APPENDIX R

Alternative Screening Traffic Analysis Memorandum – March 14, 2025

Heber Valley Corridor
ENVIRONMENTAL IMPACT STATEMENT

Memo

Date:	Friday, March 14, 2025
Project:	Heber Valley Corridor EIS
To:	HDR
From:	Parametrix
Subject:	Alternative Screening Traffic Analysis

Purpose

This memorandum documents the traffic analysis conducted to support the revised Level 1 alternative screening for the Heber Valley Corridor EIS. These efforts build on the Level 1 screening conducted previously in the study and documented in the May 2022 Draft Alternative Screening Traffic Analysis memo.

The revised Level 1 screening is in response to updated traffic forecasts for the region. The forecasts are a result of an updated regional travel demand model (Summit-Wasatch Travel Demand Model v2.1 2024-03-28). Regional travel demand models typically undergo comprehensive updates every four years coinciding with the four-year long range plan update cycle. This model update accompanied the development and adoption of the 2023 UDOT Long-range Transportation Plan. Model updates included revisions to growth assumptions for Summit and Wasatch Counties. The growth assumption revisions were an outcome of coordination between regional planning partners: UDOT, Wasatch County, Heber City, Mountainland Association of Governments, and others. The growth assumptions were revised according to statewide projections, local long-range land use plans, and locally approved developments.

Revisions to Alternatives

In previous project efforts, five build alternatives passed Level 1 screening. These alternatives all introduce a bypass on the west side of Heber City and are summarized in Table 1.

Typically, updates to the regional travel demand models that occur mid-study produce changes to traffic forecasts that are small enough to support relying on decisions made with the previous model. In this case, the new growth assumptions from the updated travel demand model resulted in traffic patterns that cause the five build alternatives that previously advanced from Level 1 screening to fail. For example, growth assumed in areas along US-40 north of Heber City results in a 30 percent increase in traffic volume on north US-40 compared to previous forecasts. Meanwhile, traffic volumes on Heber Main Street increased by 10 percent. The failure caused by the growth led the study team to develop revisions to the build alternatives.

Table 1. List of alternatives that previously passed Level 1 screening

	Alternative Name	Description
WA1	West bypass – limited access and grade-separated interchanges	Concept proposes a highway-type facility with six interchanges at major connections: US-40 (2), US-189 (2), SR-113, and 1300 South. Speed limit would be 65 miles-per-hour (mph).
WB1	West bypass – parkway and at-grade intersections	Concept proposes a parkway-type facility with eight intersections: US-40 (2), US-189 (2), SR-113, 1300 South, Industrial Parkway, and 300 West. Speed limit would be 55 mph.
WB2	West bypass – parkway and at-grade intersections and realign US-189	Concept proposes a parkway-type facility with eight intersections: US-40 (2), US-189 (2), SR-113, 1300 South, Industrial Parkway, and 300 West. Speed limit would be 55 mph. Concept includes the realignment of US-189.
WB3	West bypass – parkway and at-grade intersections with 2 northern connections to US-40	Concept proposes a parkway-type facility with eight intersections: US-40 (2), US-189 (2), SR-113, 1300 South, Industrial Parkway, and 300 West. Speed limit would be 55 mph. Concept includes 2 northern connections to US-40 at SR-32, and near 1200 North.
WB4	West bypass – parkway and at-grade intersections with 2 northern connections to US-40 and realign US-189	Concept proposes a parkway-type facility with eight intersections: US-40 (2), US-189 (2), SR-113, 1300 South, Industrial Parkway, and 300 West. Speed limit would be 55 mph. Concept includes 2 northern connections to US-40 at SR-32, and near 1200 North as well as the realignment of US-189.

First, free-flow variations were created for alternatives WB1, WB2, WB3, and WB4. The free-flow variations remove at-grade signals on the bypasses, convert intersections to interchanges, and add directional ramps to connect the bypass to existing facilities (US-40 and US-189).

Second, the WA1 alternative was not advanced to the revised Level 1 screening. The WA1 alternative already featured many similar elements as WB1 free-flow and was considered redundant.

Lastly, the original WB alternatives (now referred to as WB at-grade alternatives in this memo) were revised to add capacity to US-40 north of Heber City. This was accomplished either by widening US-40 to three lanes in each direction, adding turn lanes at signalized intersections, or both, depending on the alternative.

Alternatives that did not pass original Level 1 screening primarily consisted of bypasses on the east side of Heber City, alternatives that focused solely on improvements to Heber Main Street, and other variations of west bypass concepts. These alternatives previously failed Level 1 screening largely because they did not produce acceptable operations on Heber Main Street. With the updated traffic model showing a 10 percent traffic volume increase on Heber Main Street compared to previous forecasts, it was determined these alternatives would continue to fail and would not need to be included in this revised Level 1 screening.

Figure 1 and Figure 2 illustrate the remaining eight alternatives for screening and Table 2 provides a brief description of each.

