



20065 I-15/US-20 Safety and Mobility Study

Level Three Alternative Screening Summary

June 2020





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Executive Summary

The Idaho Transportation Department (ITD), District 6, is conducting the Interstate 15 (I-15) and United States Highway 20 (US-20) Safety and Mobility Study (Project No. A020(065), Key No. 20065). ITD, along with the Bonneville Metropolitan Planning Organization (BMPO) and its member agencies, have identified the need to improve the I-15/US-20 connection and the adjacent six interchanges. The project team includes ITD and their consultants, HDR Engineering and Horrocks Engineers for technical resources; BMPO; Bonneville County; and the City of Idaho Falls.

The project study includes two phases of work.

Phase A included collecting existing data and studies from previous work and initiating a public outreach program. Phase A was completed in the summer of 2018.

Phase B, the current phase, includes developing a Planning and Environmental Linkages (PEL) study. The PEL represents a collaborative and integrated approach to transportation decision-making that accomplishes the following.

1. Considers environmental, community, and economic goals early in the transportation planning process, and
2. Uses the information, analysis, and products developed during planning to inform the environmental process as the PEL recommendations move forward into a National Environmental Policy Act (NEPA) process or other project development steps.

The PEL involves three levels of screening for alternatives to develop a recommended list of alternatives to advance into a NEPA document, once funding allows. During screening level reviews, each alternative is screened against the screening criteria questions developed with the purpose, need, and project goal considerations.

Level One screening results recommended 10 alternatives be advanced into Level Two analysis. Level One screening is summarized in the Level One Alternative Screening Summary Report (April 2019). Level Two screening results recommended four alternatives be advanced into Level Three analysis. Level Two screening is summarized in the Level Two Alternative Screening Summary Report (August 2019).

This report summarizes the Level Three alternatives development, analysis, and alternatives screening process and results.

Level Three Summary

Following is a summary of the Level Three analysis, along with the referenced appendices that include greater detail at each step.



- Level Two screening resulted in five alternatives that were recommended to advance to Level Three screening (alternatives C, E, H, and the no build alternative) with Alternative E having two options for ramp connections to local streets (alternatives E1 and E2).
- Over the course of 8 months, the technical team worked on details for each alternative, including the following:
 - Further refined the geometrical layouts, structure locations, local roads and pedestrian/bicycle connectivity, and environmental impacts to known resources for each alternative.
 - Supplemented environmental information with field studies to collect information on wetland locations along the Snake River and potential cultural resource sites. The team decided not to collect baseline noise data at this time.
 - Completed micro-simulation modeling for the planning year 2045 and for an estimated construction year 2027 for each concept alternative to identify areas of delay and make adjustments to lane configurations in the geometric layouts. Preliminary TREDIS input data was also prepared based on modeling results.
 - Reviewed and modified Level Three evaluation screening questions, specifically regarding access.
 - Held an Environmental Resource Committee meeting on March 11, 2020, with the resource agencies.
 - Completed benefit cost analysis based on a high-level construction cost relative to the benefits each alternative provides.
- A cost risk assessment and value engineering (CRAVE) workshop was in held December 9-12, 2019. The primary objectives of the CRAVE study:
 - Verify or improve upon project concepts,
 - Identify high-risk areas in delivering the project,
 - Improve the value of the alternatives through innovative measures that improve the performance while reducing project costs, and
 - Perform a cost risk assessment on both the baseline alternatives and the value engineering recommendations.

Twenty-three individuals representing ITD, BMPO, City of Idaho Falls, Bonneville County, the Federal Highway Administration (FHWA), and the consultant team participated in the workshop.

The CRAVE study team generated over 80 ideas, which the project teams presented and evaluated against the project baseline (Level Two alternatives). The workshop group voted on which ideas to move forward to enhance the Level Three alternatives that were renamed to alternatives C3, E3, and H2. The CRAVE Executive Summary is included as part of **Appendix A**.

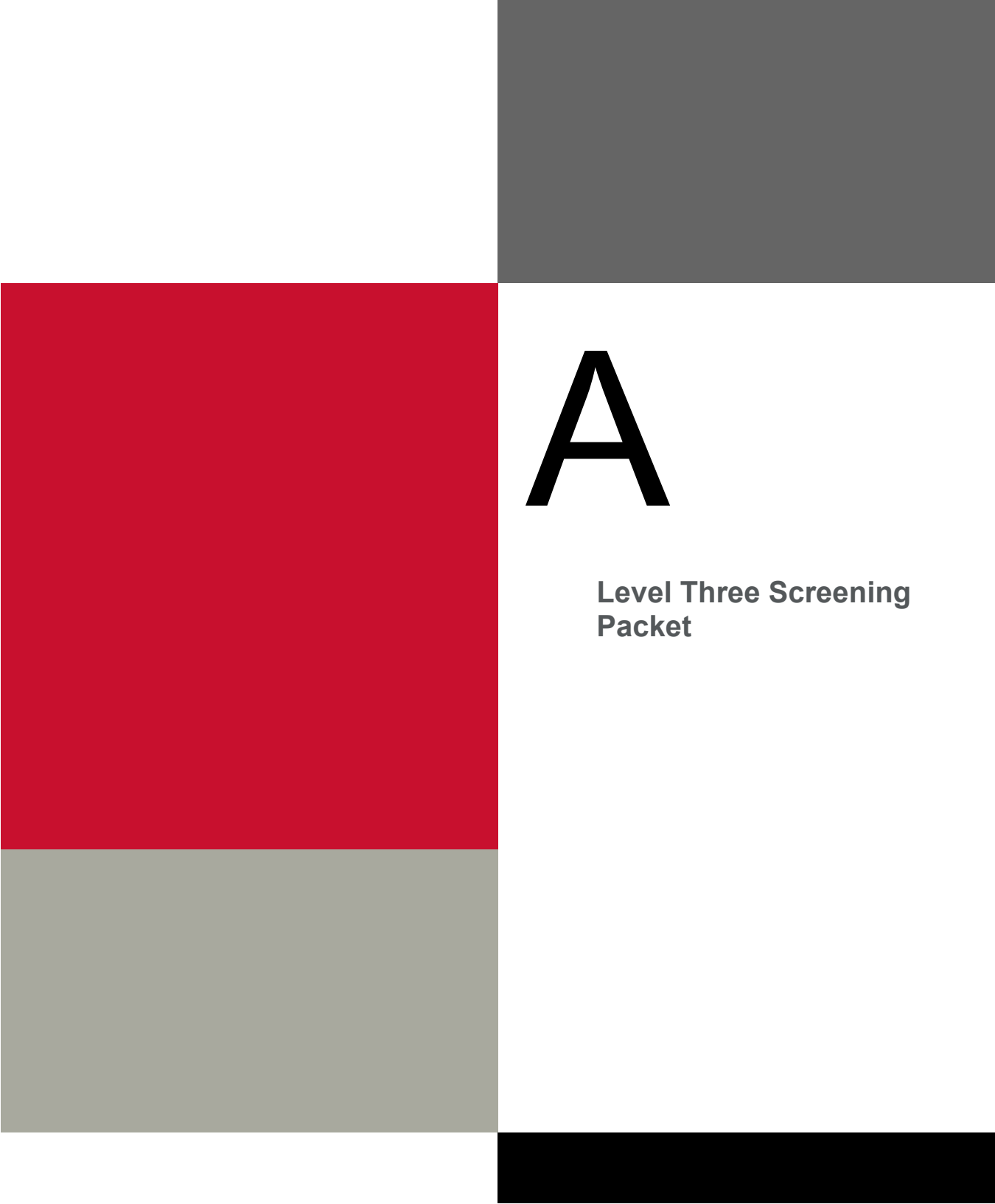


- Following the CRAVE workshop, the analysis team reviewed the CRAVE improved alternatives and updated the alignment geometry, traffic modeling, and impacts to prepare them for the Level Three screening. The analysis team also updated the micro-simulation modeling for the planning year 2045 for the CRAVE improved alternatives.
- The Community Working Group (CWG) Meeting #5, held on February 27, 2020, reviewed the CRAVE improved alternatives. The CWG's comments were collected and shared at the Level Three screening meeting.
- The following were provided to the analysis team for their review prior to the Level Three screening meeting, in addition to the meeting agenda. The Level Three Screening Packet is included in **Appendix A**.
 - Purpose and Need, and Project Goals
 - Level Three Screening Questions and Evaluation Matrix
 - Evaluation Summary Matrices
 - The 2045 Updated Alternatives Operational Analysis Technical Memo
 - The CRAVE Executive Summary
 - Level Three Concept Alternative Exhibits
- The Level Three screening meeting was held March 11 and 12, 2020 and included 20 individuals representing ITD, BMPO, City of Idaho Falls, Bonneville County, FHWA, a citizen, and the consultant team.
- At the Level Three screening meeting, two of the three alternatives were recommended to move into a NEPA study (**Appendix B**). The Level Three alternatives and results from the screening meeting will be presented to the public at an open house meeting on July 29, 2020. An online meeting will also be available and the information will be posted on the project website. An open house summary will then be posted on the project website. **Update: the open house meeting was changed to be an on-line format due to the pandemic. The on-line meeting was held on August 6-24.**

Next Steps

To conclude the PEL, the project team will complete the following:

- Incorporate feedback from the public meeting into the final PEL report.
- Coordinate with resource agencies on the concurrence letter to include in the final PEL report.
- Submit a final PEL report to FHWA that summarizes all three levels of screening and includes a completed FHWA PEL questionnaire. Request FHWA concurrence on the PEL process and the recommended alternatives to transitioning into NEPA analysis.



A

Level Three Screening
Packet

Appendix A Summary

Appendix A contains the information that was provided as part of the Level Three Screening Packet, which includes:

- Project Purpose and Need
- Level Three Exhibits
- Level Three Evaluation Questions, including the following topics:
 - Safety
 - Congestion
 - Local bicycle, pedestrian, transit and vehicle connectivity
 - Future travel demand
 - Environmental
 - Public support
 - Cost/Constructability
 - Access
 - Economics, demographics, and market impacts
- Level Three Evaluation Screening Matrix (blank)
- Level Three Screening Meeting Agenda
- Evaluation Summary Matrices
- 2045 Updated Alternatives Operational Analysis Technical Memo
- CRAVE Executive Summary

I-15/US-20 Connector

Purpose and Need

May 8, 2018

Project Purpose

The purpose of the PEL study is to identify and analyze improvements to address safety, congestion, mobility and travel time reliability for efficient movement of people, goods and services on I-15 and US-20 in or near Bonneville County and Idaho Falls.

Project Needs (details the problem, today and in the future)

The PEL will study multi-modal connections and capacity improvements to I-15 and US-20 as well as potential new roadway linkages in order to:






1. Address unsafe travel conditions on I-15 and US-20
 - a. Traffic backs up at exit ramps
 - b. Substandard lane change / merge space between exits
 - c. Interchanges are spaced too closely together
2. Reduce congestion at the I-15/US-20 interchange, particularly for traffic exiting US-20 towards southbound I-15 at the onramp, and for northbound traffic on I-15 exiting at US-20 eastbound exchange, which both operate at a current LOS D
 - a. High volumes of freight traffic
 - b. High volumes of peak hour local commuter traffic
 - c. Limited crossings of railroad and river funnel traffic to the I-15/US-20 corridor
3. Provide pedestrian and bicycle mobility within the I-15 and US-20 corridors
 - a. Built and natural barriers limit safe connectivity to adjacent facilities and the river and adjacent multiuse trails
 - b. According to the 2008 BMPO Bicycle and Pedestrian plan the corridor's "existing facilities are either inadequate, deficient, or associated with various problems."
4. Address future travel demand forecasts
 - a. Current infrastructure will not accommodate travel demands of increasing local growth and regional tourism
 - b. Current infrastructure is projected to operate at Level of Service E or F at the interchange of I-15/US-20 by the year 2045, which will not appropriately provide for future growth as identified in adopted local (City, County, and BMPO) land use and comprehensive plans.

Additional Goals

1. Provide transportation facilities that improve access to local schools, recreation facilities and commercial areas that support local land use plans while also reducing the negative impacts of the existing infrastructure on those community resources.
2. In addition to improvements to pedestrian and bicycle facilities in the corridor, seek to provide additional connections to the surrounding multi-modal network.
3. Provide improvements that serve all types of travelers including local commuters, freight, and regional tourism.
4. Consider new infrastructures impacts to local roads through coordination with Idaho Falls and Bonneville County.
5. In addition to identification and mitigation of any direct environmental impacts of the proposed improvements, seek to provide additional opportunities for the project to enhance local environmental resources.



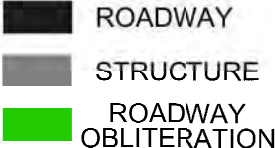


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<div>IDAHO TRANSPORTATION DEPARTMENT</div> <div>I-15/US-20 CONNECTOR</div>	 	PROJECT NO.	LEVEL 3 EXHIBIT	English		 ROADWAY  STRUCTURE  ROADWAY OBLITERATION
		A(020)065	I-15/US-20 CONNECTOR (I-15/US-20 SAFETY & MOBILITY STUDY)	COUNTY	BONNEVILLE	
			ALTERNATIVE C OPTION 3	KEY NUMBER	20065	



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<div>IDAHO TRANSPORTATION DEPARTMENT</div> <div>I-15/US-20 CONNECTOR</div>			PROJECT NO.	LEVEL 3 EXHIBIT	English	
			A(020)065	I-15/US-20 CONNECTOR (I-15/US-20 SAFETY & MOBILITY STUDY) ALTERNATIVE E OPTION 3	COUNTY	BONNEVILLE
					KEY NUMBER	20065
						



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DEPARTMENT

I-15/US-20 CONNECTOR





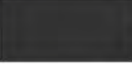
Connector




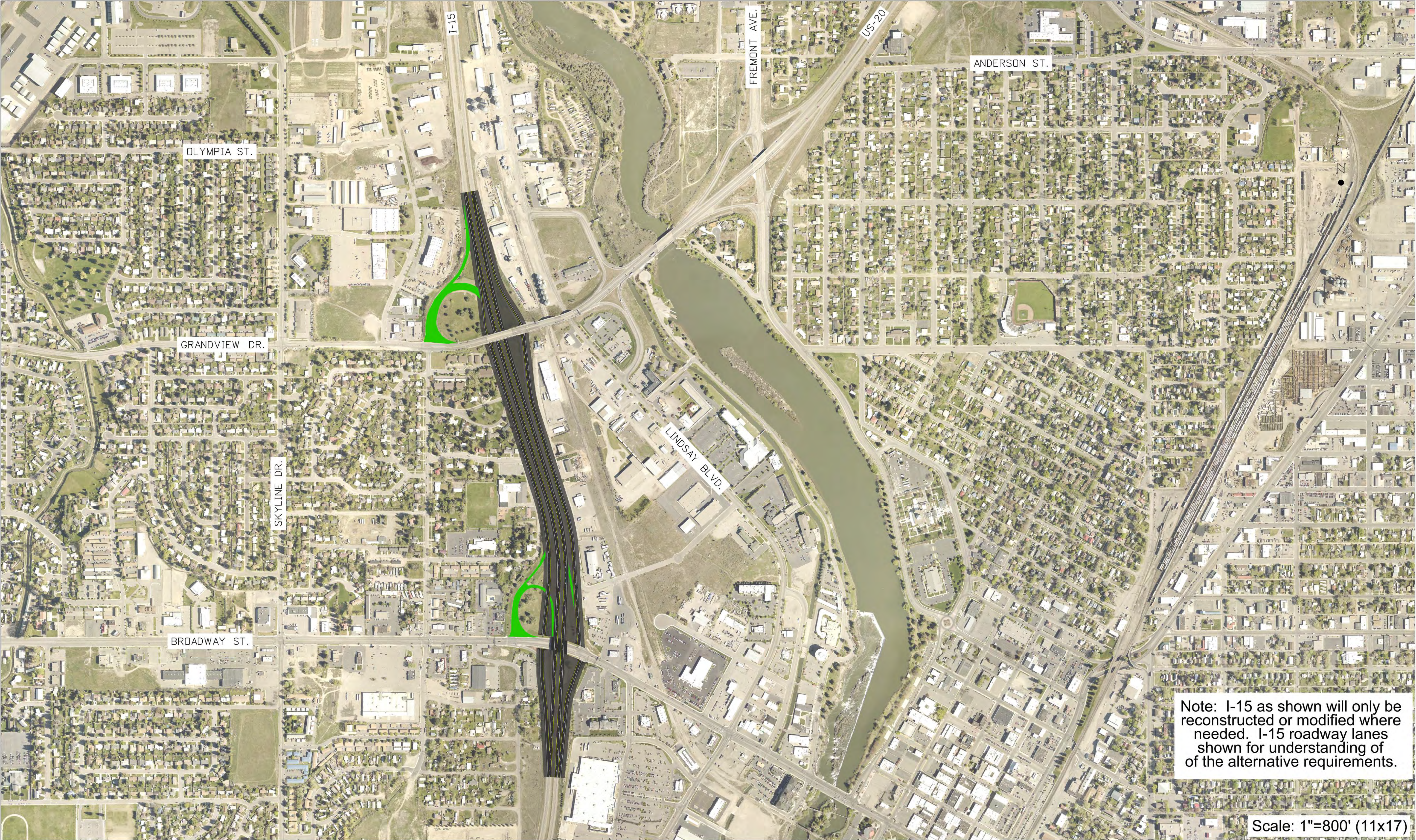
PROJECT NO.
A(020)065

LEVEL 3 EXHIBIT
I-15/US-20 CONNECTOR (I-15/US-20 SAFETY & MOBILITY STUDY)
ALTERNATIVE H OPTION 2

English	
COUNTY	BONNEVILLE
KEY NUMBER	20065
SHEET	OF

 ROADWAY






 STRUCTURE



<div>IDAHO TRANSPORTATION DEPARTMENT</div> <div>I-15/US-20 CONNECTOR</div>			PROJECT NO.	LEVEL 3 EXHIBIT	English		
			A(020)065	I-15/US-20 CONNECTOR (I-15/US-20 SAFETY & MOBILITY STUDY)	COUNTY	BONNEVILLE	
				ALTERNATIVE H OPTION 2 (Exit 118-119)	KEY NUMBER	20065	



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<div>IDAHO TRANSPORTATION DEPARTMENT</div> <div>I-15/US-20 CONNECTOR</div>	 	PROJECT NO.	LEVEL 3 EXHIBIT	English		 ROADWAY  STRUCTURE  ROADWAY OBLITERATION
		A(020)065	I-15/US-20 CONNECTOR (I-15/US-20 SAFETY & MOBILITY STUDY) ALTERNATIVE H OPTION 2 (NORTH CONNECTOR)	COUNTY	BONNEVILLE	
				KEY NUMBER	20065	



I-15/US-20 PEL Evaluation Questions

Evaluation Questions

Needs, Goals, and Objectives	Level 1 Criteria Questions	Level 1 Responses	Level 2 Criteria Questions	Level 2 Responses (all responses include qualitative discussion)	Level 3 Criteria Questions	Level 3 Responses (quantitative data and qualitative discussion)
Safety	Does the alternative improve bike, pedestrian and vehicle safety on I-15 and US-20, including the interchange on or off-ramps?	Better/Good/Fair/Negative	Does the alternative reduce backups on the exit ramps?	Better/Good/Neutral/Fair/Worse	How well do ramp signals operate?	Ramp signal LOS
			Does the alternative provide the opportunity to address geometric deficiencies on I-15, US-20 and interchange ramps, including substandard lane width, acceleration, deceleration, and weaving distance between exits?	Better/Good/Neutral/Fair/Worse	Does the alternative provide adequate weave distance?	What is the total weave distance provided between consecutive ramps?
					Does the alternative provide standard 12-foot lane widths?	What is the total number of corridor lane-miles that are narrower than 12 feet?
			Does the alternative address substandard interchange spacing on I-15 and US-20?	Better/Good/Neutral/Fair/Worse	Does the design option provide adequate distance between ramps?	What is the total distance between ramps?
			Are changes in access (closures or relocations) expected to reduce crashes?	Better/Good/Neutral/Fair/Worse	Does the alternative reduce merges and diverges?	What is the total number of predicted crashes based on HSM analysis?
Congestion	Does the alternative reduce congestion on I-15 and US-20?	Better/Good/Fair/Negative	Does the alternative increase the capacity of I-15 and US-20?	Better/Good/Neutral/Fair/Worse	What is the capacity of I-15/US-20 in the alternative?	What is the total number of vehicles able to be moved through the corridor in a given peak period?
			Does the alternative separate regional through trips and local destination trips?	Better/Good/Neutral/Fair/Worse	Does the alternative reduce end-to-end travel times through the corridor?	What is the end to end travel time in the corridor?
			Does the alternative improve freight movement?	Better/Good/Neutral/Fair/Worse	How does the alternative affect freight traffic?	What are the out of direction movements and/or total delay for high volume freight routes?



