Heber Valley Corridor
ENVIRONMENTAL IMPACT STATEMENT

Addendum to the Final Alternatives Development and Screening Report

Heber Valley Corridor Environmental Impact Statement

Lead agency:
Utah Department of Transportation

March 27, 2025

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Acronyms and Abbreviations

ac	acres
AG	at grade
CFR	Code of Federal Regulations
EIS	Environmental Impact Statement
FAQ	frequently asked questions
FF	free flow
FHWA	Federal Highway Administration
ft	feet
GIS	geographic information systems
hub	intersection of US-40 and US-189 on the south side of Heber City
ID	identifier
lf	linear feet
LOS	level of service
M	million
MAG	Mountainland Association of Governments
MOU	Memorandum of Agreement
mph	miles per hour
MPO	metropolitan planning organization
NA	not applicable
NEPA	National Environmental Policy Act
NOI	Notice of Intent
north US-40	US-40 north of Heber City between SR-32 and 900 North
PRRP	Provo River Restoration Project
SR	state route
Section 4(f)	Section 4(f) of the Department of Transportation Act of 1966
Section 404	Section 404 of the Clean Water Act
south US-40	US-40 south of Heber City
SWG	Stakeholder Working Group
U.S.	United States
US-189	U.S. Highway 189
US-40	U.S. Highway 40
UDOT	Utah Department of Transportation
USACE	United States Army Corps of Engineers
USC	United States Code
USDOT	United States Department of Transportation
WOTUS	waters of the United States

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1.0 Introduction

The purpose of this screening addendum is to summarize and present the results of the additional alternatives development and screening process in 2025 for the Environmental Impact Statement (EIS) for the Heber Valley Corridor Project. This additional screening was conducted after the release of the January 16, 2023, *Final Alternatives Development and Screening Report* and before the release of the Draft EIS.

What is the purpose of this screening addendum?

This screening addendum summarizes and presents the results of the additional alternatives development and screening process for the EIS for the Heber Valley Corridor Project.

This summary provides an overview of the changes that were made after the screening decisions were released to the public in January 2023. These changes were made as part of a revised screening effort that took into account increases to the regionally approved traffic forecast and additional data.

The study area for the transportation needs assessment used for the Heber Valley Corridor EIS is focused on U.S. Highway 40 (US-40) from its intersection with State Route (SR) 32 to its junction with U.S. Highway 189 (US-189) in Heber City. It also includes US-40 to the southeast and US-189 to the southwest. This is the same study area considered in the *Final Alternatives Development and Screening Report* (January 2023).

The alternatives development and screening process described in this screening addendum provides critical information about how well each of the project alternatives would satisfy the purpose of the project and whether each alternative is reasonable and practicable. The criteria used in the screening analysis resulted in measures that allowed the Utah Department of Transportation (UDOT) to systematically and objectively identify reasonable alternatives and screen out unreasonable alternatives. The original screening criteria are summarized in Section 3.0, *Alternatives Development and Screening Process*, of the *Final Alternatives Development and Screening Report* (January 2023). Additional screening criteria considered in this addendum are summarized below in Section 1.2, *Additional Screening Criteria Detail Used in This Screening Addendum*, and in Section 2.2, *Alternatives Screening*, of this addendum.

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been carried out by UDOT pursuant to 23 United States Code (USC) Section 327 and a Memorandum of Understanding dated May 26, 2022, and executed by the Federal Highway Administration (FHWA) and UDOT.

1.1 Changes and Updates Made to the Heber Valley Corridor Alternatives Development and Screening Process since January 2023

For the *Final Alternatives Development and Screening Report* (January 2023), UDOT relied on version 1 2020-06-10 of the Summit-Wasatch travel demand model. This model is the tool for forecasting traffic volumes in Summit and Wasatch Counties in 2050 (the design year for the EIS) to analyze how well each alternative would meet the project purpose.

What is a travel demand model?

A travel demand model is a computer model that forecasts the number of transportation trips (travel demand) in an area at a given time. This forecast is based on the expected population, employment, household, land use, and road network conditions in the area. The travel demand model used for the Heber Valley Corridor Project is jointly maintained by UDOT and the Mountainland Association of Governments.

After the release of the *Final Alternatives Development and Screening Report* (January 2023), UDOT conducted a sensitivity analysis using a draft version of the updated Summit-Wasatch travel demand model. UDOT found that traffic was forecasted to increase by as much as 30% in some locations in the needs assessment study area compared to forecasts produced using the previous version of the model. This increase in traffic warranted an investigation by UDOT to determine how the 30% increase in forecasted traffic affected the alternatives being considered. This investigation delayed the EIS process while version 2 of the model was calibrated and finalized.

What is a sensitivity analysis?

A sensitivity analysis is a review to understand how changes in variables (that is, the travel demand model) affect outcomes (that is, the screening criteria results or alternative performance).

In fall 2024, UDOT thoroughly reviewed the calibrated and finalized version of the Summit-Wasatch travel demand model (version 2.1 2024-03-28). A summary of this review is provided in Section 1.4, *Overall Timeline of the Alternatives Development and Screening Process*, and additional details are available in Appendix R, *Alternative Screening Traffic Analysis Memorandum – March 14, 2025*. The sensitivity analysis determined that all alternatives that had been screened out previously would perform worse with the higher travel demand forecasted in the model and, therefore, do not warrant additional consideration by UDOT. In other words, the alternatives that could not effectively accommodate the amount of traffic forecasted by version 1 of the model could not accommodate the increased traffic forecasted by version 2.1 of the model.

Five alternatives had been advanced for further consideration in the Draft EIS in 2023. In 2024, when these five alternatives were analyzed using version 2.1 of the travel demand model, the traffic analysis predicted failing operations with all five alternatives in 2050. This prediction means that all of the alternatives would no longer meet the purpose of the project. To accommodate the increased traffic forecasted in the Heber Valley and to develop a longer-term transportation solution, UDOT refined the designs of all five alternatives to develop eight alternatives and screened them in 2025 using version 2.1 of the model. Because some areas of refinement overlap and because there are several unique combinations of those refinements, UDOT analyzed eight alternatives during the screening in 2025. The results of this additional screening are provided in this screening addendum.

1.2 Additional Screening Criteria Detail Used in This Screening Addendum

UDOT used the same screening criteria that were used in 2023 but looked at the criteria in greater detail. The additional detail summarized in this screening addendum was important for decision-making and differentiating among the alternatives. None of the original screening criteria were removed or replaced. The refinements are described below.

- **Level 1 Screening for Safety.** As stated in Sections 2.2, 4.0, and 4.4 of the *Purpose and Need Technical Report* (UDOT 2022), safety is a concern on US-40 for all users (motorists, pedestrians, and bicyclists). Since the publication of the *Purpose and Need Technical Report*, the Mountainland Association of Governments (MAG) published a *Safety Action Plan* and crash analysis in 2023 and identified US-40 in the Heber Valley as an improvement area. The majority of US-40 in the project area was identified by MAG as being on the "high injury network." High injury network roads account for the majority of serious injury and fatal crashes in an area. Recognizing the growing safety concern on US-40 in the Heber Valley, UDOT also has funded a median barrier project on north US-40 (that is, US-40 north of Heber City) in 2025 to reduce the number of head-on vehicle collisions.

  With the increase in traffic forecasted by version 2.1 of the travel demand model, safety challenges are also anticipated to increase, so UDOT elevated the consideration of safety in the screening criteria. In the *Final Alternatives Development and Screening Report* (January 2023), conflict points (the number of intersections, driveways, and other accesses) were reviewed as a Level 1 screening criterion focused on regional mobility. In this screening addendum, conflict points are used in Level 1 screening as both safety and regional mobility criteria to inform decision-making.

  An important note: safety has always been incorporated into the alternatives' designs, but with the increased traffic and increased growth forecasted in the valley (and recent statistics from MAG's *MPO [Rural Planning Organization] Safety Action Plan for Summit and Wasatch Counties* and crash analysis), safety has been elevated as an important differentiator for decision-making and screening.

- **Level 1 Screening for Regional Travel Time Origin and Destination Pairs.** Additional origin and destination pairs were considered as measures for regional travel times. In the *Final Alternatives Development and Screening Report* (January 2023), decreasing travel time between SR-32 and US-189 (near 1800 West) was a Level 1 screening criterion. In this screening addendum, UDOT also considered decreasing travel times between SR-32 and south US-40 (that is, US-40 south of Heber City near 1500 South) on both the future proposed bypass and on Main Street. These additional travel times capture the dominant regional travel movements as UDOT considers the benefits and drawbacks of traffic signals and grade-separated intersections and the increased traffic forecasted by version 2.1 of the travel demand model.

- **Level 1 Screening for Heber City's Vision.** Reducing truck and regional through traffic on Main Street would support Heber City's vision for Main Street (that is, wide sidewalks, bike lanes, landscaping, reduced speed limit, and protecting historic buildings) by allowing local traffic to be the primary focus in downtown Heber City. In this screening addendum, UDOT also considered an alternative's potential attractiveness to truck and regional through traffic, such as travel times and number of signals or stops encountered.

- **Level 2 Screening for Section 4(f) Archaeological Sites.** Section 4(f) of the Department of Transportation Act of 1966 applies to historic properties (including archaeological sites) that are eligible for listing in the National Register of Historic Places. In the *Final Alternatives Development and Screening Report* (January 2023), Section 4(f) considerations were evaluated only for historic properties, wildlife refuges, and recreation sites in Level 2 screening. After screening in 2023, UDOT received new guidance regarding how archaeological sites could qualify for protection under Section 4(f). In this screening addendum, UDOT included impacts to Section 4(f) archaeological sites in Level 2 screening. The addition of archaeological sites ensures that UDOT is considering all applicable Section 4(f) resources.
- **Level 2 Screening for Right-of-way Impacts Including Sewer Field Impacts.** In the *Final Alternatives Development and Screening Report* (January 2023), right-of-way impacts were considered in Level 2 screening specifically for residential and commercial properties. Heber City relies on overland treatment of its effluent and will continue to do so for the foreseeable future. As UDOT continued its coordination with city officials since the original screening, it learned that impacts to the sewer fields north of US-189 are difficult to mitigate. Therefore, in this screening addendum, sewer field right-of-way impacts have been emphasized in the Level 2 screening criteria to inform decision-making.

1.3 Change in Alternatives Advanced for Further Evaluation in the Draft EIS

Using the output from the updated travel demand model (version 2.1), all five alternatives were refined to accommodate the additional forecasted traffic and were rescreened. These design refinements resulted in eight alternatives being developed for screening in 2025. The 2025 screening process includes all previous screening criteria with greater detail for safety, additional regional travel times, archaeological sites, and sewer field impacts as discussed in Section 1.2, *Additional Screening Criteria Detail Used in This Screening Addendum*, and Section 2.2, *Alternatives Screening*, of this screening addendum. The outcome of the screening process did change as a result of using the updated model. This screening addendum summarizes the results of this process.

1.4 Overall Timeline of the Alternatives Development and Screening Process

The following list shows the overall timeline of the alternatives development and screening process:

- **Fall 2020.** UDOT conducted early scoping and identification of preliminary alternatives. Preliminary alternatives were identified with public and agency input and comment. A comment period was held from August 26 to October 3, 2020.
- **Summer 2021.** UDOT conducted formal scoping, issued a Notice of Intent to prepare an EIS, and published a range of preliminary alternatives. A comment period was held from April 30 to June 14, 2021.
- **Fall 2021.** UDOT offered alternatives development review and solicited input from the public and agencies. UDOT presented 17 initial concepts to resource agencies, city and county councils,

stakeholder working groups, and the public. A comment period was held from October 5 to November 4, 2021.

- **Spring 2022.** UDOT conducted alternatives refinement. Based on agency and public feedback received in 2021, UDOT refined alternatives and began the screening process.
- **Summer 2022.** UDOT published the *Draft Alternatives Development and Screening Report*, which included 23 alternatives. A comment period was held from June 7 to July 22, 2022.
- **Early Winter 2023.** UDOT published the final screening report with refinements based on the feedback received and on further preliminary engineering. The final screening report reviewed 23 alternatives, 5 of which passed screening.
- **Spring and Summer 2023.** UDOT prepared EIS documentation with the intent to publish a Draft EIS and preferred alternative in 2023.
- **Fall 2023.** UDOT reviewed internal drafts of MAG's 2023–2050 rural long-range transportation plan and travel demand model. These drafts showed a 30% increase in traffic on north US-40 and a 10% increase in traffic on Main Street, and UDOT began to investigate version 2 of the model.
- **Early Winter 2024.** UDOT paused work related to publishing the Draft EIS for the following reason:
  - UDOT conducted a sensitivity analysis using a draft version of the updated Summit-Wasatch travel demand model. This sensitivity analysis found that none of the alternatives that passed screening in January 2023 would accommodate the future traffic forecasted by the updated model unless the alternatives were refined (that is, modified to add additional capacity).
- **Spring 2024.** The updated travel demand model (version 2.1) was calibrated and accepted by MAG as the official model version. In-depth traffic analysis using version 2.1 of the model was conducted, and the design refinement process was initiated.
- **Early Spring 2025.** The screening process was finalized based on version 2.1 of the travel demand model, and this screening addendum was published.

1.5 Results of 2023 Alternatives Rescreening in 2025

In 2022, UDOT developed 23 alternatives for evaluation in screening based on previous studies, public and agency input during scoping, and local and regional land use and transportation plans. Of the 23 alternatives that UDOT reviewed, 18 did not pass the original screening in 2023. These 18 alternatives were reviewed in 2025 based on new modeling data; UDOT confirmed that all 18 still failed screening. The primary change between the 2023 screening and the 2025 rescreening is the higher traffic forecasts in the updated travel demand model. Essentially, the additional forecasted traffic in the updated model does not improve traffic performance nor reduce the potential for resource impacts from the 2023 alternatives. For more information, see Appendix R, *Alternative Screening Traffic Analysis Memorandum – March 14, 2025*.

In 2023, Alternative WA3 passed Level 1 screening for traffic measures and failed in Level 2 screening for wetland impacts. Alternative WA3 had a combination of grade separation on the bypass and at-grade signals on north US-40 as well as at its connections with north US-40, US-189, and south US-40. It also had faster Level 1 travel measures because of the grade separation and extension through the north fields. However, the remaining five alternatives, which passed screening in 2023, provided satisfactory traffic

measures with fewer wetland impacts. With the additional traffic forecasted with version 2.1 of the travel demand model, Alternative WA3 would also need additional refinements to pass Level 1 traffic measures (these additional refinements would be needed primarily on north US-40 and at the locations of its at-grade connections) and therefore would not meet the purpose of the project. Elements of Alternative WA3 (that is, free-flow connections and an extension through the north fields) have been incorporated into the refined alternative (WB3 FF) considered in this screening addendum. Table 1-1 lists the 18 alternatives that did not pass screening in 2023 or 2025.

Table 1-1. Alternatives That Did Not Pass Screening in 2023 or 2025

Alternative			Preliminary Screening	Level 1 Screening 2023	Level 2 Screening 2023	Passed Screening 2025?
US-40 Improvements	—	Transit alternative	Fail	NA	NA	No
	40A	Widen US-40	Pass	Fail	NA	No
	40B	Improve US-40 – roundabouts	Pass	Fail	NA	No
	40C	Improve US-40 – intersection improvements	Pass	Fail	NA	No
	40D	Improve US-40 – tunneling or bridging	Fail	NA	NA	No
	40E	Reversible lanes	Pass	Fail	NA	No
	40F	One-way couplet	Pass	Fail	NA	No
	40G	One-way couplet on 100 West and 100 East	Pass	Fail	NA	No
East Bypasses	EA	East bypass – limited access and grade-separated interchanges	Pass	Fail	NA	No
	EB	East bypass – parkway and at-grade intersections	Pass	Fail	NA	No
	EC	East bypass – arterial route and at-grade intersections	Pass	Fail	NA	No
West Bypasses	WA2	West bypass – limited access and grade-separated interchanges and realign US-189	Pass	Fail	NA	No
	WA3	West bypass – limited access and grade-separated interchanges with northern extension	Pass	Pass	Fail[a]	No
	WC1	West bypass – arterial route and at-grade intersections	Pass	Fail	NA	No
	WC2	West bypass – arterial route and at-grade intersections and realign US-189	Pass	Fail	NA	No
	WD1	West bypass – parkway and turbo roundabouts	Pass	Fail	NA	No
	WD2	West bypass – parkway and turbo roundabouts with connection at 1300 South	Pass	Fail	NA	No
	WS	West bypass with southern extension – arterial route and at-grade intersections	Pass	Fail	NA	No

Definitions: NA = not applicable

[a] In 2023, Alternative WA3 passed Level 1 screening for traffic measures and failed in Level 2 for wetland impacts. Alternative WA3 would also require refinements to pass Level 1 screening measures when analyzed with version 2.1 of the travel demand model.

2.0 2025 Alternatives Development and Screening Process

This section describes the additional screening that UDOT conducted in 2025 in response to the updated travel demand model (version 2.1) for the alternatives that passed the original screening. For information regarding prior alternatives or screening, refer to the *Final Alternatives Development and Screening Report* (January 2023).