Figure 1. At-Grade Alternatives

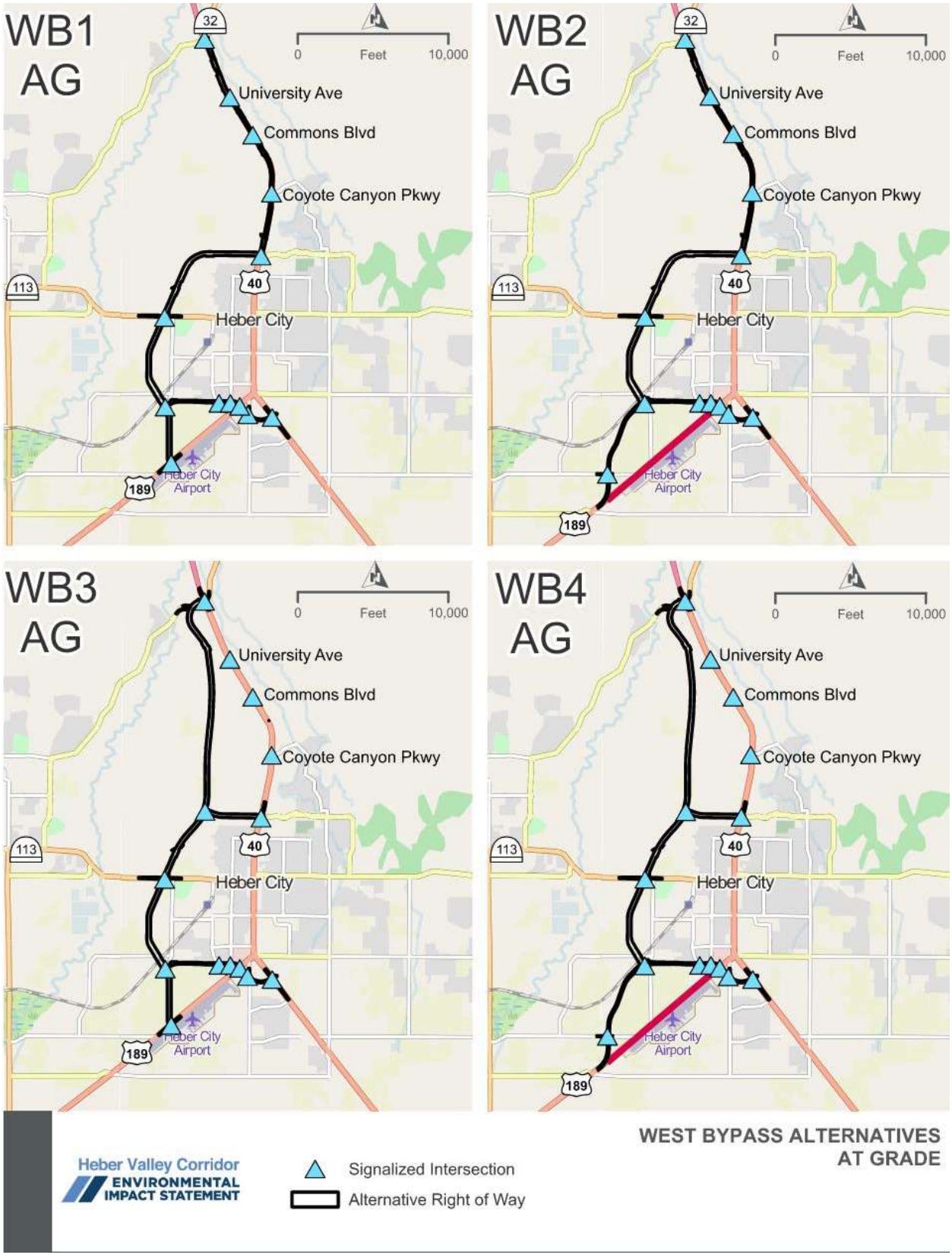


Figure 2. Free-flow Alternatives

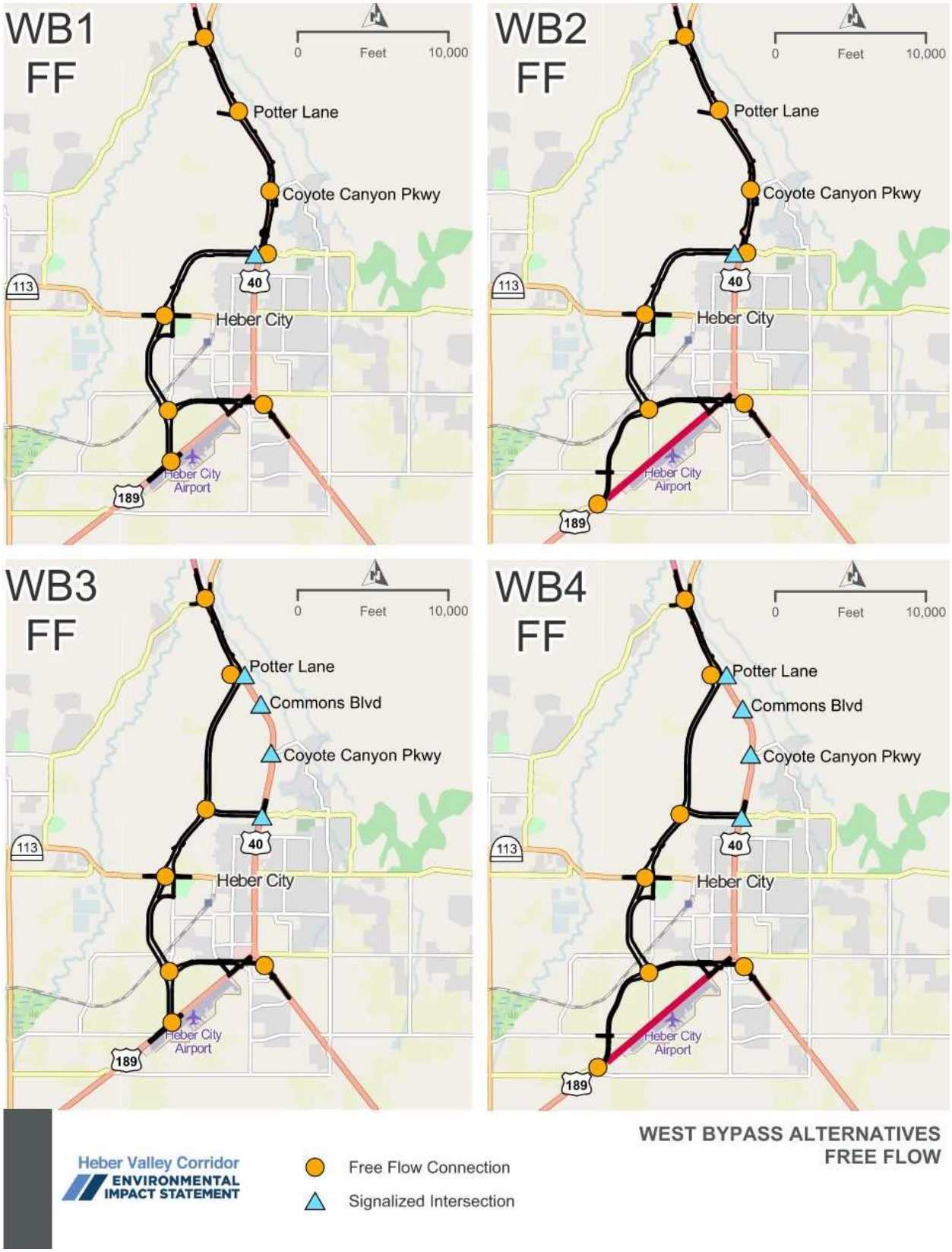


Table 2. List of revised alternatives

	Alternative Name	Description
WB1 At-Grade	West bypass – parkway and at-grade intersections	Parkway-type facility with widening US-40 from 900 North to SR-32 and adding lanes to intersections at University Avenue, Commons Boulevard, and Coyote Canyon Parkway.
WB2 At-Grade	West bypass – parkway and at-grade intersections and realign US-189	Similar to WB1 At-Grade with the realignment of US-189.
WB3 At-Grade	West bypass – parkway and at-grade intersections with 2 northern connections to US-40	Parkway-type facility with 2 northern connections to US-40 at SR-32 and 900 North. Concept includes adding lanes to intersections at University Avenue, Commons Boulevard, and Coyote Canyon Parkway.
WB4 At-Grade	West bypass – parkway and at-grade intersections with 2 northern connections to US-40 and realign US-189	Similar to WB3 At-Grade with the realignment of US-189.
WB1 Free-Flow	West bypass – limited access and grade-separated interchanges	Highway-type facility with direct connection ramps or interchanges at major connections.
WB2 Free-Flow	West bypass – limited access, grade-separated interchanges and realign US-189	Similar to WB1 At-Grade with the realignment of US-189.
WB3 Free-Flow	West bypass – limited access and grade-separated interchanges with 2 northern connections to US-40	Highway-type facility with direct connection ramps or interchanges at major connections. Concept includes 2 northern connections to US-40 near 3000 North/University Avenue and near 900 North. Concept includes adding lanes to intersections at College Way, Commons Boulevard, and Coyote Canyon Parkway.
WB4 Free-Flow	West bypass – limited access and grade-separated interchanges with 2 northern connections to US-40 and realign US-189	Similar to WB3 At-Grade with the realignment of US-189.

Preliminary Screening

After developing the free-flow alternatives and refining the at-grade alternatives, a preliminary regional travel time analysis was conducted. The regional travel time analysis compared travel times southbound from SR-32 to US-189 at approximately 3000 South (south of where bypass alternatives would tie into US-189). The analysis also evaluated the travel time from SR-32 to US-40 south of the US-189 intersection (south US-40) at approximately 1500 S. All travel times were evaluated for the 2050 PM peak and compared travel times via the bypass routes versus staying on US-40 through downtown Heber City.

Table 3 presents the results of the analysis. Results show there are distinct differences between at-grade and free-flow alternatives and distinct differences between alternatives that remained on north US-40 and those with an alignment through the North Fields. However, the differences between alternatives that leave US-189 in place versus those that realign US-189 to 1300 South

were less compelling. In particular, alternatives that realign US-189 (WB2 At-Grade, WB4 At-Grade, WB2 Free-Flow, WB4 Free-Flow) showed no significant travel time savings versus their counterparts that leave US-189 in place (WB1 At-Grade, WB3 At-Grade, WB1 Free-Flow, WB3 Free-Flow). Additionally, the alternatives that realign US-189 result in a volume increase on 1300 South by 140% to 165% (see Table 4). Thus, analysis indicated there was no clear traffic benefit to realigning US-189. The WB2 and WB4 alternatives were considered redundant to their WB1 and WB3 counterparts and were not advanced to further analysis.

Table 3. Preliminary Regional Travel Time Analysis

2050 PM Peak Southbound Travel Times	SR-32 to US-189		SR-32 to south US-40	
	Via Bypass	Via Main Street	Via Bypass	Via Main Street
At-Grade Concepts				
WB1 At-Grade	10:20	14:45	11:45	13:00
WB2 At-Grade	10:15	15:10	11:55	12:10
WB3 At-Grade	8:15	14:05	9:35	12:15
WB4 At-Grade	8:10	15:50	9:50	12:45
Free-Flow Concepts				
WB1 Free-Flow	7:25	13:55	7:50	12:25
WB2 Free-Flow	7:20	15:05	7:50	12:10
WB3 Free-Flow	6:15	14:55	6:35	13:30
WB4 Free-Flow	6:05	15:50	6:40	12:45

Table 4. List of revised alternatives

	2050 Daily Volume	% Increase From Non-Realign US-189 Counterpart Alternatives
WB1 At-Grade	7,000	
WB2 At-Grade (realigns US-189)	18,600	165%
WB3 At-Grade	7,700	
WB4 At-Grade (realigns US-189)	18,500	140%

Analysis Methodology

The traffic analysis for the remaining four alternatives (WB1 At-Grade, WB3 At-Grade, WB1 Free-Flow, WB3 Free-Flow) centered around three steps:

1. Develop traffic forecasts
2. Traffic operations analysis on US-40 Main Street
3. Traffic operations analysis for areas outside US-40 Main Street

Traffic Forecasts

Horizon year traffic forecasts were developed for alternatives using the Summit-Wasatch v2.1 travel demand model. This version of the Summit Wasatch model was also used to develop updated 2050 No Build forecasts as documented in the updated *Existing and 2050 No Build Traffic and Safety Analysis Report* (Mar 2025). Next, 2050 weekday PM peak hour traffic volumes at key intersections were developed for each build alternative. The traffic volumes were developed using 2019 weekday PM peak hour traffic volumes and the volume changes between the baseline (2019) and 2050 travel demand model results for each respective alternative. This methodology is consistent with how 2050 No Build PM peak hour traffic volumes were developed.

