

## **APPENDIX A**

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### Preliminary Evaluation of Alternatives and Concepts

**Table A-1. Preliminary Evaluation of Alternatives/Concepts Suggested during EIS Scoping Periods**

Suggested Alternative	Part of No-Action/Baseline	Reason for Not Including in the Proposed Alternatives				Evaluated Further in Level 1 Screening	Considered as Part of Alternative Design, Environmental Analysis, and/or Potential Mitigation	Additional Information
		Does Not Meet Project Objectives	Outside the EIS Study Area	Outside the Scope of the EIS	Technically and/or Feasibly Prohibitive			
<b>Wasatch Boulevard</b>								
Consider pedestrian overpasses or tunnels.							✓	Will be part of road improvements alternatives.
Add pedestrian warning lights at crosswalks.							✓	UDOT will look at pedestrian and bicycle safety as part of road improvements.
Reduce speed limits.				✓				Speed limits are a UDOT operational issue considered in accordance with state code outside NEPA. Reduced speed limits would not change the results of the roadway capacity analysis.
Don't widen Wasatch Boulevard.	✓							
Add bus-only lane.					✓			Transit-only alternatives will be considered.
Consider safety and neighborhood access. Improve intersections.							✓	Will be part of road improvements alternatives.
Add traffic signal at Kings Hill Drive.					✓			
Improve sight distance at Kings Hill Drive.							✓	Will be part of road improvements alternatives.
Add separate bicycle/pedestrian trail.							✓	Will be part of road improvements alternatives.
Improve Highland Drive to provide alternate route.	✓							Included in Phase 2 of the 2019–2050 WFRC RTP to widen Highland Drive to five lanes from 9800 South to the Draper city limits. Travel demand modeling showed that, even with Highland Drive improvements, there would be a need to improve Wasatch Boulevard.
Add bicycle lanes and improve bicycle safety.							✓	Will be part of road improvements alternatives.
Widen Wasatch Boulevard.					✓			
Provide roundabouts.					✓			
Put through traffic in a tunnel to I-215.							✓	Alternative eliminated. Cost of 3-mile tunnel would be about \$2.5 billion <sup>a</sup> . In addition, it would require extensively reworking the existing road network to accommodate entrance and exit points.
<b>Avalanche Mitigation</b>								
Current system is sufficient.	✓							
Install more remote-activation systems.		✓						More remote-activation active systems would not reduce the number closure days or hours of closure since the road would still need to be closed during activation.
Add snow sheds.						✓		
Use bridges to go over avalanche paths.						✓		
Reduce the number of vehicles (provide more transit).						✓		Transit alternatives would reduce vehicle use.
Avalanche control should start early.		✓		✓				This is a UDOT operational consideration. UDOT currently conducts avalanche control at the earliest possible time. This alternative would not reduce the amount of road closure.

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<b>Mobility/Capacity</b>								
Build transit hubs at gravel pit and 9400 South.						✓		
Provide parking for cars waiting to enter Little Cottonwood Canyon.						✓		Considered as part of the transit alternative to reduce vehicle use and avalanche mitigation to reduce closure and eliminate backup both of which reduce the number of vehicles waiting to enter Little Cottonwood Canyon.
Eliminate roadside parking at ski resorts.						✓		
Increase road capacity (three and four lanes).						✓		
Don't expand road capacity.	✓							
Consider reversible lanes.						✓		
Add a dedicated travel lane for Alta.						✓		Considered in reversible lane and widen road alternatives. If alternatives provide enough roadway capacity, there would be no need for a dedicated lane.
Add more pullouts for slow vehicles.		✓					✓	Concept will be included as part of adding capacity. Slow vehicle pull outs for buses would substantially increase travel time making buses less feasible. Does not meet project objective of improving mobility for all users (including transit users)
Build a longer merge lane at S.R. 209/S.R. 210.						✓		
Don't build a merge lane at S.R. 209/S.R. 210, and reduce speed limits.	✓			✓				Reducing speed limits is a UDOT operational consideration. Reducing speed limits would not change the need for mobility improvements.
Add a traffic signal at S.R. 209/S.R. 210.				✓				UDOT is currently making safety improvements to this intersection outside the EIS process for immediate implementation.
Restrict larger vehicles during peak periods.						✓		Transit and tolling options are being considered to reduce overall vehicle use.
Allow buses only.						✓		
Add bicycle lanes.							✓	Will be considered as part of road improvement alternatives.
Limit the number of vehicles.						✓		
Eliminate single-occupant vehicles.						✓		Will be considered as part of transit and tolling alternatives.
Provide transit priority.							✓	Will be considered as part of road improvement alternatives.
No vehicle waiting at base of canyon.						✓		Part of screening criteria to reduce vehicle waiting at base of canyon. Considered under all alternatives.
Road should be one way during AM and PM peak periods.						✓		
Provide police escorts for traffic.				✓				Operational consideration that can be implemented outside the EIS process. Would still need to have large wait areas for cars to be platooned up canyon.
Provide more smaller shuttles and fewer big buses.						✓		Feasibility of transit alternatives will be considered. Size of buses to accommodate demand will be managed by UTA outside the EIS process.
Free or discounted transit.				✓				Managed by UTA outside the EIS process.