I-15/US-20 PEL Evaluation Questions

Evaluation Questions

Needs, Goals, and Objectives	Level 1 Criteria Questions	Level 1 Responses	Level 2 Criteria Questions	Level 2 Responses (all responses include qualitative discussion)	Level 3 Criteria Questions	Level 3 Responses (quantitative data and qualitative discussion)
			Does the alternative provide improved, alternative, or additional crossings of railroad and river?	Better/Good/Neutral/Fair/Worse	Is there an alternative or redundant crossing provided in the alternative?	How many lanes cross the railroad and river?
					Does the alternative affect traffic volumes on parallel facilities?	What are the projected volumes and LOS on parallel facilities?
Local bicycle, pedestrian, transit and vehicle connectivity	Does the alternative enhance or improve bicycle, pedestrian, transit and vehicle connectivity throughout the I-15/US-20 study area?	Better/Good/Fair/Negative	Does the alternative enhance or improve bicycle, pedestrian, transit and vehicle connectivity throughout the I-15/US-20 project area?	Better/Good/Neutral/Fair/Worse	Does the alternative support current and future bicycle connection needs in the Study area?	What are the number of bicycle crossings and new trail provided?
					Does the alternative support current and future pedestrian connection needs across I-15 and US-20?	What are the total number of pedestrian crossings and/or new sidewalk or multiuse trails that meet BMPO current Bike/Ped plan standards?
					Does the alternative support current and future transit connection needs across I-15 and US-20?	What connections are supported?
					Does the alternative support current and future local vehicle connection needs across I-15/US-20?	What connections are supported?
					Does the alternative improve connections/transfers to surrounding multi-modal network?	What connections are supported?
Future Travel Demand	Does the alternative improve travel time reliability on I-15 and US-20 in the study area?	Better/Good/Fair/Negative	Does the alternative provide capacity improvements to address projected population and tourism growth?	Better/Good/Neutral/Fair/Worse	Does the alternative address 2045 peak hour congestion?	What are the 2045 peak hour congestion rates?
			Does the alternative provide LOS improvements to adequately address future growth as identified in adopted City, County, and MPO land use and comprehensive plans?	Better/Good/Neutral/Fair/Worse	Does the alternative operate at a 2045 LOS consistent with existing BMPO planning documents (LOS A-D is acceptable)?	How well does the alternative accommodate future local land use and



I-15/US-20 PEL Evaluation Questions

Evaluation Questions

Needs, Goals, and Objectives	Level 1 Criteria Questions	Level 1 Responses	Level 2 Criteria Questions	Level 2 Responses (all responses include qualitative discussion)	Level 3 Criteria Questions	Level 3 Responses (quantitative data and qualitative discussion)
Environmental	Does the alternative meet the purpose and need of the project?	Better/Good/Fair/Negative	* (Acceptable LOS per BMPO Long Range Transportation Plan = LOS A-D)			population changes?
					Does the alternative provide flexibility to accommodate increases in volume beyond the planning year?	Yes/No
			Will the environmental impacts require additional agency approvals or permits?	Better/Good/Neutral/Fair/Worse	What environmental impacts have been identified?	Identify environmental impacts.
			Does the alternative create any problematic or unmitigatable impacts to environmental resources?	Better/Good/Neutral/Fair/Worse	Are necessary mitigations for any environmental impacts likely to limit design flexibility or affect the overall schedule and cost?	Identify agency approvals and permits required (especially for 404, Section 106, 4f, 6f, etc.)
Economics, Demographics and Market Impacts	Does the alternative enhance or improve economic, demographic and market condition in accordance with city, county and MPO land use and comprehensive plan objectives and goals?	Better/Good/Fair/Negative	Does the alternative provide enhancement to local environmental resources?	Better/Good/Neutral/Fair/Worse	What enhancements would the alternative provide?	Identify enhancements.
			Not addressed in Level 2, no new additional information.		Qualitatively, what economic and demographic impacts can be anticipated with the alternative in the short-term (through construction) and the long-term (beyond 5 years)?	
Public Support			Does the alternative create any controversial issues?	Better/Good/Neutral/Fair/Worse	What are the obvious public concerns the project will have to address?	Identify public perception/support issues.
Cost/ Constructability	Does the alternative provide options for phased improvements?	Better/Good/Fair/Negative	Does the project provide logical and sequential phasing?	Better/Good/Neutral/Fair/Worse	Would phased improvements include throwaway improvements?	Identify improvements might be thrown away at a later phase of design.



I-15/US-20 PEL Evaluation Questions

Evaluation Questions

Needs, Goals, and Objectives	Level 1 Criteria Questions	Level 1 Responses	Level 2 Criteria Questions	Level 2 Responses (all responses include qualitative discussion)	Level 3 Criteria Questions	Level 3 Responses (quantitative data and qualitative discussion)
			Does the Alternative provide a reasonable cost/benefit?	Better/Good/Neutral/Fair/Worse		
					Would the alternative redirect traffic to other local roads?	Identify impacts to alternative local roads.
					What is the Benefit Cost Ratio of the alternative?	Identify BCR alternative.
	Does the alternative improve access to local resources including schools, recreational facilities, and commercial areas?	Better/Good/Fair/Negative	How well does the alternative improve access to local resources including schools, recreational facilities, and commercial areas?	Better/Good/Neutral/Fair/Worse	Is the improved access to local resources beneficial to the intent/use of the local resource?	Describe the change to the access and the likely impact on the resource.
					Does the alternative reduce access to local resources?	Describe how the access is reduced and the likely impact on the resource.

Needs, Goals, and Objectives		Evaluation Criteria 8			Evaluation Criteria 9		
		Access	Access	Access Summary	Economics/Demographics	Economics/Demographics	Economics/Demographics Summary
Alternatives		Is the improved access to local resources beneficial to the intent/use of the local resource?	Does the alternative reduce access to local resources?		What economic and demographic impacts can be anticipated with the alternative in the short-term (through construction)?	What economic and demographic impacts can be anticipated with the alternative in the long-term (beyond 5 years)?	Alternative Overall
C3	Answer						
	Comments						
E3	Answer						
	Comments						
H2	Answer						
	Comments						

Agenda

Project: I-15/US-20 Connector

Subject: Level 3 Screening of the Universe of Alternatives

Date: March 11-12, 2020

Location: ITD District 6 Office, Rigby ID

Attendees:	Karen Hiatt - ITD	Tracy Ellwein – HDR
	Drew Meppen - ITD	Cameron Waite – HDR
	Ryan Day - ITD	Jason Longsdorf – HDR
	Curtis Calderwood - ITD	Stephanie Borders – HDR
	Brad Richards - ITD	Corrie Hugaboom – HDR
	Jim Lawrence – BYU Idaho	John McPherson - HDR
	Tim Cramer – ITD	Kelly Hoopes – Horrocks
	Mark Layton – ITD	Ben Burke – Horrocks
	Jet Johnston – ITD	Mike McKee - Horrocks
	Scot Stacy - ITD	Lance Bates – Bonneville Co.
		Chris Canfield – City of Idaho Falls
		Darrell West – BMPO
		Nick Contos - Citizen

Meeting Goal – Review screening results; come to general consensus on the alternative(s)

Day 1

1:00	Welcome, Introductions, Agenda Review – Tracy/Ryan
1:15	Project update – how we got from Level 2 to Level 3 – Tracy
1:30	Public Outreach / CWG overview - Stephanie
1:45	Review of screening process / Level 3 evaluation criteria /screening matrix - Jason
2:00	Overview of the 3 updated Level Three Alternatives – Kelly/Cameron
3:15	Open discussion/feedback on the screening - Jason
	Identify discrepancies in screening results

4:00 Updates to screening matrix by individuals
4:30 Adjourn

Day 2 – Goal to identify and refine top tier alternative(s) to recommend for NEPA

8:30 Recap of day 1, share items that you thought about overnight
9:00 Review compilation of screening matrix / general consensus on the alternative(s) discussions.
9:30 Review details and discuss the top tier alternative(s) – (about 1 hr/alternative). Items to consider:

- How well the alternative performs against the screen criteria
- What are the concerns of each alternative, can concerns be addressed?
- Identify refinements that could improve the alternatives.
- Are there some alternatives that could be combined to improve the alternative?
- Identify elements that could be eliminated or added to alternatives
- Identify major mitigations needed
- Identify key agencies / Stakeholders
- Discuss phasing – logical way to phase it?
- Other concerns?

12:00 Working Lunch (lunch provided)
12:30 Recap on the alternative(s) to recommend to move into NEPA
1:00 Open dialog on alternative(s) recommendation
1:30 Discussion of next steps
2:00 Adjourn the main group
2:00 Team huddle for Project Team
3:00 Adjourn

Meeting Day Materials

- Individual screening matrix & figures (packet)
- 24 x 36 prints (1 each)
- Evaluation Criteria
- Flip chart

Safety & Congestion Matrix

Alternative Improvement	Section	Level 3 Criteria Questions	Level 3 Responses (quantitative data and qualitative discussion)	Observations from TransCAD Scenarios	Observations from Exhibits & Analysis Results
C3	Safety	How well do ramp signals operate?	Ramp signal LOS		All perform adequately at LOS D or better. Exit 311 EB ramp signal is only terminal that operates at LOS D.
		Does the alternative provide adequate weave distance?	What is the total weave distance provided between consecutive ramps?		Slip ramps between Johns Hole and Science Center require increased spacing. The rest of the alternative provides adequate weave distances for the desired movements according to AASHTO minimums, however, adjustments had to be made to achieve minimums and traffic progression may be less than ideal.
		Does the alternative provide standard 12-foot lane widths?	What is the total number of corridor lane-miles that are narrower than 12 feet?		None
		Does the design option provide adequate distance between ramps?	What is the total distance between ramps?		The alternative meets the absolute minimums according to the Green Book, however, traffic progression and flow may not be ideal for the tight spacing.
		Does the alternative reduce merges and diverges?	What is the total number of predicted crashes based on HSM analysis?		The number of merges and diverges remain the same. The total is reduced through the removals of Exits 119, 307 and 308, but is added to by the new direct ramps and slip ramps. 21 total ramps in project area
	Congestion	What is the capacity of I-15/US-20 in the alternative?	What is the total number of vehicles able to be moved through the corridor in a given peak period?		6917 total vehicles cross the Snake River during peak period. This is a 35% increase in capacity compared to No-Build condition
		Does the alternative reduce end-to-end travel times through the corridor?	What is the end to end travel time in the corridor?		5.1 minutes from NB I-15 to EB US-20. 66% decrease in travel time compared to no-build
		How does the alternative affect freight traffic?	What are the out of direction movements and/or total delay for high volume freight routes?		Separates regional and local trips while maintaining access to Idaho Falls and surrounding communities.
		Is there an alternative or redundant crossing provided in the alternative?	How many lanes cross the railroad and river?		12 lanes in total provided over river
		Does the alternative affect traffic volumes on parallel facilities?	What are the projected volumes and LOS on parallel facilities?	Yes, reduces volumes on Skyline Dr. and Lindsey Blvd. and increases volume along Fremont Ave.	LOS at Grandview Dr & Skyline Dr intersection decreases from F to C compared to No-Build alternative
	Local bicycle, pedestrian, transit and vehicle connectivity	Does the alternative support current and future bicycle connection needs in the Study area?	What are the number of bicycle crossings and new trail provided?		Yes, major impact is to future Grandview shared use path and West Snake River shared use path. C3 should allow for easier implementation of these paths by removing non-local traffic from adjacent roadway. 3 new crossing must be provided
		Does the alternative support current and future pedestrian connection needs across I-15 and US-20?	What are the total number of pedestrian crossings and/or new sidewalk or multiuse trails that meet BMPO 2008 Bike/Ped plan standards?		Yes, major impact is to future Grandview shared use path and West Snake River shared use path. C3 should allow for easier implementation of these paths by removing non-local traffic from adjacent roadway. 3 new crossing must be provided
		Does the alternative support current and future transit connection needs across I-15 and US-20?	What connections are supported?		Maintains connections to current transit routes and may improve connection from Grandview to destination east of the Snake River
		Does the alternative support current and future local vehicle connection needs across I-15/US-20?	What connections are supported?		Yes, connections to Grandview Dr., Lindsey Blvd., Fremont Ave. and Science Center Blvd. are still supported.
		Does the alternative improve connections/transfers to surrounding multi-modal network?	What connections are supported?		See mobility matrix for details
	Future Travel Demand Needs, Goals, and Objectives	Does the alternative address 2045 peak hour congestion?	What are the 2045 peak hour congestion rates?		Yes, all but four intersections are estimated to operate similarly or better than no-build alternative. No merge, diverge or weave areas are estimated to operate at LOS F.
		Does the alternative operate at a 2045 LOS consistent with existing BMPO planning documents (LOS A-D is acceptable)?	How well does the alternative accommodate future local land use and population changes?		21 out of 24 intersections are estimated to operate at LOS D or better, and none estimated to operate at LOS F. 13 of 21 ramps analyzed are estimated to operate at LOS D or better, and none estimated to operate at LOS F.
		Does the alternative provide flexibility to accommodate increases in volume beyond the planning year?	Yes/No		Yes, most intersections and ramps operate at LOS D or better

Safety & Congestion Matrix

Alternative Improvement	Section	Level 3 Criteria Questions	Level 3 Responses (quantitative data and qualitative discussion)	Observations from TransCAD Scenarios	Observations from Exhibits & Analysis Results
E3	Safety	How well do ramp signals operate?	Ramp signal LOS		All perform adequately at LOS D or better, except for Exit 311 EB ramp signal which is estimate to operate at LOS F.
		Does the alternative provide adequate weave distance?	What is the total weave distance provided between consecutive ramps?		Yes, the alternative provides adequate weave distances for the desired movements according to AASHTO minimums, however, adjustments had to be made to achieve minimums and traffic progression may be less than ideal.
		Does the alternative provide standard 12-foot lane widths?	What is the total number of corridor lane-miles that are narrower than 12 feet?		None
		Does the design option provide adequate distance between ramps?	What is the total distance between ramps?		Yes, the alternative provides adequate distances between ramps according to the Green Book, however, traffic progression and flow may not be ideal for the tight spacing. Some of the EN-EN Ramps may require additional spacing
		Does the alternative reduce merges and diverges?	What is the total number of predicted crashes based on HSM analysis?		The number of merges and diverges increase slightly. The total is reduced through the removals of Exits 119, 307 and 308, but is added to by the new Olympia interchange and direct ramps. 22 total ramps in project area
	Congestion	What is the capacity of I-15/US-20 in the alternative?	What is the total number of vehicles able to be moved through the corridor in a given peak period?		6942 total vehicles cross the Snake River during peak period. This is a 36% increase in capacity compared to No-Build condition
		Does the alternative reduce end-to-end travel times through the corridor?	What is the end to end travel time in the corridor?		5.4 minutes from NB I-15 to EB US-20. 65% decrease in travel time compared to no-build
		How does the alternative affect freight traffic?	What are the out of direction movements and/or total delay for high volume freight routes?		Separates regional and local trips while maintaining access to Idaho Falls and surrounding communities.
		Is there an alternative or redundant crossing provided in the alternative?	How many lanes cross the railroad and river?		No. 14 lanes in total provided over river
		Does the alternative affect traffic volumes on parallel facilities?	What are the projected volumes and LOS on parallel facilities?	Yes, reduces volumes on Skyline Dr. and Grandview Dr.	LOS at Grandview Dr & Skyline Dr intersection decreases from F to B compared to No-Build alternative. Grandview Dr. and Saturn and Lindsey Blvd. intersections estimated to operate at LOS A.
	Local bicycle, pedestrian, transit and vehicle connectivity	Does the alternative support current and future bicycle connection needs in the Study area?	What are the number of bicycle crossings and new trail provided?		Yes, major impact is to future Grandview shared used path, future West and existing East Snake River shared use path. Project should allow for easier implementation of path by removing non-local traffic from adjacent roadway. 2 new crossing must be provided
		Does the alternative support current and future pedestrian connection needs across I-15 and US-20?	What are the total number of pedestrian crossings and/or new sidewalk or multiuse trails that meet BMPO 2008 Bike/Ped plan standards?		Yes, major impact is to future Grandview shared used path, future West and existing East Snake River shared use path. Project should allow for easier implementation of path by removing non-local traffic from adjacent roadway.
		Does the alternative support current and future transit connection needs across I-15 and US-20?	What connections are supported?		Maintains connections to current transit routes and may improve connection from Grandview to destination east of the Snake River
		Does the alternative support current and future local vehicle connection needs across I-15/US-20?	What connections are supported?		Yes, connections to Grandview Dr., Lindsey Blvd., Fremont Ave. and Science Center Blvd. are still supported.
		Does the alternative improve connections/transfers to surrounding multi-modal network?	What connections are supported?		See mobility matrix for details
	Future Travel Demand Needs, Goals, and Objectives	Does the alternative address 2045 peak hour congestion?	What are the 2045 peak hour congestion rates?		Doesn't help existing local system congestion. Helps reduce I-15/US-20 congestion through direct ramps and removal of Exits 119 and 307. Some congestion is moved downstream to Exits 309 and 310, with each having one ramp estimated to operate at LOS F.
		Does the alternative operate at a 2045 LOS consistent with existing BMPO planning documents (LOS A-D is acceptable)?	How well does the alternative accommodate future local land use and population changes?		19 out of 24 intersections are estimated to operate at LOS D or better, with two estimated to operate at LOS F. 16 of 22 ramps analyzed are estimated to operate at LOS D or better, with one estimated to operate at LOS F.
		Does the alternative provide flexibility to accommodate increases in volume beyond the planning year?	Yes/No		Yes, most intersections and ramps operate at LOS D or better

Safety & Congestion Matrix

Alternative Improvement	Section	Level 3 Criteria Questions	Level 3 Responses (quantitative data and qualitative discussion)	Observations from TransCAD Scenarios	Observations from Exhibits & Analysis Results
H2	Safety	How well do ramp signals operate?	Ramp signal LOS		All perform adequately at LOS D or better. 5 out of 7 ramp signals are estimated to operate at LOS D.
		Does the alternative provide adequate weave distance?	What is the total weave distance provided between consecutive ramps?		This alternative does provide adequate weave distances according to AASHTO Minimums. No adjustments were necessary to achieve minimums. You should have some space to make additional adjustments
		Does the alternative provide standard 12-foot lane widths?	What is the total number of corridor lane-miles that are narrower than 12 feet?		None
		Does the design option provide adequate distance between ramps?	What is the total distance between ramps?		Yes, the alternative provides adequate distances between ramps.
		Does the alternative reduce merges and diverges?	What is the total number of predicted crashes based on HSM analysis?		The number of merges and diverges increase slightly. The total is reduced through the modification of Exits 118 & 119, and removals of Exits 308, 309, 310 and 311, but is added by the new Y-interchange and River and Telford interchanges. 22 total ramps in project area
	Congestion	What is the capacity of I-15/US-20 in the alternative?	What is the total number of vehicles able to be moved through the corridor in a given peak period?		6638 total vehicles cross the Snake River during peak period. This is a 30% increase in capacity compared to No-Build condition
		Does the alternative reduce end-to-end travel times through the corridor?	What is the end to end travel time in the corridor?		6.7 minutes from NB I-15 to EB US-20. 56% decrease in travel time compared to no-build
		How does the alternative affect freight traffic?	What are the out of direction movements and/or total delay for high volume freight routes?		Separates regional and local trips while maintaining access to Idaho Falls and surrounding communities.
		Is there an alternative or redundant crossing provided in the alternative?	How many lanes cross the railroad and river?		No. 11 lanes in total provided over river
		Does the alternative affect traffic volumes on parallel facilities?	What are the projected volumes and LOS on parallel facilities?	Yes, reduces volumes on Skyline Dr. and Fremont Ave. Increases volume on Lewisville Hwy	LOS at Grandview Dr & Skyline Dr intersection decreases from F to D compared to No-Build alternative. Grandview Dr. and Saturn and Lindsey Blvd. intersections estimated to operate at LOS A.
	Local bicycle, pedestrian, transit and vehicle connectivity	Does the alternative support current and future bicycle connection needs in the Study area?	What are the number of bicycle crossings and new trail provided?		Yes, major impact is to future West and existing East Snake River shared use path. 4 new crossing must be provided
		Does the alternative support current and future pedestrian connection needs across I-15 and US-20?	What are the total number of pedestrian crossings and/or new sidewalk or multiuse trails that meet BMPO 2008 Bike/Ped plan standards?		Yes, major impact is to future West and existing East Snake River shared use path. 4 new crossing must be provided
		Does the alternative support current and future transit connection needs across I-15 and US-20?	What connections are supported?		Maintains connections to current transit routes and may improve connection from Grandview to destination east of the Snake River
		Does the alternative support current and future local vehicle connection needs across I-15/US-20?	What connections are supported?		Yes, connections to Grandview Dr., Lindsey Blvd., Fremont Ave. and Lewisville Hwy still provided. Limited connections to Science Center Blvd. and N 15th E.
		Does the alternative improve connections/transfers to surrounding multi-modal network?	What connections are supported?		See mobility matrix for details
	Future Travel Demand Needs, Goals, and Objectives	Does the alternative address 2045 peak hour congestion?	What are the 2045 peak hour congestion rates?		Yes, all but four intersections are estimated to operate similarly or better than no-build alternative. Overall congestion is reduced at the modified Exit 118 and 119 interchanges, but congestion increases along Exit 307 WB on ramp compared to No-Build condition, though is still estimate to fail.
		Does the alternative operate at a 2045 LOS consistent with existing BMPO planning documents (LOS A-D is acceptable)?	How well does the alternative accommodate future local land use and population changes?		23 out of 24 intersections are estimated to operate at LOS D or better, and none estimated to operate at LOS F. 18 of 22 ramps analyzed are estimated to operate at LOS D or better, with two estimated to operate at LOS F.
		Does the alternative provide flexibility to accommodate increases in volume beyond the planning year?	Yes/No		Yes, most intersections and ramps operate at LOS D or better