Traffic Operations Analysis on Main Street

US-40 through downtown Heber City is also designated as Heber City Main Street. This 1.5-mile section from US-189 to 500 North features five traffic signals. The interaction between these signals has a significant influence on Main Street traffic operations. The signals at 100 South (SR-113) and Center Street are only one block apart (approximately 400 feet) and queueing activity from one intersection can easily influence the other. Additionally, pedestrian crossings are more frequent. Due to the complexity of operations, traffic analysis for Main Street was conducted with the microsimulation analysis software VISSIM. This is consistent with analysis for the 2050 No Build and results and steps to calibrate the 2050 No Build VISSIM model are contained in the *Existing and 2050 No Build Traffic and Safety Analysis Report* (Mar 2025) and the *Heber Valley Parkway Existing Conditions Calibration Report* (Aug 2020).

Traffic Operations Analysis outside Main Street

Outside of the immediate Heber City Main Street area, traffic operations are less complex. Existing signals and locations for future signals have greater spacing. Likewise, there is less pedestrian activity. Traffic analysis for areas beyond Heber City Main Street were primarily conducted with the traffic analysis software Synchro.

Alternatives

Level 1 traffic analysis was conducted for the at-grade and free-flow versions of WB1 and WB3. Analysis was not conducted for the WB2 and WB4 at-grade or free-flow alternatives. The only difference between WB1 and WB2 alternatives and between WB3 and WB4 alternatives is the realignment of US-189. Comparing these two sets of volumes from initial results in the v2.1 travel demand model indicates there is little difference in overall traffic volumes on Heber Main Street when realigning US-189. Thus, the WB2 and WB4 alternatives are redundant to their WB1 and WB3 counterparts and were not advanced to further analysis.

Travel Demand Modeling

Alternative Model Results

Bypass alternatives were coded in the Summit-Wasatch v2.1 travel model to develop 2050 daily volume forecasts. Functional type and speeds for model links were coded to match the respective bypass roadway. Additionally, the model network was adjusted to represent the degree of access offered by each bypass type. Next, PM peak hour traffic volume forecasts were developed using 2019 weekday PM peak hour traffic volumes and the volume changes between the baseline (2019) and 2050 travel demand model results for each respective alternative. Graphics summarizing PM peak hour turning movement volumes are contained in the Appendix.

Figure 3 through Figure 5 summarize the 2050 build volumes for key segments. Overall, every bypass alternative reduces traffic volumes on portions of Heber City Main Street from 2050 No Build conditions. The reduction in traffic ranges between about 9,000 and 10,000 vehicles per day.

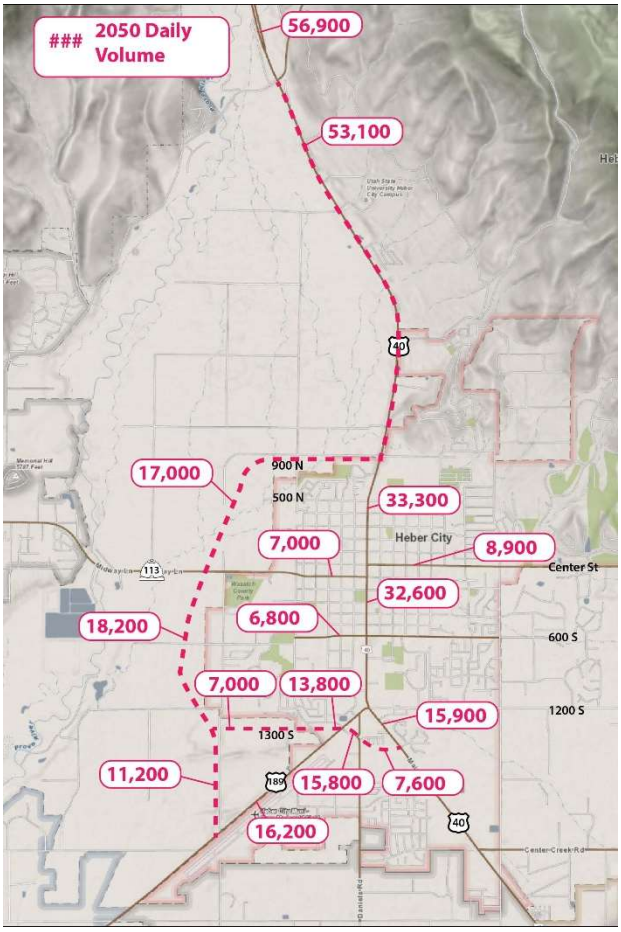
Free-flow bypass alternatives (WB1 Free-Flow, WB3 Free-Flow) have an effect of reducing volumes on US-40 north of Heber City more than their at-grade counterparts (WB1 At-Grade, WB3 At-Grade). The reductions are between 20 and 25 percent.

The quality of local access provided for the bypass east-west connection (1300 South) to US-189 and south US-40 was an important factor in the amount of traffic a bypass alternatives carries. The at-grade alternatives offer more direct access to the commercial sector in south Heber City. Trips between the west side of the Heber Valley and south Heber City are more likely to use the bypass as an alternative to Main Street when there is more direct local access provided on the bypass east-west connection to US-189 and south US-40. Consequently, bypass segments between SR-113 and south US-40 carry more traffic with the at-grade alternatives than the free-flow alternatives. Additionally, traffic volumes on SR-113 west of US-40 are also lower for at-grade alternatives than free-flow alternatives. This supports the concept that bypass alternatives are important to serving both through traffic and local traffic in the Heber Valley.

Figure 3. Existing and 2050 No Build Daily Volumes

Figure 4. WB1 At-Grade and WB1 Free-Flow 2050 Volumes

WB1 At-Grade



WB1 Free-Flow

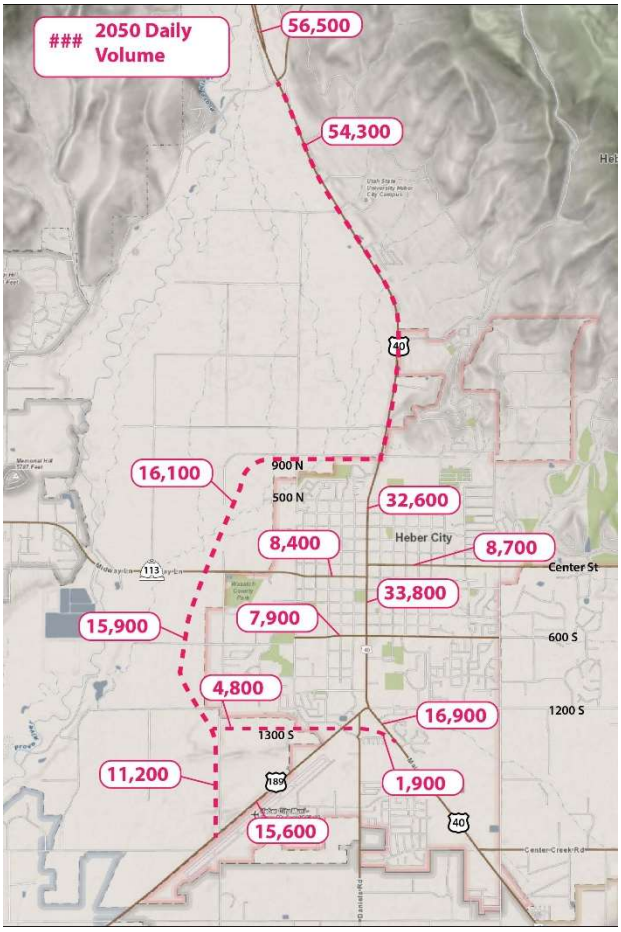
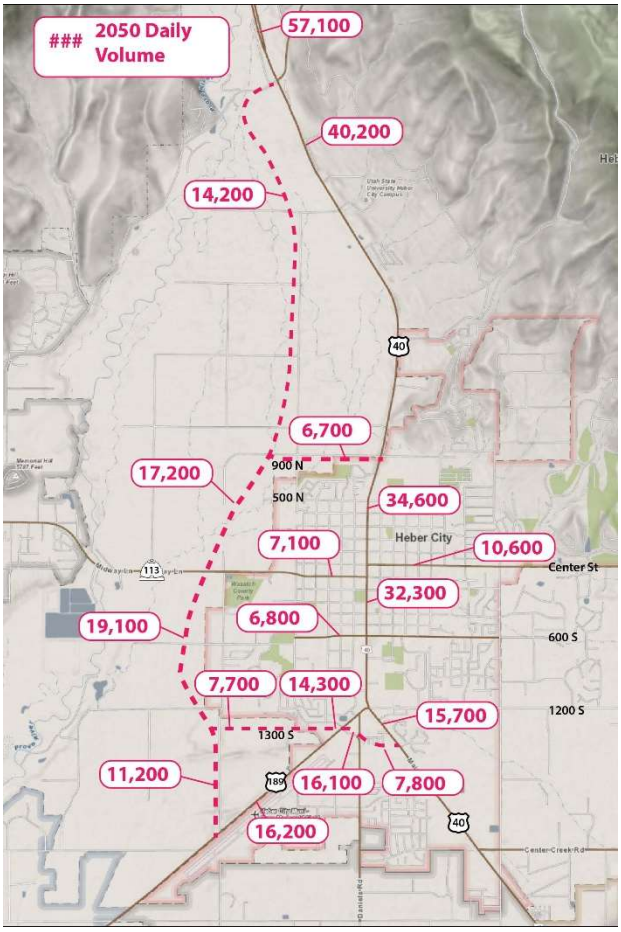
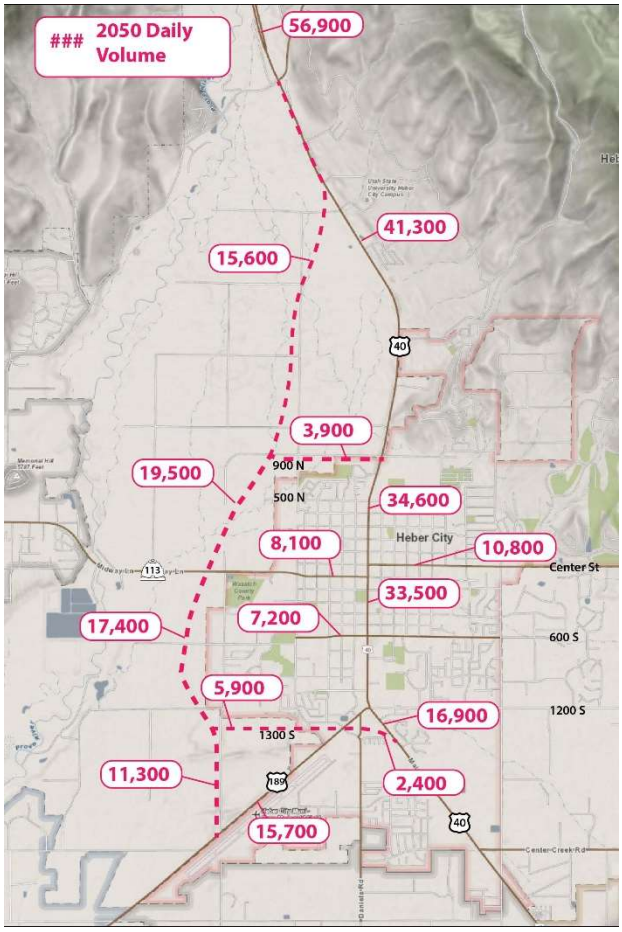