2.1 Range of Alternatives Considered in the 2025 Screening Process

UDOT refined the five alternatives that passed screening in 2023 to enhance each alternative's ability to accommodate the increased traffic forecasted by the updated travel demand model (version 2.1). In UDOT's initial review of a draft of version 2 of the model, these five alternatives showed failing traffic operations on north US-40 in 2050, and these failing operations led UDOT to pause the EIS process and regroup. The basis of the project purpose developed by UDOT is to provide a lasting, durable transportation facility for the Heber Valley that can accommodate traffic through 2050.

After UDOT thoroughly reviewed version 2.1 of the travel demand model and the performance of the five alternatives that previously passed screening, UDOT determined that all five alternatives would require several modifications to meet the project purpose. UDOT first revised Alternatives WB1, WB2, WB3, and WB4 to accommodate more traffic on north US-40 by adding additional lanes and larger intersections with more turning capacity. These four alternatives are the "at-grade" alternatives referenced in this screening addendum, and they include traffic signals at most intersections (Figure 2-1). The updated model forecasts that traffic will increase by 30% on north US-40 and by 10% on other roads, including Main Street, compared to the forecasts from the previous version of the model. The growth in traffic is largely local traffic attributed to the continued development approvals, particularly along north US-40. For this reason, UDOT took a more in-depth look at adding capacity by creating free-flow (or grade-separated) intersections.

Alternative WA1 was the sole "free-flow" alternative that passed screening in 2023. However, Alternative WA1 had only two interchanges on the bypass and five signalized intersections on north US-40 and did not include an interchange at SR-32. Given that 30% more traffic was forecasted on north US-40 in version 2.1 of the travel demand model, consideration of a complete free-flow alternative was warranted, and UDOT developed a free-flow version of every at-grade alternative for screening. These four alternatives are referred to as "free-flow" versions of Alternatives WB1, WB2, WB3, and WB4 (Figure 2-2). Alternatives WA1 and WB1 FF follow the same alignment; therefore, Alternative WA1 was determined to be redundant and less effective and was removed from further consideration.

How does north US-40 compare to other Utah roads?

For reference, the traffic forecasted for north US-40 in 2050 is about 50,000 vehicles per day, which is comparable to the existing traffic on Bangerter Highway in Salt Lake County and University Parkway in Utah County.

Table 2-1 describes the eight alternatives that are considered in this screening addendum.

Table 2-1. Revised Alternatives Considered in Screening

Alternative[a]		Capacity and Other Refinements Made in 2024
At-grade Alternatives (Figure 2-1)		
WB1 AG	West bypass – parkway and at-grade intersections	• Two additional travel lanes (three lanes in each direction total) and additional turn lanes at signalized intersections were included on north US-40 to accommodate the anticipated increased demand. • A center median was added on north US-40 to improve safety. • Bypass alignment and at-grade intersections on the south end are similar to the 2023 WB1 alternative.
WB2 AG	West bypass – parkway and at-grade intersections and realign US-189	• Two additional travel lanes (three lanes in each direction total) and additional turn lanes at signalized intersections were included on north US-40 to accommodate the anticipated increased demand. • A center median was added on north US-40 to improve safety. • Bypass alignment, including the realignment of US-189, and at-grade intersections on the south end are similar to the 2023 WB2 alternative.
WB3 AG	West bypass – parkway and at-grade intersections with northern extension	• North US-40 has two travel lanes in each direction (similar to the existing road). • A center median was added on north US-40 to improve safety. • Additional turn lanes at signalized intersections were included on north US-40 to accommodate the anticipated increased demand. • Bypass alignment, including the extension through the north fields, and at-grade intersections on the south end are similar to the 2023 WB3 alternative.
WB4 AG	West bypass – parkway and at-grade intersections with northern extension and realigned US-189	• North US-40 has two travel lanes in each direction (similar to the existing road). • A center median was added on north US-40 to improve safety. • Additional turn lanes at signalized intersections were included on north US-40 to accommodate the anticipated increased demand. • Bypass alignment, including the extension through the north fields and the realignment of US-189, and at-grade intersections on the south end are similar to the 2023 WB4 alternative.
Free-flow Alternatives (Figure 2-2)		
WB1 FF	West bypass – limited access and free-flow intersections	• This alternative was formerly Alternative WA1; it was revised for version 2.1 of the travel demand model to accommodate additional demand and improve safety. • Select intersections are grade-separated with bridges and ramps (free-flow) from SR-32 to south US-40 and US-189. • North US-40 has two travel lanes in each direction (similar to the existing road). • Partial frontage roads were incorporated on north US-40 between SR-32 and 900 North to consolidate access to grade-separated intersections and to facilitate safe local access to properties. • 900 North includes free-flow ramps to the bypass. • The area south of the hub intersection[b] includes a redesigned free-flow connection to 1300 South.
WB2 FF	West bypass – limited access and free-flow intersections and realign US-189	• This bypass alignment is similar to WB2 AG, but select alternative intersections are grade-separated with bridges and ramps (interchanges) from SR-32 to south US-40 and US-189 to increase capacity and improve safety. • North US-40 has two travel lanes in each direction (similar to the existing road). • Partial frontage roads were incorporated on north US-40 between SR-32 and 900 North to consolidate access to grade-separated intersections and to provide safe access to properties. • 900 North includes free-flow ramps to the bypass. • US-189 is realigned through the sewer fields (no change from 2023). • The area south of the hub intersection[b] includes a redesigned free-flow connection to 1300 South.

(*Continued on next page*)

Table 2-1. Revised Alternatives Considered in Screening

Alternative[a]		Capacity and Other Refinements Made in 2024
WB3 FF	West bypass – limited access and free-flow intersections with northern extension	• This bypass alignment is similar to Alternative WB3 AG, but select alternative intersections are grade-separated with bridges and ramps from SR-32 to south US-40 and US-189 to increase capacity and improve safety. • North US-40 is two travel lanes in each direction between Potter Lane and 900 North. • Coyote Canyon Parkway and 900 North are at-grade signalized intersections. • Partial frontage roads were incorporated on north US-40 between SR-32 and Potter Lane. • North fields extension starts near Potter Lane to maintain interchange spacing standards between SR-32 and the bypass. • The area south of the hub intersection[b] includes a redesigned free-flow connection to 1300 South.
WB4 FF	West bypass – limited access and free-flow intersections with northern extension and realigned US-189	• This bypass alignment is similar to Alternative WB4 AG, but select intersections are grade-separated from SR-32 to south US-40 and US-189 to increase capacity and improve safety. • North US-40 is two travel lanes in each direction between Potter Lane and 900 North. • Coyote Canyon Parkway and 900 North are at-grade signalized intersections. • Partial frontage roads were incorporated on north US-40 between SR-32 and Potter Lane. • North fields extension starts near Potter Lane to maintain interchange spacing standards between SR-32 and the bypass. • US-189 is realigned through the sewer fields (no change from 2023). • The area south of the hub intersection[b] includes a redesigned free-flow connection to 1300 South.

[a] AG stands for “at-grade” and FF stands for “free-flow.”

[b] The hub intersection is the intersection of US-40 and US-189 on the south side of Heber City.

Figure 2-1. Design Layouts for At-grade West Bypasses

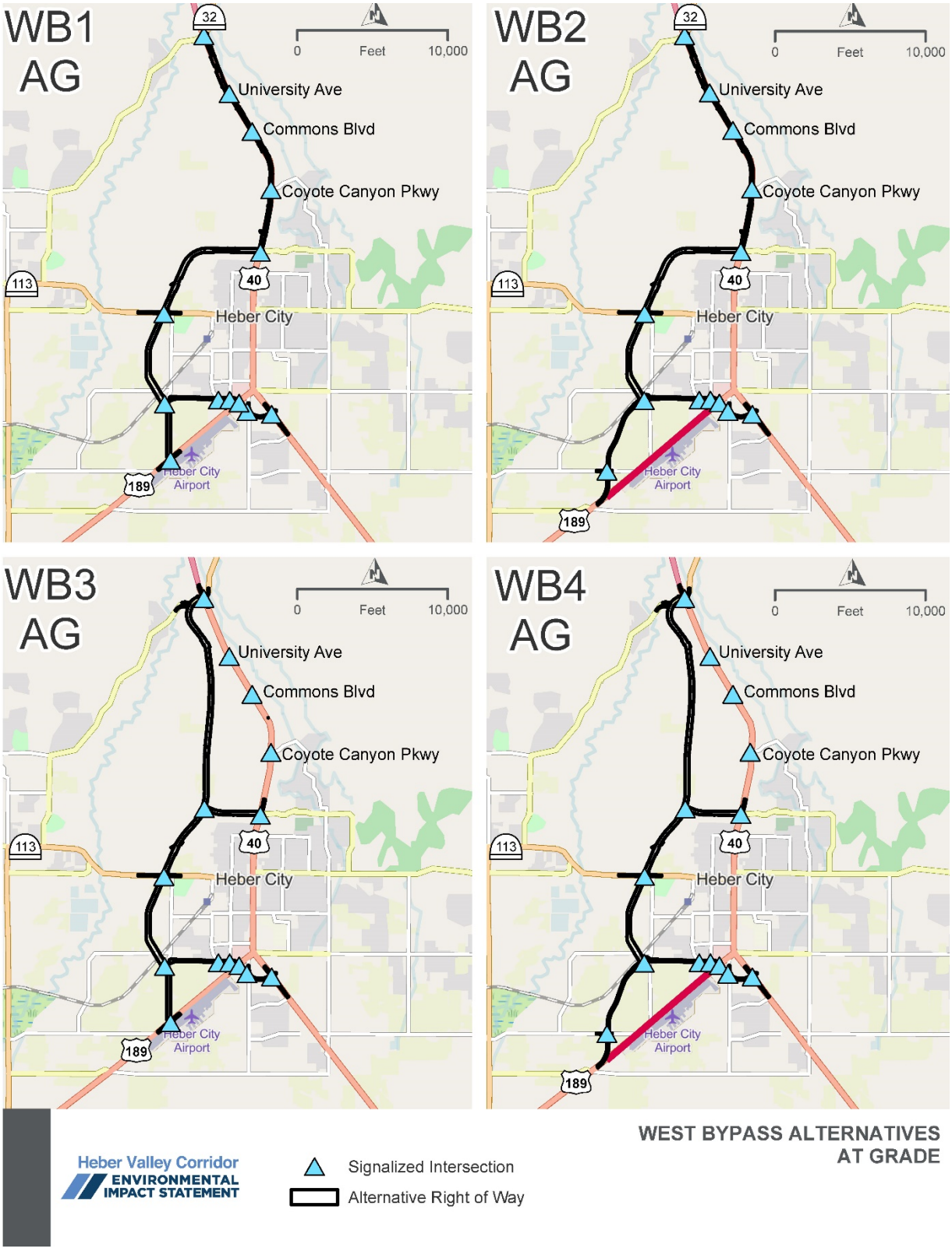
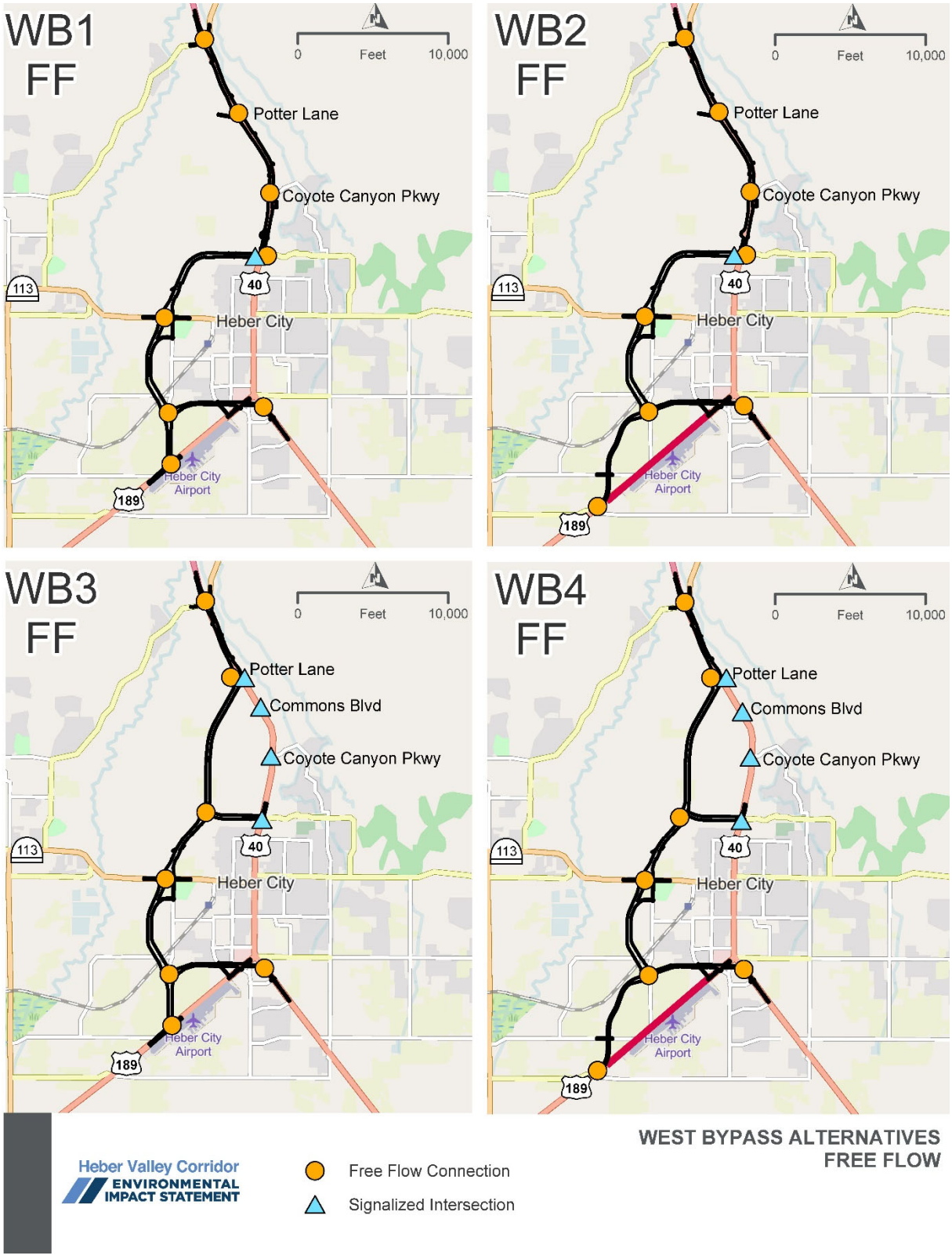


Figure 2-2. Design Layouts for Free-flow West Bypasses



2.2 Alternatives Screening

2.2.1 Preliminary Evaluation of Alternatives

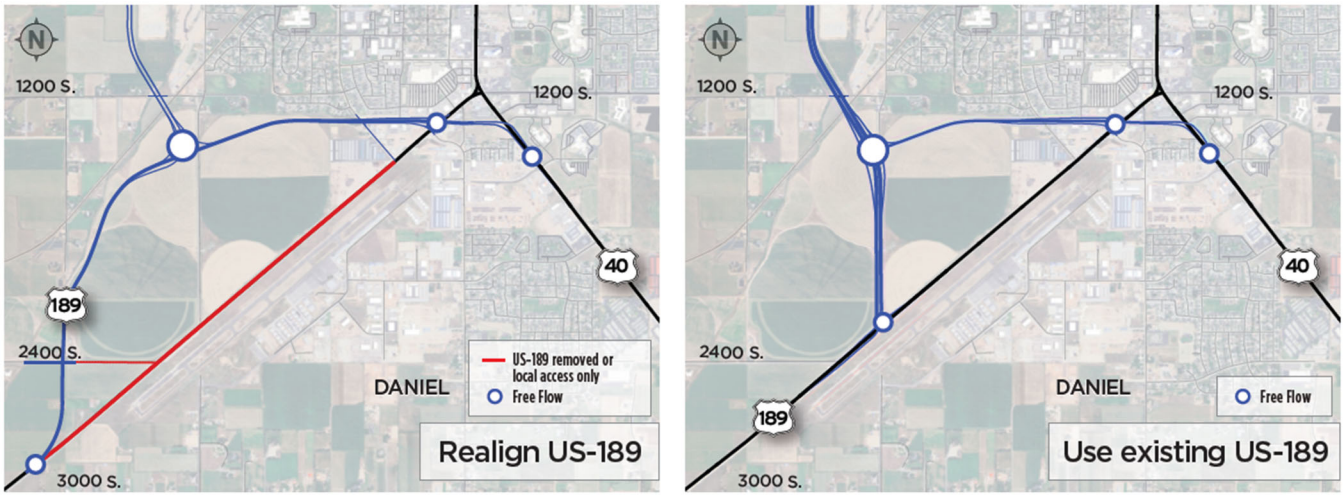
UDOT first evaluated the eight alternatives listed above in Table 2-1, *Revised Alternatives Considered in Screening,* for fatal flaws or redundancy with other alternatives to determine whether they should be further developed and advanced to Level 1 screening.