Environmental Matrix

Alternative	Needs, Goals, and Objectives	Level 3 Criteria Questions	Level 3 Responses (quantitative data and qualitative discussion)	Environmental Resources						
				Section 4(f)	Historic Resources	Hazardous Materials	Wetland Impacts	Biological Resources	Noise	Enviro
				Comments	Comments	Comments	Comments	Comments	Comments	Comments
C3	Environmental	What environmental impacts have been identified?	Identify environmental impacts.	See historic resources column for 4(f) impacts from historic Rec impacts: Greenbelt, Boat dock	Potential impacts to: Union Pacific Railroad (UPRR) Grain elevators Porter Canal Highland Park subdivision (several homes) Vissing Circle (2 homes)	Displaces several industrial facilities, most of which are not officially listed 2 underground storage tank (UST), 5 Resource Conservation and Recovery Act (RCRA) facilities impacted	Conceptual estimate of 0.7 ac wetland impact 3 new + 1 replacement river crossing 3 new Porter Canal crossing	Ute Ladies Tresses (ULT) habitat not ruled out; will need to determine at river crossings	2 likely neighborhood impacts (Highlands either side of highway) 1 possible neighborhood impact (Antares) 1 possible school impact 1 possible park impact	Approx 10-15 business displacements Approx 6 residential displacements Several apartment building displacements near Sci. Ctr. 1 church displacement
C3	Environmental	Are necessary mitigations for any environmental impacts likely to limit design flexibility or affect the overall schedule and cost?	Identify agency approvals and permits required (especially for 404, Section 106, 4f, 6f, etc.)	Negotiations to mitigate Section 4(f) impacts can be lengthy. Agency involvement will depend on historic or rec impact.	Negotiations to mitigate Section 106 impacts can be lengthy; Work with State Historic Preservation Office (SHPO), Advisory Council on Historic Preservation (ACHP), Federal Highway Administration (FHWA) would be required.	Coordination with Idaho Department of Environmental Quality (IDEQ) may be required.	No wetland mitigation banks exist in Eastern Idaho. Mitigation may involve compensatory constructed wetlands.	If ULT impacts occur, avoidance or mitigation would be necessary. Surveys recommended, U.S. Fish and Wildlife Service (USFWS) consultation may be required.	Noise walls may be required. FHWA approval will be required.	Some displacements may occur in low income or minority areas.
C3	Environmental	What enhancements would the alternative provide?	Identify enhancements.	Possible enhanced greenbelt connectivity	None	None	None	None	None	Enhanced ped/bike connectivity
C3	Economics, Demographics and Market Impacts	Qualitatively, what economic and demographic impacts can be anticipated with the alternative in the short-term (through construction) and the long-term (beyond 5 years)?								
E3	Environmental	What environmental impacts have been identified?	Identify environmental impacts.	See historic resources column for 4(f) impacts from historic Rec impacts: Greenbelt	Potential impacts to: UPRR Grain elevators Porter Canal 2 potentially historic farmsteads Highland Park subdivision (some homes - less than C)	Displaces one industrial facility, which is not listed 1 UST, 1 closed leaking underground storage tank (LUST), 6 RCRA facilities impacted	Conceptual estimate of 0.9 to 1.2 ac wetland impact 1 new + 1 replacement river crossing 1 new Porter Canal crossing	ULT habitat not ruled out; will need to determine at river crossings	1 likely neighborhood impact (Highlands north side) 1 likely church impact 1 possible neighborhood impact (Highlands south side)	Approx 4-6 business displacements RV Park displacement Approx 3 residential displacements 1-2 apartment building displacements
E3	Environmental	Are necessary mitigations for any environmental impacts likely to limit design flexibility or affect the overall schedule and cost?	Identify agency approvals and permits required (especially for 404, Section 106, 4f, 6f, etc.)	Negotiations to mitigate Section 4(f) impacts can be lengthy. Agency involvement will depend on historic or rec impact.	Negotiations to mitigate Section 106 impacts can be lengthy; Work with SHPO, ACHP, FHWA would be required.	Coordination with IDEQ may be required.	No wetland mitigation banks exist in Eastern Idaho. Mitigation may involve compensatory constructed wetlands.	If ULT impacts occur, avoidance or mitigation would be necessary. Surveys recommended, USFWS consultation may be required.	Noise walls may be required. FHWA approval will be required.	Some displacements may occur in low income or minority areas.
E3	Environmental	What enhancements would the alternative provide?	Identify enhancements.	Possible enhanced greenbelt connectivity	None	None	None	None	None	Enhanced ped/bike connectivity
E3	Economics, Demographics and Market Impacts	Qualitatively, what economic and demographic impacts can be anticipated with the alternative in the short-term (through construction) and the long-term (beyond 5 years)?								

Environmental Matrix

Alternative	Needs, Goals, and Objectives	Level 3 Criteria Questions	Level 3 Responses (quantitative data and qualitative discussion)	Environmental Resources						
				Section 4(f)	Historic Resources	Hazardous Materials	Wetland Impacts	Biological Resources	Noise	Enviro
				Comments	Comments	Comments	Comments	Comments	Comments	Comments
H2	Environmental	What environmental impacts have been identified?	Identify environmental impacts.	See historic resources column for 4(f) impacts from historic Possible Antares Park impact	Potential Impacts to: Farmstead at ~900 E 49th St 4 other poten. hist. farmsteads UPRR (new crossing) Idaho Canal (new crossing) Progressive Canal (new cross)	Alt H traverses Hatch Pit, which is active landfill facility 1 Brownfields facility impacted	Conceptual Estimate of 1.9 ac wetland impact 1 new + 1 replacement river crossing 1 new Idaho Canal crossing + 1 new Progressive Canal crossing	ULT habitat not ruled out; will need to determine at river crossings Some concerns expressed by USFWS about yellow-billed cuckoo (YBC) and extending urban center northward, further reducing habitat	4 likely neighborhood impacts	Approx. 4-6 business displacements Approx. 8-10 residential displacements Possible Antares Park impact
H2	Environmental	Are necessary mitigations for any environmental impacts likely to limit design flexibility or affect the overall schedule and cost?	Identify agency approvals and permits required (especially for 404, Section 106, 4f, 6f, etc.)	Negotiations to mitigate Section 4(f) impacts can be lengthy. Agency involvement will depend on historic or rec impact.	Negotiations to mitigate Section 106 impacts can be lengthy; Work with SHPO, ACHP, FHWA would be required.	Crossing Hatch Pit presents unique challenges. Coordination with IDEQ will be required.	No wetland mitigation banks exist in Eastern Idaho. Mitigation may involve compensatory constructed wetlands.	If ULT impacts occur, avoidance or mitigation would be necessary. Surveys recommended, USFWS consultation may be required.	Noise walls may be required. Alt H noise impacts includes some small groupings of houses for which noise mitigations may not be feasible. FHWA approval will be required.	Some displacements may occur in low income or minority areas.
H2	Environmental	What enhancements would the alternative provide?	Identify enhancements.	None	None	None	None	None	None	None
H2	Economics, Demographics and Market Impacts	Qualitatively, what economic and demographic impacts can be anticipated with the alternative in the short-term (through construction) and the long-tern (beyond 5 years)?								

Public Involvement Matrix

Alternative	Needs, Goals, and Objectives	Level 3 Criteria Questions	Identify public perception/support issues.	Level 3 Responses	
				Public Opinion/Support Risk	Enviro Justice/Neighborhood
				Comments	Comments
C3	PI	What are the obvious public concerns the project will have to address?	Summary comments from meeting: Commercial Impacts, Neighborhood Impacts, Environmental, Cost of New Construction, Complicated Design; Short-Term Solution; Congestion	All alternatives have risk of those displaced resisting ROW negotiations and forcing condemnation. Complicated river crossings will require education for drivers	Could have displacements that are low income areas. Apartments.
E3	PI	What are the obvious public concerns the project will have to address?	Noise; pollution; don't like converting US-20 to local street; short-term solution; pedestrian overpass needed; disrupts valuable riverfront spaces; inconvenient during construction; too complex; need to separate recreational traffic from commuters; doesn't provide link to US-26.	All alternatives have risk of those displaced resisting ROW negotiations and forcing condemnation.	RV park. Could have displacements in low income areas.
H2	PI	What are the obvious public concerns the project will have to address?	Commercial Impacts, Neighborhood Impacts, Environmental, Cost of New Construction, Noise, Traffic, Bald Eagles at Pancheri, Loss of Property Value, Pedestrian and Bicyclist Safety, Viability of Constructing over Current Landfill/Hatch Pit; FAA Rules might not allow this design; Frequent road closures due to wind/drifted dust; takes traffic away from downtown Additional Concerns: Too far away from main transportation needs; provide exit to East River Road; Needs to address the needs of INL workers; needs airport access; like if combined with E.2; no consideration of southeast side?; move this alternative to south side of Iona. Lots of public comments on the connection to US-26 at meeting last year. Heard more at CWG. People want that even though FHWA sees as a separate project.	49th Neighborhood could file lawsuit if the roadway is moved closer to them. Noise walls were suggested at CWG but neighbors might fight that as well. Business and residential displacements could go to condemnation if there is a lack of cooperation.	Possible low income area displacements.

Cost/ Constructability Matrix

Alternative	Needs, Goals, and Objectives	Level 3 Criteria Questions	Level 3 Responses (quantitative data and qualitative discussion)	Level 3 Responses
				Comments
C3	Cost/ Constructability	Would phased improvements include throwaway improvements?	Identify improvements might be thrown away at a later phase of design.	<p>Alternative C is primarily located in the same location as the existing facility. It ultimately provides a more fluid flow of traffic, however, during construction there will be extensive detours and temporary crossings required. Much of this effort will be thrown away or need to be removed with subsequent phasing.</p> <p>The City Center/Riverside Interchange, the Lindsay Interchange, and much of the existing Exit 119 Interchange will be modified extensively and demolished as a part of the construction.</p>
C3	Cost/ Constructability	Would the alternative redirect traffic to other local roads?	Identify impacts to alternative local roads.	Accessibility of the Lindsay Blvd Interchange (307) traffic and the existing City Center/Riverside Interchange (308) to the US-20 corridor is removed. A new crossing at Higham Street will aid in the accessibility of this traffic however, this local traffic will be required to use the new proposed C-D Ramps and the Higham Street crossing to find access to the I-15/US-20 system.
C3	Cost/ Constructability	What is the Benefit Cost Ratio of the alternative?	Identify BCR of alternative	0.93
E3	Cost/ Constructability	Would phased improvements include throwaway improvements?	Identify improvements might be thrown away at a later phase of design.	Alternative E includes the development of a new interchange with high speed direct ramps. These improvements are located north of the existing Exit 119 facility. Much of this can be constructed while the rest of the system remains in operation. Much of the existing Exit 119 structures can remain in place and serve as a local facility. Connections to I-15 south of Exit 119 and just west of the Science Center Int. (Exit 309) will require extensive construction. Some detours needed for the maintenance of traffic will become throw away components.
E3	Cost/ Constructability	Would the alternative redirect traffic to other local roads?	Identify impacts to alternative local roads.	This alternative addresses the congestion and weaving concerns by spacing out and consolidating interchanges. Traffic using the existing City Center/Riverside Interchange (Exit 308) would be redirected to the Science Center Interchange (Exit 309). Much of the Lindsay Interchange (Exit 307) local traffic would be need to access the system through at the Broadway Interchange or by using local roads connecting to Science Center Interchange (Exit 309).
E3	Cost/ Constructability	What is the Benefit Cost Ratio of the alternative?	Identify BCR of alternative	1.01
H2	Cost/ Constructability	Would phased improvements include throwaway improvements?	Identify improvements might be thrown away at a later phase of design.	Because the alternative is going to be constructed off of the existing roadways and facilities, very little will become throw away components of the maintenance of traffic during construction and phasing.
H2	Cost/ Constructability	Would the alternative redirect traffic to other local roads?	Identify impacts to alternative local roads.	Downtown traffic accessing US-20 between John's Hole and the Lewisville Highway connecting east on US-20 would be required to use the 5th West Roadway/new Interchange and the Lewisville highway and new Interchange at St. Leon. This stretch of US-20 would become a City of Idaho Falls roadway. Redirect will be required.
H2	Cost/ Constructability	What is the Benefit Cost Ratio of the alternative?	Identify BCR of alternative	0.07

Structures Congestion/Constructability Matrix							
Alternative	Needs, Goals, and Objectives	Level 3 Criteria Questions	Congestion/Constructability - Structures				
			Opportunities	Challenges	Overall User Cost/Savings	ROW Impacts	Structure Improvements
			Comments	Comments	Comments	Comments	Comments
C3	Congestion	Does the alternative provide improved, alternate, or additional crossings of railroad and river?	Alternative adds a 3 lane bridge north of John's hole. Alternative replaces the John's Hole bridge with 4 two lane one way bridges, and 1 one lane one way bridge.				
C3	Cost/ Constructability	Does the project provide logical and sequential phasing?	*Can shift traffic on I-15 to one side of interstate while bridges at Grandview and Broadway are constructed.	*Option has a lot of construction on and around I-15. * Staging required for removing I-15 over Broadway Bridges and Grandview. *Grandview may need to be closed under interstate, as it is being changed from an overpass to being and underpass. *Lot of construction around John's Hole	*Demolition of Grandview Bridge will need careful consideration do not pollute the river.	*Removing railroad will be costly. *New ramps from I-15 to US20 are through businesses, would require a lot of ROW purchases.	23 New Bridges: *I-15 NB/SB over Broadway *I-15 NB Ramp to US20 East over Frontage Road *US20 WB Ramp to I-15 SB over Frontage Road *US20 WB Ramp to I-15 SB over I-15 NB & SB *I-15 over Grandview *I-15 NB to US-20 EB Ramp over Lindsay *Frontage Road to US-20 EB over Lindsay *US-20 to I-15 SB Ramp over Grandview *Grandview EB over Canal *Grandview WB over Canal *I-15 NB to US-20 EB Ramp over Canal & Grandview *US20 WB TO I-15 SB Ramp over Canal & Grandview *US-20 EB over Snake *US-20 WB over Snake *Grandview EB over Snake *Grandview WB over Snake *Grandview Ramp to US-20 WB *US-20 EB over Riverside *US-20 WB over Riverside *US-20 EB over Science Center Dr *US-20 WB over Science Center Dr *International Way over I-15 *International Way over Canal *International Way over Snake

Structures Congestion/Constructability Matrix							
Alternative	Needs, Goals, and Objectives	Level 3 Criteria Questions	Congestion/Constructability - Structures				
			Opportunities	Challenges	Overall User Cost/Savings	ROW Impacts	Structure Improvements
			Comments	Comments	Comments	Comments	Comments
E3	Congestion	Does the alternative provide improved, alternate, or additional crossings of railroad and river?	*Alternative adds 5 lanes across the Snake north of Grandview, while keeping Grandview bridge in place.				
E3	Cost/ Constructability	Does the project provide logical and sequential phasing?	<p>*Keeping Grandview as an overpass eases staging, will keep US20 open in both directions.</p> <p>*Much less construction on I-15. Most construction is North, reduces impacts to traffic.</p>	*US20 WB to I-15 SB bridge is curved and very skewed. May be difficult to construct.	*No demolition in river will save costs.	<p>*Removing railroad will be costly.</p> <p>*New ramps from I-15 to US20 are through businesses, would require a lot of ROW purchases.</p>	<p>14 New Structures:</p> <p>*Grandview over I-15 (14' included)</p> <p>*WB US20 to I-15 SB Ramp over I-15</p> <p>*WB US20 to I-15 SB Ramp over Frontage Roads</p> <p>*I-15 NB to US20 EB Ramp over Frontage Roads</p> <p>*Frontage Road to US20 WB over Frontage Road</p> <p>*US20 (Realigned Olympia St) over I-15</p> <p>*US20 (Realigned Olympia St) over Frontage Road</p> <p>*US20 WB TO I-15 SB Ramp over US20</p> <p>*US20 WB TO I-15 SB Ramp over Canal</p> <p>*I-15 NB TO US20 EB Ramp over Canal</p> <p>*US20 over Snake</p> <p>*US20 over Fremont</p> <p>*US20 EB/WB over Science Center Dr.</p>
H2	Congestion	Does the alternative provide improved, alternate, or additional crossings of railroad and river?	*Alternative adds 4 lanes across the Snake north of Grandview, while keeping Grandview bridge in place.				
H2	Cost/ Constructability	Does the project provide logical and sequential phasing?	*Traffic on I-15 will be nearly uninterrupted. Will be able to build re-routed I-15 while existing is in service	*Tightly curved steel bridges can be difficult to construct and line-up/fit correctly.	*No demolition in river will save costs.	<p>*Removing railroad will be costly.</p> <p>*Most construction in farmlands, will have much less ROW impacts.</p>	<p>11 new bridges:</p> <p>*SB I-15 TO EB US20 RAMP OVER I-15</p> <p>*SB I-15 TO EB US20 RAMP OVER RAILROAD</p> <p>*EB US20 OVER SNAKE</p> <p>*NB I-15 TO EB US20 RAMP OVER RAILROAD</p> <p>*WB US20 TO NB I-15 OVER RAILROAD</p> <p>*WB US20 OVER SNAKE</p> <p>*WB US20 TO SB I-15 OVER RAMP & I-15 & RAILROAD</p> <p>*US20 over N 5th St.</p> <p>*US20 over Canal</p> <p>*US20 over 5th E. St.</p> <p>*US20 over 49th St. Interchange</p>

Access Matrix

Alternative	Needs, Goals, and Objectives	Level 3 Criteria Questions	Level 3 Responses (quantitative data and qualitative discussion)	Level 3 Responses
				Comments
C3	Access	Is the improved access to local resources beneficial to the intent/use of the local resource?	Describe the change to the access and the likely impact on the resource.	Access to Downtown Idaho Falls and local resources is maintained similarly to existing conditions. Separating regional through traffic from local access traffic should make it less difficult to get to the local resources.
C3	Access	Does the alternative reduce access to local resources?	Describe how the access is reduced and the likely impact on the resource.	Maintains existing access points except for Lindsay Blvd. Exit 307. Access to and from interchanges provided via new river crossing north of US-20. I-15 Exits 118 and Exit 119 carry less traffic on ramps from I-15, so potentially easier to access local attractions. Local connectivity is separated from the I-15/US-20 thru traffic at I-15 Exit 118 and Exit 119 and US-20 Exit 308 and 309.
E3	Access	Is the improved access to local resources beneficial to the intent/use of the local resource?	Describe the change to the access and the likely impact on the resource.	The northbound one-way frontage road between the new interchange north of Grandview and the Broadway interchange enhances connectivity for local traffic and removes conflict with regional traffic. Southbound traffic will use new Olympia interchange or Broadway interchange. Local Grandview traffic now has a crossing of the Snake River without the regional traffic conflict traffic. Lindsay Blvd access. Connectivity from Grandview to US-20 would be via the existing Broadway interchange and the new interchange on the north.
E3	Access	Does the alternative reduce access to local resources?	Describe how the access is reduced and the likely impact on the resource.	Increases access to resources along Science Center Dr. by providing full interchange. Removes direct access from I-15 and US-20 to neighborhoods along Grandview Dr. and Temple View Elementary School. Both can be accessed by way of Skyline Dr or Saturn Ave from Olympia and Broadway interchanges, respectively.
H2	Access	Is the improved access to local resources beneficial to the intent/use of the local resource?	Describe the change to the access and the likely impact on the resource.	Access to Downtown Idaho Falls and local resources is maintained similarly to existing conditions except the old US-20 is now more of a local street connection with at-grade intersections. Separating regional through traffic from local access traffic should make it less difficult to get to the local resources.
H2	Access	Does the alternative reduce access to local resources?	Describe how the access is reduced and the likely impact on the resource.	Maintains existing access points from I-15. I-15 Exits 118 and Exit 119 carry less traffic on ramps from I-15, so potentially easier to access local attractions. Connectivity of I-15 and US-20 north of the urban area helps to separate the thru traffic and the in-town traffic. Opportunities to enhance connectivity and access to the new US-20 alignment would be shifted north away from the John's Hole area. This alternative also allows improved future connectivity to US-26 and for new routes to the west.