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Consider ride-share programs.	✓			✓				Rider-share companies currently exist along with ride-share apps. UDOT can accommodate ride-share areas but would not provide a system under which ride-sharing would operate.
Direct bus service to ski resorts (no stops).					✓			
Train and/or light rail.					✓			
Gondola from the Salt Lake Valley.					✓			
Gondola from Park City.					✓			
Give buses priority when leaving parking areas and on the road.						✓		Will be considered as part of transit alternatives.
Bus priority at signalized intersections.						✓		Will be considered as part of Wasatch Boulevard alternatives.
Bus-only reversible lane in Little Cottonwood Canyon.					✓			
Add bicycle trail by paving Temple Quarry/Little Cottonwood Creek Trail.				✓				The trail is managed and maintained by USDA Forest Service and would require a separate NEPA action.
Provide tunnels at strategic locations to ease traffic flow, mainly at ski resorts.						✓		
Open Emma Mine Tunnel between Little Cottonwood Canyon and Big Cottonwood Canyon to disperse traffic.		✓		✓				Tunnels between Little Cottonwood Canyon and Big Cottonwood Canyon are not necessary to meet the objectives of improving mobility in Little Cottonwood Canyon.
<b>Trailhead Parking</b>								
No additional parking at trailheads.					✓			
Charge fee for parking at trailheads.		✓		✓				UDOT does not have ability to charge for parking at trailheads. USDA Forest Service would be responsible for implementing a recreational fee program.
Expand trailhead parking with restrooms.					✓			
Allow roadside parking in Little Cottonwood Canyon near trailheads.					✓			
Add parking at Grit Mill.				✓				Project is partially funded, and USDA Forest Service has conducted the NEPA process.
Improve parking at Gate Butress.					✓			
No parking at Lisa Falls.	✓							
<b>Tolling</b>								
No tolls.	✓							
Toll single-occupant vehicles only.					✓			
Toll all nontransit vehicles.					✓			
Toll based on number of occupants.					✓			

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Reduce toll for low-income populations.						✓	Environmental justice and equity will be evaluated in the EIS.	
Dynamic tolling based on time of day and occupants.					✓			
Tolling revenue should go back into canyon.				✓			The state legislature and the Utah Transportation Commission would decide how tolling revenue would be spent.	
<b>Other</b>								
Fire suppression in snow sheds should be nontoxic with no release into Little Cottonwood Creek.						✓		
Snow sheds should provide room for a train.						✓	Will be considered as part of snow shed alternatives design.	
Provide avalanche protection for Tanner Flats.		✓					UDOT has analyzed the avalanche paths that have the greatest effect on road closure. The Tanner Flats avalanche path was determined not to warrant protection.	
Charge fee for resort parking and/or reserved parking.				✓			UDOT does not have the authority to require private businesses to charge fees for parking.	
Add parking at base of canyon.					✓		Will be considered as part of transit alternatives.	
Open parking at 3900 South/Wasatch Boulevard.					✓		Transit alternatives evaluated in the EIS will be evaluated to determine the capacity of parking. UTA can determine routes and park-and-ride locations without the need for a NEPA analysis.	
Allow parking at Reams strip mall at 7200 South.					✓		Transit alternatives evaluated in the EIS will be evaluated to determine the capacity of parking. UTA can determine routes and park-and-ride locations without the need for a NEPA analysis.	
Ski areas should build parking structures.					✓			
Build parking structure at the tree farm.					✓			
Don't expand parking at Little Cottonwood Canyon park-and-ride lot.					✓		The transit and road alternatives will look at options that could include additional parking.	
Expand parking at the swamp lot.					✓		The transit and road alternatives will look at options that could include additional parking.	
Use school and church parking lots for bus park-and-ride lots.					✓		UDOT and UTA will develop alternatives to meet the project's purpose and will consider parking as part of the alternative design that best promotes efficient bus use.	
Parking should be underground or limited to two levels.						✓		
Include rumble strips and box dots to protect cyclists.						✓	Road alternatives will consider meeting cyclist safety standards.	
Improve high-tee intersections at Alta and Snowbird.				✓			UDOT is currently looking at improving these intersections as part of safety improvements.	
Eliminate "right on red" at S.R. 209 and Old Wasatch Boulevard.	✓		✓				S.R. 209 is not part of the scope of the EIS.	
Add guard rail in Little Cottonwood Canyon.						✓	UDOT will meet safety design standards for the alternatives considered.	
Reduce travel on Albion Basin Road.				✓			Albion Basin Road is not part of S.R. 210.	
Preregister vehicles for winter use and provide a fast pass.				✓			This is an operational program that would require state legislative approval. It would not require a NEPA analysis.	

