

ALTERNATIVE SCREENING PROCESS AND RESULTS

PROJECT PURPOSE AND NEED

The purpose of the Heber Valley Corridor Project is to improve regional and local mobility on US-40 from SR-32 to US-189 and provide opportunities for non-motorized transportation while allowing Heber City to meet their vision for the historic town center.

PRELIMINARY EVALUATION OF ALTERNATIVE CONCEPTS

UDOT conducted a three-level screening evaluation of 23 transportation alternatives. The original 17 alternative concepts were developed by the study team or brought forward from previous studies and were based on initial analysis and public input. Following the Oct. 5 to Nov. 4, 2021 alternatives public comment period **six new alternatives were developed**.

The process started with a preliminary evaluation of concepts developed by UDOT or suggested by the public.

To be advanced to the next level of screening, concepts needed to:

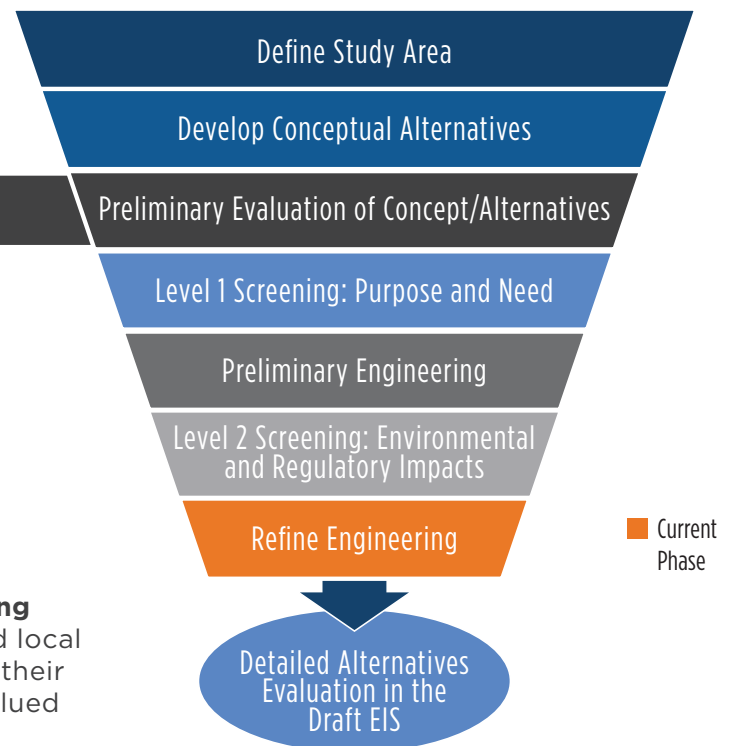
- ✓ Meet project objectives
- ✓ Not be redundant with other alternatives
- ✓ Be within the project study area
- ✓ Be technically and economically feasible
- ✓ Not be planned as a separate project
- ✓ Not be part of a larger alternative

All alternatives that were advanced to **Level 1 screening** were reviewed for their ability to improve regional and local mobility and allow Heber City to meet their vision for their historic town center (protect historic buildings and valued places) and Main Street (wide sidewalks, bike lanes, landscaping, reduced speed limit). Alternatives that did not meet this vision were eliminated.

Level 2 screening eliminated alternatives that might meet the purpose and need of the project but would be unreasonable alternatives for other reasons, such as unreasonable environmental or regulatory impacts.

Based on an evaluation of 23 alternatives, five alternatives passed the Level 1 and 2 screening process. The other 18 alternatives were eliminated in preliminary, Level 1 or Level 2 screening.

The remaining alternatives will be developed to include non-motorized (bicycle/pedestrian) accommodations.



LEVEL 1 SCREENING CRITERIA

Level 1 screening was based on the project purpose and need. The first tier of Level 1 traffic screening reviewed alternatives for their ability to decrease travel time, queue lengths at intersections, and improve Level of Service (LOS) on US-40 Main Street within Heber City limits (local mobility). The second tier considered whether an alternative would allow Heber City to meet their vision for the historic town center. The third tier of Level 1 traffic screening reviewed a remaining alternative's ability to improve regional traffic mobility by decreasing travel time north/south across Heber Valley and decrease the number of conflict points (intersections and driveways) from SR-32 to US-189 south of the airport when compared to no-build conditions.