Figure 5. WB3 At-Grade and WB3 Free-Flow 2050 Volumes

WB3 At-Grade



WB3 Free-Flow



Traffic Operations Analysis

Performance Measures

Traffic operations performance measures were crafted to support Level 1 Screening criteria. The performance measures consisted of four local mobility measures and one regional mobility measure for the PM peak hour. The four local mobility measures are:

1. Intersection Level of Service (LOS)
2. Regional Mobility Travel Time
3. Local Mobility Travel Time
4. Vehicle Queue Length
5. Arterial LOS

INTERSECTION LOS

Intersection LOS is the measure of the overall operating conditions of an intersection. As defined by the Highway Capacity Manual (HCM), intersection LOS is described on an A through

F scale with LOS A indicating free-flow conditions with minimal delay and LOS F indicating intersection failure. Intersection LOS was measured using the node evaluation results for average vehicle delay from the VISSIM simulation model.

REGIONAL MOBILITY TRAVEL TIME

Regional mobility included the same travel time analysis for the four routes conducted for the preliminary screening:

1. SR-32 to US-189 at approximately 3000 South (via bypass)
2. SR-32 to US-189 at approximately 3000 South (via Main Street)
3. SR-32 to US-40 south of US-189 at approximately 1500 S (via bypass)
4. SR-32 to US-40 south of US-189 at approximately 1500 S (via Main Street)

Travel times were evaluated for 2050 PM peak and northbound travel times were included in addition to the southbound travel times evaluated in preliminary screening. Travel times on Heber Main Street were measured from VISSIM model outputs. As mentioned previously, traffic operations analysis outside of downtown Main Street is less complex than Main Street operations and, thus, analyzed with Synchro rather than VISSIM.

LOCAL MOBILITY TRAVEL TIME

The local travel time measure reflects southbound travel times along US-40 through downtown Heber City. To capture the effect of large queues extending north of Heber City for No Build conditions and some alternatives, travel times measurements began at SR-32 and ended at the US-189 intersection. As with the regional mobility travel time, travel times were measured from VISSIM model outputs for downtown Main Street and measured from Synchro for other areas.

The location of the signals evaluated between SR-32 and Heber City varied for each alternative. For at-grade alternatives, the signals were assumed to be located at the cross streets specified in 2008 UDOT/Wasatch County US-40 corridor agreement and its three subsequent amendments in 2018 and 2023 (University Avenue, Commons Boulevard, Coyote Canyon Parkway).

For WB1 Free-Flow, it was assumed that US-40 north of Heber City would feature grade-separated interchanges instead of signals. In order to achieve interchange spacing close to or greater than one mile, it was assumed there would only be three interchanges located at SR-32, College Way/Potter Lane and Coyote Canyon Parkway.

For WB3 Free-Flow, signals were assumed at College Way/Potter Lane, Commons Boulevard, and Coyote Canyon Parkway. The College Way/Potter Lane location was assumed instead of University Avenue because of the conflict with the bypass tie-in ramps.

VEHICLE QUEUE LENGTH

Vehicle queue lengths were obtained from the VISSIM microsimulation model for key movements in downtown Heber City. As observed for the No Build analysis, long southbound queues propagate from congestion in central Heber City and extend northward outside of town. Long southbound queues extending past 500 North are an indicator of downtown congestion. Likewise, long queues on eastbound SR-113 at Main Street are an indicator of congestion since

SR-113 is a major contributor to Main Street traffic. Queue lengths are reported as the 95th percentile queue. The 95th percentile queue lengths represent the queue length that only has a five percent probability of being exceeded during the PM peak hour.

ARTERIAL LOS

Similar to intersection LOS, arterial LOS is based on an A through F scale with thresholds according to the average speed of vehicles compared to the segment's free-flow speed or the posted speed limit. Using segment speeds from VISSIM, arterial LOS was calculated using HCM criteria. Arterial LOS was evaluated for the following segments:

1. US-40: From 500 North to 100 North
2. US-40: From 100 North to Center Street
3. US-40: From Center Street to 100 South
4. US-40: From 100 South to 600 South
5. US-40: From 600 South to US-189
6. US-40: South of US-189
7. US-189: Southwest of US-40

Results

RESULTS OVERVIEW

Traffic operations analysis results reveal several patterns. First, as seen in the 2050 No Build analysis, the closely-spaced signals on Main Street at SR-113 and Center Street are one of the primary traffic flow bottlenecks. This congestion can spill out of downtown on US-40 to the north as evidenced by traffic performance metrics, such as the southbound queue lengths at 500 North and southbound travel times through downtown.

Second, there is a correlation between traffic volume reduction on Main Street and improved operations. There is also a correlation between traffic volume reductions on the primary east-west connections to Main Street and improved operations. Center Street and SR-113 are some of the primary contributors to traffic turning on and off Main Street. Volume reductions on these roadways are also associated with improved operations.

Third, bypass volumes are influenced by the quality of local access provided in south Heber City. Alternatives with more direct local access in south Heber City (WB1 At-Grade and WB3 At-Grade) experience more traffic on the bypass than their free-flow counterparts (WB1 Free-Flow and WB3 Free-Flow).

Fourth, all build alternatives provide faster regional travel times than the No Build conditions. The various bypass alignments allow vehicles to avoid delays from Main Street traffic signals. Free-flow alternatives provide the fastest regional travel times as vehicles traverse intersecting streets at interchanges rather than stopping at traffic signals.

The following is a detailed discussion of each build alternative followed by several summary tables of the performance measures.

ALTERNATIVE WB1 AT-GRADE

Alternative WB1 At-Grade operates with better performance than No Build conditions with no LOS E or LOS F intersections. The regional travel times are much shorter than No Build but are among the longest of the alternatives. Local travel time decreases to about 11 minutes and the southbound 95th percentile queue is reduced to about 1,100 feet. There are no LOS F arterial segments.