Economic and Demographic Impacts

Alternative	Needs, Goals, and Objectives	Level 3 Criteria Questions	Level 3 Responses	
			Short Term (during construction)	Long Term (beyond 5 years)
			Comments	Comments
C3	Economics	What economic and demographic impacts can be anticipated with the alternative?	Business interruption impacts due to relocation of about 10 businesses along Mercury Ave and Lindsay Blvd. Impacts for 1-2 residential relocations. Temporary boost in construction jobs and secondary supporting economy. Major traffic detours and diversions create impacts on business based on slower commuter travel and travel for freight based businesses. No discernable impact on demographics.	Improved travel times and safety along I-15 and US 20 support a growing population and economy. Improved connectivity based on Higham St bridge over the river and I-15 to the airport provides additional access and supports airport growth plans. No discernable impact on demographics.
E3	Economics	What economic and demographic impacts can be anticipated with the alternative?	Business interruption impacts due to relocation of several businesses along Lindsay Blvd north of US 20. Temporary boost in construction jobs and secondary supporting economy. Some traffic detours and diversions create impacts on business based on slower commuter travel and slower travel for freight based businesses. Minor impacts to tourism based on closure or relocation of Snake River RV park. Potential impact to developed properties along Jefferson Ave. and Canyon Ave. near Presto St. If necessary residential relocations would have a slight impact on demographics due to displacement of low income residents.	Improved travel times and safety along I-15 and US 20 support a growing population and economy. Improved connectivity based on Olympia St bridge over the river and I-15 to the airport provides additional access and supports airport growth plans. No discernable impact on demographics.
H2	Economics	What economic and demographic impacts can be anticipated with the alternative?	Temporary boost in construction jobs and secondary supporting economy. Minimal traffic detours and diversions create extremely minor impacts on business based on slower commuter travel and slower travel for freight based businesses. Impacts to several residences and farming operations, especially along East River Road. and immediately east of I-15 between 33rd and 49th. Residential relocations would have a slight impact on demographics, but are not likely to displace low income residents.	Improved travel times and safety along I-15 and US 20 support a growing population and economy. New "41st" alignment will encourage growth from Idaho Falls in this northern area, especially commercial uses around interchanges at 49th and at East River Road. Reclassification of the old US 20 roadway alignment may also encourage new types of development along that corridor from I-15 to 49th. No discernable impact on demographics.

Mobility Matrix

Calculated by:
Checked by:

BAF
CCW

Date: 2/21/2020
Date: 2/21/2020

Alternative Improvement	Bike/Pedestrian Facility	Status	Facility Opportunities with Alternative	Facility Challenges with Alternative	Difficulty of Facility Implementation with Alternative	Difficulty of Traveling on Facility Through Alternative	Additional Structures Needed with Alternative
C3	Grandview Shared Use Path Extension to Snake River	Proposed	Opportunity to implement at grade spot improvement in areas of need along Grandview Dr., along with installing portion of facility from Saturn to Snake River with alternative improvements.	Not impacting path footprint with proposed US-20 direct ramp columns	Building path with alternative improvements could make it easier to build than in existing conditions. Difficulty arises in navigating footprint of proposed direct ramps	Potential to reduce difficulty (compared to implementing with existing conditions) by consolidating Exit 307 ramp terminals into one intersection crossing	None
	Skyline Dr. Bike Lanes	Proposed	None	None	None	None	None
	Saturn Dr. Signed Bike Route	Proposed	Implementing at grade spot improvement at Saturn Ave. & Grandview Dr. with other alternative improvements along Grandview Dr.	None	Would likely make implementation easier than if were implemented with existing conditions	Less difficult than existing if grade spot improvement is implemented	Possible Pedestrian Signal
	West Snake River Shared Use Path	Existing south of US-20, Proposed north of US-20	Ability to implement facility under realigned Grandview Dr. and US-20/direct ramps, and proposed Higham St extension	Path crossing under realigned Grandview Dr. and US-20, and Higham St extension	Somewhat difficult - facility must pass under/over Grandview Dr., direct ramps, and Higham St.	Added difficulty - path crossings under roadway facilities will likely confine travelers	Structure/culverts underneath Grandview Dr. and direct ramps, as well Higham St.
	East Snake River Shared Use Path	Existing south of railroad, Proposed north of railroad	Reducing path crossing distance at existing Exit 308 WB on and EB off ramps	Ensuring path can cross under new ramp and realigned US-20, as well as extended Higham St.	Somewhat difficult - facility must pass under/over realigned US-20, new ramps and Higham St.	Added difficulty - path crossings under roadway facilities will likely confine travelers	Structure/culverts underneath US-20 and new ramps, as well Higham St.
	Science Center Shared Use Path	Proposed	Could be implemented along with alternative improvements along Science Center Blvd. and Exit 309	Making sure new off ramp columns do not interfere with path	Not difficult	Would remain relatively same if built with existing conditions	None
	Anderson St. Shared Use Path	Changes Proposed	None	None	None	None	None
	Iona St. Shared Use Path	Proposed	Ability to connect Iona St. and shared used path to improved Fremont Ave. with alternative improvements	None	None	Would reduce difficulty of travel	Signal
	Idaho Canal Shared Use Path	Proposed	None	None	None	None	None
	Freeman Park Shared Use Paths	Existing	None	None	None	None	None
	Fremont Ave. Bike Lanes	Proposed	Ability to implement portion of facility with alternative improvements to Fremont Ave.	None	None	Would reduce difficulty of travel	Possible Signal at Fremont Ave./Higham St. intersection
	N 5th West Shared Use Path	Proposed	None	None	None	None	None
	65th North Shared Use Path	Proposed	None	None	None	None	None
	Riverview Dr. Signed Bike Route	Proposed	None	None	None	None	None
	Neighborhood, School, Park sidewalks	Existing	Ability to improve/add sidewalks along Grandview Dr., Lindsey Blvd., Fremont Ave., and Science Center Blvd. with alternative improvements	Proposed Exit 309 WB off ramp would impact housing in neighborhood to east of Fremont Park	None	None	None

Alternative Improvement	Bike/Pedestrian Facility	Status	Facility Opportunities with Alternative	Facility Challenges with Alternative	Difficulty of Facility Implementation with Alternative	Difficulty of Traveling on Facility Through Alternative	Additional Structures Needed with Alternative
E3	Grandview Shared Use Path Extension to Snake River	Proposed	Could be implemented with improvements to Grandview Drive brought about with project alternative. Alternative also removes Grandview intersections with Exit 119 ramps, and consolidates Exit 307 ramps into one intersection crossing.	None	Would likely make implementation easier than if were implemented with existing conditions	Reduced difficulty by removing Grandview intersections with Exit 119 ramp terminals	None
	Skyline Dr. Bike Lanes	Proposed	Ability to implement facility near Skyline intersection and improved Olympia St intersection	Adding more crossing traffic on Olympia St because of US-20 realignment, as well as traffic on Skyline from vehicles traveling from Olympia interchange to Grandview Dr.	Keeping continuity of facilities through future, expanded, signalized intersection with Olympia St	Additional crossing traffic on Olympia St due to US-20 realignment	Signal
	Saturn Ave. Signed Bike Route	Proposed	Implementing at grade spot improvement at Saturn Ave. & Grandview Dr. with other alternative improvements along Grandview Dr.	None	Would likely make implementation easier than if were implemented with existing conditions	Less difficult than existing if grade spot improvement is implemented	Possible Pedestrian Signal
	West Snake River Shared Use Path	Existing south of US-20, Proposed north of US-20	Ability to implement facility under improved Grandview Dr. and realigned US 20	Path crossing under Grandview Dr. and realigned US-20	Somewhat difficult - facility must pass under/over Grandview Dr. and realigned US-20	Added difficulty - path crossings under Grandview Dr. and US-20 will likely confine travelers	Structure/culvert underneath Grandview Dr., realigned US-20 and direct ramps
	East Snake River Shared Use Path	Existing south of railroad, Proposed north of railroad	Removing facility crossing over existing Exit 308 WB on ramp, as well as consolidating crossing over existing EB off ramp/proposed Grandview Dr.	Ensuring path can cross realigned US-20 at two proposed crossings	Somewhat difficult - facility must pass under/over realigned US-20	Added difficulty - path crossings under US-20 will likely confine travelers	Structure/culvert underneath realigned US-20 along path paralleling river
	Science Center Shared Use Path	Proposed	Could be implemented along with alternative improvements along Science Center Blvd. and Exit 309	Making sure new off ramp columns do not interfere with path	Not difficult	Would remain relatively same if built with existing conditions	None
	Anderson St. Shared Use Path	Changes Proposed	None	None	None	None	None
	Iona St. Shared Use Path	Proposed	Ability to connect Iona St. and shared used path to improved Fremont Ave. with alternative improvements	None	None	Would reduce difficulty of travel	Signal
	Idaho Canal Shared Use Path	Proposed	None	None	None	None	None
	Freeman Park Shared Use Paths	Existing	None	None	None	None	None
	Fremont Ave. Bike Lanes	Proposed	Ability to implement portion of facility with alternative improvements to Fremont Ave.	None	None	Would reduce difficulty of travel	None
	N 5th West Shared Use Path	Proposed	None	None	None	None	None
	65th North Shared Use Path	Proposed	None	None	None	None	None
	Riverview Dr. Signed Bike Route	Proposed	None	None	None	None	None
	Neighborhood, School, Park sidewalks	Existing	Ability to improve/add sidewalks along Grandview Dr., Lindsey Blvd., Fremont Ave., and Science Center Blvd. with alternative improvements	Proposed Exit 309 WB off ramp would impact housing in neighborhood to east of Fremont Park. Exit 309 Proposed EB ramps would be much closer to AH Bush Elementary School than existing.	None	Difficulty of walking near/around elementary school with proposed layouts of Exit 309 EB ramps	None

Mobility Matrix

Calculated by:
Checked by:

BAF
CCW

Date:
Date:

2/20/2020
2/21/2020

Alternative Improvement	Bike/Pedestrian Facility	Status	Facility Opportunities with Alternative	Facility Challenges with Alternative	Difficulty of Facility Implementation with Alternative	Difficulty of Traveling on Facility Through Alternative	Additional Structures Needed with Alternative
H2	Grandview Shared Use Path Extension to Snake River	Proposed	Ability to implement facility along Grandview Dr. where split diamond interchange improvements are proposed. This includes implement the at grade spot improvement at Grandview Dr. & I-15 NB ramps terminal	Additional intersection crossing with realignment of Exit 119 SB ramp terminal	Not difficult. Implementation of portion of facility could be wrapped into split diamond interchange constructions	Closely spaced, high traffic demand intersections. Difficulty of travel could be eased with at grade spot improvements at NB ramp terminal	None
	Skyline Dr. Bike Lanes	Proposed	None	None	None	None	None
	Saturn Dr. Signed Bike Route	Proposed	None	None	None	None	None
	West Snake River Shared Use Path	Existing south of US-20, Proposed north of US-20	Ability to implement portion of facility crossing realigned US-20	Providing clearance for peds and bikes to cross under realigned US-20	Depends on if additional structure/culvert is needed for path crossing; if needed, difficulty increases.	Added difficulty - path crossings under US-20 will likely confine travelers	Possible structure/culverts underneath realigned US-20
	East Snake River Shared Use Path	Existing south of railroad, Proposed north of railroad	Ability to implement portion of facility crossing realigned US-20	Providing clearance for peds and bikes to cross under realigned US-20	Depends on if additional structure/culvert is needed for path crossing; if needed, difficulty increases.	Added difficulty - path crossings under US-20 will likely confine travelers	Possible structure/culverts underneath realigned US-20
	Science Center Shared Use Path	Proposed	None	None	None	None	None
	Anderson St. Shared Use Path	Changes Proposed	None	None	None	None	None
	Iona St. Shared Use Path	Proposed	None	None	None	None	None
	Idaho Canal Shared Use Path	Proposed	None	None	None	None	None
	Freeman Park Shared Use Paths	Existing	None	None	None	None	None
	Fremont Ave. Bike Lanes	Proposed	Ability to implement portion of facility along River Road with proposed interchange and roadway improvements	Addition of two, likely high volume, intersections along roadway with proposed US-20 interchange	Keeping continuity of facilities through proposed US-20 interchange	Crossing through interchange ramp intersections	Possible signals
	N 5th West Shared Use Path	Proposed	None	None	None	None	None
	65th North Shared Use Path	Proposed	None	None	None	None	None
	Riverview Dr. Signed Bike Route	Proposed	None	None	None	None	None
	Neighborhood, School, Park sidewalks	Existing	Adding sidewalk along River Road through proposed improvements	Houses along River Road within proposed US-20/River Road interchange footprint would be impacted and needed to be removed	None	Traversing through interchange ramp intersections	None



Memo

Date: Monday, March 02, 2020

Project: KN 20065 – I-15/US-20 Connector

To: Ryan Day, ITD District 6

From: Cameron Waite, PE, PTOE

Subject: PEL Level 3 2045 Updated Alternatives Operational Analysis Technical Memo

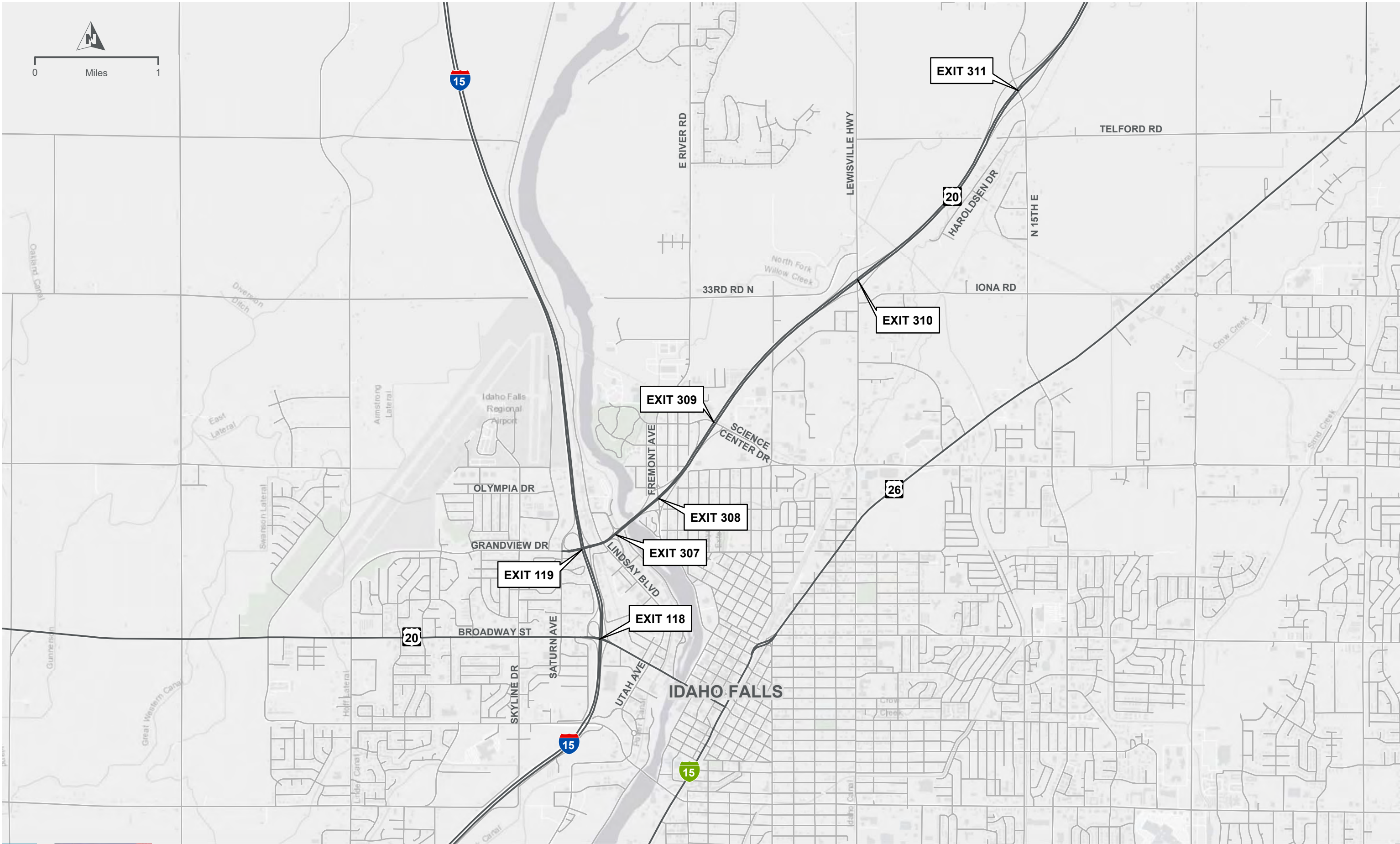
Introduction

The Idaho Transportation Department (ITD) District 6 is developing the Interstate 15 (I-15) and United States Highway 20 (US-20) Connector project (Project No. A020(065), Key No. 20065). HDR and Horrocks are the consulting team developing this planning and environmental linkages (PEL) study for ITD, who along with the Bonneville Metropolitan Planning Organization (BMPO) and member agencies in the BMPO have identified the need to improve the I-15/US-20 connection and adjacent interchanges. This memo summarizes the conceptual operational analysis for the updated I-15/US-20 Connector PEL Level 3 alternatives. These alternatives were developed through the Level 1 and Level 2 screening and public engagement processes, but then were further updated and refined since the last operational analysis through a cost risk assessment and value engineering (CRAVE) study facilitated by HDR.

The purpose of this operational analysis was to model each updated alternative, including the No-Build alternative, with planning year 2045 travel demand forecasts and identify operational measurements and capacity as well as estimated travel times for each. This analysis was completed at a high level and some individual intersection, interchange, and/or ramp models may be refined in future phases of the project to give more refined or different results. This conceptual analysis allows a comparison between the Level 3 Alternatives, including the No-Build Alternative. **Figure 1** presents the project vicinity.

Alternatives Development & Descriptions

The PEL includes three levels of screening for alternatives to develop a recommended list of alternatives to advance into a National Environmental Policy Act (NEPA) document, once funding allows. A screening level reviews each alternative against the screening criteria questions developed with the purpose and need and project goals considerations. The Level 3 Alternatives described below have been developed through the first two screening levels and the CRAVE study. Baseline concept alternatives that were moved forward from the Level 2 screening were reviewed and the CRAVE team generated 81 ideas for the project. The ideas were then evaluated and developed into three new refined alternatives: C3, E3, and H2. Details of the alternative development can be found in the summary documents for each level of screening, the CRAVE study, and public engagement activities.



I-15/US-20 CONNECTOR
VICINITY MAP
FIGURE 1



The conceptual interchange configurations for each alternative are typically assumed to be traditional diamond or split diamond unless a specific configuration is required. This allows for simplicity of modeling and comparing results between alternatives. The ultimate interchange configuration may be modified and refined in future analyses. All on and off ramps are assumed to be one lane at the merge/diverge points except for direct ramps from I-15 to US-20, which are assumed to have two lanes.