Four alternatives—all alternatives that realign US-189—were eliminated in the preliminary evaluation and were not further developed by UDOT. This section describes the alternatives that were eliminated from further analysis and the reasons why they were eliminated.

Consideration for US-189 in Alternatives Development

The realignment of US-189 was considered in the west bypass alternatives development process to encourage traffic to take the bypass route and reduce traffic on Main Street and to reduce impacts to the Heber Valley Special Service District's sewer fields. The sewer fields are important to the city's treatment of its effluent and are difficult to mitigate. Alternatives WB2 AG, WB4 AG, WB2 FF, and WB4 FF are similar to Alternatives WB1 AG, WB3 AG, WB1 FF, and WB3 FF except for the realignment of US-189. Figure 2-3 shows the two options for the alignment of US-189 for the free-flow alternatives. The alignments in Figure 2-3 are similar for the at-grade alternatives except for the segment south of the hub intersection between US-189 and US-40. (The hub intersection is the intersection of US-40 and US-189 on the south side of Heber City.)

Figure 2-3. Comparison of the Two Options Considered for the Alignment of US-189



Note: When preparing this screening addendum, UDOT did not determine whether US-189 would be removed, would be closed, or would remain open for local access.

Preliminary Results

UDOT reviewed the regional traffic operations, conflict points, and sewer field impacts for the eight alternatives because this information corresponds with the anticipated benefits of realigning US-189. Table 2-2 summarizes the information grouped by "like" alternative; that is, Alternatives WB1 AG and WB2 AG are the same except for the realignment of US-189. UDOT found that traffic operations on the bypass alternatives would be similar whether US-189 is realigned or not, and the alternatives that would realign US-189 have an equal or greater potential for sewer field impacts.

Table 2-2. Preliminary Regional Mobility Criteria and Resource Results

Alternative or Condition		Travel Time (Southbound) (minutes:seconds)				Traffic Volume on 1300 South in 2050[b]	Number of Conflict Points[a]	Sewer Field Impacts[c] (acres)
		SR-32 to US-189		SR-32 to US-40				
		Via Bypass	Via Main Street	Via Bypass	Via Main Street			
Existing conditions (2019)		—	10:55	—	9:15	—	144	—
US-40 no-action (2050)		—	23:40	—	21:50	—	152–157	—
At-grade on-alignment alternatives, with and without US-189 realigned								
WB1 AG	West bypass – parkway and at-grade intersections	10:20	14:45	11:45	13:00	7,000	26–35	39.7
WB2 AG	West bypass – parkway and at grade intersections and realign US-189	10:15	15:10	11:55	12:10	18,600	27–36	38.8
At-grade alternatives with north fields extension, with and without US-189 realigned								
WB3 AG	West bypass – parkway and at-grade intersections with northern extension	8:15	14:05	9:35	12:15	7,700	12	39.7
WB4 AG	West bypass – parkway and at grade intersections with northern extension and realigned US-189	8:10	15:50	9:50	12:45	18,500	12	38.8
Free-flow on-alignment alternatives, with and without US-189 realigned								
WB1 FF	West bypass – limited access and free-flow intersections	7:25	13:55	7:50	12:25	—	1	54.8
WB2 FF	West bypass – limited access and free-flow intersections and realign US-189	7:20	15:05	7:50	12:10	—	1	70.5

(*Continued on next page*)

Table 2-2. Preliminary Regional Mobility Criteria and Resource Results

Alternative or Condition		Travel Time (Southbound) (minutes:seconds)				Traffic Volume on 1300 South in 2050[b]	Number of Conflict Points[a]	Sewer Field Impacts[c] (acres)
		SR-32 to US-189		SR-32 to US-40				
		Via Bypass	Via Main Street	Via Bypass	Via Main Street			
Free-flow alternatives with north fields extension, with and without US-189 realigned								
WB3 FF	West bypass – limited access and free-flow intersections with northern extension	6:15	14:55	6:35	13:30	—	1	54.8
WB4 FF	West bypass – limited access and free-flow intersections with northern extension and realigned US-189	6:05	15:50	6:40	12:45	—	1	70.5

[a] Conflict points include the existing and potential future accesses, such as driveways and intersecting side streets, along the alternative. Reducing conflict points improves safety and regional mobility. All alternatives would reduce the number of conflict points compared to the no-action conditions.

[b] Traffic volumes on 1300 South were modeled only for the at-grade alternatives. The free-flow alternatives are likely to have a similar increase in traffic for the realigned US-189 alternatives (WB2 FF and WB4 FF). The modeling for the at-grade alternatives projects a traffic increase of 140% to 165% on 1300 South with US-189 realigned.

[c] Sewer field impacts include the combined total direct and indirect impacts in acres.

Rationale for the Elimination of the Realignment of US-189 Alternatives

The four alternatives that would realign US-189 (WB2 AG, WB4 AG, WB2 FF, and WB4 FF) were eliminated for being redundant with the remaining four alternatives that would not realign US-189 (WB1 AG, WB3 AG, WB1 FF, and WB3 FF) without providing any obvious benefit. The four alternatives that would realign US-189 perform similarly with respect to traffic operations to their counterparts that do not realign US-189 (there is no traffic benefit from realigning US-189). In addition, there would be negative effects from realigning US-189. Table 2-3 summarizes the rationale for eliminating the four alternatives that would realign US-189.

Table 2-3. Preliminary Evaluation of Alternatives That Would Realign US-189

Resource or Location	Discussion of Impact or Drawback of Alternatives WB2 AG, WB4 AG, WB2 FF, and WB4 FF
Traffic operations and regional mobility	• There would be no benefit to realigning US-189 with respect to regional mobility (see Table 2-2). • Regional travel times north and south through the Heber Valley using the bypass are comparable among the alternatives whether or not US-189 is realigned. Travel times for trips from US-189 to the south portion of US-40 would take longer with the alternatives that would realign (or potentially remove) US-189 because it would be a longer distance (via 1300 South instead of through the Hub Intersection). These alternatives would introduce some out-of-direction travel for those traveling to south US-40. A longer route and out-of-direction travel on realigned US-189 (via 1300 South) could increase the potential for cut-through traffic on 3000 South in Daniel.
1300 South	• The four alternatives that realign US-189 would increase traffic on 1300 South (which abuts a residential neighborhood) and increase the potential for noise impacts for residents. The modeling for the at-grade alternatives projects a traffic increase of 140% to 165% on 1300 South with US-189 realigned (see Table 2-2).
Right-of-way	• The four alternatives that realign US-189 would require additional residential property acquisitions compared to the alternatives that do not realign US-189.
Sewer fields	• All eight alternatives would impact the sewer fields. The four alternatives that realign US-189 would result in similar or greater impacts. Sewer field impacts are included in Table 2-2.
Main Street traffic operations	• Realigning US-189 would not provide an obvious benefit to traffic operations on Main Street.
Cost	• Realigning US-189 would cost more to construct and maintain because it would create a new and longer route into downtown Heber City than the original US-189 route.

2.2.2 Level 1 Screening

Level 1 screening was based on the project purpose. The purpose of the Heber Valley Corridor Project is to substantially improve regional and local mobility on US-40 through 2050, provide opportunities for nonmotorized transportation, and allow Heber City to meet their vision for the historic town center. For a full description of screening criteria, see Section 3.3.2, *Level 1 Screening*, in the *Final Alternatives Development and Screening Report* (January 2023).

What is the purpose of Level 1 screening?

The purpose of Level 1 screening is to eliminate alternatives that do not meet the purpose of the project.

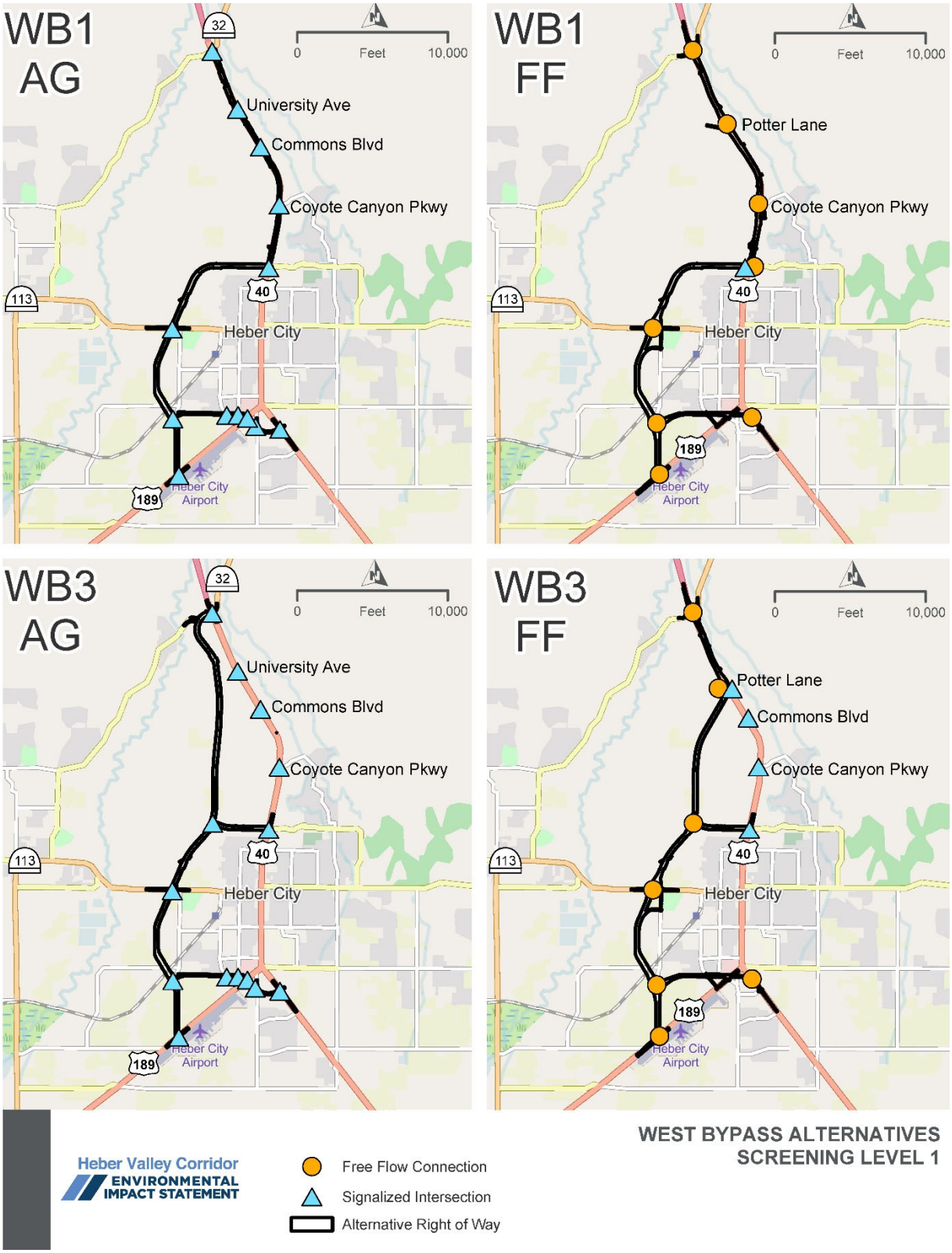
To allow Level 1 screening (Table 2-4), UDOT developed the four alternatives that passed through the preliminary evaluation in enough detail to model and evaluate traffic operations on US-40 and estimate travel times (Figure 2-4).

Table 2-4. Level 1 Screening Criteria and Measures

Criterion	Measures[a]
Improve regional mobility through 2050	• Substantially decrease through traffic travel time from SR-32 to US-189 and from SR-32 to south US-40. • Minimize conflicts (driveway accesses, intersections, etc.) to north–south mobility for through traffic. Minimizing conflicts also improves safety to the traveling public.
Improve local mobility on Main Street through 2050	• Improve arterial and intersection level of service (LOS) on US-40. • Decrease travel time on Main Street (SR-32 to hub intersection). • Substantially decrease vehicle queue lengths on US-40.
Provide opportunities for nonmotorized transportation	• Provide opportunities for nonmotorized transportation consistent with local and regional planning documents.
Allow Heber City to meet their vision for the historic town center	• Avoid or minimize impacts to valued places and historic buildings in the historic town center (along Main Street, 100 East, and 100 West). • Avoid improvements that would preclude Heber City from implementing strategies to achieve their vision for Main Street (wide sidewalks, bike lanes, landscaping, and a reduced speed limit). • Potential for alternative to attract truck and regional through traffic through improved travel times and fewer stops.

[a] For more detail regarding measures, see Section 3.3.2, *Level 1 Screening*, in the *Final Alternatives Development and Screening Report* (January 2023).

Figure 2-4. Level 1 Design Layouts for At-grade and Free-flow West Bypasses



Level 1 Regional Mobility and Safety Criteria

Regional mobility and safety are the primary considerations of this additional screening. US-40 is a U.S. highway facility that connects regional destinations and is becoming increasingly burdened with local traffic as a result of the rapid development in the Heber Valley. The latest version of the travel demand model (version 2.1) confirms this rapid growth with considerably greater levels of traffic forecast than previous model versions. As a result, without improvements, North US-40 specifically will experience more congestion in the future as a result of the extensive development that is approved along its north and east sides.

Table 2-5 and Table 2-6 summarize the results of the safety and regional traffic mobility screening. Existing and no-action conditions (that is, the conditions without any improvements) were updated using version 2.1 of the travel demand model. The free-flow alternatives (WB1 FF and WB3 FF) would perform best for regional mobility and safety. The free-flow alternatives would have the fewest conflicts with cross traffic. For this reason, these alternatives would be inherently safer, and they would have the fastest regional travel times (about 30% to 50% faster than their at-grade counterparts). The at-grade alternatives (WB1 AG and WB3 AG) would be the slowest for regional travel times, would be less safe in comparison, and would have more conflict points than the free-flow alternatives (that is, additional intersections, driveways, and other accesses), In addition, Alternative WB1 AG would require local traffic to cross three lanes on north US-40 when making left-hand turns at intersections (a challenging maneuver). At-grade signalized intersections have a greater potential for rear-end and sideswipe crashes than do interchanges.

The at-grade alternatives required several design refinements that conflict with the regional traffic needs of a highway that is intended to function for city-to-city regional travel. Alternative WB1 AG would require three lanes in each direction on north US-40, and all at-grade alternatives would require multiple traffic signals, which would increase conflict points and degrade safety compared to the free-flow alternatives. To create an acceptable safety environment, the at-grade alternatives would need to have slower speed limits to safely provide local access. A lower speed limit, although necessary, is counter to the intended function of a State/US highway. With regard to safety and the longevity of a transportation solution in a valley with a fast-growing population and development, the free-flow alternatives would provide the most durable solution to the transportation need.

UDOT anticipates that the free-flow alternatives would continue to perform the best into the future as the population and development in the valley increase. Essentially, the increased traffic makes the function and safety of the at-grade alternatives even more challenging.

For the reasons stated above, the free-flow alternatives are recommended for Level 2 screening because they best meet the regional mobility and safety criteria and provide a long-lasting solution to the transportation need.

Table 2-5. Level 1 Regional Mobility Travel Time Criteria Screening Results

Alternative or Condition		Travel Time (Southbound)[a] (minutes:seconds)				Travel Time (Northbound) (minutes:seconds)				Recommended for Level 2 Screening?
		SR-32 to US-189		SR-32 to US-40		US-189 to SR-32		US-40 to SR-32		
		Via Bypass	Via Main Street	Via Bypass	Via Main Street	Via Bypass	Via Main Street	Via Bypass	Via Main Street	
Existing conditions (2019)		—	10:55	—	9:15	—	10:50	—	8:40	NA
US-40 no-action (2050)		—	23:40	—	21:50	—	22:00	—	18:40	NA
Refined West Bypasses										
WB1 AG	West bypass – parkway and at-grade intersections	10:20	14:45	11:45	13:00	12:00	13:25	13:10	11:25	No
WB3 AG	West bypass – parkway and at-grade intersections with northern extension	8:15	14:05	9:35	12:15	8:45	13:45	9:35	11:45	No
WB1 FF	West bypass – limited access and free-flow intersections	7:25	13:55	7:50	12:25	7:25	12:15	7:50	10:05	Yes
WB3 FF	West bypass – limited access and free-flow intersections with northern extension	6:15	14:55	6:35	13:30	6:15	13:10	6:35	11:00	Yes

Definitions: NA = not applicable

[a] Travel time in this table has minimal differences compared to Table 2-2, *Level 1 Screening Criteria and Measures*, above. Alternatives continued to be refined after UDOT eliminated Alternatives WB2 AG, WB2 FF, WB4 AG, and WB4 FF in Level 1 screening.

