future 2040 alternative conditions analysis is to study the intersections during the peak travel periods of the day under projected 2040 traffic volumes and an alternative geometric change to the 1200 East / 1000 North (West Leg) and 1200 East / 1000 North (East Leg) intersections.

ALTERNATIVE

This alternative proposes realignment of both east and west legs of 1000 North, and installing a signalized intersection at 1200 East / 1000 North. Based on a spot study from the collected data, it was assumed that 35% of vehicles turning right onto 1200 East from 1000 North (East Leg) also turn into 1000 North (West Leg). It was also assumed that 20% of the vehicles turning right onto 1200 East from 1000 North (West Leg) also turn into 1000 North (East Leg). These vehicles were assumed to make an eastbound and westbound through movement at the new signal.

LEVEL OF SERVICE ANALYSIS

Using VISSIM simulation software and the HCM 2010 delay thresholds introduced above, the future 2040 signal AM and PM peak hour LOS were computed for each study intersection (see appendix for detailed LOS reports). The results of this analysis are reported in **Figure 6** and **Table 7**.

As shown in **Table 7**, under projected 2040 volumes and with signal at 1200 East / 1000 North, all intersections operate at LOS C or better for both AM and PM peak hours. It should be noted that the intersection at 1200 East / 1000 North was analyzed as a signalized intersection and therefore the overall intersection delay and LOS was reported.

TABLE 7 FUTURE 2040 SIGNAL CONDITIONS PEAK HOUR LEVEL OF SERVICE

Intersection				Worst Movement[1]			Overall Intersection	
ID	Location	Period	Control	Movement[3]	Delay (sec/veh)	LOS	Avg. Delay (sec/veh)[2]	LOS
1	1200 East / 1100 North	AM	Side-Street Stop	WBL	14.2	B	-	-
		PM		WBL	20.8	C	-	-
2	N/A[4]	-	-	-	-	-	-	-
		-		-	-	-	-	-
3	1200 East / 1000 North	AM	Signal	-	-	-	12.9	B
		PM		-	-	-	21.9	C
4	1200 East / 900 North	AM	Side-Street Stop	WBL	18.1	C	-	-
		PM		WBL	22.6	C	-	-

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.
2. This represents the overall intersection LOS and delay (seconds/vehicle).
3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, and TH=Through
4. The east and west legs of 1000 North were analyzed as one signalized intersection.

Source: Fehr & Peers.

PERSON DELAY

Additionally for this analysis, network performance for pedestrians and bicycles were measured for the different scenarios. Network performance for vehicles were measured as well. **Table 8** shows the AM and PM peak hour person average delay for 2040 conditions.

TABLE 8 AM AND PM PEAK HOUR PERSON AVERAGE DELAY (SECONDS) SUMMARY – 2040 CONDITIONS

	Background		Ovalabout		Hi-T		Roundabout		Realigned Signal	
Mode	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Pedestrians	0.0	0.0	0.2	0.1	29.7	8.8	0.0	0.0	6.9	7.6
Bicycles	0.1	0.2	0.4	0.3	0.1	0.0	0.0	0.4	18.7	27.0
Cars	22.8	34.3	18.3	20.4	31.4	29.4	18.8	25.3	22.4	26.7

Source: Fehr & Peers.

As shown in **Table 8**, the 2040 background, ovalabout, and roundabout conditions show minimal delay for pedestrians and bicycles. This is due to the pedestrians and bicycles having the right-of-way with vehicles yielding to them. On the other hand, the Hi-T and signal conditions show delay for pedestrians and bicycles. Traffic signals in general cause more delay for the active transportation users given the wait time to cross the roadway. As show in Table 8, the signalized intersection scenarios (Hi-T and Realigned Signal) cause higher delay for the pedestrians and bicyclists. The network delay for vehicles are moderately low in the ovalabout and roundabout conditions compared to the other scenarios.

CONCLUSIONS

Table 9 shows a summary of the LOS results of all scenarios. As shown in **Table** 9, The Hi-T and roundabout at the north do not help mitigate the poor LOS conditions at 1200 East / 1000 North (West Leg) and 1200 East / 1000 North (East Leg) intersections. On the other hand, the ovalabout and signal with realigned roads do show acceptable LOS. The signal however introduces an increase in delay to pedestrians and bicycles, as shown previously in **Table 8**.

TABLE 9 LOS SUMMARY

	Intersection		Existing	2040 Background	2040 Ovalabout	2040 Hi-T	2040 Roundabout	2040 Signal
ID	Location	Period	LOS & Sec/Veh[1]	LOS & Sec/Veh[1]	LOS & Sec/Veh[1]	LOS & Sec/Veh[1]	LOS & Sec/Veh[1]	LOS & Sec/Veh[1]
1	1200 East / 1100 North	AM	B / 12	B / 14	B / 14	E / 45	B / 13	B / 14
		PM	B / 13	C / 18	C / 18	D / 30	C / 18	C / 21
2	1200 East / 1000 North (West Leg)	AM	B / 14	F / 73	N/A[2]	C / 23	A / 9	N/A[2]
		PM	C / 23	F / 136	N/A[2]	C / 21	B / 11	N/A[2]
3	1200 East / 1000 North (East Leg)	AM	B / 13	C / 17	A / 9	C / 18	A / 8	B / 13
		PM	B / 14	E / 46	B / 13	E / 35	F / 83	C / 22
4	1200 East / 900 North	AM	B / 13	B / 14	B / 14	C / 17	C / 16	C / 18
		PM	B / 14	C / 22	C / 20	D / 26	C / 20	C / 23

1. Overall intersection LOS and average delay (seconds/vehicle) for the signalized intersections and roundabouts, and worst movement LOS and average delay for the unsignalized intersections.
2. East and west legs of 1000 North consolidated into one intersection, and results are shown in Intersection 3.

Source: Fehr & Peers