ALTERNATIVE WB1 FREE-FLOW

Alternative WB1 Free-Flow operates with no LOS F intersections and one LOS E intersection (US-189). The regional travel times are among of the shortest of the alternatives since vehicles do not need to stop at any traffic signals. Local travel time decreases to below 11 minutes and the southbound 95th percentile queue is reduced to about 1,150 feet. One arterial segment operates as LOS F (100 North to Center Street in the southbound direction). The segment is one block long and – with all alternatives – the average speed is near the threshold between LOS E and LOS F. As mentioned previously, LOS F on short segments of Main Street and areas with closely-spaced signals are not necessarily a cause for concern or a fatal flaw for an alternative. Even without congestion, vehicles on short segments have little opportunity to accelerate to higher speeds and qualify for a higher arterial LOS.

ALTERNATIVE WB3 AT-GRADE

Alternative WB3 At-Grade operates with no LOS F intersections and one LOS E intersection (Center Street). The regional travel times are all much shorter than No Build conditions. Local travel time decreases to below 11 minutes and southbound 95th percentile queues are about 1,300 feet. There are no LOS F arterial segments.

ALTERNATIVE WB3 FREE-FLOW

Alternative WB3 Free-Flow has no LOS F intersections and three LOS E intersections (500 N, Center St, US-189). The alternative features the fastest bypass regional travel times due to the more direct travel path and no need to stop at traffic signals. Local travel times decrease to about 11 minutes and the southbound 95th percentile queues are about 2,300 feet. Similar to WB1 Free-Flow, the short arterial segment between 100 North and Center Street operates at LOS F in the southbound direction and is not a fatal flaw for an alternative.

Table 5 presents the intersection LOS results on Main Street for No Build and the four build alternatives. Failing conditions (LOS F and V/C > 1.0) are colored in red text. Orange text indicates near failing conditions (LOS E and V/C > 0.9).

Table 5. Intersection LOS

LOS / Avg Delay (sec/veh)	Existing	No Build	WB1 At-Grade	WB1 Free-Flow	WB3 At-Grade	WB3 Free-Flow
500 N	B / 17	F / >100	D / 36	D / 37	D / 45	E / 77
Center St	C / 24	D / 39	D / 53	D / 54	E / 57	E / 65
100 S	C / 30	F / >100	C / 32	C / 32	D / 52	D / 41
600 S	B / 18	F / >100	D / 37	D / 53	D / 36	D / 42
US-189	C / 29	F / 100	D / 54	E / 58	D / 43	E / 59

Table 6 presents the regional mobility travel times for Existing, the No Build alternative and build alternatives. All build alternatives provide faster regional travel times than the No Build whether via the respective bypass or via Main Street. The bypass alignments allow vehicles to avoid delays from Main Street traffic signals.

Free-flow alternatives provide the fastest regional travel times. Free-flow alternatives have faster bypass travel times than at-grade counterparts in either the northbound or southbound direction. WB1 At-Grade has the slowest travel times because vehicles travel through more signalized intersections on US-40 north of Heber City than other alternatives.

Table 6. Regional Travel Time

Travel Time (M:SS)			Existing	No Build	WB1 At-Grade	WB1 Free-Flow	WB3 At-Grade	WB3 Free-Flow
SR-32 to US-189	SB	via Bypass	n/a	n/a	10:20	7:25	8:15	6:15
		via Main St	10:55	23:40	14:45	13:55	14:05	14:55
	NB	via Bypass	n/a	n/a	12:00	7:25	8:45	6:15
		via Main St	10:50	22:00	13:25	12:15	13:45	13:10
SR-32 to US-40	SB	via bypass	n/a	n/a	11:45	7:50	9:35	6:35
		via Main St	9:15	21:50	13:00	12:25	12:15	13:30
	NB	via Bypass	n/a	n/a	13:10	7:50	9:35	6:35
		via Main St	8:40	18:40	11:25	10:05	11:45	11:00

Table 7 summarizes the local travel time results along Main Street and for No Build and the four build alternatives. Red text indicates travel times that exceeded 12 minutes. Local mobility travel times greater than 12 minutes generally correlated with problematic conditions for other local mobility measures for respective alternatives, such as failing intersection LOS and unacceptable queue lengths on Main Street.

Table 7. Local Travel Time

	Existing	No Build	WB1 At-Grade	WB1 Free-Flow	WB3 At-Grade	WB3 Free-Flow
Travel Time (M:SS)	8:20	20:30	10:55	10:35	10:35	11:05

Table 8 presents the vehicle queue length results. As mentioned previously, long southbound queues extending past 500 North along North US-40 are an indicator of downtown congestion. All build alternatives improve queues compared to the No Build.

Table 8. 95th Percentile Queue Lengths

Queue Length (ft)	Existing	No Build	WB1 At-Grade	WB1 Free-Flow	WB3 At-Grade	WB3 Free-Flow
Southbound US-40 at 500 N	375	17,100	1,125	1,150	1,325	2,275
Southbound US-40 at Center St	750	>2,400	2,225	1,900	2,600	2,450
Southbound US-40 at 100 S	375	>400	400	>400	400	>400
Eastbound 100 S at US-40	125	>2,500	175	250	150	225

Table 9 presents the arterial LOS results on Main Street for No Build and the four build alternatives. Failing conditions (LOS F) are colored in red text and near-failing conditions (LOS E) are colored in orange. It should be noted that LOS F on short segments of Main Street and areas with closely-space signals is not necessarily a cause for concern. Even without congestion, vehicles on short segments have little opportunity to accelerate to higher speeds and qualify for a higher arterial LOS.

Table 9. Arterial LOS on Main Street

LOS / Avg Speed (mi/hr)	Existing	No Build	WB1 At-Grade	WB1 Free-Flow	WB3 At-Grade	WB3 Free-Flow
Southbound						
US-40: 500 N to 100 N	B / 26	F / 10	C / 21	C / 21	C / 21	C / 19
US-40: 100 N to Center St	11 / F	F / 9	E / 12	F / 11	E / 12	F / 10
US-40: Center St to 100 S	11 / F	E / 14	D / 16	E / 14	D / 16	E / 13
US-40: 100 S to 600 S	24 / B	D / 15	C / 20	D / 17	C / 20	C / 19
US-40: 600 S to US-189	25 / B	C / 22	C / 21	C / 23	B / 25	B / 23
US-40: S. of US-189	36 / A	A / 36	A / 36	A / 36	A / 37	A / 36
US-189: SW of US-40	32 / B	C / 26	C / 28	C / 29	C / 28	C / 28
Northbound						
US-189: SW of US-40	22 / C	E / 14	E / 15	E / 16	E / 15	D / 16
US-40: S. of US-189	23 / C	E / 14	D / 19	D / 20	D / 20	D / 19
US-40: US-189 to 600 S	30 / A	B / 24	B / 25	B / 25	B / 27	B / 26
US-40: 600 S to 100 S	22 / C	E / 13	C / 18	C / 18	D / 16	D / 18
US-40: 100 S to Center St	10 / F	E / 12	D / 14	D / 15	E / 11	E / 14
US-40: Center St. to 100 N	27 / B	B / 25	B / 26	B / 26	B / 26	B / 26
US-40: 100 N to 500 N	23 / B	B / 26	B / 26	B / 27	B / 26	B / 26

Safety Considerations

High-speed run-off-road crashes and head-on crashes are a concern on North US-40 as identified in the Mountainland Association of Governments Safety Action Plan (2024). UDOT is planning on a median barrier on North US-40 in response to this crash pattern. The free-flow alternatives will provide grade separation at major intersections which will help reduce high-speed collisions and will provide greater safety benefit than the at-grade alternatives.