Table 2-6. Level 1 Regional Mobility Safety Criteria Screening Results

Alternative or Condition		Number of Conflict Points[a]	Access Category[b]	Recommended for Level 2 Screening?
Existing conditions (2019)		144	5	NA
US-40 no-action (2050)		152–157	5	NA
Refined West Bypasses				
WB1 AG	West bypass – parkway and at-grade intersections	26–35	5	No
WB3 AG	West bypass – parkway and at-grade intersections with northern extension	12	3	No
WB1 FF	West bypass – limited access and free-flow intersections	1	1	Yes
WB3 FF	West bypass – limited access and free-flow intersections with northern extension	1	1	Yes

Definitions: NA = not applicable

[a] Conflict points include the existing and potential future accesses, such as driveways and intersecting side streets, along the alternative. Reducing conflict points improves safety and regional mobility. All alternatives would reduce the number of conflict points compared to the no-action conditions.

[b] Access category is not a measure. This is a disclosure of the proposed access category for the alternative. The access category was used to calculate the number of conflict points that would be allowed according to UDOT's design standards and access management rules (UDOT 2019).

Level 1 Local Mobility Criteria

Meeting local mobility and Heber City's vision criteria are necessary for an alternative to meet the project's purpose. For an alternative to advance as reasonable, it must satisfy both. The summarized results of Level 1 screening are provided in Table 2-10, *Final Level 1 Screening Results*, on page 24.

Traffic Screening for Local Mobility on US-40

The Level 1 local mobility screening criteria focused on traffic operations on Main Street between SR-32 and US-189 at the hub intersection because this is the focal point of local trips. A microsimulation traffic model was used to review each alternative for its ability to improve southbound PM peak-hour (5:00 to 6:00 PM) travel time on Main Street, limit vehicle queue lengths at the 500 North intersection, and improve the level of service (LOS) on Main Street and its intersections in downtown Heber City. Existing and no-action conditions were updated based on the updated travel demand model (version 2.1). All alternatives would perform well with regard to local mobility.

Alternatives WB1 FF and WB3 FF are projected to have one failing southbound segment on Main Street; however, this is a function of the close proximity of Center Street and 100 South (SR-113). The signals at 100 South (SR-113) and Center Street are only one block apart (about 400 feet), and vehicles backing up from one intersection can easily influence the other intersection. Even without congestion, vehicles on short segments of road have little opportunity to accelerate to higher speeds and qualify for a higher arterial level of service. All alternatives passed Level 1 local mobility screening. Table 2-7 summarizes the local mobility screening results.

Table 2-7. Level 1 Travel Demand Model Screening Results (Local Mobility)

Alternative or Conditions		Number of Intersections at LOS F	Travel Time (mm:ss)	Southbound Queue Length at 500 North (ft)	Number of Southbound Segments at LOS F	Recommended for Level 2 Screening?
Existing conditions (2019)		0	8:20	375	2	NA
US-40 no-action (2050)		4	20:30	17,100	2	NA
Refined West Bypasses						
WB1 AG	West bypass – parkway and at-grade intersections	0	10:55	1,125	0	Yes
WB3 AG	West bypass – parkway and at-grade intersections with northern extension	0	10:35	1,325	0	Yes
WB1 FF	West bypass – limited access and free-flow intersections	0	10:35	1,150	1	Yes
WB3 FF	West bypass – limited access and free-flow intersections with northern extension	0	11:05	2,275	1	Yes

Definitions: ft = feet; LOS = level of service; mm:ss = minutes:seconds; NA = not applicable

Screening for Heber City Vision and Valued Places

The four alternatives that were advanced to Level 1 screening were reviewed for their ability to allow Heber City to meet their vision for Main Street (wide sidewalks, bike lanes, landscaping, reduced speed limit, and protecting historic buildings) and the protection of Heber City's valued places (Tabernacle Square, Main Street Park, and the Public Safety Property) and historic buildings. Reducing truck traffic on Main Street is also important to Heber City's vision for improving Main Street's streetscape. Both truck traffic and regional traffic prioritize the shortest travel time. The free-flow alternatives provide a faster route than travel on Main Street in 2050; therefore, the free-flow alternatives would be more likely to reduce truck and regional traffic on Main Street in line with Heber City's vision. The at-grade alternatives would be less likely to attract truck traffic from Main Street because drivers would encounter multiple traffic signals. For traffic (including oil tankers) traveling from or to south US-40, there would be one additional traffic signal on the bypass with Alternative WB1 AG compared to existing conditions on Main Street (Table 2-8).

Table 2-8. Number of Traffic Signals by Alternative

Alternative or Conditions		Traffic Signals between SR-32 and 1500 South (via Main Street)	Traffic Signals between SR-32 and 1500 South (via Bypass)
US-40 no-action (2050)		11	NA
Refined West Bypasses			
WB1 AG	West bypass – parkway and at-grade intersections	11	12
WB3 AG	West bypass – parkway and at-grade intersections with northern extension	11	7
WB1 FF	West bypass – limited access and free-flow intersections	7	1 (1500 South)
WB3 FF	West bypass – limited access and free-flow intersections with northern extension	7	1 (1500 South)

To pass Level 1 screening, an alternative must be compatible with Heber City's vision criteria for Main Street and the historic town center. The vision statements in *Heber City Envision 2050* (Heber City's general plan) for open space and agricultural protection will be evaluated during the preparation of the Draft EIS and will be considered by UDOT in identifying a preferred alternative. All four alternatives evaluated in Level 1 screening are west bypasses, so they would not directly impact valued places or buildings on Main Street. The free-flow alternatives are more likely to attract more truck traffic and regional traffic to the bypass; therefore, they pass the Heber City Vision and Valued Places Level 1 screening criteria. Table 2-9 summarizes the Heber City vision and valued places screening results.

What is the Heber City historic town center?

Heber City defines their historic town center as the area between 200 West and 200 East from 300 North to 300 South. Heber City has defined a specific vision for their historic town center in *Heber City Envision 2050*, Heber City's general plan.

Table 2-9. Level 1 Heber City Vision and Valued Places Screening Results

Alternative or Conditions		Valued Places Impacts on Main Street	Historic Buildings Impacts in the Historic Town Center	Allows Heber City to Achieve Their Vision for Main Street?	Recommended for Level 2 Screening?
US-40 no-action (2050)		NA	NA	No. The forecasted traffic in 2050 prevents Heber City from achieving their vision for Main Street.	NA
Refined West Bypasses					
WB1 AG	West bypass – parkway and at-grade intersections	No impacts to valued places on Main Street.	No impacts to historic buildings in the historic town center.	No. The at-grade alternatives would attract less truck traffic, thereby limiting Heber City's ability to implement traffic calming and other elements of their vision for Main Street.	No
WB3 AG	West bypass – parkway and at-grade intersections with northern extension				No
WB1 FF	West bypass – limited access and free-flow intersections			Yes. The free-flow alternatives would allow Heber City to implement traffic calming and other elements of their vision for Main Street.	Yes
WB3 FF	West bypass – limited access and free-flow intersections with northern extension				Yes

Definitions: NA = not applicable

Nonmotorized Transportation Screening

All alternatives that pass Level 1 and Level 2 screening will be refined with additional engineering to include bicycle and pedestrian accommodations that are compatible with local planning documents. No alternatives were eliminated in Level 1 screening for not having nonmotorized accommodations (all alternatives would have a nonmotorized pathway).

Summary of Level 1 Screening Results

Table 2-10 shows the final Level 1 screening results. As a result of Level 1 screening, the two free-flow alternatives (WB1 FF and WB3 FF) were progressed forward to Level 2 screening because they best meet the project purpose and would provide a longer-lasting transportation solution (the at-grade alternatives are worse for regional mobility, safety, and meeting Heber City's vision for the historic town center). The at-grade alternatives are also not as forward-compatible with the expected growth and development in the Heber Valley. The section following Table 2-10 describes the alternatives that are not recommended for further analysis (WB1 AG and WB3 AG) and the reasons why they are not recommended.

What is a forward-compatible investment?

A forward-compatible investment is one that can be easily scaled to match future traffic needs.

Table 2-10. Final Level 1 Screening Results

Alternative		Improves Regional Mobility and Safety in the Heber Valley in 2050?	Allows Heber City to Meet Their Vision for the Historic Town Center?	Improves Local Mobility on US-40 through 2050?	Recommended for Level 2 Screening?
West Bypasses					
WB1 AG	West bypass – parkway and at-grade intersections	No	No	Yes	No
WB3 AG	West bypass – parkway and at-grade intersections with northern extension	No	No	Yes	No
WB1 FF	West bypass – limited access and free-flow intersections	Yes	Yes	Yes	Yes
WB3 FF	West bypass – limited access and free-flow intersections with northern extension	Yes	Yes	Yes	Yes

Alternatives Eliminated in Level 1 Screening

Both at-grade alternatives (WB1 AG and WB3 AG) were eliminated for similar reasons. The at-grade alternatives would be the slowest for regional travel times (30% to 50% slower than the free-flow alternatives) and would have additional conflict points (that is, additional intersections, driveways, and other accesses), making them less safe than the free-flow alternatives. In addition, Alternative WB1 AG would require local traffic to cross three lanes when making left-hand turns at intersections on north US-40 (a challenging maneuver). These additional travel lanes and conflict points would impede traffic (as vehicles turn onto an intersecting road) and would increase the potential for unsafe vehicle interactions as traffic increases in the Heber Valley. With more traffic, there is a greater potential for collisions when a road has more driveway access and intersections (conflict points). The free-flow alternatives would enhance safety and protect regional mobility while still accommodating local traffic, thereby satisfying the purpose of the project because of the increase in forecasted traffic and better support of the valley over the long term as development and population increase.

The rapid pace of development in the Heber Valley is evident in the increasing population and traffic assumptions between version 1 and version 2.1 of the travel demand model. Additionally, more development proposals have been submitted to local agencies that are not included in version 2.1 of the model. The at-grade alternatives are not forward-compatible with the continued population and development growth in the valley, nor does UDOT expect them to support regional mobility beyond 2050. Table 2-11 summarizes the reasons by the at-grade alternatives were eliminated.

The most prudent investment, and the best-performing alternatives that meet the purpose of and need for the project, for the Heber Valley are the free-flow alternatives (WB1 FF and WB3 FF).

Table 2-11. Reasons Why the At-grade Alternatives Were Eliminated

Resource or Topic	Discussion of Impact or Drawbacks of Alternatives WB1 AG and WB3 AG
Regional Mobility / Travel Time	• US-40 is the regional transportation facility in the Heber Valley and is expected to serve regional traffic. The at-grade alternatives would perform worse with respect to regional mobility (the free-flow alternatives would be the best for regional mobility). • Regional travel times with the free-flow alternatives would be 30% to 50% faster than with their at-grade counterparts.
Regional Mobility / Safety	• At-grade alternatives would not be as safe as the free-flow alternatives because they would have more conflict points and signalized intersections. These conflict points would increase the potential for rear-end and sideswipe crashes as vehicles access US-40 from intersections. • The majority of US-40 in the project area was identified by MAG as being on the "high injury network." High injury network roads account for the majority of serious injury and fatal crashes in an area. By reducing conflict points, the safety of US-40 would be enhanced.
Heber City's Vision	• Drivers on the at-grade alternatives would encounter six traffic signals when bypassing Main Street; the existing configuration of Main Street has five traffic signals. Truck traffic would be more likely to take Main Street because the route would be more direct and would have one fewer traffic signal. • The free-flow alternatives would not require stops.
Forward Compatibility	• The at-grade alternatives would not be forward-compatible with the growth and development in Heber City. • The at-grade alternatives cannot be "retrofitted" to their free-flow counterpart without fully reconstructing most of the alternative. The intersection and interchange locations for the at-grade and free-flow alternatives are different due to design standards for intersection and interchange spacing and design speeds. The number of lanes on north US-40 is greater for the at-grade alternatives (three lanes in each direction) to increase vehicle throughput that would be impeded by traffic signals. The free-flow alternatives can accommodate the same traffic with two travel lanes in each direction. • The local road network would be built around the preferred alternative[a], further complicating the ability to retrofit intersections to interchanges in the future. • Building an at-grade alternative first and then building a free-flow alternative in the future would double the cost of the investment and double the impacts of construction on residents and businesses.
Public Input	• The project team has received comments that UDOT should "build it once and build it right the first time." The project area is developing rapidly, and many development decisions hinge on the preferred alternative for US-40.

[a] The preferred alternative will be identified in the Draft EIS.

2.2.3 Level 2 Screening

The purpose of Level 2 screening is to eliminate alternatives that perform similarly in meeting the purpose of the project compared to other alternatives but would result in greater impacts to key resources. The alternatives that passed Level 1 screening were refined with additional engineering and were then evaluated in Level 2 screening in terms of their expected impacts to key resources. During Level 2 screening, UDOT evaluated the two alternatives that passed Level 1 screening (WB1 FF and WB3 FF) against criteria that focus on each alternative's impacts to key resources and project costs. Table 2-12 lists the Level 2 screening criteria. Figure 2-5 through Figure 2-8 show the design layouts.

What is the purpose of Level 2 screening?

The purpose of Level 2 screening is to eliminate alternatives that perform similarly in meeting the purpose of the project compared to other alternatives but would result in greater impacts to key resources.

Table 2-12. Level 2 Screening Criteria and Measures

Criterion	Measure[a]
Waters of the United States	• Acres and types of wetlands and other waters of the United States affected • Linear feet of ditches and creeks affected
Section 4(f) resources	• Number of Section 4(f) historic properties affected (all properties in addition to the historic town center) • Number of Section 4(f) recreation resources affected • Number of Section 4(f) wildlife and waterfowl refuges affected • Number of Section 4(f) archaeological sites affected (historic rail lines, canals, and ditches)
Right-of-way	• Number of full property acquisitions and relocations (commercial and residential) • Number of partial property acquisitions • Acres of sewer fields affected
Cost	• Alternative's cost compared to other alternatives (alternatives would not be eliminated based on cost unless the cost is an order of magnitude greater)

[a] For more detail regarding measures, see Section 3.3.3, *Level 2 Screening*, in the *Final Alternatives Development and Screening Report* (January 2023).

The criteria listed above in Table 2-12 were selected based on applicable federal regulations—such as Section 4(f) of the U.S. Department of Transportation Act of 1966 and Section 404 of the Clean Water Act—and comments received during agency and public outreach. Waters of the United States and Section 4(f) properties were given special consideration during screening because federal laws require UDOT to consider and analyze alternatives that avoid or minimize impacts to these resources.

The overall process for Level 2 screening was as follows:

- Conduct additional engineering refinement to develop a footprint for each alternative and to consider alignment shifts to avoid or minimize impacts.
- Estimate the impacts on key resources of each alternative that passed Level 1 screening.
- Evaluate the alternatives' costs.
- Determine whether any of the alternatives would have substantially greater impacts or costs without having substantially greater benefits in meeting the purpose of the project.

Using the information obtained from Level 2 screening, UDOT determined which alternatives are reasonable and will be studied in greater detail in the EIS. These alternatives are listed in Table 2-16, *Final Level 2 Screening Results*.

Conduct Engineering Refinement. UDOT conducted additional engineering on the two alternatives that passed Level 1 screening. Engineers developed alignments to meet applicable UDOT design criteria. Alternatives were refined to establish an adequate number of lanes, median spacing, lane width, and safe curve geometry for the proposed travel speeds and estimated travel demand. The alignments were configured to determine how they would connect to US-40 and US-189 at each end, whether bridges and ramps were needed, and how other major roads would connect. UDOT also considered the space necessary to build an alternative, including construction impacts and equipment access. Based on this engineering, right-of-way lines were estimated. The right-of-way area was used to calculate impact values for Level 2 screening. The engineering analysis was also used to try to avoid or minimize impacts to key resources.

Local road connectivity across the alternative alignments will be further refined in the Draft EIS. The alternatives include bridges over Daniels Road, US-189, 300 West, and other local roads throughout their length. The free-flow alternatives allow right-in and right-out access to and from Industrial Parkway.

Estimate Impacts to Key Resources and Private Property. Using geographic information systems (GIS) software and field survey data, UDOT estimated how each alternative that passed Level 1 screening might affect key resources such as wetlands, other potential waters of the United States, Section 4(f) resources, and the Heber Valley Special Service District's sewer fields. Wetland and Section 4(f) resources were field-verified and digitized in GIS software. The expected impacts were determined by overlaying the estimated right-of-way for each alternative that passed Level 1 screening over the GIS datasets for these resources. UDOT used the same approach to identify the potential property acquisitions and relocations. For the two alternatives that are carried forward for analysis in the EIS, UDOT will conduct additional engineering refinement and resource impact analysis.

Compare Impacts and Costs to Benefits. UDOT used the screening results to determine whether any of the two alternatives that passed Level 1 screening would have substantially greater impacts to key resources or costs without having substantially greater benefits in meeting the purpose of the project. The alternatives were also refined to try to avoid or minimize impacts to key resources. Alternatives that would have the same or similar benefits as another alternative but would have substantially greater impacts or costs were eliminated and considered unreasonable for National Environmental Policy Act (NEPA) purposes.