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Provide electric buses.						✓	Operational requirement that can be determined by UTA based on technical feasibility. Does not need to be part of the NEPA decision.	
To encourage transit use provide ski lockers and improved stops bus stop locations. Include amenities at bus stops such as lift ticket purchasing and heating.						✓	Will be considered part of transit alternatives.	
Increase fines for ill-equipped vehicles or improve monitoring.		✓		✓			This is a state enforcement consideration and does not require a NEPA analysis.	
Improve traffic condition communications.	✓			✓			UDOT is currently improving canyon communications to address safety and mobility.	
Work with car rental companies regarding the types of vehicles allowed in the canyon.				✓			UDOT does not have the authority to change how car rental companies operate.	
Plow trailhead parking.		✓					Plowing trailheads does not meet the project purpose of improving mobility.	
Provide e-bicycle rentals in summer.		✓		✓			Summer mobility is not part of the project purpose.	
Provide black ice warning system.						✓	Safety improvements will be considered as part of roadway alternatives.	
Restrict development in Little Cottonwood Canyon.				✓			UDOT does not have the authority to limit development. Local government agencies are responsible to implement zoning.	
Allow access to Snowbird from American Fork Canyon.				✓			This alternative is being considered by Snowbird Ski Resort across its private land and is an economic decision by a private company.	
No IKON pass use at ski resorts.				✓			UDOT does not have the authority to limit IKON passes.	
Ski resorts should incentivize people to stay longer and stagger skiers exiting parking lots.				✓			UDOT does not have the authority to implement how a private business operates.	
No bicycles on the road.		✓					Eliminating bicycles is not required to meet the project's objectives.	
Add more snow plows.						✓		
Replace bridge at Wasatch Resort.		✓		✓			Wasatch Resort is a private development and road outside the authority of UDOT.	
Address summer use.					✓		Summer trailhead parking is being considered in the EIS. Mobility improvements during the summer are not needed to meet project's objectives.	
Use technology to reduce vehicle use.						✓	UDOT will consider the latest available technology when developing alternatives.	
Add parking at Temple Quarry Trail.		✓					UDOT and UTA will develop alternatives to meet the project's purpose and will consider parking as part of the alternative design that best promotes efficient bus use.	

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Add parking at S.R. 210/Wasatch Boulevard.							✓	UDOT and UTA will develop alternatives to meet the project's purpose and will consider parking as part of the alternative design that best promotes efficient bus use.
Provide electric charging stations at park-and-ride lots.							✓	

AM = morning; EIS = Environmental Impact Statement; I-215 = Interstate 215; NEPA = National Environmental Policy Act; PM = afternoon; RTP = *Wasatch Front Regional Transportation Plan*; S.R. = State Route; UDOT = Utah Department of Transportation; USDA = United States Department of Agriculture; UTA = Utah Transit Authority; WFRC = Wasatch Front Regional Council

<sup>a</sup> In 2012, the cost estimate for the Alaskan Way Viaduct tunnel in the state of Washington was \$1.35 billion for the 9,100-foot tunnel, or about \$148,352 per linear foot. This cost includes all elements to construct the Alaskan Way Viaduct tunnel. The LCC team used cost index inflation rates from the *Engineering News-Record* to escalate the 2012 construction cost estimate to 2018 values. Based on this cost escalation, the 2018 cost would be about \$165,000 per linear foot.