APPENDIX A – Alternative PM Peak Hour Turning Movement Volumes

Figure 6. Alternative WB1 At-Grade PM Peak Hour Intersection Volume – 1

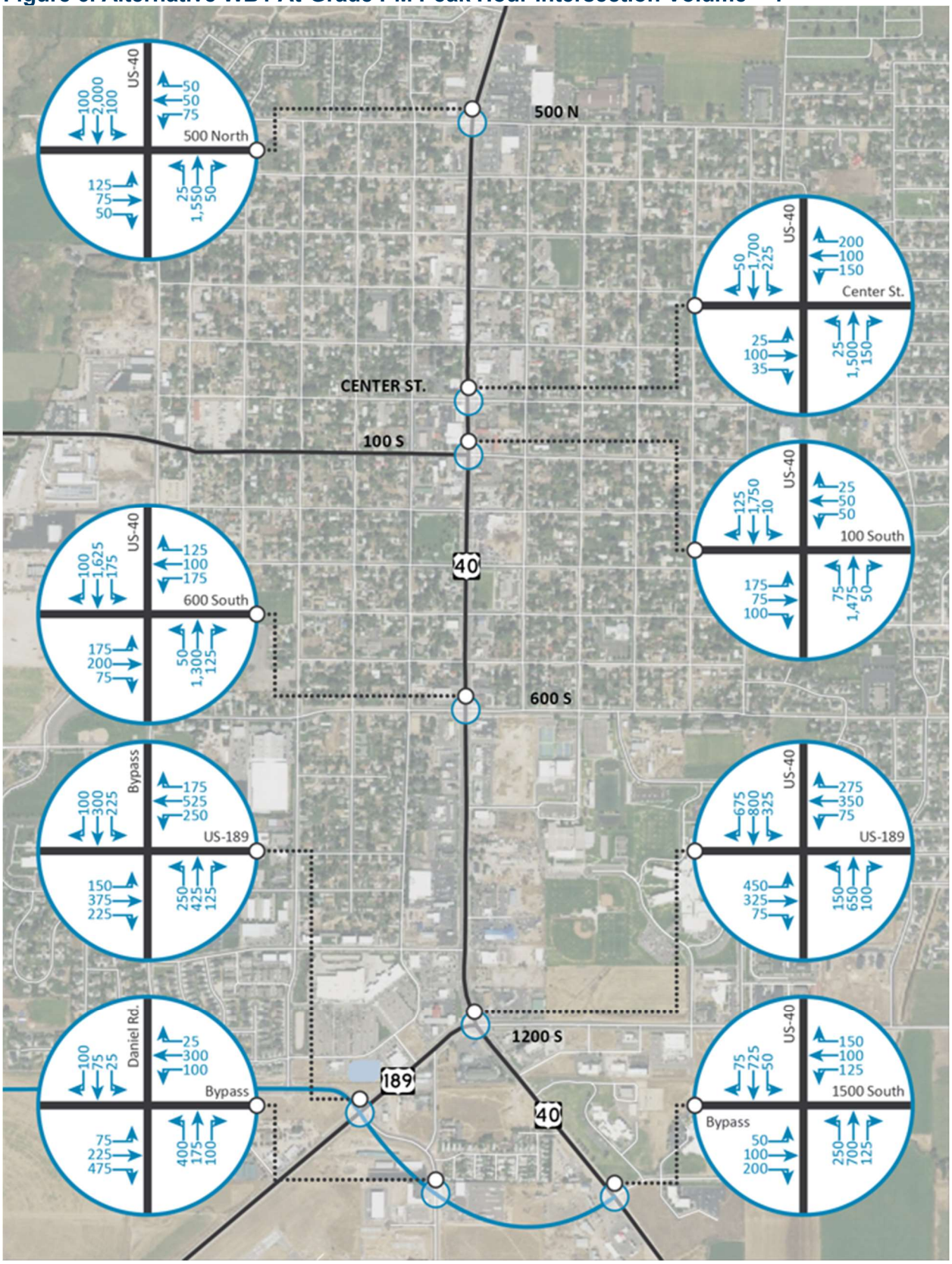


Figure 7. Alternative WB1 At-Grade PM Peak Hour Intersection Volume – 2

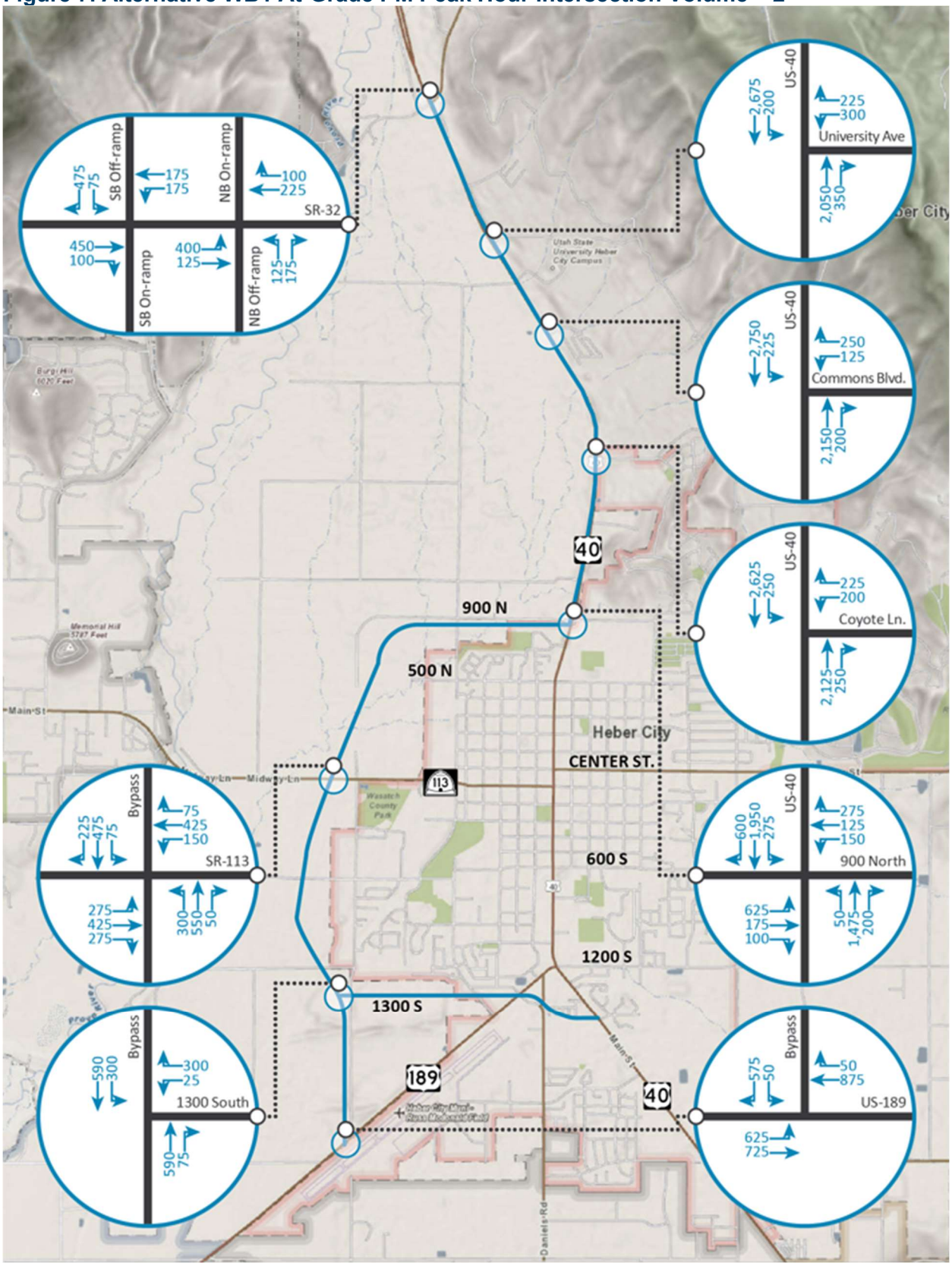