Criteria	Measure
Improve regional and local mobility on US-40 through 2050	<ul style="list-style-type: none"> • Improve arterial and intersection Level of Service (LOS) on US-40 • Substantially decrease thru-traffic travel time • Substantially decrease southbound queue length along US-40 at 500 N • Minimize conflicts¹ to north-south mobility for thru-traffic
Provide opportunities for non-motorized transportation	<ul style="list-style-type: none"> • Provide opportunities for non-motorized transportation consistent with local and regional planning documents²
Allow Heber City to meet their vision for the historic town center	<ul style="list-style-type: none"> • Avoid/minimize impacts to valued places³ and historic buildings on Main Street • Avoid improvements that would preclude Heber City from implementing strategies to achieve their vision for Main Street (<i>wide sidewalks, bike lanes, landscaping, reduced speed limit</i>)

1. Conflicts include cross streets and driveways.

2. Downtown urban parks in the Heber City Parks, Trails, and Open Space Master Plan.

3. Waters of the US-and Section 4(f)/6(f) are given special consideration because federal laws require UDOT to consider and analyze alternatives that avoid these resources.

ALTERNATIVES ELIMINATED IN LEVEL 1 SCREENING

US-40 ALTERNATIVES

Alternative	Primary reason for failing screening
Widen Main St (40A)	<ul style="list-style-type: none"> • Would not allow Heber City to meet their vision for the historic town center. • Would only marginally improve local mobility over the no-action conditions.
Roundabouts Main St (40B)	<ul style="list-style-type: none"> • Two-lane roundabouts would result in failing LOS at 5 intersections on Main Street. • Three lane roundabouts would not allow Heber City to meet their vision for the historic town center due to historic building impacts.
Intersections Main St (40C)	<ul style="list-style-type: none"> • Widening US-40 at intersections to accommodate additional vehicle turning movements would fail local mobility criteria. • Would not allow Heber City to meet their vision for the historic town center.
Tunnel/Bridge Main St (40D)	<ul style="list-style-type: none"> • Tunnel is not a practical or reasonable alternative to a standard surface road. • Bridge would not allow Heber City to meet their vision for the historic town center.
Reversible Lanes (40E)	<ul style="list-style-type: none"> • Would not improve local mobility with failing LOS at 3 intersections. • Would not allow Heber City to meet their vision for the historic town center due to visual impacts from 21 to 32 overhead gantries, in addition to the existing traffic signals.
Couplet w/100 W (40F) Couplet w/100 E (40G)	<ul style="list-style-type: none"> • Both couplets would support local traffic mobility on Main Street but would add an additional barrier (100 W and/or 100 E) to local east-west mobility in Heber City. • Would not allow Heber City to meet their vision for the historic town center.

ALTERNATIVES ELIMINATED IN LEVEL 1 SCREENING-CONTINUED

EAST BYPASS ALTERNATIVES

The primary reason these alternatives fail is because east alternatives do not attract enough traffic away from Main Street. There is more traffic on the west side (Provo–Orem area on US-189) compared to the east (Daniel’s Canyon on US-40 heading southeast).

- All three eastern bypass alternatives failed Level 1 screening because they would not improve local mobility on US-40 through 2050. All of the east alternatives would have several failing intersections and arterial segments (LOS F), long travel times, and long vehicle queue lengths.
- US-189 traffic would not find eastern bypass options useful due to out-of-direction travel. The traffic model predicts that the US-189 traffic heading north of Heber City would continue to use Main Street.
- Midway residents contribute to the local and regional travel demand and would not find east-side routes beneficial and Main Street would continue to have local mobility problems.

WEST BYPASS ALTERNATIVES

The 1300 South connection provides an important route for traffic from the west side of the Heber Valley to access commercial centers in south Heber City.