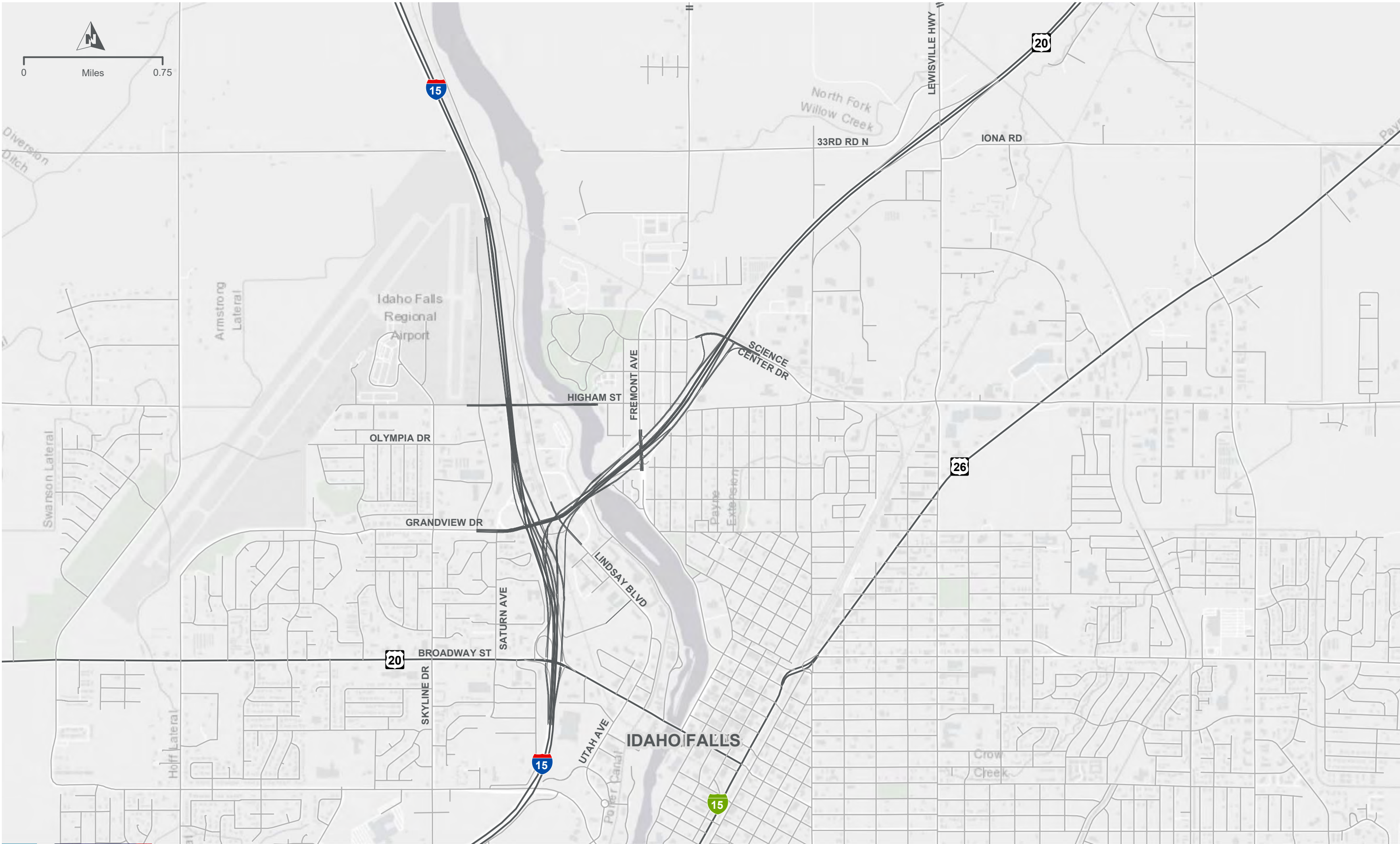
No-Build Alternative

This alternative assumed the 2045 travel demand forecast volumes travel on the existing transportation network with no changes to the I-15 or US-20 access or interchange configurations while including the following locally programmed improvement projects:

- Widen the Old Butte Road to Pancheri Drive connection to 5 lanes
- Widen 600 feet of 5th West to University Blvd. to 5 lanes
- Widen Hitt Road from Sunnyside Road to 49th South to 5 lanes
- Widen 65th South from Yellowstone Highway to Hitt Road to 5 lanes
- Widen Holmes Avenue from Sunnyside Road to 65th South to 5 lanes
- Widen 1st Street from Ammon Rd to 45th East to 5 lanes
- Widen St. Leon Road from Lincoln Road to US-20 to 5 lanes
- Widen 25th East from Lincoln Road to US-26 to 5 lanes

Alternative C3

This alternative reduces weaving concerns between I-15 Exits 118 and 119 by separating regional traffic not exiting in Idaho Falls by providing direct ramp connections from I-15 north of Exit 118 to US-20 west of Exit 309. The direct ramps go over one railroad crossing and Lindsay Blvd. before tying into the realigned US-20 west of the Snake River. Numerous slip ramps and collector/distributor roads connect I-15 Exits 118 and 119 and allow vehicles to access Grandview Dr., Lindsay Blvd., Fremont Ave. and Science Center Blvd. Exit 307 is removed from accessing US-20. A new Snake River crossing is added north of US-20 from Lindsay Blvd. to Higham Street for local street connectivity to Fremont Ave. and access to US-20 at Exit 308. Portions of Broadway St., Grandview Drive, US-20, and Fremont Ave. are rebuilt to install the proposed improvements. Broadway St. is widened from five to seven lanes between the Exit 118 northbound ramp intersection and Utah Ave. A conceptual layout is presented in **Figure 2**.



CONCEPTUAL LAYOUT

ALTERNATIVE C3

FIGURE 2



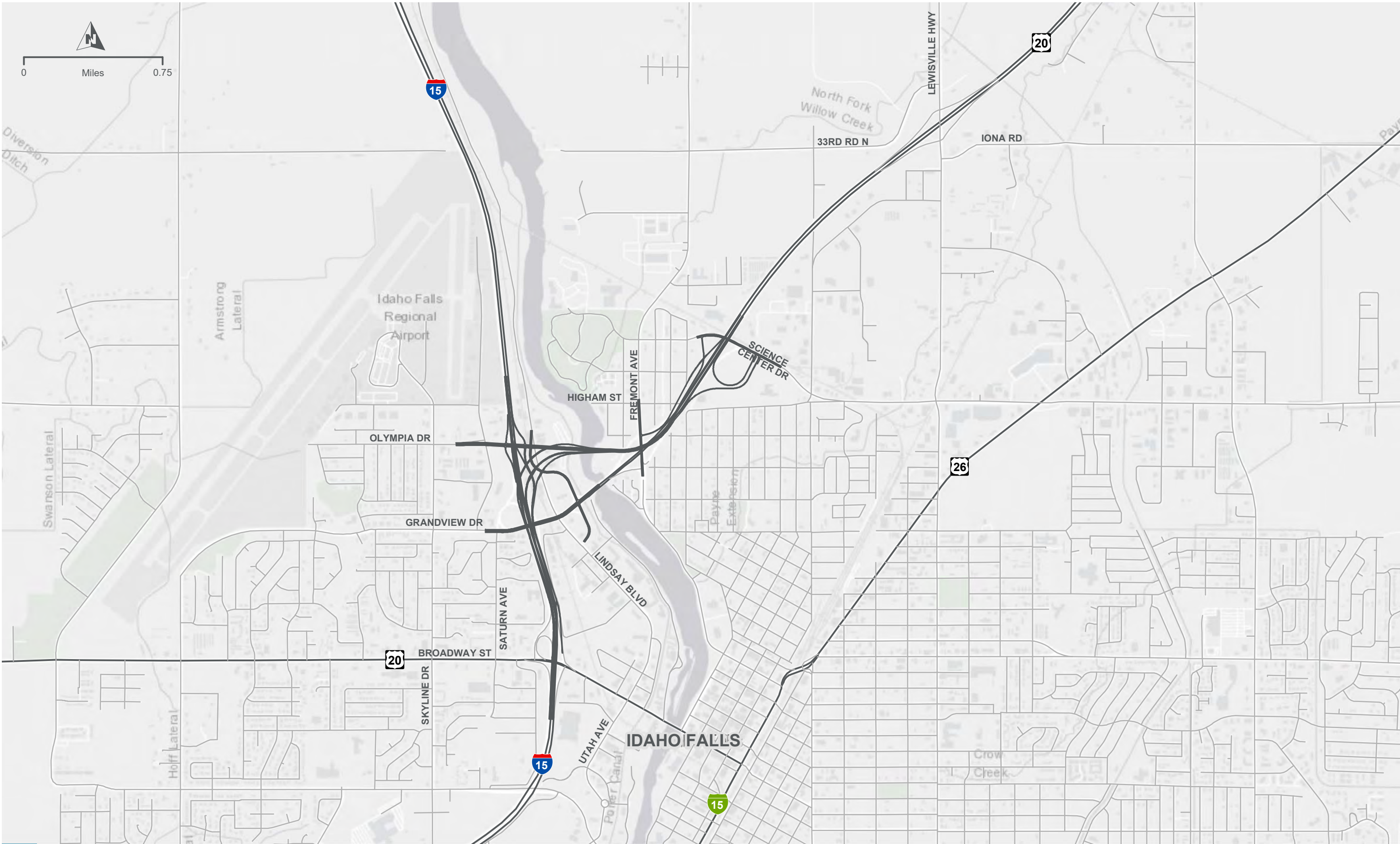
Alternative E3

This alternative reduces weaving concerns between I-15 Exits 118 and 119 by separating regional traffic not exiting in Idaho Falls by providing direct ramp connections from I-15 north of Exit 118 to a new US-20 alignment in line with the existing Olympia St. This realignment goes over Fremont Ave. and then matches into the existing US-20 alignment just to the east. The direct ramps go over Grandview Dr., one railroad crossing, Lindsay Blvd., US-20, and the Snake River before merging into the US-20 alignment west of Fremont Ave.

Exit 118 on I-15 largely remains the same, except for the northbound on ramp which is realigned into a direct ramp connecting to US-20 and new northbound I-15 collector distributor road to the new Olympia Street interchange and northbound I-15. The existing Exit 119 is totally removed from I-15 and no access is provided from Grandview Dr. The new north ramp from Exit 118 connects to the new diamond interchange at the realigned US-20 and Olympia St. interchange. Exit 307 has been removed and rebuilt into an at-grade, signalized intersection between Grandview Dr. and Lindsay Blvd. Exit 308 is also rebuilt as an at-grade, T-intersection on the old US-20 alignment, where Grandview Dr. is terminated upon intersecting Fremont Ave. Two new ramps are provided along US-20 for the Exit 309 interchange to provide full access. The new eastbound loop on-ramp connects to Science Center Blvd. east of US-20, and the westbound off-ramp diverges from US-20 south of Science Center Blvd. and connects to Fremont Ave. Portions of Broadway St., Grandview Drive, US-20, Lindsay Blvd., Fremont Ave. and Science Center Blvd. are rebuilt to install the proposed improvements. Broadway St. is widened from five to seven lanes between the Exit 118 northbound ramp intersection and Utah Ave. A conceptual layout is presented in **Figure 3**.

Alternative H2

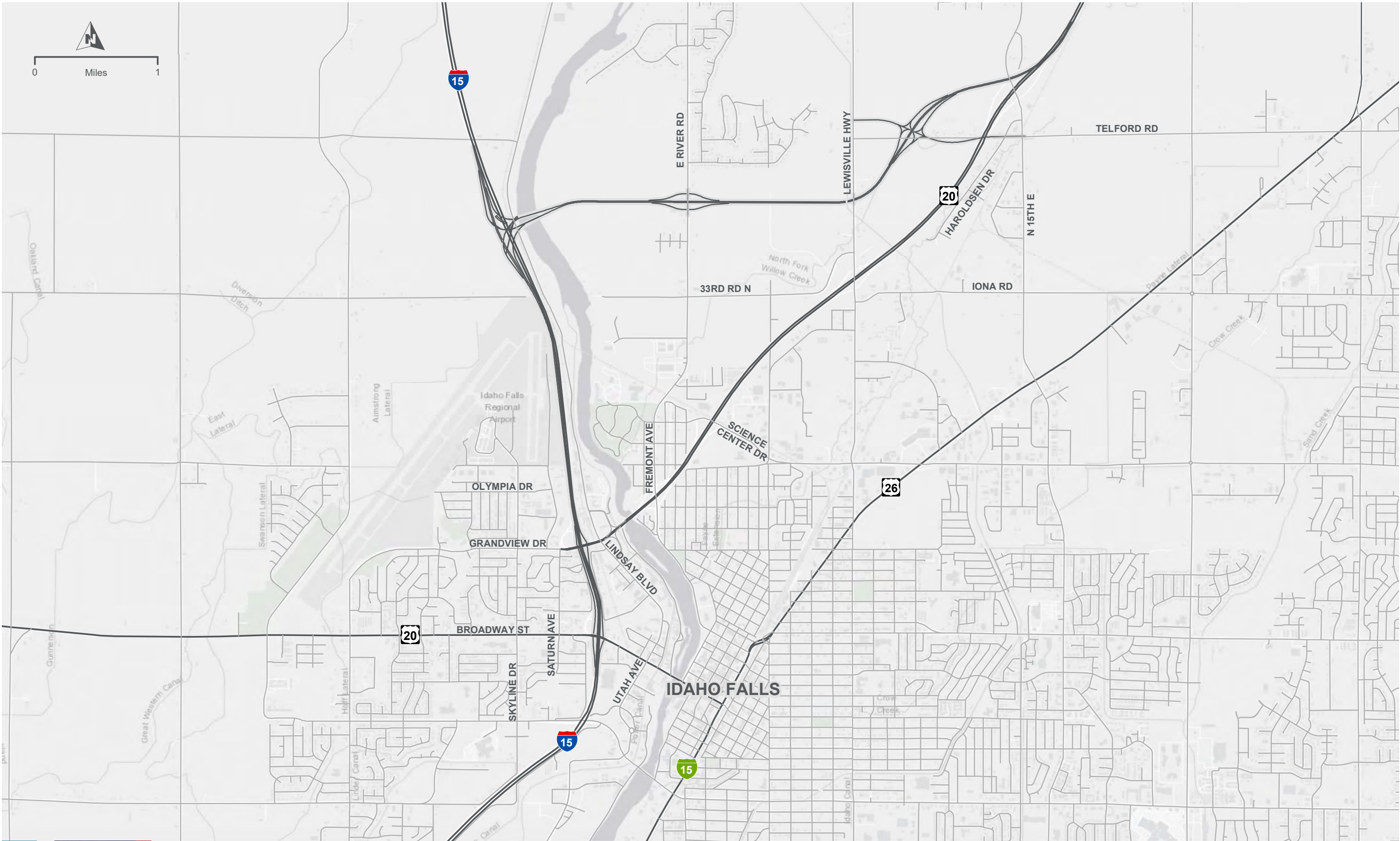
This alternative realigns US-20 from east of Exit 311, relocating that interchange to the west, and moving US-20 to the north and parallel to 33rd North before crossing the Snake River and accessing I-15 at a system interchange with direct ramps for movements between the freeways. I-15 is realigned north of the airport to allow the system interchange to be installed on the west side of the Snake River so only two US-20 bridges are needed over the river. The Exit 311 interchange is rebuilt as a SPUI along the new alignment at Telford Road and N 15th East St. becomes an overpass over the highway. Telford Road is extended and realigned to connect through the new interchange to the Lewisville Highway. The realigned US-20 goes over Lewisville Highway and connects with River Road with a new diamond interchange to access River Road. Exits 118 and 119 on I-15 are rebuilt as a split diamond interchange and Exit 307 on the old US-20 is maintained for access. The split diamond interchange is a potential option to address concerns with the existing interchanges, and was assumed for the operational analysis performed with the 2045 Alternative H travel demand forecasts. The old US-20 alignment becomes a local road with at grade intersections with Fremont Ave., Science Center Dr., Lewisville Road, and Telford Road. Broadway St. is widened from five to seven lanes between the Exit 118 northbound ramp intersection and Utah Ave. A conceptual layout is presented in **Figure 4**.



CONCEPTUAL LAYOUT

ALTERNATIVE E3

FIGURE 3



CONCEPTUAL LAYOUT

ALTERNATIVE H2

FIGURE 4



Planning Year

The planning year of 2045 was agreed upon through discussions with the Technical Leadership and Project Management Teams for this project. The Team members discussed the planning year with the Environmental Resources Team, which includes representatives from ITD District 6, Headquarters, FHWA, BMPO, and the City of Idaho Falls. The purpose of this planning year is to provide a large enough design window of opportunity for the PEL process and the proposed phased approach to developing improvements.

Forecast Travel Demand Volumes

The team has coordinated with BMPO to obtain a copy of their TransCAD travel demand model, which includes the estimated land uses for the years 2014, 2025, and 2040. Socioeconomic data for other years (e.g. 2017 and 2045) was obtained by straight line interpolation/extrapolation of the data included with the model.

The 2045 No-Build and updated Level 3 Alternatives travel demand volumes were developed using modified versions of the TransCAD model with minimal changes to the transportation network for the No-Build and specific network modifications as described for each Level 3 Alternative. The forecast travel demand models created for this study are specific for these analyses and investigations and are not official BMPO models and should not be used for any other purpose.

2045 Alternatives Operational Analysis

The concept of level of service (LOS) was developed to correlate numerical traffic operational data to subjective descriptions of traffic performance. LOS is defined as the system of six designated ranges, from “A” (best) to “F” (worst), used to evaluate performance. The ITD *Roadway Design Manual* (August 2013) Section 335.06 identifies recommended minimum LOS for various roadway classifications, rural or urban settings, and terrain. I-15 and US-20 through the project area fall into the urban/suburban freeway category and are recommended to meet a LOS C threshold. The manual explains that in some cases, the cost of construction for recommended LOS may be prohibitive and lower LOS is acceptable for economic reasons. LOS D was used as the acceptable threshold for operations for the future operational and capacity analysis for comparing how the proposed alternatives will operate.

VISSIM software was used to model and analyze project area highways, roadways, interchanges, and intersections under forecast conditions. HCM 6 analysis methods were used to estimate LOS for the intersection and merge/diverge locations. As the alternatives were analyzed the existing lane configuration and intersection control of local streets were maintained unless specifically modified by the alternative improvements.

Intersection Analysis

Table 1 presents the *Highway Capacity Manual* (HCM) 6th Edition LOS thresholds at stop-controlled and signal controlled intersections. For this concept level analysis, the overall intersection LOS and delay are reported for each intersection modeled.

Table 1. LOS Thresholds for Motor Vehicles at Intersections

LOS	Stop-controlled Intersection Control Delay (s/veh)	Signal-controlled Intersection Control Delay (s/veh)
A	≤ 10	≤ 10
B	> 10-15	> 10-20
C	> 15-25	> 20-35
D	> 25-35	> 35-55
E	> 35-50	> 55-80
F	> 50	> 80

Merge and Diverge Analysis

Freeway congestion usually occurs at freeway merge, diverge, and weaving segments that have the potential to develop bottlenecks, which is evident in existing operations of the I-15 and US-20 system. Average density of traffic flow in passenger cars per mile per lane (pc/mi/ln) in the merge/diverge area is the criteria that defines LOS for ramp operations. **Table 2** presents the HCM 6 LOS thresholds for ramp merge and diverge area. The ramp LOS and estimated density are reported for each ramp merge, diverge, and weaving segment for each alternative.

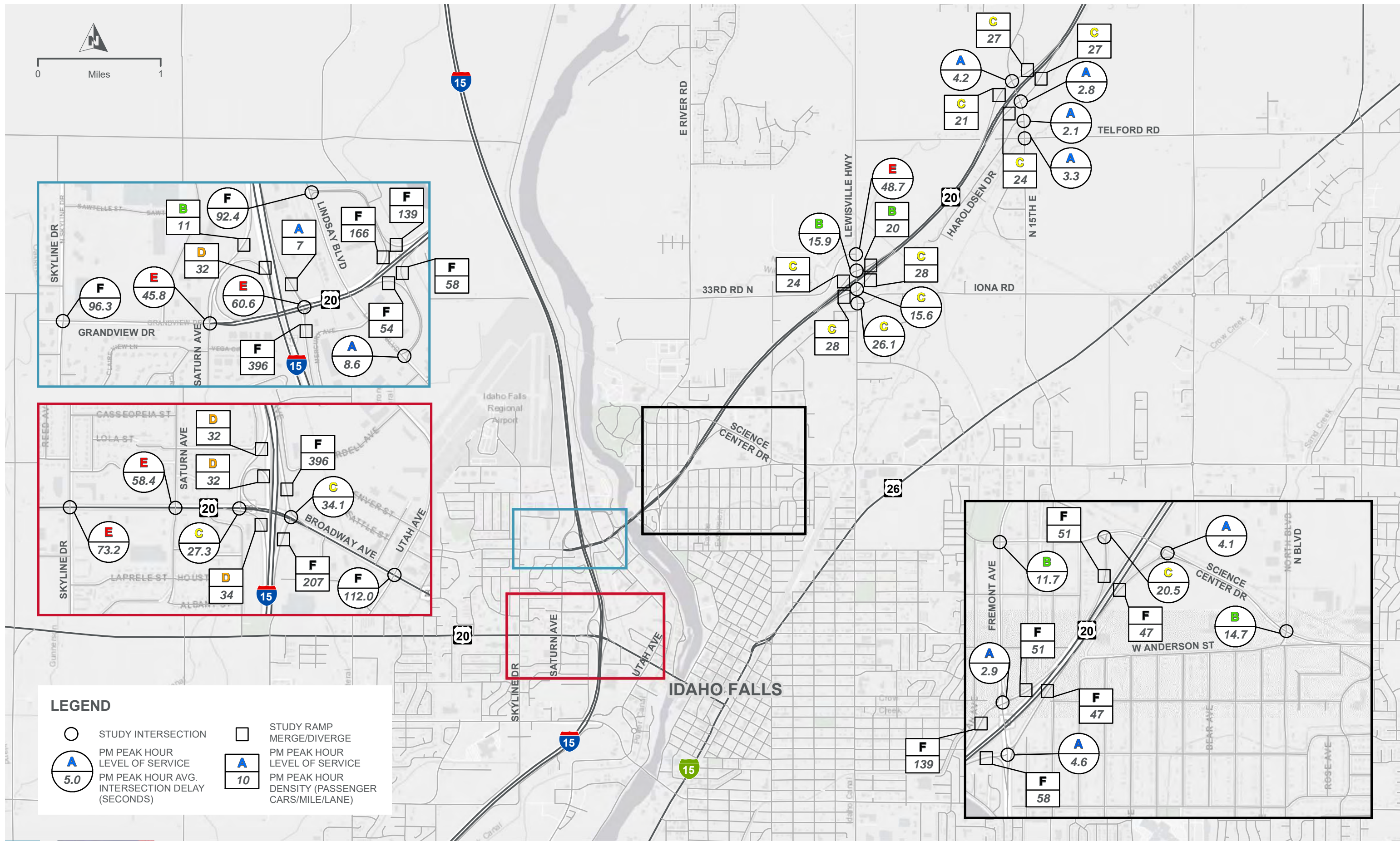
Table 2. LOS Thresholds for Motor Vehicles at Ramp Merge, Diverge, & Weaving Locations

LOS	Density (pc/mi/ln)	Description
A	≤ 10	Unrestricted operations
B	> 10-20	Merging and diverging maneuvers are noticeable to driver
C	> 20-28	Influence are speeds begin to decline
D	> 28-35	Influence area turbulence becomes intrusive
E	> 35	Turbulence felt by virtually all drivers
F	Demand exceeds capacity	Ramp and freeway queues form

Results

NO-BUILD ALTERNATIVE

Intersection and ramp merge/diverge operational analysis results for the 2045 No-Build Alternative are presented in **Figure 5**. During the forecast p.m. peak hour 16 out the 24 intersections analyzed are estimated to operate at an overall intersection average LOS D or better. The intersections of Broadway St. with Skyline Dr. and Saturn Ave., Grandview Dr. with the Saturn Ave./Exit 119 southbound ramp and Exit 119 northbound ramp, and Lewisville Road with 33rd North are estimated to operate at LOS E overall.