Figure 8. Alternative WB1 Free-Flow PM Peak Hour Intersection Volume – 1

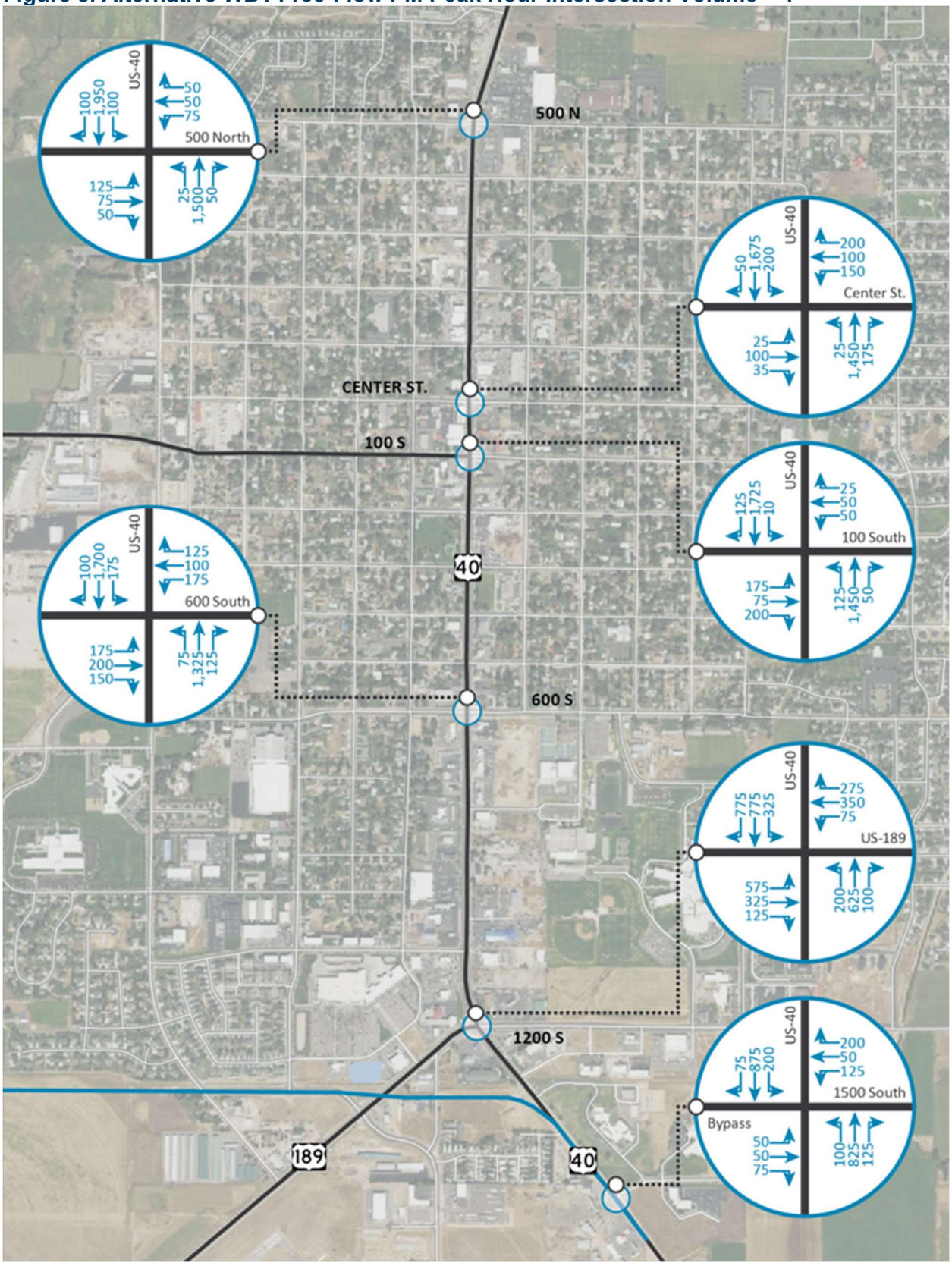


Figure 9. Alternative WB1 Free-Flow PM Peak Hour Intersection Volume – 2

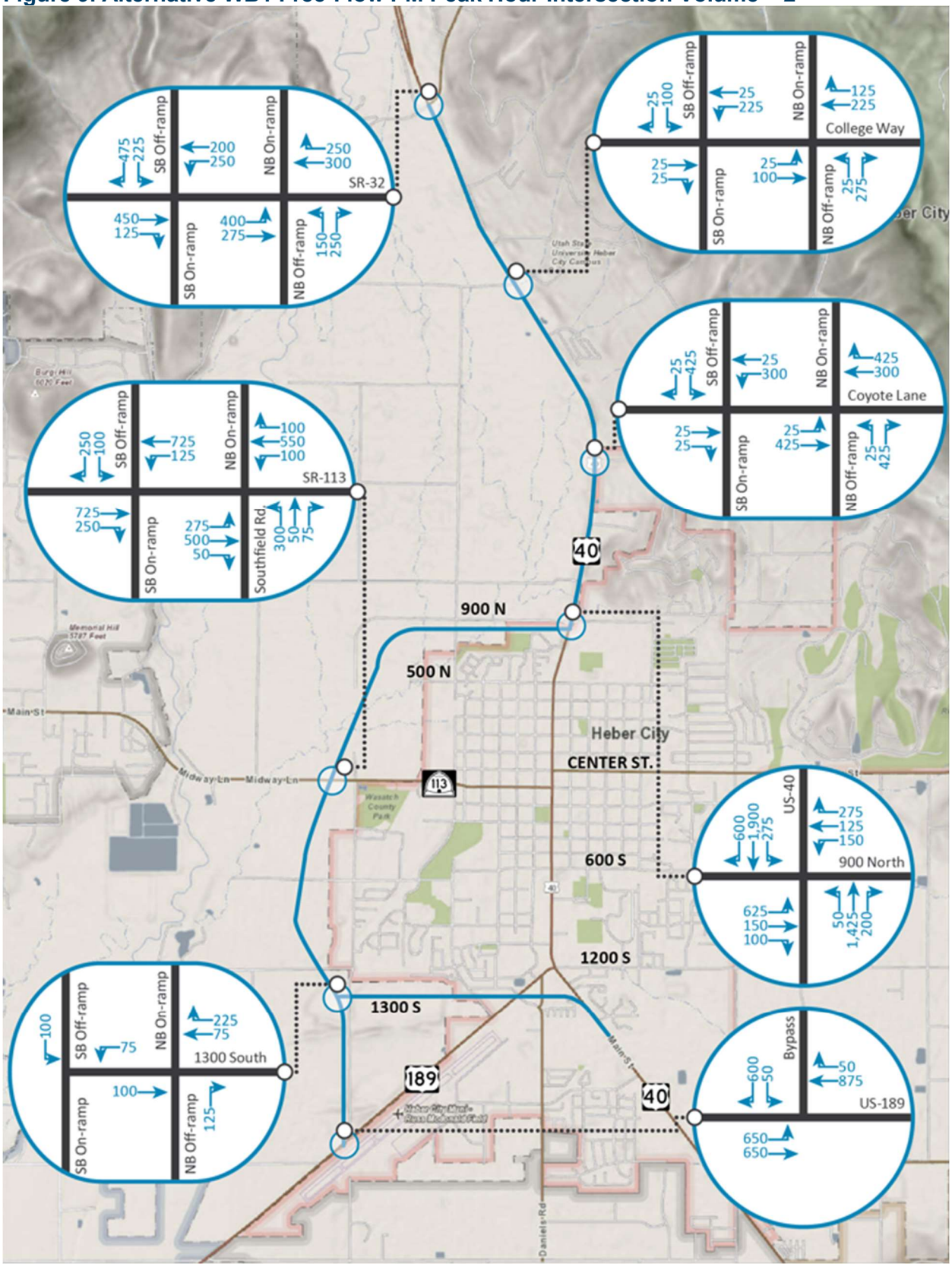


Figure 10. Alternative WB3 At-Grade PM Peak Hour Intersection Volume – 1

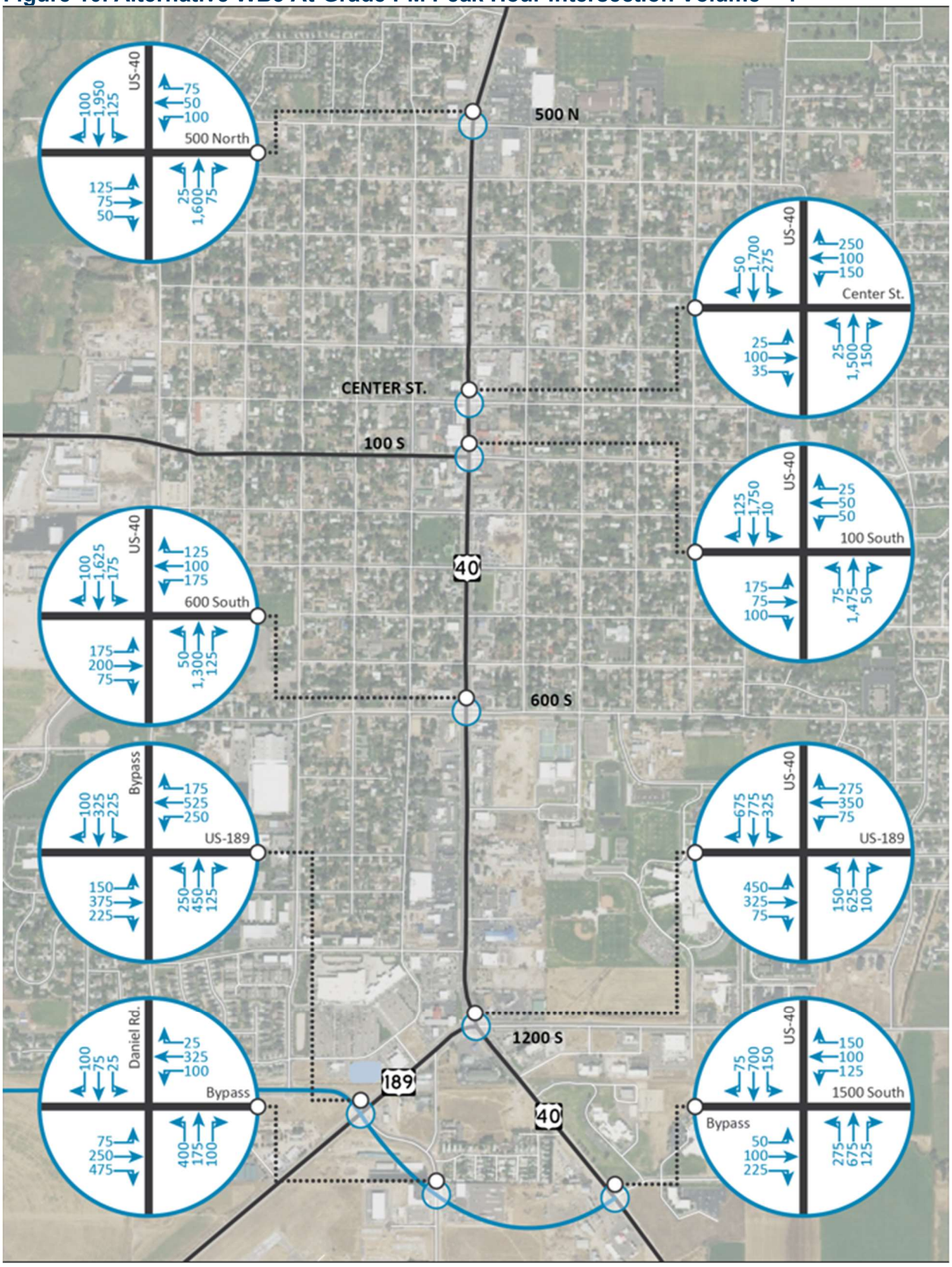