- Western bypass alternatives without a connection to 1300 South would not move enough local traffic to improve local mobility because the alternatives would not be an attractive alternative to Main Street.
- Without the 1300 South connection, more traffic would be forced to continue to use Main Street.

Alternative	Reason for failing screening
West Bypass Limited Access with Realigned US-189 (WA2)	<ul style="list-style-type: none"> • Would not reduce traffic on Main Street enough to improve local mobility. • Two intersections on Main Street would fail (LOS F) and have slower travel times, compared to other alternatives.
West Bypass Arterial (WC1)	<ul style="list-style-type: none"> • Would not improve local mobility with two failing intersections on Main Street (LOS F), slow travel times, and long queue length.
West Bypass Arterial with Realigned US-189 (WC2)	<ul style="list-style-type: none"> • Would not support regional mobility due to lower speeds and high number of conflict points (intersections and driveways).
West Bypass with Turbo Roundabouts (WD1)	<ul style="list-style-type: none"> • Would not improve local mobility because it would not attract enough traffic away from Main Street without a 1300 South connection. • <i>Although WD was eliminated, two new alternatives that include the northern extension were developed based on public comment and evaluated (WB3 & WB4).</i>
West Bypass with Turbo Roundabouts and 1300 South (WD2)	<ul style="list-style-type: none"> • Would not improve local mobility, even with a 1300 S connection. • Doesn’t perform as well as similar alternatives because it lacks a connection at 800 North and; therefore, does not pick up as much local traffic.
West Bypass with Southern Extension (WS)	<ul style="list-style-type: none"> • Would be too far south to support local traffic movements, attracting only 2,000 trips per day. • Would not improve local mobility or reduce traffic volumes on Main Street.

What is level of service?

Level of service (LOS) is a measurement of the vehicle-carrying capacity and performance of a street, freeway, or intersection.

Level of Service

A | NO DELAYS

Highest quality of service. Free traffic flow with few restrictions on maneuverability or speed.

B | NO DELAYS

Stable traffic flow. Speed becoming slightly restricted. Low restriction on maneuverability.

C | MINIMAL DELAYS

Stable traffic flow. Speed becoming slightly restricted. Low restriction on maneuverability.

UDOT Goal

D | NOTICEABLE DELAYS

Traffic flow becoming unstable. Speed subject to sudden change.











E | CONSIDERABLE DELAYS

Unstable traffic flow. Speed changes quickly and maneuverability is low.

F | CONSIDERABLE DELAYS

Heavily congested traffic. Demand exceeds capacity and speed varies greatly.