Figure 2-5. Level 2 Design Layout for West Bypass Limited Access (WB1 FF)

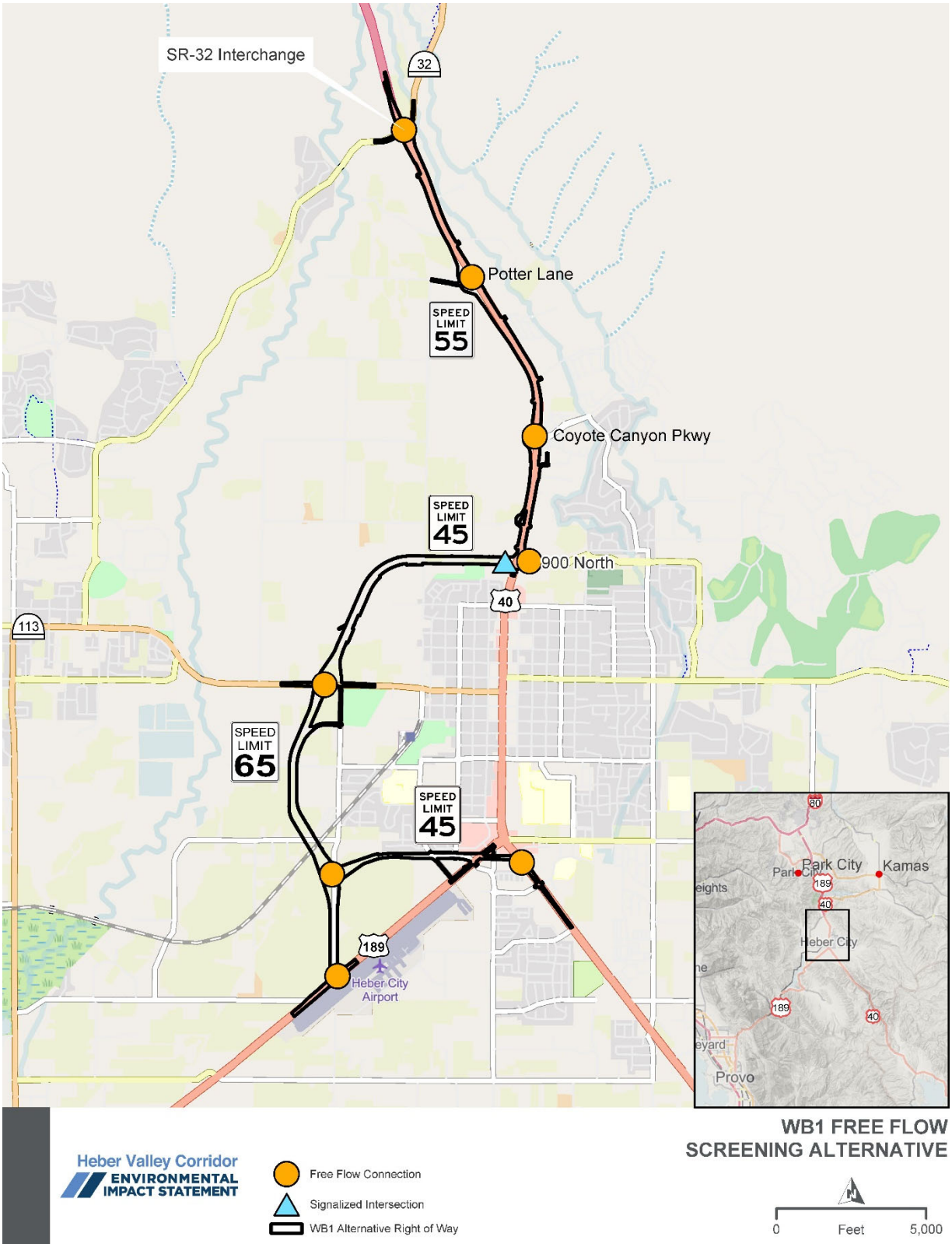


Figure 2-6. Level 2 Design Layout for West Bypass Limited Access with Northern Extension (WB3 FF)

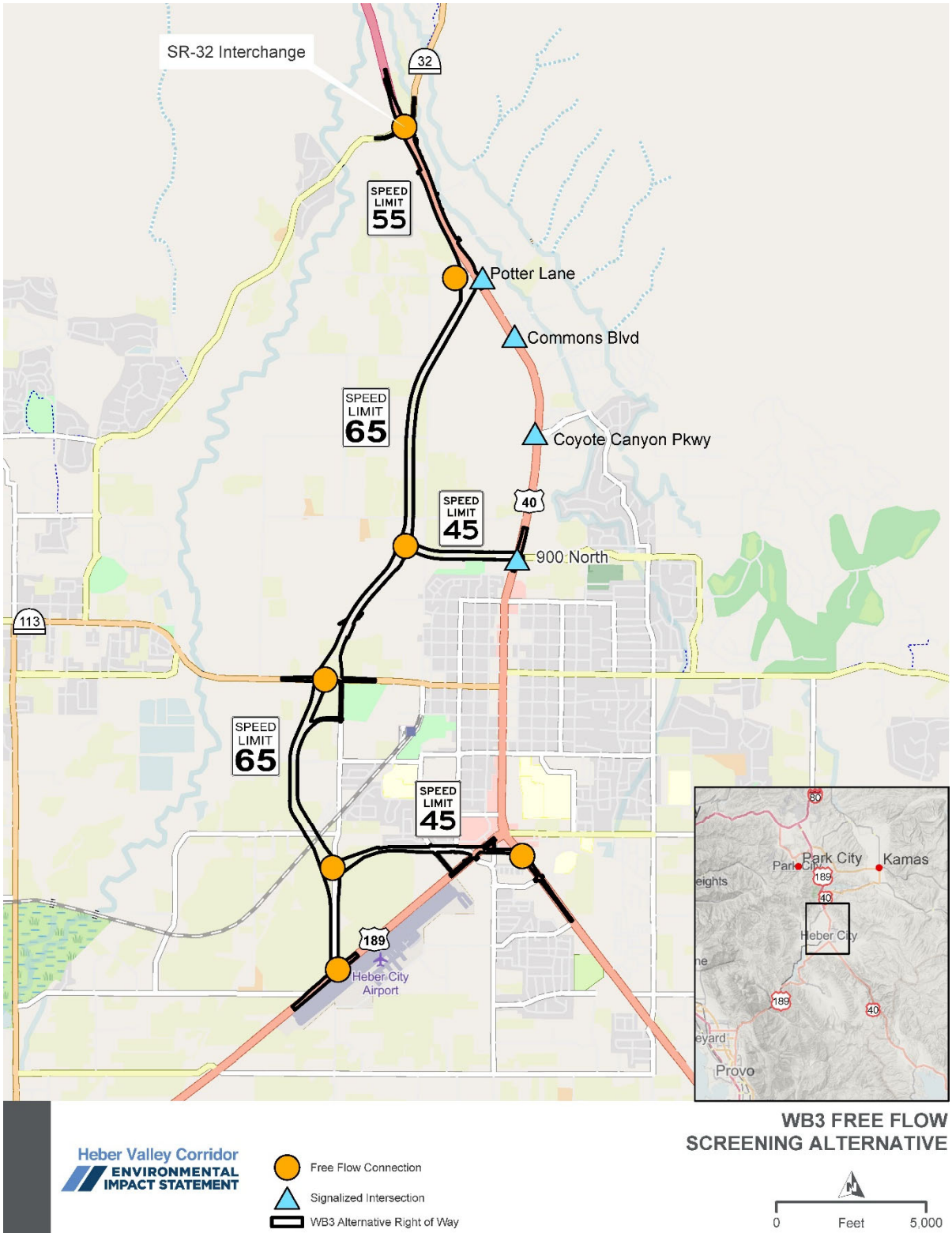
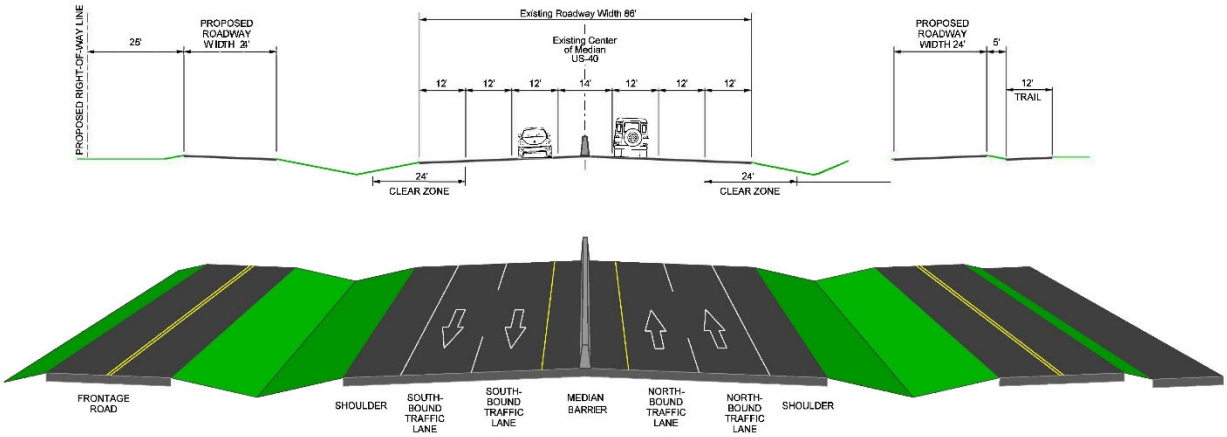
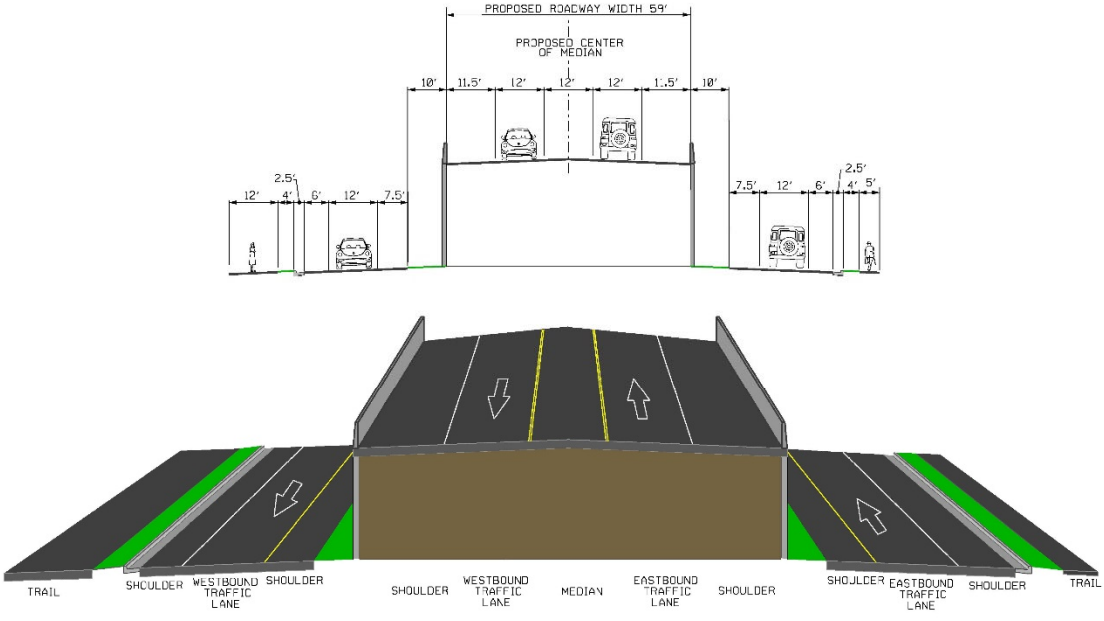


Figure 2-7. Level 2 Design Cross Sections for North US-40 and 1300 South



ALTERNATIVE WB1 FREE FLOW
ALTERNATIVE WB3 FREE FLOW
U.S. 40

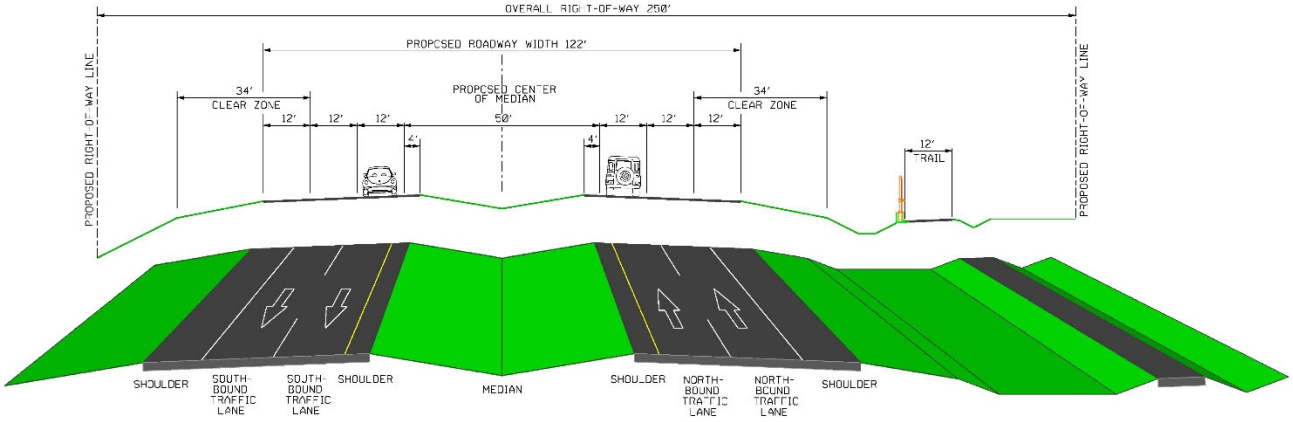


ALTERNATIVE WB1 FREE FLOW
ALTERNATIVE WB3 FREE FLOW
1300 SOUTH
45 MPH

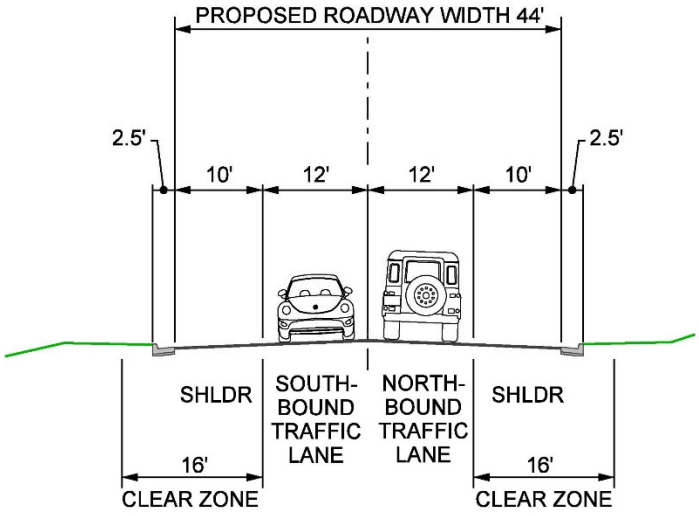
TYPICAL CROSS SECTIONS

Heber Valley Corridor
ENVIRONMENTAL IMPACT STATEMENT

Figure 2-8. Level 2 Design Cross Sections for Bypass Segment and SR-113



BYPASS CROSS SECTION - ALL ALTERNATIVES
BYPASS ROAD - 2 LANES EACH DIRECTION
65 MPH



SR-113 All Alternatives

**BYPASS AND SR-113
TYPICAL CROSS SECTIONS**

Level 2 Screening for Waters of the United States

Waters of the United States (WOTUS) are protected by Section 404 of the Clean Water Act. A Section 404 permit from the U.S. Army Corps of Engineers (USACE) is required for projects that would impact WOTUS. Water quality impacts to WOTUS are considered by USACE in its permitting process. USACE cannot issue a permit if a practicable alternative exists that would have less adverse impacts. Table 2-13 summarizes the potential WOTUS that would be intersected by each alternative that passed Level 1 screening.

Additional wetland delineation is necessary to fully understand the WOTUS impacts of Alternative WB3 FF. The area surrounding the proposed ramps near Potter Lane/College Way has not yet been delineated by UDOT. Wetland delineation will occur during the upcoming 2025 field season. For the analysis in Table 2-13, a combination of delineated data and National Wetlands Inventory data was used.

These potential WOTUS impacts will be refined and minimized during the analysis conducted for the Draft EIS.

Table 2-13. Level 2 Waters of the United States Screening Results

Alternative		Canals[a]	Ditches[a]	Perennial Streams[a]	Wetlands[b]	Total WOTUS Impacts
WB1 FF	West bypass – limited access and free-flow intersections	4,015 lf 1.06 ac	9,005 lf 0.60 ac	1,677 lf 0.82 ac	19.8 ac	22.3 ac
WB3 FF	West bypass – limited access and free-flow intersections with northern extension	4,015 lf 1.06 ac	6,826 lf 0.43 ac	4,819 lf 1.87 ac	47.8 ac	51.2 ac

Definitions: ac = acres; lf = linear feet; WOTUS = waters of the United States

[a] Linear feet and acreage of potential impacts are calculated from the alternative's cut-and-fill lines with a 15-foot buffer.

[b] Wetland impact acreage does not include canals, ditches, or perennial stream acreages.