2045 FORECAST INTERSECTION OPERATIONS

NO BUILD ALTERNATIVE



The intersections of Broadway St. with Utah Ave., Grandview Dr. with Skyline Dr., and Lindsay Blvd. with the Exit 307 westbound ramp are all estimated to operate at LOS F overall. Significant queues are estimated to build along Broadway St., Grandview Dr., US-20, and the I-15 off ramps to Exits 118 and 119 from these poor performing intersections that will impact adjacent intersection and roadway capacity and access.

Following HCM 6 standards, several merge and diverge segments on I-15 and US-20 are estimated to operate at LOS F. At Exit 118, the northbound off ramp and on ramp both fail with significant densities of queued vehicles. The Exit 119 northbound off ramp also fails with more demand than the intersection at Grandview Dr./US-20 can handle, so the queue spills back onto I-15 and the Exit 118 northbound on ramp. This also impacts the Exit 118 northbound off ramp as do the significant queues at the Broadway St. and Utah Ave. intersection, which back up to the Exit 118 northbound ramp terminal intersection and keep vehicles from being able to turn right from the off ramp to Broadway St. All of the US-20 Exits 307, 308, and 309 on and off ramps are estimated to operate at LOS F. These ramp merges and diverges fail due to significant back up queues on US-20 from the Exit 119 intersections, inadequate weaving distances, and short acceleration lengths.

The I-15 Exit 118 southbound on and off ramps and Exit 119 southbound on ramps are estimated to operate at LOS D. The Exit 119 northbound on ramp is estimated to operate at LOS A, and the southbound off ramp estimated to operate at LOS B. The US-20 Exits 310 and 311 on and off ramps are all estimated to operate at LOS C, except for the Exit 310 westbound off ramp, which is estimated to operate at LOS B.

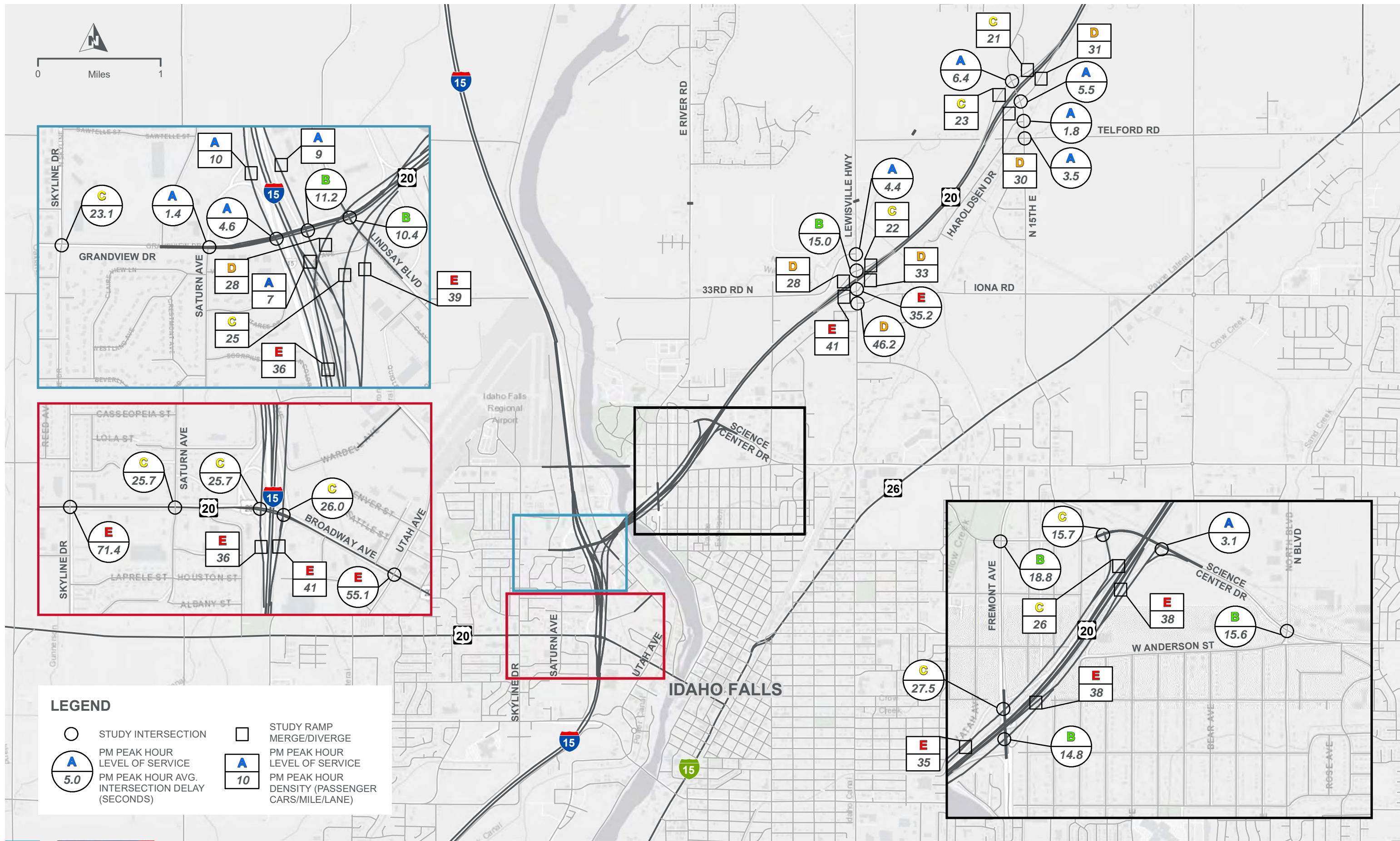
The travel time for drivers traveling on I-15 northbound through the No-Build system is estimated to be 11.2 minutes while southbound drivers are estimated to travel for 4.4 minutes to cover the same distance. Estimated travel time for drivers traveling from I-15 south of Exit 118 to US-20 east of Exit 311 is 15.2 minutes while the time for drivers traveling the same distance from US-20 to I-15 is estimated to be 6.9 minutes.

The total estimated vehicle-miles travelled (VMT) during the peak hour in the 2045 No-Build system is 38,552 miles with vehicle-hours traveled (VHT) at 1,751 hours.

The total vehicles estimated to be able to cross the Snake River under the No-Build Alternative p.m. peak hour conditions is 2,427 eastbound and 2,687 westbound for a total of 5,114. The only available crossing point in the analyzed system is the existing US-20 Bridge, commonly known as the Johns Hole Bridge.

ALTERNATIVE C3

Intersection and ramp merge/diverge operational analysis results for the 2045 Alternative C3 are presented in **Figure 6**. During the forecast p.m. peak hour 21 out the 24 intersections analyzed are estimated to operate at an overall intersection average LOS D or better, and all but four intersections are estimated to operate similarly to or better than in the No-Build Alternative. Broadway St. with Skyline Dr. and Utah Ave., and the Exit 310 EB ramp terminal are the only intersections estimated to operate worse than LOS D at LOS E overall.



2045 FORECAST INTERSECTION OPERATIONS

ALTERNATIVE C3

FIGURE 6



The intersection of Grandview Dr. with Skyline Dr. has much less delay than the No-Build alternative (23.1 seconds versus 96.3 seconds) while operating at LOS C. The intersection of Fremont Avenue and the I-15 southbound direct on ramp/Exit 309 off ramp operates worse because this intersection serves significant traffic accessing I-15 from westbound US-20. The intersection of Lewisville Road and the Exit 311 eastbound ramp operates worse in Alternative C3 because the upstream bottleneck at Exit 119 is removed and more vehicles are able to reach this intersection.

The majority of Alternative C3 merge and diverge segments on I-15 and US-20 are estimated to operate at LOS D or better. The improved ramps at I-15 Exits 118 and 119 operate better than in the No-Build Alternative, US-20 Exit 307 is removed, and Exit 308 is modified. The Alternative C3 improvements allow more eastbound US-20 traffic to reach the interchanges east of the Snake River crossing and the Exit 308 on ramps to eastbound and westbound US-20, the Exit 309 eastbound off and westbound onramps, and the Exit 310 eastbound off ramp are all estimated to operate at LOS E. This is caused by the increase in traffic reaching and using these interchanges which cannot reach them in the No-Build Alternative due to upstream bottlenecks. The direct ramp from I-15 northbound to US-20 eastbound is estimated to operate at LOS E for both the off ramp from I-15 and the on ramp to US-20.

The new direct ramps from Exit 118 to US-20 are estimated to operate at LOS E. The LOS E for the direct ramp connections to I-15 is due to the high volumes entering and exiting I-15 combined with the Exit 118 southern ramp volumes, increasing the volumes using the direct ramps above any other alternative.

The travel time for drivers traveling on I-15 northbound through the Alternative C system is estimated to be 4.4 minutes while southbound drivers are estimated to travel for 4.2 minutes to cover the same distance. The southbound drivers will see a small decrease from the No-Build Alternative and the northbound vehicles travel time is estimated to be reduced by 61%.

Estimated travel time for drivers traveling from I-15 south of Exit 118 to US-20 east of Exit 311 is 5.1 minutes while the time for drivers traveling the same distance from US-20 to I-15 is estimated to be 5.3 minutes. These are reductions of 66% and 22% from the No-Build Alternative, respectively.

The total estimated VMT during the peak hour in the 2045 Alternative C system is 45,268 miles with a total VHT of 1,328 hours. This equates to a 17% increase in VMT and a 24% decrease in VHT over the No-Build Alternative.

The total vehicles estimated to be able to cross the Snake River under Alternative C p.m. peak hour conditions is 3,611 eastbound and 3,307 westbound for a total of 6,918, which is a 35% increase over the No-Build Alternative. The available Snake River crossing points in the analyzed system includes the Johns Hole Bridge, the direct ramp bridges, and the proposed bridge to connect Lindsay Blvd. and Higham St.



ALTERNATIVE E3

Intersection and ramp merge/diverge operational analysis results for the 2045 Alternative E3 are presented in **Figure 7**. During the forecast p.m. peak hour 19 out of the 24 intersections analyzed are estimated to operate at an overall intersection average LOS D or better. The intersections of Broadway St. with Skyline Dr., Lewisville Road with the Exit 310 EB ramp terminal, and Lewisville Road with Iona Road are estimated to operate at LOS F, LOS E, and LOS E, respectively, performing significantly worse compared to the No-Build Alternative. The Lewisville Road intersections operate more poorly due to more vehicle volume being able to get downstream on US-20 EB. The at-grade signalized intersections of Lindsay Blvd. and Fremont Ave. with the old US-20 alignment operate adequately at LOS A and LOS B, respectively, although the latter is worse than the ramp terminal intersection LOS at the interchange under No-Build Conditions. Intersections that are predicted to see significant improvements with the alternative are Broadway St. with Saturn Ave. and Utah Ave., Grandview Dr. with Skyline Dr. and the Exit 119 ramp terminals, and Lewisville Road and 33rd North.

The new intersections on the new US-20/Olympia St. alignment at the north end of the split diamond interchange are estimated to operate well, both at LOS A.

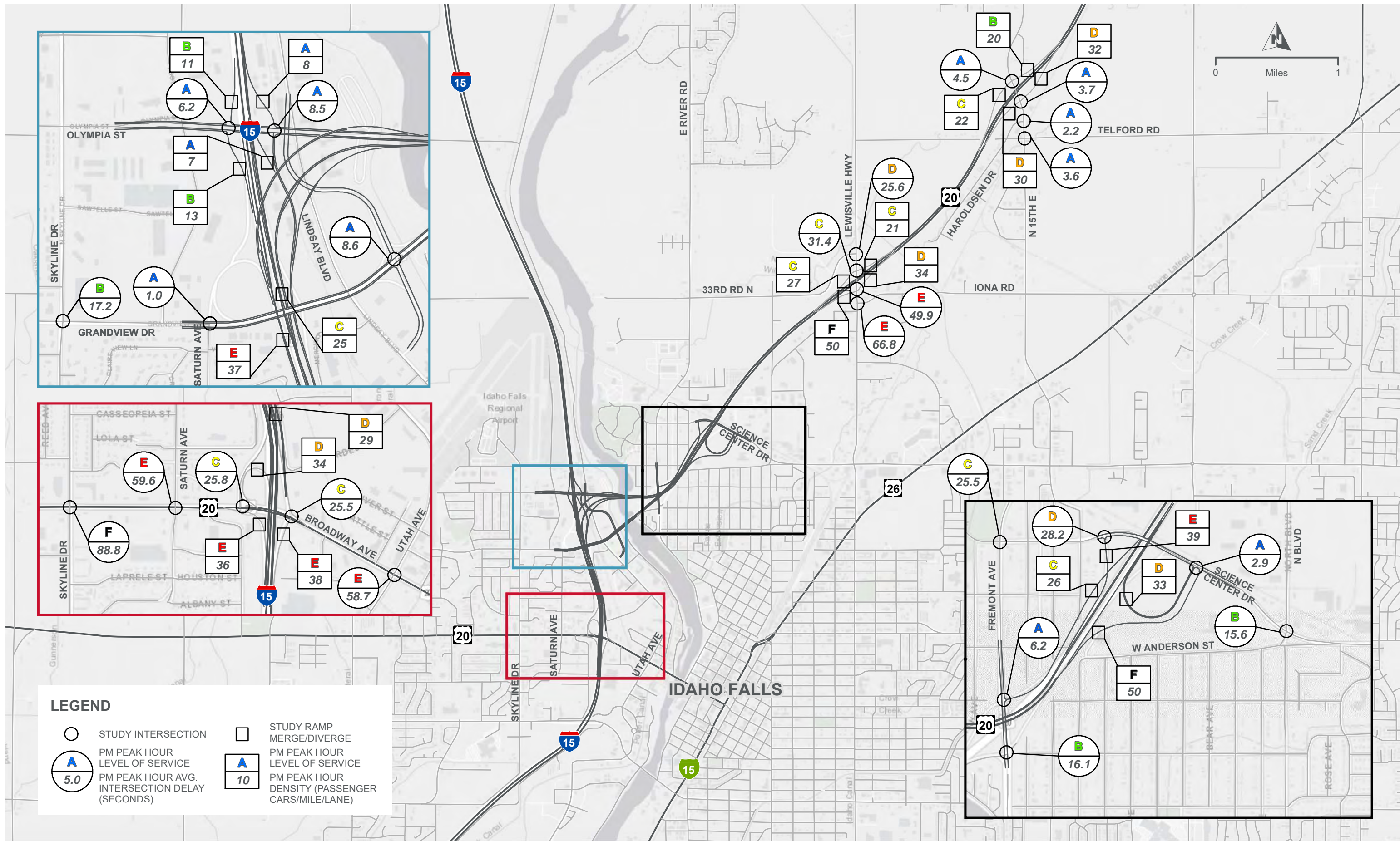
Most of the Alternative E3 merge and diverge segments on I-15 and US-20 are estimated to operate at LOS D or better. The modified configuration of the I-15 exits removes Exit 119 and includes ramps north of Exit 118 to I-15 that directly tie into realigned US-20, west of Fremont Ave. The northbound direct ramp between I-15 and US-20 is estimated to operate at LOS C, and southbound direct ramp at LOS E in the p.m. peak hour. The westbound US-20 weave from the Exit 309 on ramp to the off ramp to southbound I-15 operates at LOS F. The eastbound US-20 off ramp to Exit 310 operates at LOS F because more traffic is able to get downstream on US-20 than in the No-Build alternative.

The travel time for drivers traveling on I-15 northbound and southbound through the Alternative E3 system is estimated to be 4.4 minutes in each direction. The southbound drivers will see no improvement from the No-Build Alternative, but the northbound vehicle travel time is estimated to be reduced by 61%.

Estimated travel time for drivers traveling from I-15 south of Exit 118 to US-20 east of Exit 311 is 5.4 minutes while the time for drivers traveling the same distance from US-20 to I-15 is estimated to be 5.3 minutes. These are reductions of 65% and 22% from the No-Build Alternative, respectively.

The total estimated VMT during the peak hour in the 2045 Alternative E3 system is 44,273 miles with a total VHT of 1,376 hours. This equates to a 15% increase in VMT and a 21% decrease in VHT over the No-Build Alternative.

The total vehicles estimated to be able to cross the Snake River under Alternative E3 p.m. peak hour conditions is 3,813 eastbound and 3,129 westbound for a total of 6,942, which is a 36% increase over the No-Build Alternative. The available Snake River crossing points in the analyzed system include the existing Johns Hole Bridge, the realigned US-20 Bridge, which the direct ramps tie into.





ALTERNATIVE H2

Intersection and ramp merge/diverge operational analysis results for the 2045 Alternative H2 are presented in **Figure 8**. During the forecast p.m. peak hour 23 out of the 24 intersections analyzed are estimated to operate at an overall intersection average LOS D or better, and all but the Exit 118 ramp terminal intersections are estimated to operate similarly to or better than in the No-Build Alternative. There are no intersections estimated to operate at LOS F with this alternative. The intersection of Broadway St. with Skyline Dr. is estimated to operate at LOS E overall. This alternative shifts demand away from the Lewisville Highway interchange and the intersections along this road operate well.

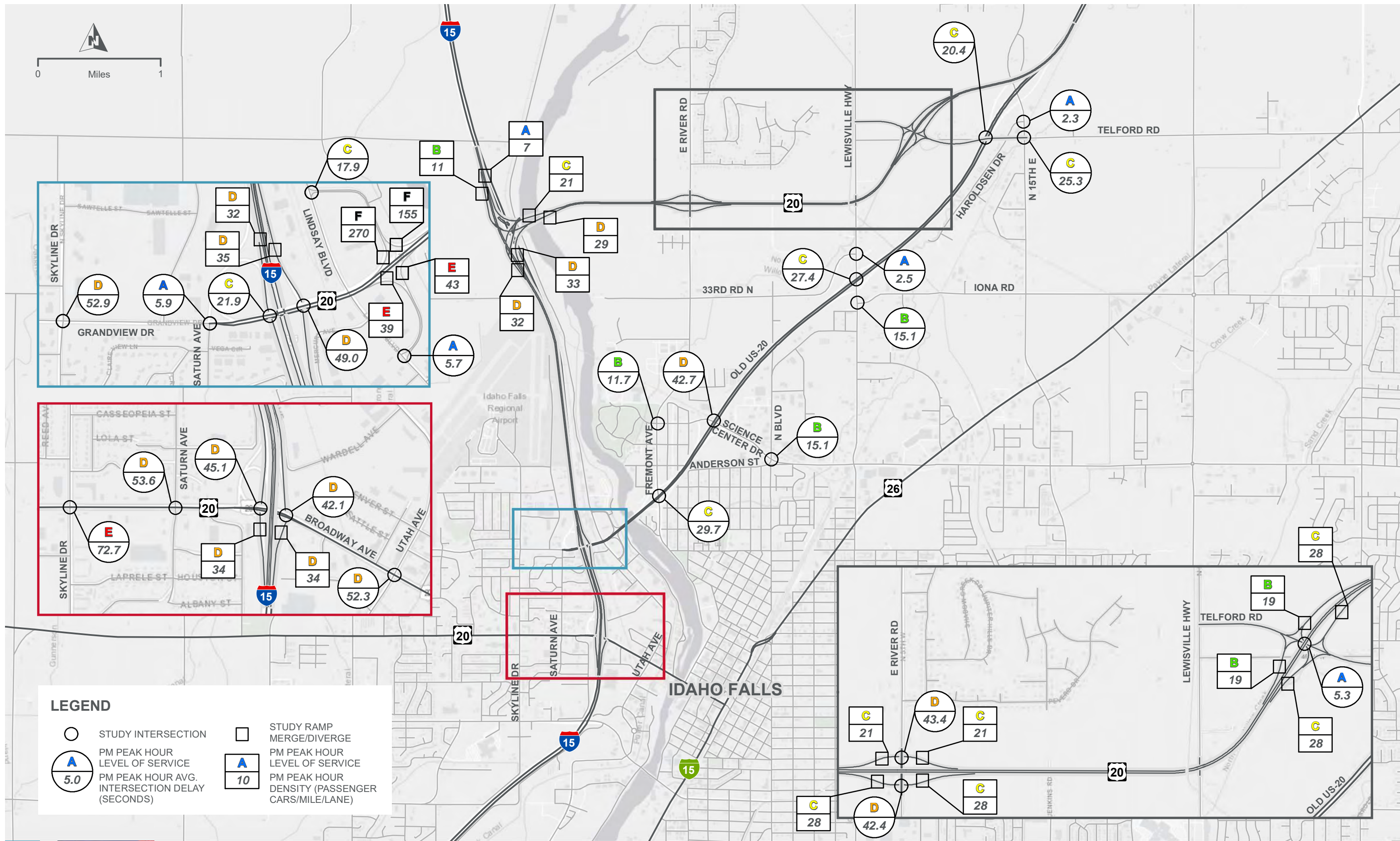
Most of the Alternative H2 merge and diverge segments on I-15 and US-20 are estimated to operate at LOS D or better. The ramps serving the split diamond configuration of the I-15 118 and 119 exits operate well with reduced demand due to the realigned US-20 mainline and better spacing between on and off ramps. The Exit 307 interchange is assumed to remain and the ramps are estimated to operate at LOS E and F. While this is better than the No-Build Alternative, similar issues with queue backups and the close spacing of the ramps to the split diamond intersections with Grandview Dr. exist with this alternative causing congestion and queue backups through the Exit 307 ramps. The direct ramps between I-15 and US-20 are estimated to operate adequately in the p.m. peak hour.