LEVEL 1 SCREENING RESULTS SUMMARY

ALTERNATIVE	Preliminary Screening	LOCAL CONSIDERATIONS							REGIONAL CONSIDERATIONS		 Recommended for Level 2? <i>An alternative must pass all Level 1 criteria to advance to Level 2 screening</i>
		Local Mobility (PM Peak hour operations on Main Street)				Heber City Vision			Regional Mobility		
		 Number of Intersections at LOS F	 Southbound Segments with LOS F	 Travel Time on US-40 SR-32 to US-189/US-40 intersection (m:s)	 Southbound Queue Length at 500 North (feet)	 Valued Places Impacts	 Downtown Historic Buildings Impacts	 Allows Heber City to Achieve Vision	 Travel Time on Bypass SR-32 to US-189/3000 South (m:s)	 Conflict Points Intersections, cross streets, driveways	
US-40 Existing Conditions (2019)	-	0	2	8:20	375	No	No	No	10:40	144	-
US-40 No-action (2050)	-	3	2	17:40	13,100	No	No	No	19:05	152-157	-
Transit Alternative	No	Similar to no action scenario									No
Widen Main St (40A)	Yes	1	2	10:30	525	Yes	33	No	Failed local considerations - no analysis		No
Roundabouts Main St (40B)	Yes	5	Roundabouts were analyzed using a different traffic analysis tool/method to determine intersection LOS with poor results, no further analysis.			Yes	9	No	Failed local considerations - no analysis		No
Intersections Main St (40C)	Yes	4	2	17:50	14,700	Yes	17	No	Failed local considerations - no analysis		No
Tunnel/Bridge Main St (40D)	No	Tunneling under US-40 alternative was eliminated for not being a practical or reasonable alternative to a standard surface road. Bridging over US-40 alternative was eliminated for not meeting the Heber City Vision and for operational and safety concerns.									No
Reversible Lanes (40E)	Yes	3	0	10:45	950	No	1	No	Failed local considerations - no analysis		No
Couplet w/100 W (40F)	Yes	0	0	9:40	350	Yes	15	No	Failed local considerations - no analysis		No
Couplet w/100 E (40G)	Yes	0	0	9:40	350	Yes	36	No	Failed local considerations - no analysis		No
East Bypass Limited Access (EA)	Yes	3	3	14:55	6,100	No	0	Yes	Failed local considerations - no analysis		No
East Bypass Parkway (EB)	Yes	3	2	14:00	5,200	No	0	Yes	Failed local considerations - no analysis		No
East Bypass Arterial (EC)	Yes	2	3	17:15	11,800	No	0	Yes	Failed local considerations - no analysis		No
West Bypass Limited Access (WA1)	Yes	0	1	11:05	1,600	No	0	Yes	9:10	16	Yes
West Bypass Limited Access with Realigned US-189 (WA2)	Yes	2	1	12:30	2,800	No	0	Yes	Failed local considerations - no analysis		No
West Bypass Limited Access with Northern Extension (WA3)	Yes	0	1	10:00	1,100	No	0	Yes	6:45	3	Yes
West Bypass Parkway (WB1)	Yes	0	1	11:00	1,500	No	0	Yes	10:25	26-35	Yes
West Bypass Parkway with Realigned US-189 (WB2)	Yes	0	0	9:30	400	No	0	Yes	10:05	27-36	Yes
West Bypass Parkway with Northern Extension (WB3)	Yes	0	0	8:55	375	No	0	Yes	8:10	12	Yes
West Bypass Parkway with Northern Extension and Realigned US-189 (WB4)	Yes	0	1	8:55	400	No	0	Yes	7:45	12	Yes
West Bypass Arterial (WC1)	Yes	2	1	13:10	4,800	No	0	Yes	Failed local considerations - no analysis		No
West Bypass Arterial with Realigned US-189 (WC2)	Yes	1	1	10:55	1,300	No	0	Yes	10:45	74-123	No
West Bypass with Turbo Roundabouts (WD1)	Yes	2	2	13:30	4,700	No	0	Yes	Failed local considerations - no analysis		No
West Bypass with Turbo Roundabouts and 1300 South (WD2)	Yes	2	1	11:15	2,100	No	0	Yes	Failed local considerations - no analysis		No
West Bypass with Southern Extension (WS)	Yes	2	2	13:15	3,800	No	0	Yes	Failed local considerations - no analysis		No

LEVEL 2 SCREENING CRITERIA

The alternatives that passed Level 1 screening were then evaluated with Level 2 screening. The purpose of Level 2 screening was to eliminate alternatives that perform similarly with respect to the purpose and need but would result in additional impacts without additional benefit.

UDOT conducted additional engineering on alternatives that passed Level 1 screening and developed alignments to meet applicable 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. The alignments were configured to determine how they would connect to US-40 and US-189 at each end and how other major roads would connect. Cut-and-fill lines were generated to estimate the right-of-way lines and footprint required to build each alternative (a 15-foot buffer was added to account for potential construction impacts and equipment access). The footprint and right-of-way area were used to calculate impact values for key resources and private property.