Figure 11. Alternative WB3 At-Grade PM Peak Hour Intersection Volume – 2

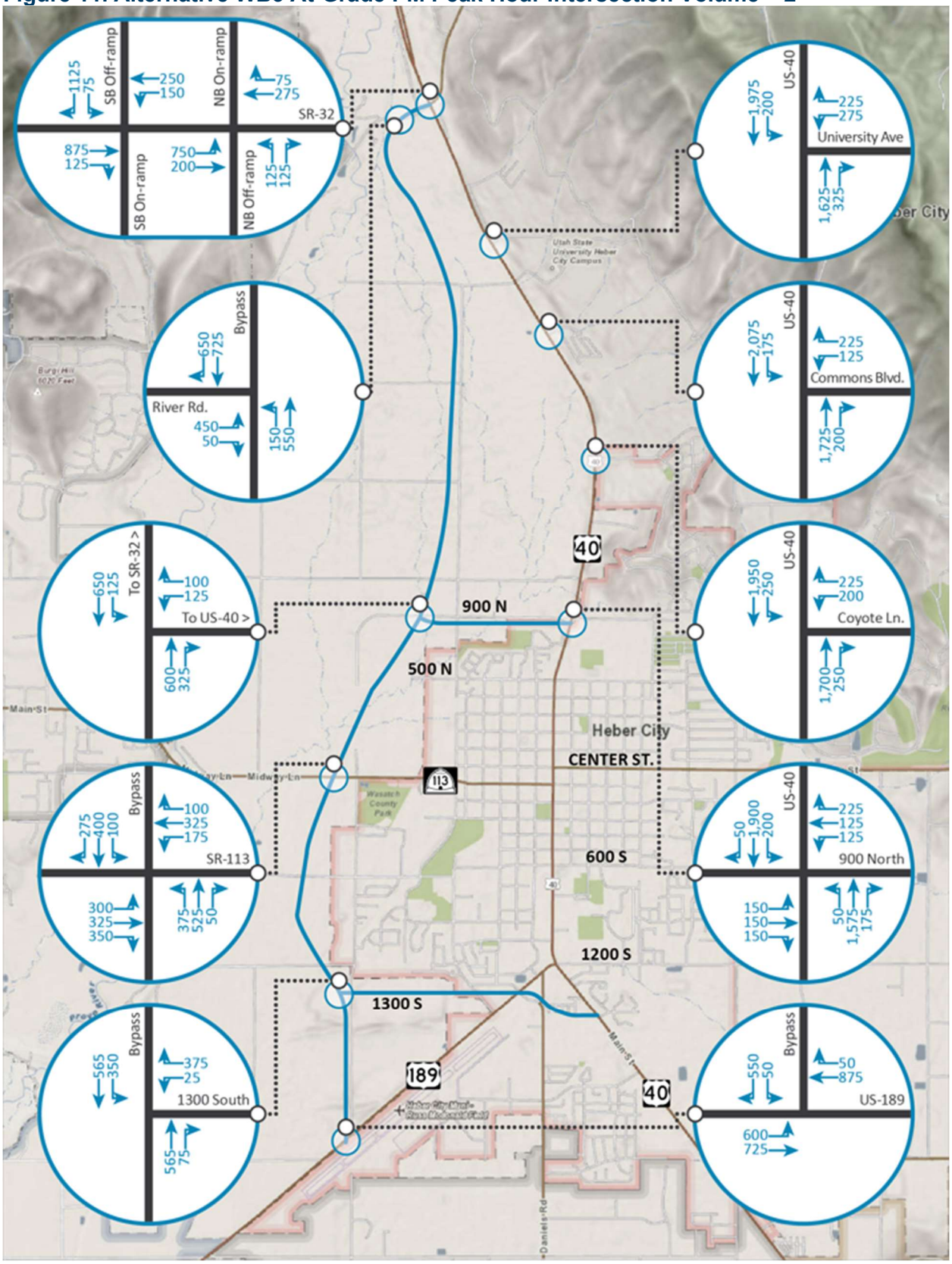


Figure 12. Alternative WB3 Free-Flow PM Peak Hour Intersection Volume – 1

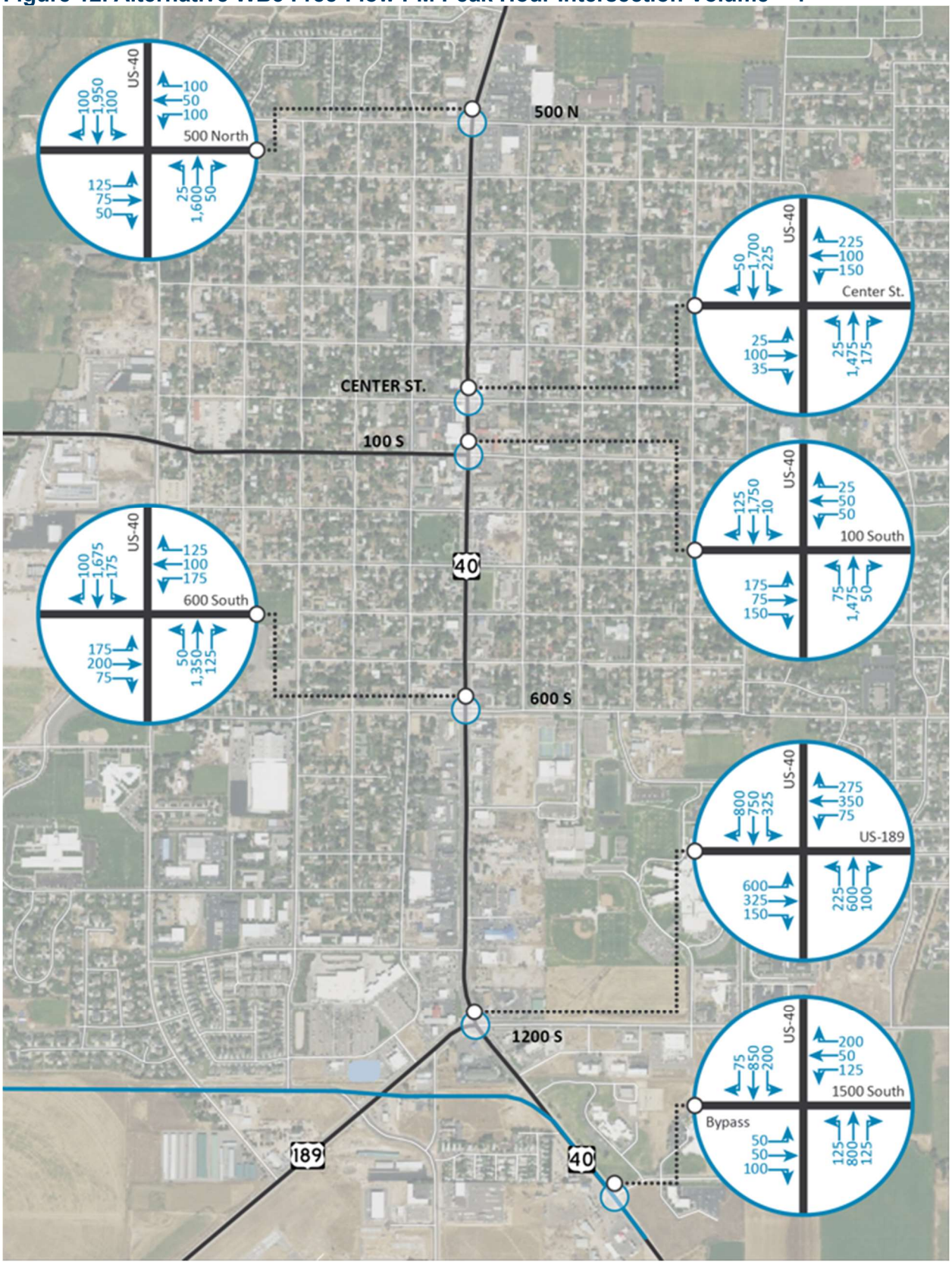


Figure 13. Alternative WB3 Free-Flow PM Peak Hour Intersection Volume – 2