The travel time for drivers traveling on I-15 northbound and southbound through the Alternative H2 system is estimated to be 4.4 minutes in each direction. The southbound drivers will see no improvement from the No-Build Alternative but the northbound vehicles travel time is estimated to be reduced by 61%.

Estimated travel time for drivers traveling from I-15 south of Exit 118 to US-20 east of Exit 311 is 6.7 minutes while the time for drivers traveling the same distance from US-20 to I-15 is estimated to be 6.4 minutes. These are reductions of 56% and 7% from the No-Build Alternative, respectively. Drivers traveling through the Alternatives H2 network from I-15 to US-20 travel a farther distance than in the previous alternatives.

The total estimated VMT during the peak hour in the 2045 Alternative H2 system is 49,357 miles with a total VHT of 1,614 hours. This equates to a 28% increase in VMT and an 8% decrease in VHT over the No-Build Alternative. These measures of effectiveness are higher than previous alternatives because the I-15 to US-20 trips travel a farther distance than the previous alternatives.

The total vehicles estimated to be able to cross the Snake River under Alternative H2 p.m. peak hour conditions is 3,566 eastbound and 3,072 westbound for a total of 6,638, which is a 30% increase over the No-Build Alternative. The available Snake River crossing points in the analyzed system includes the Johns Hole Bridge and the realigned US-20 bridges.



2045 FORECAST INTERSECTION OPERATIONS

ALTERNATIVE H2

FIGURE 8

Conclusions

This analysis was completed at a high level and some individual intersections, interchanges, and/or ramp models may be refined in future phases of the project to give more refined or different results. This conceptual analysis allows a comparison between the updated Level 3 Alternatives, including the No-Build Alternative, in the following tables. This comparison will be used to identify improvements that can be included with each alternative and evaluate which should be carried forward into a NEPA analysis.

Table 3 summarizes the estimated travel times for each alternative in minutes, **Table 4** summarizes the total VMT and VHT for each alternative, and **Table 5** summarizes the total vehicles estimated to cross the Snake River with each alternative. Each table also estimates the change in the measurement from No-Build for each alternative.

Table 3. Estimated Travel Times for Each Alternative (Minutes)

Route	No-Build	Alt. C3	% Change	Alt. E3	% Change	Alt. H2	% Change
I-15 NB Through	11.2	4.4	-61%	4.4	-61%	4.4	-61%
I-15 SB Through	4.4	4.2	-5%	4.4	0%	4.4	0%
I-15 NB to US-20 EB	15.2	5.1	-66%	5.4	-65%	6.7	-56%
US-20 WB to I-15 SB	6.9	5.3	-22%	5.3	-22%	6.4	-7%

Table 4. Estimated VMT and VHT

Measure	No-Build	Alt. C3	% Change	Alt. E3	% Change	Alt. H2	% Change
VMT	38,552	45,268	17%	44,273	15%	49,357	28%
VHT	1,751	1,328	-24%	1,376	-21%	1,614	-8%

Table 5. Total Vehicles Crossing the Snake River

Route	No-Build	Alt. C3	% Change	Alt. E3	% Change	Alt. H2	% Change
Eastbound	2,427	3,611	49%	3,813	57%	3,566	47%
Westbound	2,687	3,307	23%	3,129	16%	3,072	14%
Total	5,114	6,917	35%	6,942	36%	6,638	30%



The tables below summarize the results of the operational analysis for each alternative and allow a comparison of the measurements. LOS is reported in each table along with a color code with **LOS A = BLUE**, **LOS B = GREEN**, **LOS C = YELLOW**, **LOS D = ORANGE**, **LOS E = RED**, and **LOS F = BLACK**. **Table 6** presents the results of the analysis for the intersections included in each alternative. **Table 7** presents the results of the analysis for the merge and diverge ramps included in each alternative.



Table 6. Intersection Analysis Results

Intersection	No-Build		Alt. C3		Alt. E3		Alt. H2	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Broadway St - US-20 / Skyline Dr	73.2	E	71.4	E	88.8	F	72.7	E
Broadway St - US-20 / Saturn Ave	58.4	E	25.7	C	59.6	E	53.6	D
Broadway St - US-20 / Exit 118 SB Ramp	27.3	C	25.7	C	25.8	C	45.1	D
Broadway St - US-20 / Exit 118 NB Ramp	34.1	C	26.0	C	25.5	C	42.1	D
Broadway St / Utah Ave	112.0	F	55.1	E	58.7	E	52.3	D
Grandview Dr / Skyline Dr	96.3	F	23.1	C	17.2	B	52.9	D
Grandview Dr / Saturn Ave	NA	NA	1.4	A	1.0	A	5.9	A
Grandview Dr / Exit 119 SB Ramp	45.8	E	4.6	A	NA	NA	21.9	C
Grandview Dr / Exit 119 NB Ramp	60.6	E	11.2	B	NA	NA	49.0	D
Lindsay Blvd / Exit 307 WB Ramp	92.4	F	NA	NA	NA	NA	17.9	C
Lindsay Blvd / Exit 307 EB Ramp	8.6	A	NA	NA	NA	NA	5.7	A
Grandview Dr / Lindsay Blvd	NA	NA	10.4	B	8.6	A	NA	NA
Fremont Ave / Exit 308 WB Ramp	2.9	A	NA	NA	NA	NA	NA	NA
Fremont Ave / Exit 308 EB Ramp	4.6	A	NA	NA	NA	NA	NA	NA
Fremont Ave / Exit 309 WB Ramp	NA	NA	27.5	C	6.2	A	NA	NA
Fremont Ave / Grandview Dr	NA	NA	14.8	B	16.1	B	29.7	C
Science Center Dr / Fremont Ave	11.7	B	18.8	B	25.5	C	11.7	B
Science Center Dr / Exit 309 WB Ramp	20.5	C	15.7	C	28.2	D	42.7	D
Science Center Dr / Exit 309 EB Ramp	4.1	A	3.1	A	2.9	A		
Science Center Dr / North Blvd	14.7	B	15.6	B	15.6	B	15.1	B
Lewisville Rd / 33rd North	48.7	E	4.4	A	25.6	D	2.5	A
Lewisville Rd / Exit 310 WB Ramp	15.9	B	15.0	B	31.4	C	27.4	C
Lewisville Rd / Exit 310 EB Ramp	15.6	C	35.2	E	49.9	E		
Lewisville Rd / Iona Road	26.1	C	46.2	D	66.8	E	13.5	B
N 15th E / Exit 311 WB Ramp	4.2	A	6.4	A	4.5	A	NA	NA
N 15th E / Exit 311 EB Ramp	2.8	A	5.5	A	3.7	A	NA	NA
N 15th E / Haroldsen Dr	2.1	A	1.8	A	2.2	A	2.3	A
N 15th E / Telford Rd	3.3	A	3.5	A	3.6	A	25.3	C
Olympia St / I-15 SB Ramp	NA	NA	NA	NA	6.2	A	NA	NA
Olympia St / I-15 NB Ramp	NA	NA	NA	NA	8.5	A	NA	NA
Telford Rd / US-20	NA	NA	NA	NA	NA	NA	5.3	A
Telford Rd / Grandview Dr	NA	NA	NA	NA	NA	NA	20.4	C
E River Rd / US-20 WB	NA	NA	NA	NA	NA	NA	43.4	D
E River Rd / US-20 EB	NA	NA	NA	NA	NA	NA	42.4	D

Table 7. Merge/Diverge Analysis Results

Ramp	No-Build		Alt. C3		Alt. E3		Alt. H2	
	Density	LOS	Density	LOS	Density	LOS	Density	LOS
Exit 118 NB Off Ramp	207	F	41	E	38	E	34	D
Exit 118 EB Broadway St SB On Ramp	34	D	36	E	36	E	34	D
Exit 118 WB Broadway St SB On Ramp	32	D			34	D		
Exit 118 NB On Ramp	396	F	39	E	NA	NA	NA	NA
Exit 119 NB Off Ramp			NA	NA	NA	NA	NA	NA
Exit 118 SB Off Ramp	32	D	36	E	NA	NA	NA	NA
Exit 119 SB On Ramp			NA	NA	NA	NA	NA	NA
Exit 119 NB On Ramp	7	A	9	A	NA	NA	35	D
Exit 119 SB Off Ramp	11	B	10	A	NA	NA	32	D
Exit 307 EB Off Ramp	54	F	NA	NA	NA	NA	39	E
Exit 307 WB On Ramp	166	F	NA	NA	NA	NA	270	F
Exit 307 EB On Ramp	58	F	NA	NA	NA	NA	43	E
Exit 308 EB Off Ramp			NA	NA	NA	NA	NA	NA
Exit 307 WB Off Ramp	139	F	NA	NA	NA	NA	155	F
Exit 308 WB On Ramp			35	E	NA	NA	NA	NA
Exit 308 EB On Ramp	47	F	38	E	NA	NA	NA	NA
Exit 309 EB Off Ramp			38	E	50	F	NA	NA
Exit 308 WB Off Ramp	51	F	26	C	26	C	NA	NA
Exit 309 WB On Ramp			NA	NA	39	E	NA	NA
Exit 309 EB On Ramp	NA	NA	NA	NA	33	D	NA	NA
Exit 310 EB Off Ramp	28	C	41	E	50	F	NA	NA
Exit 310 WB On Ramp	24	C	28	D	27	C	NA	NA
Exit 310 EB On Ramp	28	C	33	D	34	D	NA	NA
Exit 310 WB Off Ramp	20	B	22	C	21	C	NA	NA
Exit 311 WB On Ramp	21	C	23	C	22	C	NA	NA
Exit 311 EB Off Ramp	25	C	30	D	30	D	NA	NA
Exit 311 EB On Ramp	27	C	31	D	32	D	NA	NA
Exit 311 WB Off Ramp	27	C	21	C	20	B	NA	NA
Direct Ramp NB I-15 Off Ramp	NA	NA	25	C	25	C	33	D
Direct Ramp SB I-15 On Ramp	NA	NA	28	D	37	E	32	D
Direct Ramp NB I-15 On Ramp	NA	NA	7	A	7	A	7	A
Direct Ramp SB I-15 Off Ramp	NA	NA	NA	NA	NA	NA	11	B
Direct Ramp EB US-20 On Ramp	NA	NA	39	E	NA	NA	29	D
Direct Ramp WB US-20 Off Ramp	NA	NA	NA	NA	NA	NA	21	C
Olympia St SB I-15 On Ramp	NA	NA	NA	NA	13	B	NA	NA
Olympia St SB I-15 Off Ramp	NA	NA	NA	NA	11	B	NA	NA
Olympia St NB I-15 On Ramp	NA	NA	NA	NA	8	A	NA	NA
Olympia St NB I-15 Off Ramp	NA	NA	NA	NA	29	D	NA	NA
E River Rd EB US 20 Off Ramp	NA	NA	NA	NA	NA	NA	28	C
E River Rd WB US 20 On Ramp	NA	NA	NA	NA	NA	NA	21	C
E River Rd WB US 20 Off Ramp	NA	NA	NA	NA	NA	NA	21	C
E River Rd EB US 20 On Ramp	NA	NA	NA	NA	NA	NA	28	C
Telford Rd EB US 20 Off Ramp	NA	NA	NA	NA	NA	NA	28	C
Telford Rd WB US 20 On Ramp	NA	NA	NA	NA	NA	NA	19	B
Telford Rd EB US 20 On Ramp	NA	NA	NA	NA	NA	NA	28	C
Telford Rd WB US 20 Off Ramp	NA	NA	NA	NA	NA	NA	19	B



Cost Risk Assessment and Value Engineering Report

I-15/US-20 Connector

Idaho Transportation Department

Idaho Falls, Idaho

December 9-12, 2019

Prepared by:



HDR Engineering, Inc.
412 E. Parkcenter Blvd
Suite 100
Boise, ID 83706

Executive Summary

Introduction

This cost risk assessment and value engineering (CRAVE) report summarizes the events of the study conducted for the Idaho Transportation Department (ITD) and facilitated by HDR Engineering, Inc. (HDR). The subject of the CRAVE study was the I-15/US-20 Connector Project.

The study was conducted December 9-12, 2019. The primary objectives of the CRAVE study were to:

- Verify or improve upon the various concepts for the project.
- Identify high risk areas in delivering the project.
- Improve the value of the project alternatives through innovative measures aimed at improving the performance while reducing costs of the project.
- Perform a cost risk assessment on both the baseline design and the Value Engineering (VE) recommendations.

Project Overview

The Idaho Transportation Department (ITD) is working with the City of Idaho Falls and Bonneville County to study ways to improve I-15 and US-20 to better serve Idaho Falls and the growing region.

ITD is conducting a PEL (Planning and Environmental Linkages) study of six interchanges within a two-mile area that have outlived their usefulness and service capacity. Traffic volumes and congestion and aging infrastructure are impacting safety and travel for all users. The purpose of the PEL study is to identify and analyze corridor improvements that address safety, congestion, mobility and travel time reliability for all users on I-15 and US-20 in Bonneville County near Idaho Falls. This study is a necessary and important preliminary step in redesigning the corridor to provide a safe and reliable commute for the next 20 years and beyond.

The CRAVE team was presented three alternatives:

- **Alternative C 'As-Presented'**
 - Adds lanes and ramps to separate the through-traffic from the local exiting traffic between the I-15 Exit 118 (Broadway Street) and US-20 Exit 308 (Riverside Drive/City Center)
 - Requires new retaining walls, bridges, and replaces US-20 Exit 308, I-15 Exits 118 and 119
 - Maintains alignment near or in the same location as the existing I-15/US-20 roadways

- **Alternative E ‘As-Presented’**
 - Moves the I-15/US-20 interchange (Exit 119) about a half mile north
 - Adds separated through-lanes and frontage roads and converts the existing US-20 from Grandview Drive to Fremont Avenue to a local street
 - *Alternative E – Option 1 ‘As-Presented’*
 - Removes Exits 307 and 308 and Exit 309
 - *Alternative E – Option 2 ‘As-Presented’*
 - Removes Exit 307 and replaces the interchange at Exit 308 and Exit 309 into one interchange with ramp modifications
- **Alternative H ‘As-Presented’**
 - Moves the I-15/US-20 interchange (Exit 119) about a mile north and adds a new roadway to connect to US-20 at E 49th N (Telford Road)
 - Converts existing US-20 between Johns Hole and E 49th N to a local street
 - Includes new interchanges at I-15 and US-20 to tie new roadway back to existing roadway
 - Adds safety and capacity improvements on I-15 at Exits 118 and 119

Value Engineering Recommendations

In total, the CRAVE team generated 81 ideas for the project. These ideas were compared against the baseline concepts of each alternative and presented by the project team. The ideas evaluated were developed and then added to create new improved alternatives (options):

- Alternative C – Option 3
- Alternative E – Option 3
- Alternative H – Option 1

The performance of the improved alternatives above are shown in **Table 1** and are detailed in Section 6, Development Phase

Table 1: Summary of Recommendations

Description	Performance (P)	Cost (C) \$ millions	Value Index
Alternative C – Option 3	634	\$ 297.1	2.13
Alternative E – Option 3	634	\$ 253.5	2.50
Alternative H – Option 1	620	\$ 411.3	1.51

To facilitate implementation, a Value Engineering Recommendation Approval Form is included in **Appendix A**. If the Project Manager elects to reject or modify a recommendation, a brief explanation of why is located on the bottom of the form. Should these VE recommendations be implemented, a separate scenario risk analysis was performed to provide the project team with the additional information associated with

both base cost reduction and risk mitigation. This information is provided in the Analysis of Results section of this report.

Cost and Schedule Risk Analysis

In performing the cost risk analysis, a risk-based modeling tool was incorporated to model the cost and schedule uncertainty and the identified project risks. **Table 2** shows the projects base costs in YOE (Year of Expenditure) dollars. An escalation rate of 3% was used in this analysis. The modeled results at the 70th percentile for Alternative C ‘As-Presented’ were **\$385.0 million**, Alternative E – Option 2 ‘As-Presented’ **\$360.6 million**, and Alternative H ‘As-Presented’ **\$510.6 million** prior to implementation of risk management strategies and VE recommendations.

The CRAVE team identified 41 risks that carry both potential schedule and cost impacts to these alternatives. In the workshop, a likely range of schedule and costs impacts and the probability of occurrence were identified for each risk. The next step was to develop response strategies and VE recommendations for the active risks. These were added into the risk-based modeling tool as results to measure the overall impact the risk mitigation strategies would have on the project. Additional opportunities were developed to capture the magnitude of the VE recommendations developed by the team.

This secondary analysis result was presented to the audience during the Presentation Phase of the CRAVE based on the risk mitigation strategies and value engineering recommendations for each alternative as developed by the team.

Please refer to **Table 2** for additional information on additional recommendations introduced as a result of risk mitigation strategies. Additional detail is provided in Section 7, Analysis of Results.

Table 2: ‘As-Presented’ and Improved CRAVE Analysis – Risk Mitigation

Alternative	Base Total Project Cost (YOE \$M)	Value (YOE \$M)		
		10%	70%	90%
Alternative C ‘As-Presented’	\$306.6	\$337.9	\$385.0	\$404.6
Alternative C – Option 3	\$217.0	\$238.5	\$271.7	\$286.0
Net Reduction in Projected Cost of \$113.3 million				
Alternative E – Option 2 ‘As-Presented’	\$291.0	\$310.1	\$360.6	\$376.3
Alternative E – Option 3	\$203.9	\$212.7	\$237.1	\$248.7
Net Reduction in Projected Cost of \$123.5 million				
Alternative H ‘As-Presented’	\$402.0	\$453.2	\$510.6	\$535.9
Alternative H – Option 1	\$320.6	\$360.2	\$411.3	\$435.8
Net Reduction in Projected Cost of \$99.3 million				

The results in **Table 2** illustrate the power of proactive management and implementation of risk mitigation strategies. In summary, implementing the risk mitigation strategies and


VE recommendations can offer an additional cost reduction beyond the direct cost of the risks themselves due to time related costs, including escalation and extended overheads.

The CRAVE team wishes to express its appreciation to the project design team and management for the excellent support they provided during the study. These recommendations and other design considerations provided will assist in the management decisions necessary to move the project forward.

Sincerely,

A handwritten signature in blue ink, reading 'Blane H. Long'.

Blane H. Long, CVS®
HDR



B

**Level Three Screening
Results**

Meeting Minutes

Project:	I-15/US-20 Connector	
Subject:	Level Three Screening of Alternatives	
Date:	Wednesday, March 11 – Thursday, March 12, 2020	
Location:	ITD District 6 Office, Rigby	
Attendees:	Karen Hiatt - ITD	Tracy Ellwein - HDR
	Ryan Day - ITD	Cameron Waite - HDR
	Curtis Calderwood - ITD	Jason Longsdorf - HDR
	Mark Layton - ITD	Kelly Hoopes - Horrocks
	Lisa Applebee (phone) - FHWA	Ben Burke - Horrocks
	Brent Ingram - FHWA	Mike McKee - Horrocks
	Chris Canfield - City of Idaho Falls	Darrell West - BMPO
	Lance Bates - Bonneville County	Corrie Hugaboom - HDR (phone)
	Drew Mephin - ITD	Stephanie Borders - HDR
	Nick Contos - Citizen	John McPherson - HDR

The purpose of the Level Three Screening of Alternatives meeting was for the analysis team to review the screening completed by each team member for the four alternatives carried forward and refined from the Level Two screening. The goal of this meeting was to review the screening results and come to a general consensus on the alternatives to recommend move forward in a future NEPA study.