Criteria	Measure
 Waters of the U.S.	<ul style="list-style-type: none"> • Acres and types of wetlands and other waters of the U.S. affected • Linear feet of ditches and creeks affected
 Section 4(f) Resources	<ul style="list-style-type: none"> • Number of Section 4(f) historic properties affected • Number of Section 4(f) recreation resources affected
 Right-of-way	<ul style="list-style-type: none"> • Number of full property acquisitions and relocations (<i>commercial and residential</i>) • Number of partial property acquisitions
 Cost	<ul style="list-style-type: none"> • Alternatives cost compared to other alternatives (<i>alternatives would not be eliminated based on cost unless they are an order of magnitude greater</i>)

ALTERNATIVES ELIMINATED IN LEVEL 2 SCREENING

The western bypass limited access and grade-separated interchanges with northern extension alternative (WA3) was eliminated based on Level 2 screening. WA3 would have the greatest estimated Waters of the U.S. (WOUS) impacts of all alternatives and the highest estimated cost.











DETAILED IMPACTS ANALYSIS OF THE REMAINING ALTERNATIVES

The five alternatives that passed the screening process will be further developed with refined engineering to support detailed analysis in the Draft EIS. The engineering refinement phase will include additional design work to provide details such as horizontal and vertical alignments, right-of-way needs, intersection design, pedestrian and bicycle accommodations, access design, and potential drainage designs including stormwater management.

All alternatives passing Level 2 screening sever the connectivity of minor local roads and cut off access to some properties. UDOT will determine how to restore connectivity and provide access for all alternatives prior to detailed analysis in the DEIS.

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 U.S.C. 327 and a Memorandum of Understanding dated January 17, 2017, and executed by FHWA and UDOT.

LEVEL 2 SCREENING RESULTS SUMMARY

ALTERNATIVE	Waters of the US				Section 4(f)			Right of Way			Cost High level estimate (millions)	Recommended for detailed evaluation in Draft EIS?
	 Canals (acres)	 Ditches (acres)	 Perennial Streams (acres)	 Wetlands (acres)	Historic Buildings		 Recreation Resources <i>Midway Lane Connector/ Wasatch County Railroad Trail</i> (linear feet)	 Potential Full Acquisitions	 Full Acquisitions	 Number and acreage of Parcels Intersected		
					 Potential Full Acquisitions	 Full Acquisitions						
US-40 Existing Conditions (2019)	-	-	-	-	-	-	-	-	-	-	-	-
US-40 No-action (2050)	-	-	-	-	-	-	-	-	-	-	-	-
West Bypass Limited Access (WA1) <i>Freeway with North US-40 (WA1)</i>	0.36	0.11	0.63	7.74	3 Residences	1 Business 2 Residences 2 Outbuildings	1,973	3 Businesses 5 Residences	4 Businesses 6 Residences	162 parcels 186.40 ac	\$234M	Yes
West Bypass Limited Access with Northern Extension (WA3)	0.36	0.24	1.98	22.14	0	1 Business	2,038	1 Business	4 Businesses 2 Residences	144 parcels 240.27 ac	\$270M	No
West Bypass Parkway (WB1) <i>Highway with North US-40 (WB1)</i>	0.33	0.04	0.58	5.60	3 Residences 1 Outbuilding	1 Business 2 Residences 1 Outbuilding	1,236	2 Businesses 3 Residences	4 Businesses 8 Residences	146 parcels 141.10 ac	\$173M	Yes
West Bypass Parkway with Realigned US-189 (WB2) <i>Highway with North US-40 and Realigned US-189 (WB2)</i>	0.33	0.04	0.58	5.60	3 Residences 1 Outbuilding	1 Business 2 Residences 1 Outbuilding	1,236	2 Businesses 3 Residences	4 Businesses 9 Residences	148 parcels 137.14 ac	\$179M	Yes
West Bypass Parkway with Northern Extension (WB3) <i>Highway to SR-32 (WB3)</i>	0.33	0.18	1.32	10.53	0	1 Business	1,236	2 Business	4 Businesses 2 Residences	139 parcels 212.00 ac	\$191M	Yes
West Bypass Parkway with Northern Extension and Realigned US-189 (WB4) <i>Highway to SR-32 and Realigned US-189 (WB4)</i>	0.46	0.18	1.32	10.53	0	1 Business	1,236	2 Business	4 Businesses 3 Residences	141 parcels 208.05 ac	\$197M	Yes