The potential WOTUS impacts shown above in Table 2-13 are predictably higher for the off-alignment alternative that extends through the north fields (WB3 FF) than for the on-alignment alternative (WB1 FF). UDOT will conduct additional design refinements to minimize harm and will evaluate WOTUS impacts in greater detail in the Draft EIS and after additional wetland data are collected. UDOT will also coordinate with USACE regarding the jurisdictional status of the wetlands based on the recent *Sackett v. Environmental Protection Agency* ruling. Several wetlands in the north fields have the potential to not be jurisdictional as a result of the *Sackett* ruling and changes in jurisdictional status could change the overall WOTUS impacts.

Level 2 Screening for Section 4(f) Resources

Section 4(f) properties are protected under Section 4(f) of the U.S. Department of Transportation Act of 1966. UDOT can approve an alternative that uses Section 4(f) properties if (1) there is no prudent and feasible alternative that would avoid such impacts and (2) the action includes all possible planning to minimize harm to the property, or if (3) use of the property would have only a *de minimis* impact. For example, an alternative can be selected if the alternative's impact to a Section (4f) property would be *de minimis*. Or, if all alternatives would affect Section 4(f) properties, then the selected alternative must have the least overall harm. Table 2-14 summarizes the Section 4(f) properties that would be impacted by the two alternatives that passed Level 1 screening. Section 4(f) properties include:

- Parks and recreation areas of national, state, or local significance that are both publicly owned and open to the public
- Historic sites of national, state, or local significance in public or private ownership regardless of whether they are open to the public
    - Provo River Restoration Project (PRRP): This Section 4(f) recreation resource is located along the Provo River.
- Publicly owned wildlife and waterfowl refuges of national, state, or local significance that are open to the public to the extent that public access does not interfere with the primary purpose of the refuge

Table 2-14. Level 2 Section 4(f) Screening Results

Alternative		Historic Buildings		Archaeological Sites	Provo River Restoration Project Impacts	Wasatch County Railroad Trail
		Potential Full Acquisitions	Full Acquisitions			
WB1 FF	West bypass – limited access and free-flow intersections	2	3	3.36 ac	—	368 lf
WB3 FF	West bypass – limited access and free-flow intersections with northern extension	0	1	4.62 ac	—	368 lf

Definitions: ac = acres; lf = linear feet

[a] Section 4(f) trails are intersected and can be mitigated. Wasatch County Railroad Trail intersected.

UDOT will strive to minimize the Section 4(f) impacts shown above in Table 2-14 through preliminary engineering design refinements and will evaluate the Section 4(f) uses in greater detail in the Draft EIS.

Level 2 Screening for Right-of-way and Cost

UDOT analyzed each alternative for its potential impacts to residential and commercial property and construction costs. For screening purposes, *potential full acquisitions* were identified as properties with buildings that would be within 15 feet of an alternative (whether a full acquisition is necessary would need additional analysis). *Full acquisitions* were identified as properties with larger potential impacts where the alternative would intersect with structures on the parcel and change the primary use, access, or function of the parcel, or there would be no useable remainder.

If an action alternative that requires acquisitions is ultimately selected in the project's Record of Decision, UDOT would work with property owners to acquire the right-of-way. Properties would be acquired in accordance with the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970[1]; Title VI of the Civil Rights Act of 1964, as amended; and the State of Utah Relocation Program (under the Utah Relocation Assistance Act, Utah Code, Section 57-12).

The potential property acquisitions of an alternative and its construction costs are included in its cost estimate. The construction cost was estimated at a high level for each alternative using standard per-lane mile and per acreage of right-of-way assumptions. Construction costs will be refined after design refinements are made as part of the EIS process. Table 2-15 summarizes the right-of-way and cost information by alternative.

Table 2-15. Level 2 Right-of-way and Cost Screening Results

Alternative		Potential Full Acquisitions	Full Acquisitions	Right-of-way Acreage	Cost Estimate
WB1 FF	West bypass – limited access and free-flow intersections	2 residences 1 business under construction	11 residences 4 businesses 4 businesses under construction	218.3 acres	$590.4 million
WB3 FF	West bypass – limited access and free-flow intersections with northern extension	1 residence	5 residences 4 businesses	237.2 acres	$583.9 million

The right-of-way and property impacts shown above in Table 2-15 are predictably greater and more expensive for the on-alignment alternative (WB1 FF) than for the off-alignment alternative (WB3 FF). There is extensive development along north US-40.

[1] This is a federal law that establishes minimum standards for federally funded programs and projects that require the acquisition of property or that displace persons from their homes, businesses, or farms.

Level 2 Screening Results

Table 2-16 shows the Level 2 screening results. Neither free-flow alternative was eliminated as a result of Level 2 screening, and both will be further refined in the Draft EIS. There are tradeoffs between the two free-flow alternatives (shown in Table 2-16) that warrant additional review that will be conducted in the Draft EIS. This review will also provide more information for the public to consider during the Draft EIS public comment period.

Table 2-16. Final Level 2 Screening Results

Alternative		Impacts			Cost	Recommended for Draft EIS?
		WOTUS	Section 4(f) Resources	Property Acquisitions		
WB1 FF	West bypass – limited access and free-flow intersections	22.3 ac	5 structures 3.36 ac of archaeological sites	22	$590.4 million	Yes
WB3 FF	West bypass – limited access and free-flow intersections with northern extension	51.2 ac	1 structure 4.62 ac of archaeological sites	10	$583.9 million	Yes

Definitions: ac = acres; WOTUS = waters of the United States

3.0 Draft EIS and Preliminary Engineering Phase

The alternatives that passed the screening process (WB1 FF and WB3 FF) will be further developed through preliminary engineering to support detailed analysis in the Draft EIS. The preliminary engineering phase will include additional design work to provide details such as vertical alignments, right-of-way needs, intersection design, pedestrian and bicycle accommodations, access design, and drainage designs including stormwater management. Refinements will also take into account maintaining access to properties.

How will the alternatives be designed?

The alternatives that passed screening and are evaluated in the Draft EIS might be revised or incorporate minor alignment variations as the alternatives are refined to improve operations or avoid impacts.

UDOT is working closely with Heber City and Wasatch County to stay current on approved development plans, new conservation easements, the City's proposed airport improvements, and local access needs. Both alternatives will be refined based on the latest information where feasible and will be designed to a similar level of detail following UDOT design standards.

Once the preliminary engineering phase is complete, the expected effects of the alternatives will be characterized and compared to the No-action Alternative in the Draft EIS, as required by NEPA.

The Heber Valley Corridor EIS will analyze the reasonably foreseeable activities and operations that would occur from implementing the action alternatives. Resources that would be affected will be analyzed in the EIS to provide decision-makers with enough information to plan and make informed decisions. For this analysis, the following 16 resource categories will be considered: land use, farmlands, social/community, economics, property, traffic and transportation, joint development, considerations related to pedestrians and bicyclists, air quality, noise, water resources, ecosystem resources, floodplains, cultural resources, hazardous materials and waste sites, and visual resources.

3.1 New Alternative Names for the EIS

The alternative names used in the scoping and screening processes were created to identify the location of each alternative (east of Heber City, west of Heber City, or on US-40) and to describe the features that made the alternative unique compared to other alternatives in the same location. Moving forward, in the EIS these alternative names will be simplified. Because only two western alternatives will be advanced to the EIS, the names no longer need to describe the location. The new names are listed in Table 3-1.

Table 3-1. New Alternative Names for Western Bypasses That Advance to the EIS

Alternative ID	Scoping and Screening Report Name	EIS Name
WB1 FF	West bypass – limited access and free-flow intersections	Alternative A (on US-40 alignment)
WB3 FF	West bypass – limited access and free-flow intersections with northern extension	Alternative B (off US-40 alignment)

Definitions: ID = identifier

4.0 References

Avenue Consultants

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[MAG] Mountainland Association of Governments

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2023 Wasatch Back Rural Transportation Plan 2023–2050. https://experience.arcgis.com/experience/0b65f82874e34d709269fa04017ba1d1.

2024 MAG MPO [Metropolitan Planning Organization] Safety Action Plan. https://drive.google.com/file/d/1UmQG2rNRWHUblxc7K-tspH-2Uyx04N1f/view.

[PEC] Project Engineering Consultants

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[UDOT] Utah Department of Transportation

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APPENDIX R

Alternative Screening Traffic Analysis Memorandum –

March 14, 2025

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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

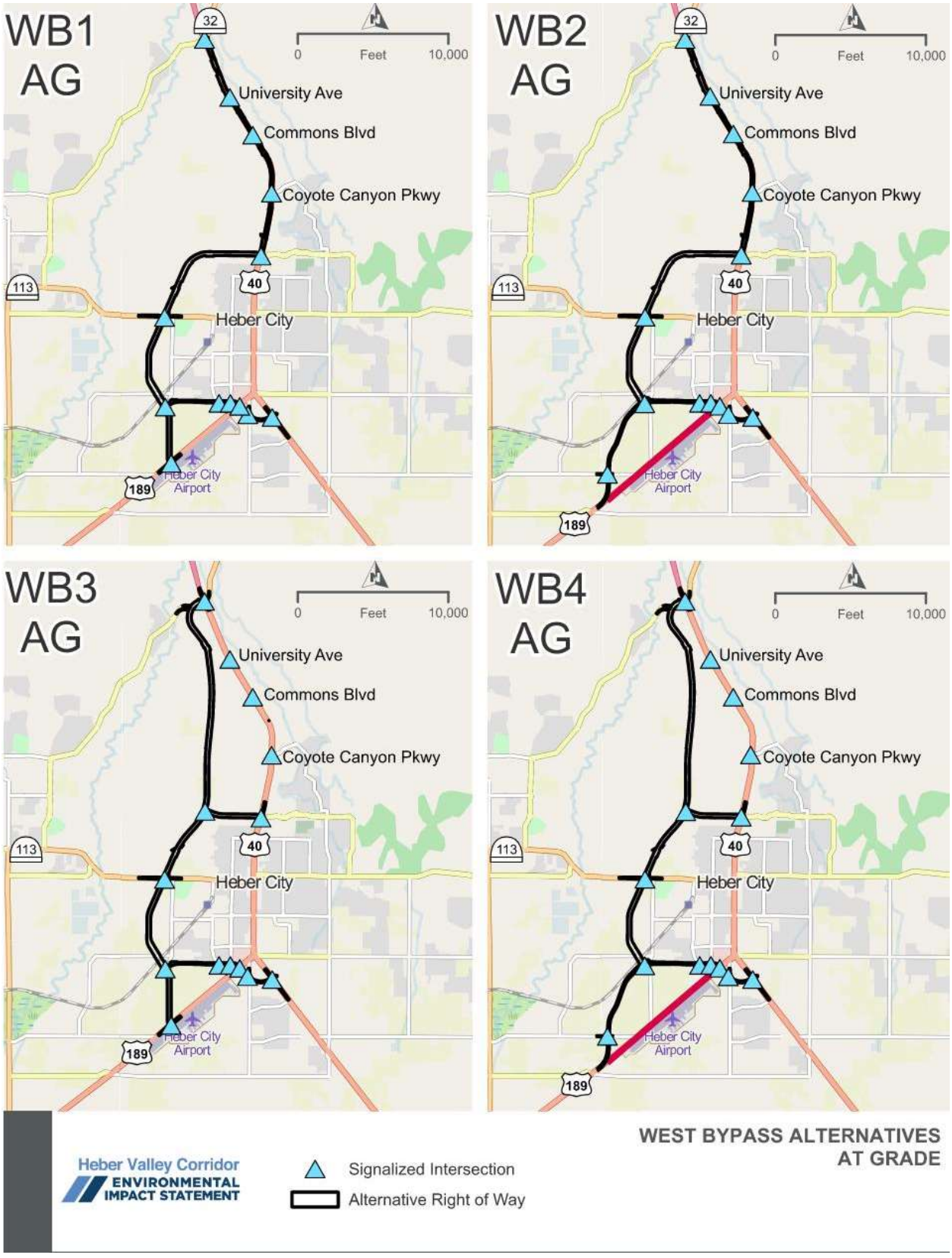


Figure 2. Free-flow Alternatives

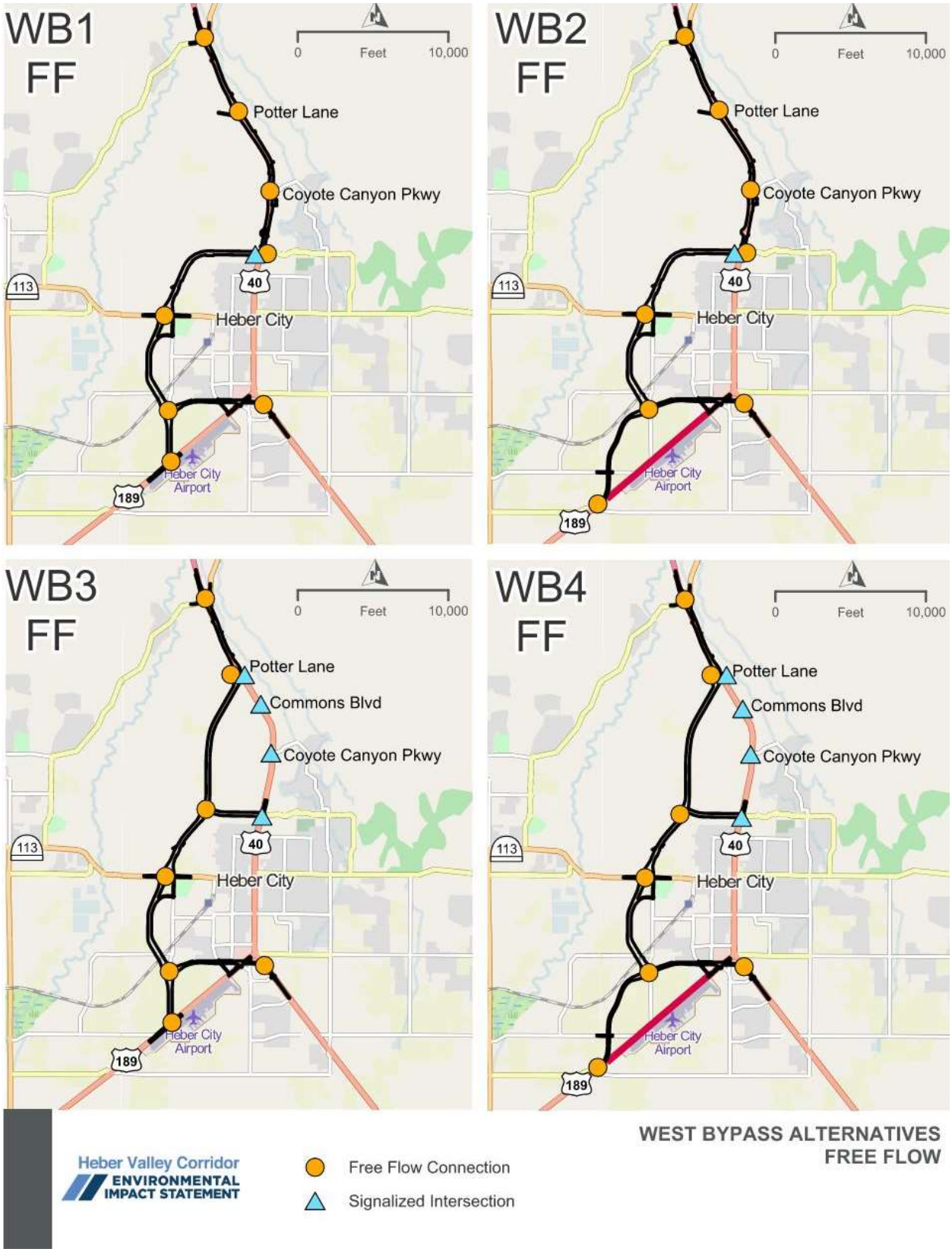


Table 2. List of revised alternatives

	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.

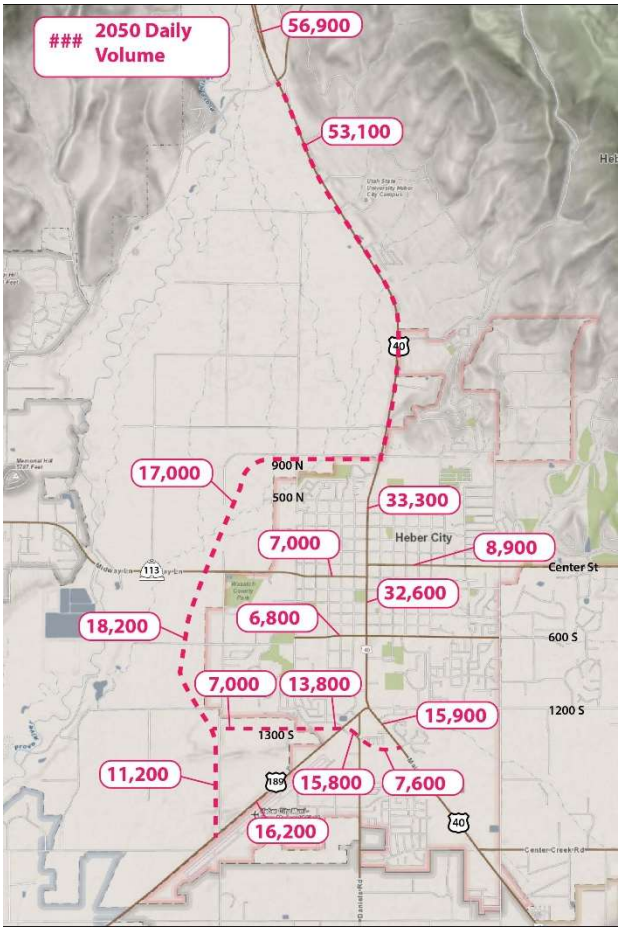
Free-flow bypass alternatives (WB1 Free-Flow, WB3 Free-Flow) have an effect of reducing volumes on US-40 north of Heber City more than their at-grade counterparts (WB1 At-Grade, WB3 At-Grade). The reductions are between 20 and 25 percent.