Each member of the analysis team was provided a packet of study information and an alternatives evaluation matrix prior the screening meeting.

The first day of the meeting began with an alternatives overview, followed by a short Q&A session. Each team member received their evaluation matrix back to review their scoring based on the presentation of the alternatives. The second day of the meeting included reviewing the evaluation matrix, discussion of the screening questions and agreeing on alternatives to recommend to move into NEPA.

Day 1, March 11, 1:00 - 4:30 pm

PROJECT OVERVIEW

Tracy began the meeting with an overview of project updates from Level Two to Level Three. The updates included additional public outreach, geometric refinements to each alternative, historic resource and wetland identification research, and a Cost Risk and Value Engineering

(CRAVE) study. The five alternatives included in the review were: C, E-1, E-2, H, and the no build alternative.

PUBLIC OUTREACH AND COMMUNITY WORKING GROUP

Stephanie provided a summary of public outreach completed since the May 2019 public open house.

- a. 49th East neighborhood requested a meeting to review Alternative H and one was held at the ITD District 6 office on June 10, 2019.
- b. Updated the website with additional study information.
- c. Worked with the school district to send 1,000 project information flyers home with school children.
- d. Held the fifth CWG on February 27th, 2020. A separate meeting summary will be posted on the website. Main comments from the CWG include: the ability to connect Alternative H to the west; concerns about Alternative H cutting through farmland and the industrial dump site; airport/FAA direction in terms of where and what type of development can occur NE of the airport runways.
- e. The CWG will be provided the open house displays and boards to comment on before we finalize for the next public open house.

OVERVIEW OF SCREENING PROCESS

Jason explained the Level Three screening process, how the evaluation criteria were developed through the screening phases and the screening matrix. The screening process will be captured in a PEL study and submitted to FHWA. Earlier today (3/11/2020) the Environmental Resources Committee met and the project team discussed with the resource agencies a request forthcoming for a concurrence letter that states the agencies were involved with the PEL study and agree with recommendations.

REVIEW OF THE LEVEL 3 ALTERNATIVES

The team collected LIDAR data in the fall of 2019 to aid in the geometric layout and rough modeling to establish impact areas. All alternatives meet current AASHTO standards, though some features only meet minimums. Traffic analysis included VISSIM (microsimulation) for Level 3 alternatives. The outcome of the CRAVE study, held in December 2019, led to enhancements of the Level Three alternatives to improve operations and consider ways to reduce cost while maintaining benefits. The analysis team received an overview of the revised alternatives from the CRAVE and highlights are as follows:

Alternative C – On alignment near the existing I-15/US-20 location.

- Site limitations caused the direct connect ramps to be designed to 50 mph, not the 55 mph design speed. The speed reduction helps improve geometry and minimize impacts.
- Improved local access at Fremont and Science Center ramps
- Grandview remains at ground level; therefore the Lindsay intersection is at grade.
- This design does not require major changes to the Broadway interchange.
- Slip ramp from Riverside SB to US-20 / I-15 flyover via direct connect.

- Additional River crossing (Lindsay) is beneficial but may not be critical to the overall operational benefit of Alternative C. However, there are benefits to local movements and could be useful during construction staging for the Exit 119 interchange replacement.

Alternative E-1 & E-2 – Slight shift north of existing Exit 119. E-1 and E-2 are the same configuration on the west side of the river and are different on the east side of the river.

- Impacts the potentially historically eligible grain silos.
- Improved construction staging since most new roadway is off alignment.
- Bike/pedestrian connectivity works well.
- Grandview overpass needs to be widened.
- Traffic modeling shows this alternative seems to drive much more traffic to the Broadway I-15 interchange.
- Would require removing the railroad and relocating the businesses.

Alternative H

- Minimal revisions through the CRAVE, mainly shifted the E-W US-20 alignment south, about ¼ mile.
- The I-15 direct connect ramps were reduced to 50 mph design speed.
- Geometric revisions to reduce the number of river crossings from four to two.
- This alternative does assume a split interchange at Exit 118/119.
- Even though there is additional vehicle miles traveled (VMT) with alternative H, it is handling almost 20,000 more vehicles per day.
- Travel cost savings in this scenario are not as high as anticipated due to increased VMT.

Day 2, March 12, 8:30 am - 3:00 pm

Open discussion on team member's thoughts and observations from previous day's meeting.

- Constructability is a challenge.
- What does the conversion of US-20 look like if Alternative C is not recommended? Some grade separations will remain because of the railroad crossings.
- Wetland impacts have changed through the CRAVE analysis and with the updated field studies, therefore the wetland impacts to H and E have been reduced from the screening packet.
- Impacts to the railroad and railroad supported businesses is a concern.
- Could we consider a C or E now and then long term solution would be H? Given the project size and magnitude, group determined it would be unlikely we could spend money on two options and instead suggested that we just do one that fits the purpose and need.
- Where is the growth projected in Idaho Falls? The growth will be in the north and south of the city – not as much east and west. Population is expected to grow from 120,000 to 190,000 in the next 30 years. Some policy board members thought those projections were too low.

DISCUSSION OF SUMMARIZED EVALUATIONS

Group reviewed the VISSIM traffic visualization and discussed the evaluations for each alternative.

Alternative C

Pros: Alternative is closest to town for connectivity; less impacts as it is on alignment.

Cons:

- Grades on ramps cause concerns for freight and heavy vehicles
- Railroad relocation
- Runway proximity for the new connection to Higham (is this critical?)
- Ramps may need additional lanes and slip ramps are geometrically close

Evaluation Criteria Review:

- Consider a question in the demographics about whether this is consistent with long-term plans.
- Are additional improvements likely required to accommodate 50 year traffic needs?
- Economic impacts based on construction will create problems for the downtown area.
- Concerns about the impact of the ramps and bridges over the river near downtown during construction.
- Likely requires a temporary bridge over the river.

Alternative E

Pros: Provides an additional river crossing; still close to the downtown area.

Cons:

- Operational issues at Lewisville at Exit 310
- Railroad relocation and business impacts
- Need to do something to mitigate traffic at Broadway since we don't have the CD roads that are present in Alt C

Alternative H

Pros: Off alignment lends to good constructability with limited impacts to highway users and business; improved safety with the spacing of the access points.

Cons:

- Impacts to farmland
- Varying public support
- Impact on the existing view shed for residents

- Changes to development plans with some areas already platted, though some may be in the airport restricted zone. Concerns about expansion to the west and the possibility of US-20 extending further west across additional farmland.
- May lead to sprawling development and drawing potential business away from downtown
- Unknowns in the industrial waste site

DISCUSSION OF RECOMMENDED ALTERNATIVES

Each analysis team member gave an overview on their observations, concerns and recommendations for what alternatives met screening questions and should be recommended to move into a NEPA study.

Below is a summary of the discussion points:

- Alternative C will be very difficult to construct, impacting business, highway users and increased cost for traffic control. The alternative could pose safety risks during construction due to the congested area. It does not add a new river crossing, which is beneficial to help Broadway and also during construction. Alternative C and Alternative E are very similar, though Alternative E would provide better constructability. The geometric layout of the ramps lends to weaving concerns, possible safety issues and design challenges to make ramps meet AAHSTO standards.
- Alternative E would require railroad removal and business relocation, both north and south of Grandview. Working with the railroad could present challenges for negotiations and agreements. There would be impacts to an RV park that could be an environmental justice issue. Alternative C or Alternative E would serve the in-town needs more than Alternative H.
- Alternative H would provide the best constructability. Exits 118 and 119 will still need improvements. The alternative would provide a new river crossing and have fewer wetland and environmental justice impacts. It would impact the neighborhood to the north. Alternative H provides long-term benefits as the area grows.

The group agreed to move forward with two recommended alternatives: Alternative E and Alternative H.

STEPS FORWARD

- Prepare for the public information meeting to present Level Three alternatives and the recommendation to move two alternatives forward. Collect comments and feedback.
- Consider sending a separate letter to properties within Alternative E and H impact areas as an extra outreach to suggest they attend the public information meeting.
- Consider running traffic models to look beyond the planning year horizon to determine when alternatives might fail. Include Broadway in this model.
- Consider using a planning year of 2050 in the NEPA study.
- Utilize the interim project at Exit 119. It allows acceptable LOS through 2031 with a 119 dual right to EB US-20.

I-15/US-20 Alternatives Summary

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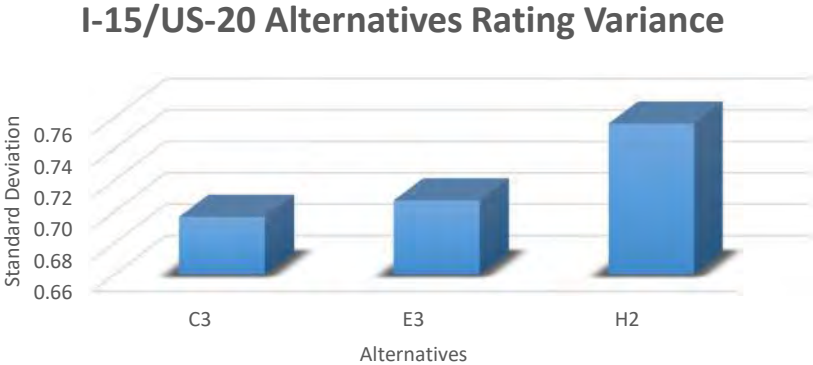
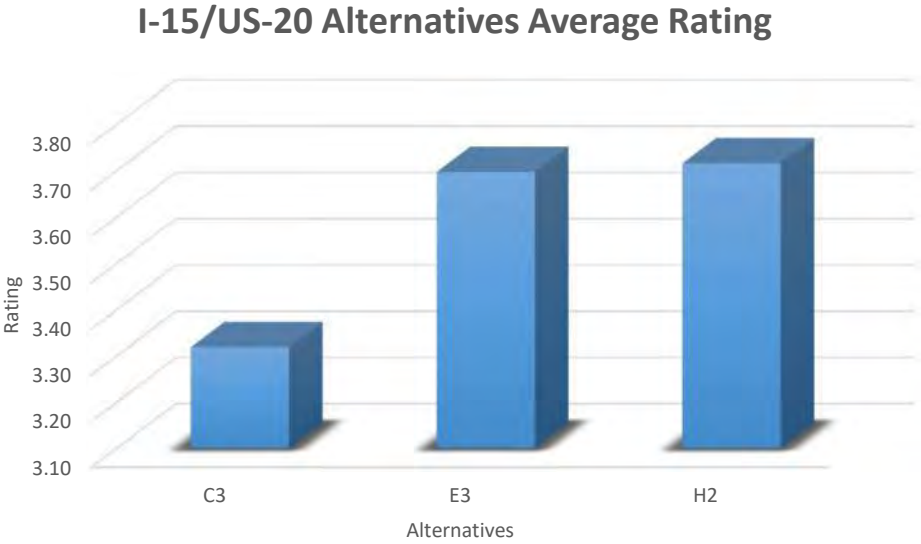
Checked by:

Date:

Date:

Evaluator	Alternative		
	C3	E3	H2
	3.70	3.70	3.40
	2.80	2.90	3.60
	3.40	4.30	4.20
	4.00	4.60	2.90
	3.40	3.60	3.90
	3.10	3.15	3.60
	2.90	3.70	4.40
	2.80	4.00	3.60
	3.30	3.40	2.90
	3.00	3.90	3.70
	3.80	3.90	4.30
	3.40	4.00	4.00
	3.20	3.30	3.50
	3.80	4.00	3.85
	3.70	3.80	4.10
	2.80	2.90	3.50
Average Rating	3.32	3.70	3.72
Std. Dev.	0.70	0.71	0.76

Statistics	Avg. Rating	Std. Dev.
Max:	3.72	0.76
Min:	3.32	0.70
Mean:	3.58	0.72
Median:	3.70	0.71



Alternative C3 Score Summary

Calculated by:
Checked by:

Date:
Date:

Alternative	Evaluator	Criteria										Average
		#1: Safety	#2: Congestion	#3: Connectivity	#4: Future Travel Demand	#5: Environmental	#6: Public Support	#7: Constructability	#8: Access	#9: Economic	Overall	
C3		4	4	4	4	3	4	3	4	3	4	3.70
		2	3	3	3	3	3	2	4	3	2	2.80
		3	4	4	3	4	4	3	3	3	3	3.40
		4	4	4	5	3	3	4	5	4	4	4.00
		4	4	4	4	3	3	2	5	2	3	3.40
		4	3	4	4	3	3	3	3	2	2	3.10
		3	3	3	4	3	3	3	3	1	3	2.90
		3	4	3	4	3	3	1	3	2	2	2.80
		4	4	4	4	3	2	3	4	2	3	3.30
		4	3	3	3	3	3	3	2	3	3	3.00
		4	4	4	4	4	3	4	4	4	3	3.80
		4	4	4	5	3	4	2	2	3	3	3.40
		3	4	3	3	3	4	3	3	3	3	3.20
		4	5	4	5	4	4	2	4	3	3	3.80
		4	5	4	3	2	3	4	4	4	4	3.70
		3	3	3	3	3	4	2	3	1	3	2.80
	Average	3.56	3.81	3.63	3.81	3.13	3.31	2.75	3.50	2.69	3.00	3.32
	Std. Dev.	0.63	0.66	0.50	0.75	0.50	0.60	0.86	0.89	0.95	0.63	0.70

Max:

Min:

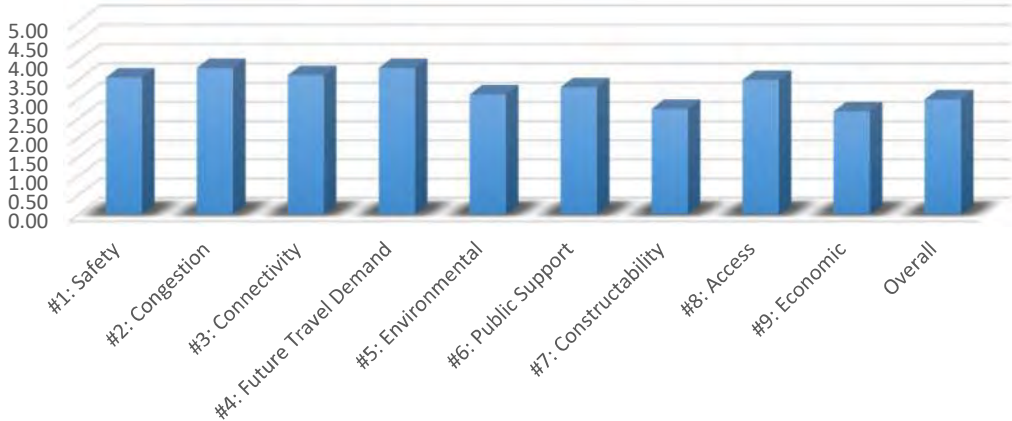
Mean:

Median:

Std. Dev.

4.00
2.80
3.32
3.35
0.70

Alternative C3 - Criteria Averages



Alternative E3 Score Summary

Calculated by:

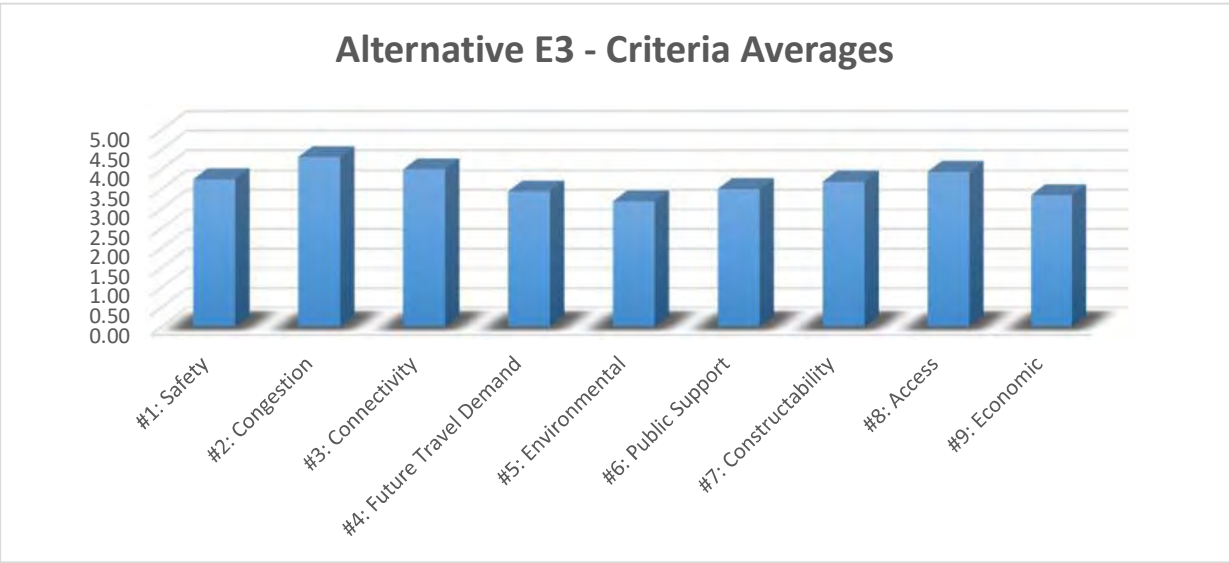
Checked by:

Date:

Date:

Alternative	Evaluator	Criteria									Overall	Average
		#1: Safety	#2: Congestion	#3: Connectivity	#4: Future Travel Demand	#5: Environmental	#6: Public Support	#7: Constructability	#8: Access	#9: Economic		
E3		5	4	4	4	2	3	4	4	3	4	3.70
		3	3	3	2	3	3	3	4	2	3	2.90
		4	5	5	4	4	4	4	4	4	5	4.30
		5	5	4	5	3	4	5	5	5	5	4.60
		4	4	4	3	3	4	3	4	3	4	3.60
		3	4	4	2	3	3	4	3	2.5	3	3.15
		4	4	4	4	3	3	4	4	3	4	3.70
		4	5	5	4	4	4	4	3	3	4	4.00
		3	4	4	3	3	3	4	5	1	4	3.40
		4	4	4	4	3	4	4	4	4	4	3.90
		4	5	4	3	4	3	4	5	4	3	3.90
		4	5	4	4	4	4	3	4	4	4	4.00
		3	4	3	3	2	4	3	4	4	3	3.30
		4	5	4	5	4	4	3	3	4	4	4.00
		3	5	5	3	3	3	4	4	4	4	3.80
		3	3	3	2	3	3	3	3	3	3	2.90
	Average	3.75	4.31	4.00	3.44	3.19	3.50	3.69	3.94	3.34	3.81	3.70
	Std. Dev.	0.68	0.70	0.63	0.96	0.66	0.52	0.60	0.68	0.98	0.66	0.71

Statistics	Avg. Rating
Max:	4.60
Min:	2.90
Mean:	3.70
Median:	3.75
Std. Dev.	0.71



Alternative H2 Score Summary

Calculated by:
Checked by:

Date:
Date:

Alternative	Evaluator	Criteria									Overall	Average
		#1: Safety	#2: Congestion	#3: Connectivity	#4: Future Travel Demand	#5: Environmental	#6: Public Support	#7: Constructability	#8: Access	#9: Economic		
H2		3	3	3	5	4	2	2	5	4	3	3.40
		4	3	5	4	3	2	2	5	4	4	3.60
		5	4	5	4	4	3	3	5	5	4	4.20
		5	3	4	4	2	1	2	2	3	3	2.90
		5	4	4	4	4	3	4	4	3	4	3.90
		3	3	4	4	4	2	3	5	4	4	3.60
		5	4	4	5	4	3	4	5	5	5	4.40
		5	3	4	4	3	2	3	5	4	3	3.60
		4	4	3	4	2	1	2	4	3	2	2.90
		4	4	3	4	2	4	4	4	4	4	3.70
		5	4	4	5	4	3	5	4	5	4	4.30
		5	4	4	5	2	3	3	5	5	4	4.00
		4	4	3	4	3	2	4	3	5	3	3.50
		5	4	3	5	3	4	4	2.5	4	4	3.85
		4	4	4	4	3	3	4	5	5	5	4.10
		4	3	4	5	2	2	3	4	4	4	3.50
	Average	4.38	3.63	3.81	4.38	3.06	2.50	3.25	4.22	4.19	3.75	3.72
	Std. Dev.	0.72	0.50	0.66	0.50	0.85	0.89	0.93	0.98	0.75	0.77	0.76

Statistics	Avg. Rating
Max:	4.40
Min:	2.90
Mean:	3.72
Median:	3.65
Std. Dev.	0.76

Alternative H2 - Criteria Averages