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

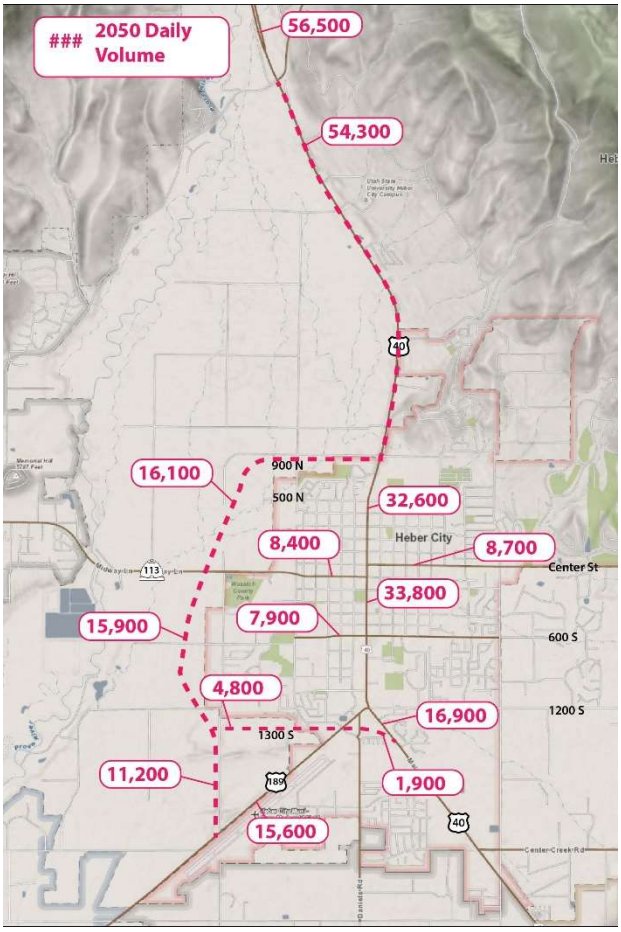
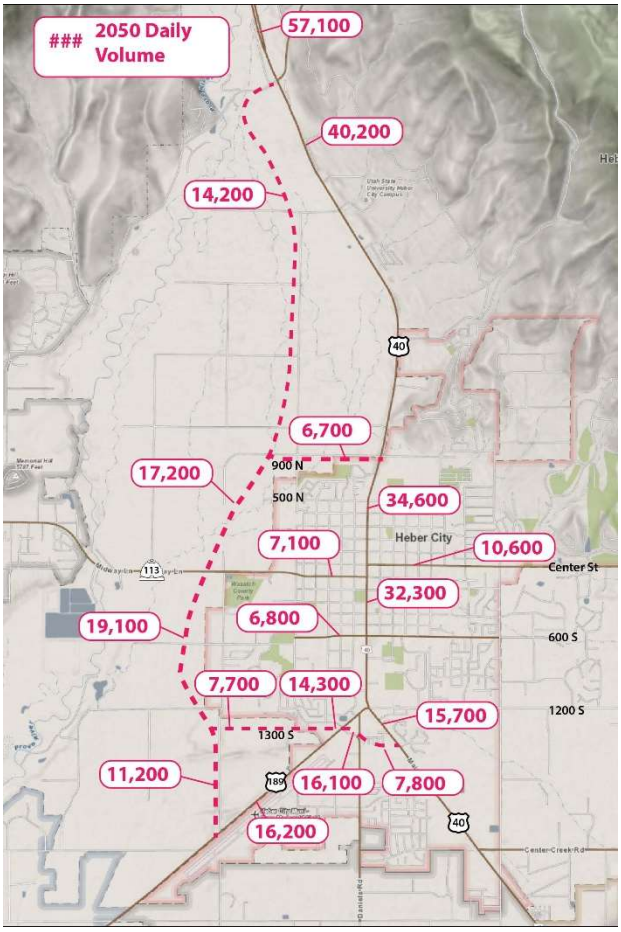
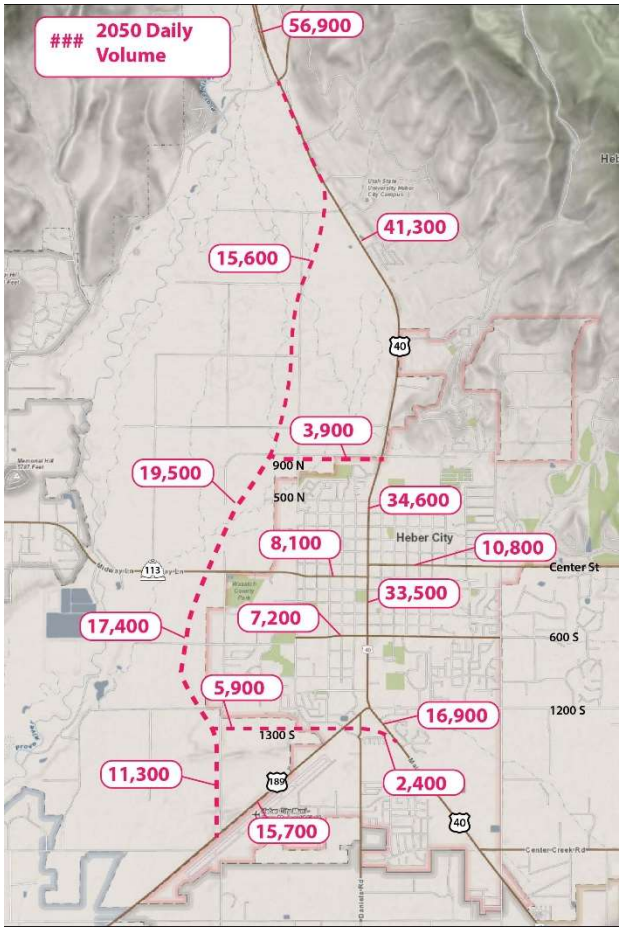


Figure 5. WB3 At-Grade and WB3 Free-Flow 2050 Volumes

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

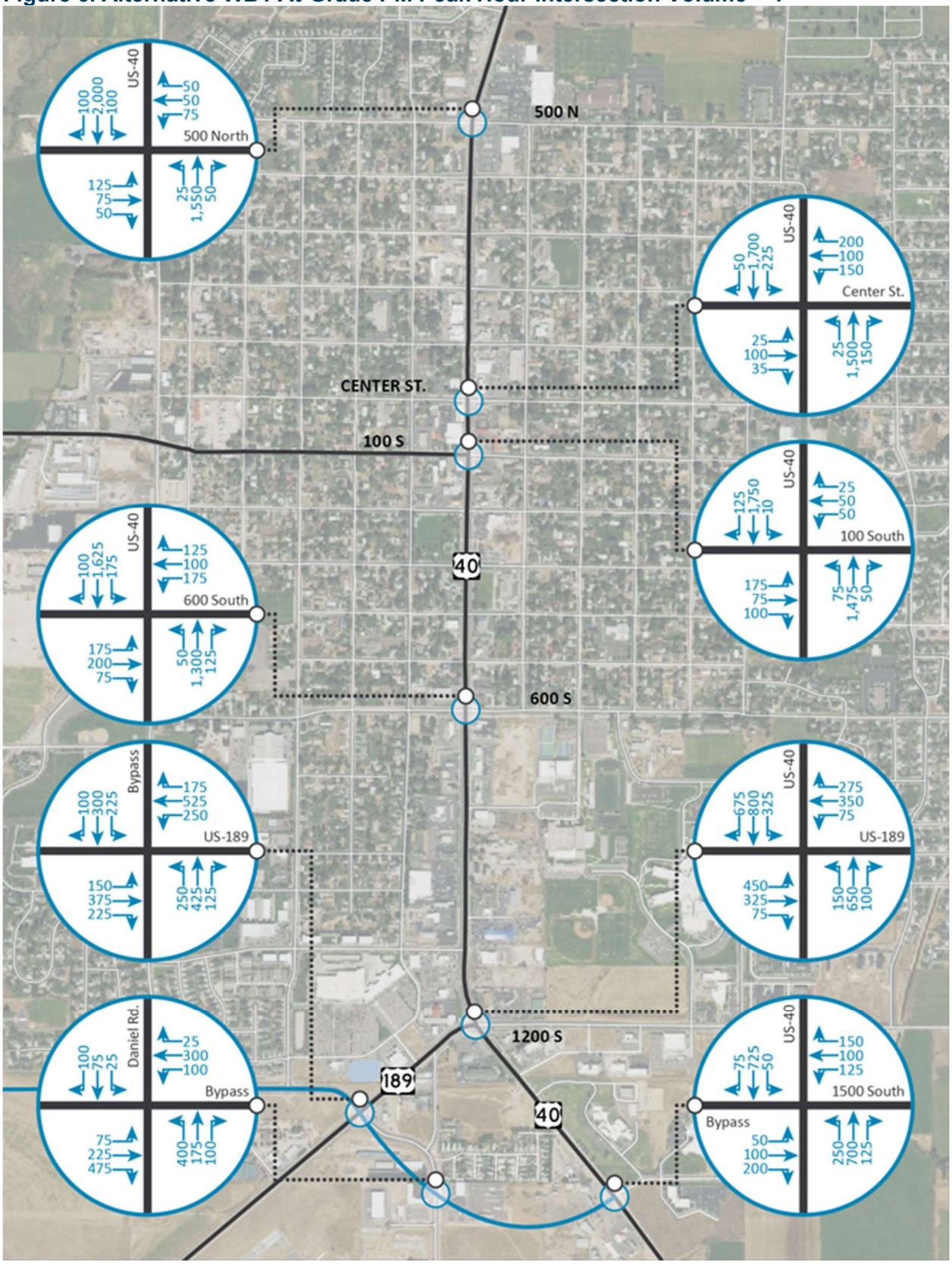


Figure 7. Alternative WB1 At-Grade PM Peak Hour Intersection Volume – 2

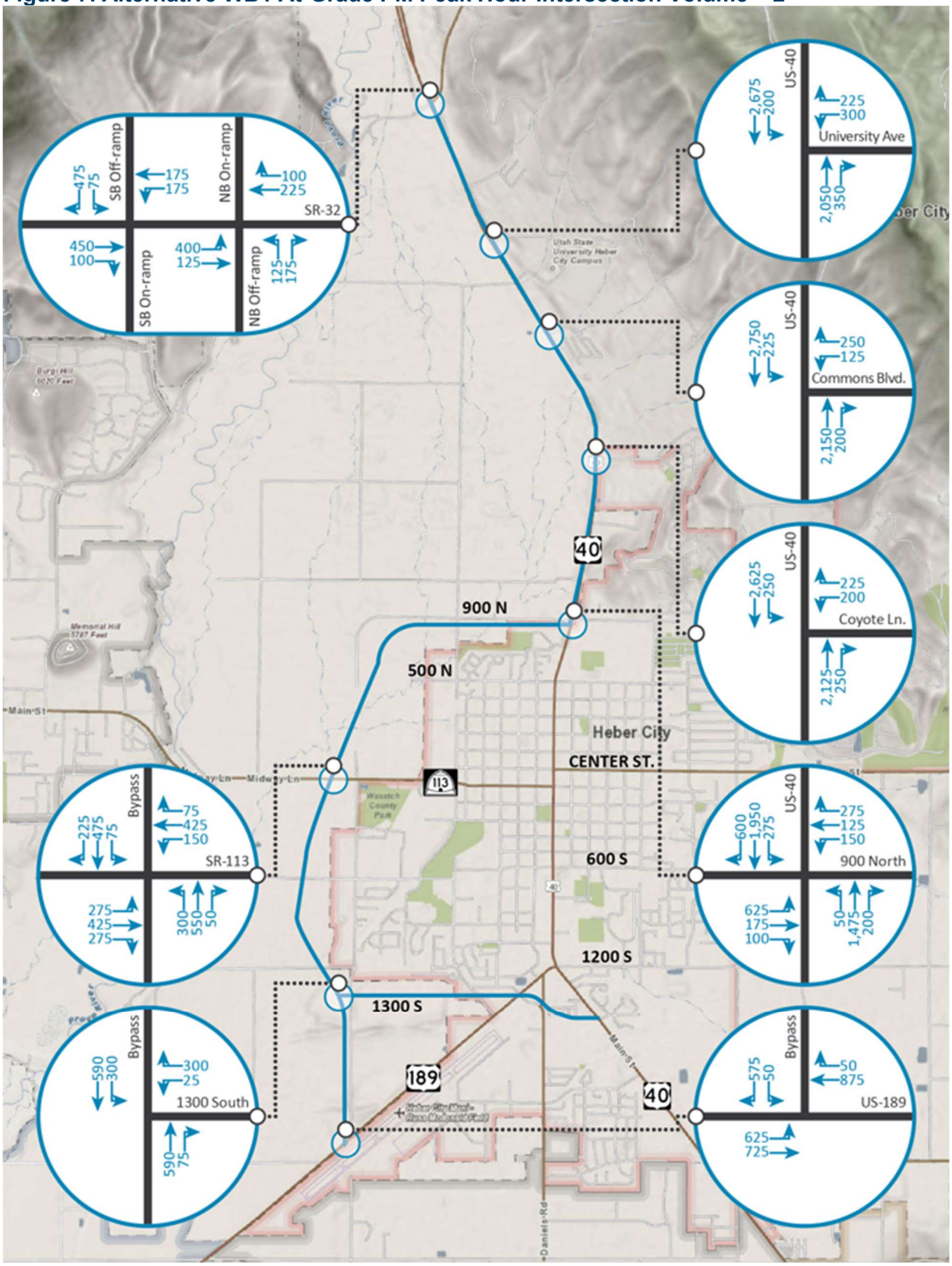


Figure 8. Alternative WB1 Free-Flow PM Peak Hour Intersection Volume – 1

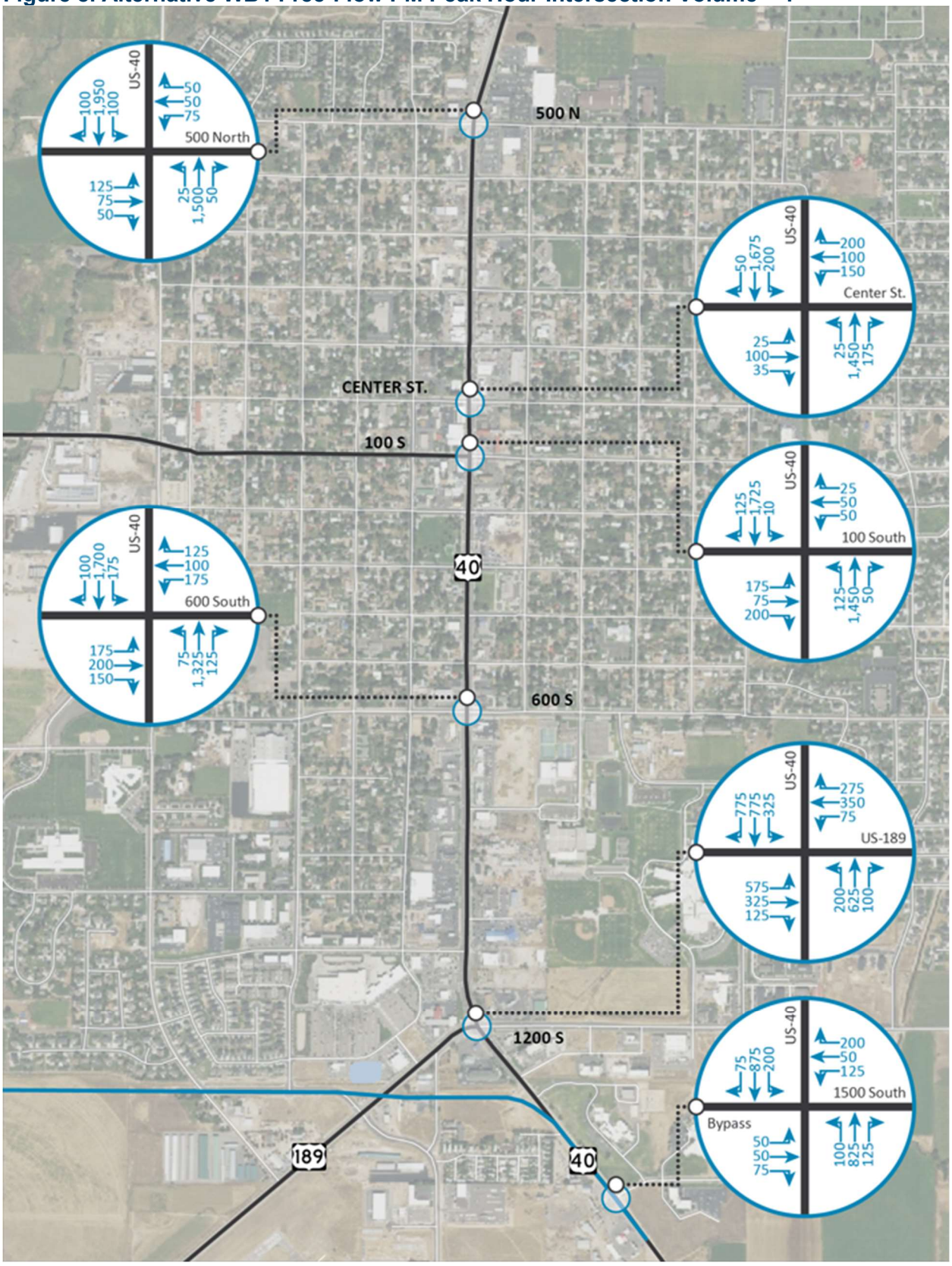


Figure 9. Alternative WB1 Free-Flow PM Peak Hour Intersection Volume – 2

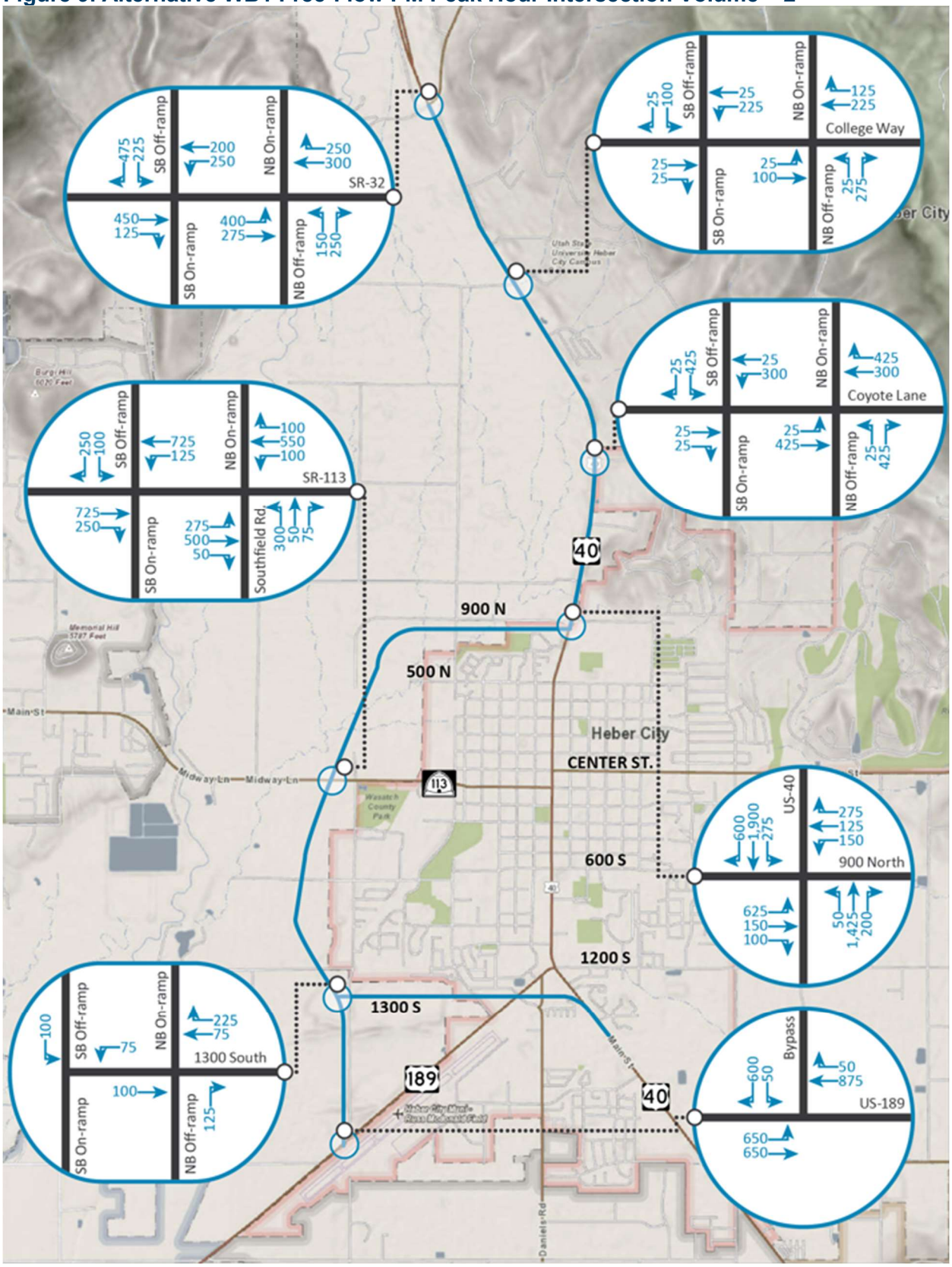


Figure 10. Alternative WB3 At-Grade PM Peak Hour Intersection Volume – 1

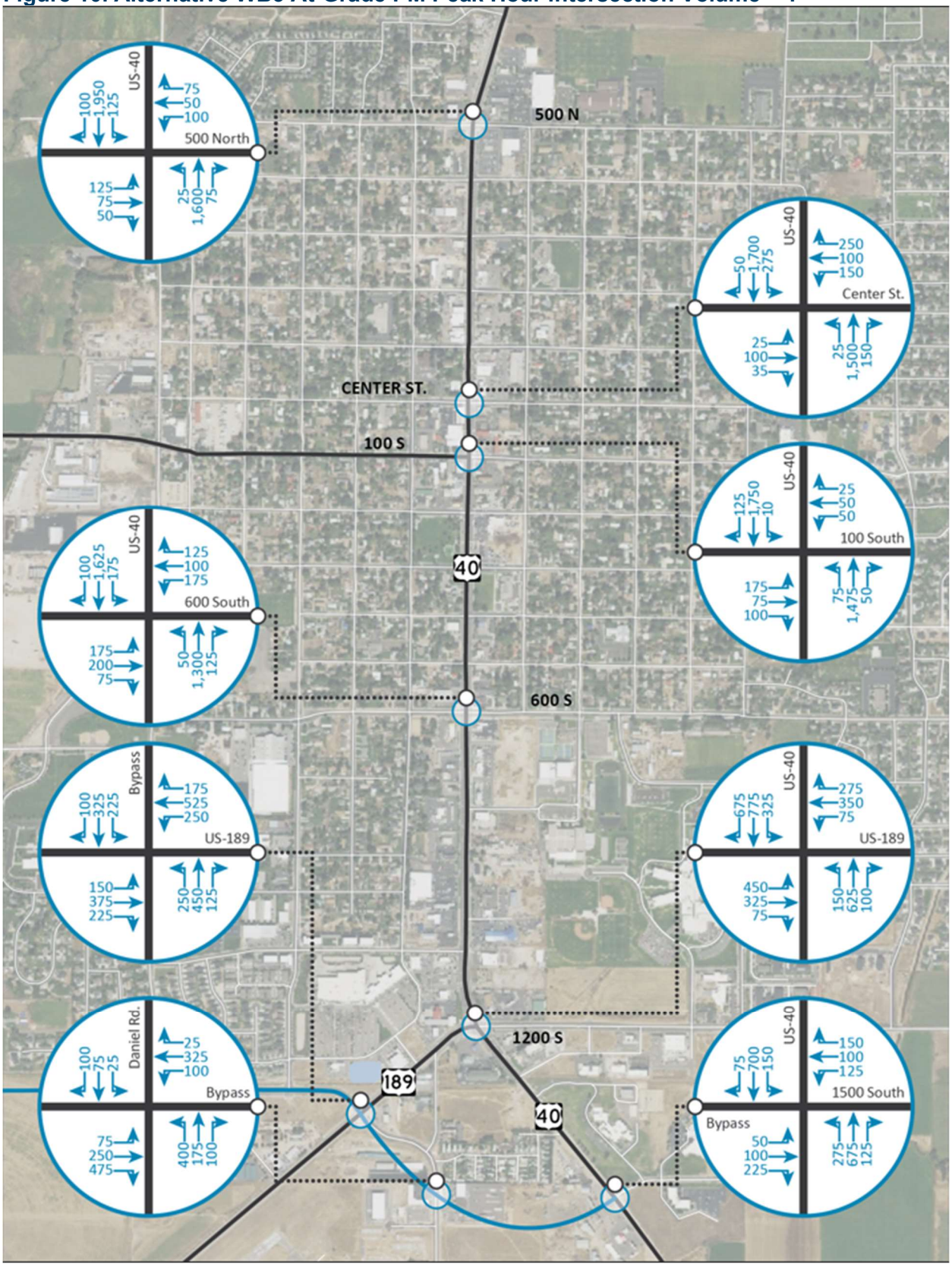


Figure 11. Alternative WB3 At-Grade PM Peak Hour Intersection Volume – 2

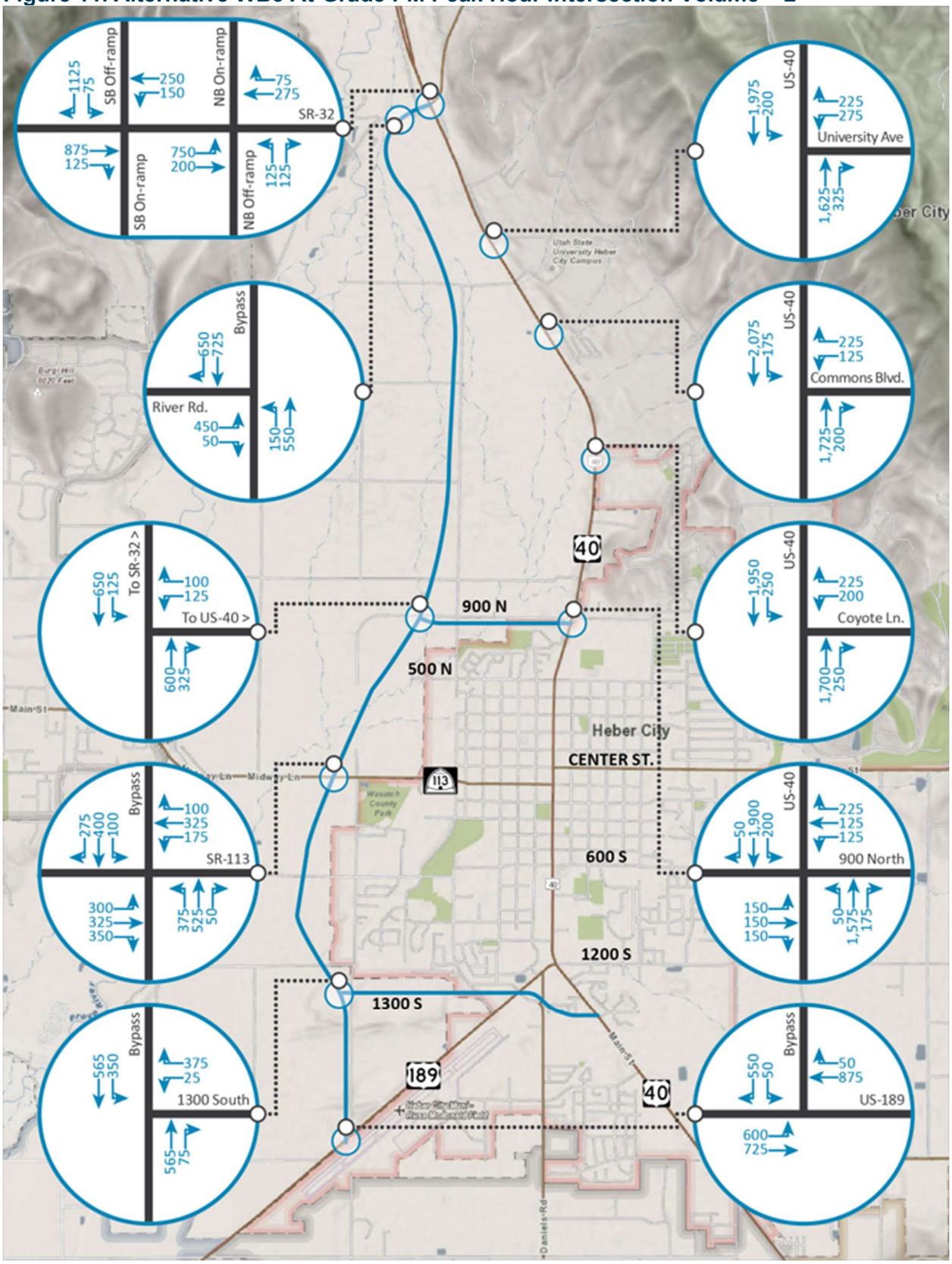


Figure 12. Alternative WB3 Free-Flow PM Peak Hour Intersection Volume – 1

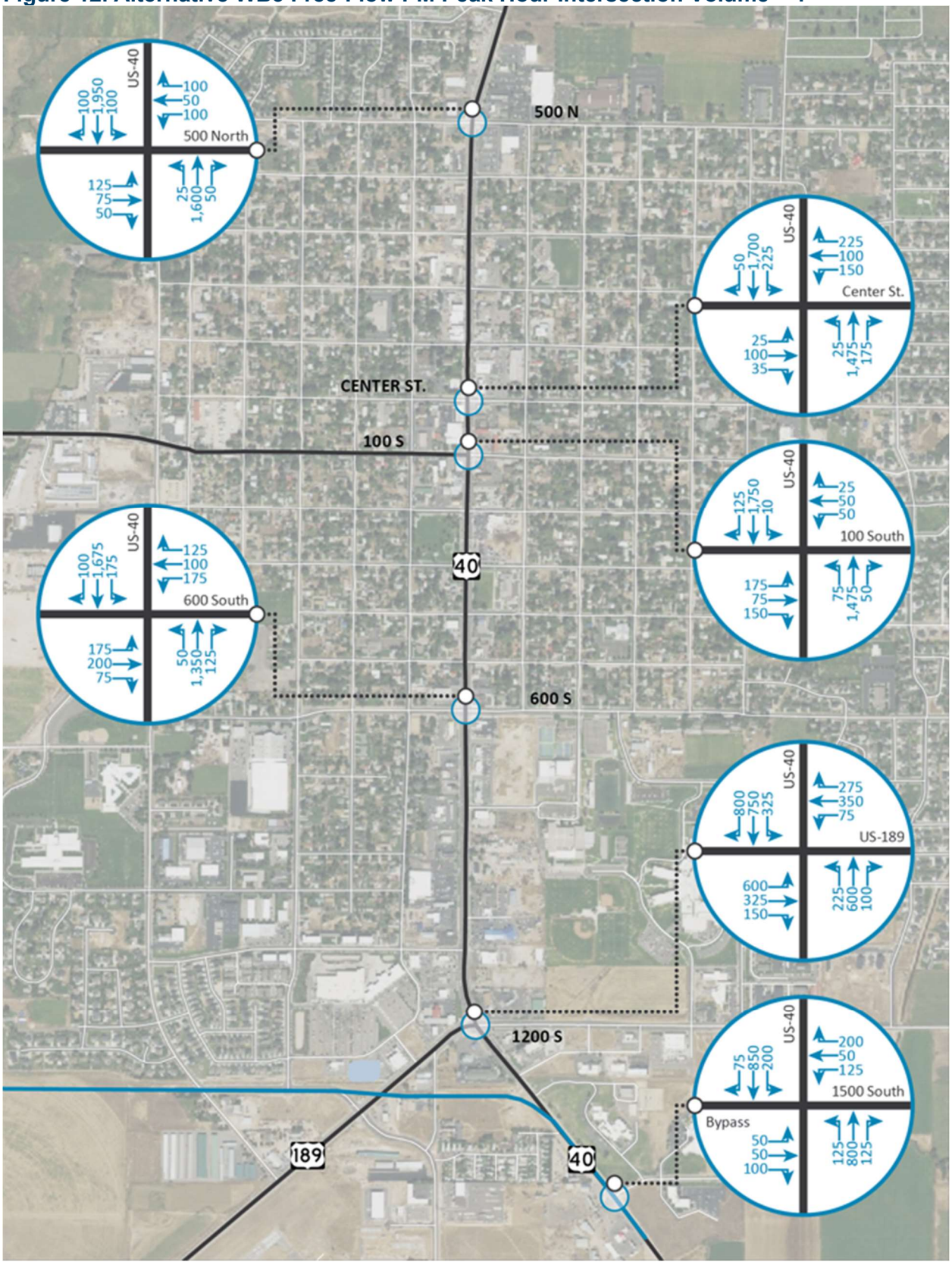


Figure 13. Alternative WB3 Free-Flow PM Peak Hour Intersection Volume – 2