US 20 & SH 75
TIMMERMAN JUNCTION
Intersection Study

US-20/SH-75 (TIMMERMAN JUNCTION) INTERSECTION STUDY

TIER 1 ALTERNATIVES ASSESSMENT PACKET

The Idaho Transportation Department (ITD), in collaboration with local community leaders and representatives, is evaluating a wide range of alternatives for potential future improvements to the US-20/ SH-75 (Timmerman Junction) intersection. This study is applying a tiered approach to evaluating alternatives and determining intersection improvement recommendations. This approach will involve three stages - Tier 1 Alternatives, Tier 2 Alternatives, Recommended Intersection Improvements.

This packet provides information on the existing conditions of the intersection, along with information on nine Tier 1 Alternatives for the intersection (several of the alternatives have multiple variations). The Tier 1 Alternatives are the initial set of alternatives developed for the intersection and represent the "wide range" of alternatives being considered.

ITD welcomes your feedback and appreciates your time in completing the comment sheet provided at the back of this packet. Your comments will be considered to help determine the alternatives carried forward as Tier 2 Alternatives.

For more information please contact:
Bruce Christensen
ITD Study Manager
208-886-7860
Bruce.Christensen@itd.idaho.gov

or visit
http://itd.idaho.gov/projects/d4/US20_ID75_IntersectionStudy/

EXISTING CONDITIONS

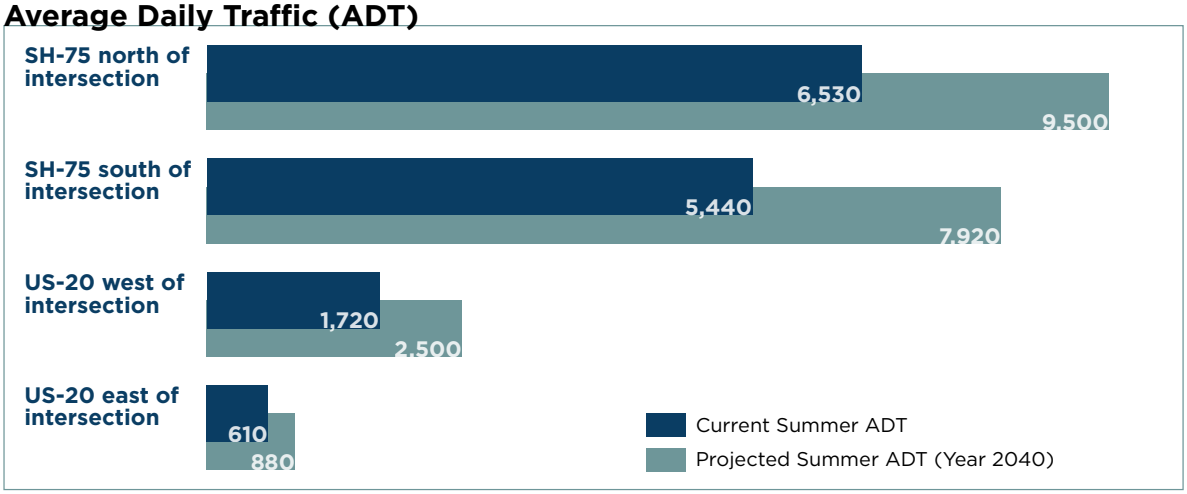
INTERSECTION CHARACTERISTICS

The US-20/SH-75 intersection is currently two-way, stop-controlled with eastbound and westbound US-20 being the stop-controlled approaches and northbound and southbound SH-75 being uncontrolled approaches. Each approach entry has a single left-through-right lane with the exception of the southbound entry, which has a left-through lane and a separate right-turn lane.

EXISTING CONDITIONS CONTINUED

	SH-75	US-20
Posted Speeds	**45 MPH** within 1/2 mile of intersection **55 MPH** beyond 1/2 mile of intersection	**65 MPH**
Functional Classification	**Minor Arterial**	**Principal Arterial** (National Highway System Route)
Scenic Byways	**Sawtooth Scenic Byway**	**Peaks to Craters Scenic Byway** east of the intersection

Average Daily Traffic (ADT)



Trucks in ADT

4%

4%

8%

8%

Crash Data (2011-2015)

10 reported crashes

8 involved at least one injury

1.7 expected crashes/ year

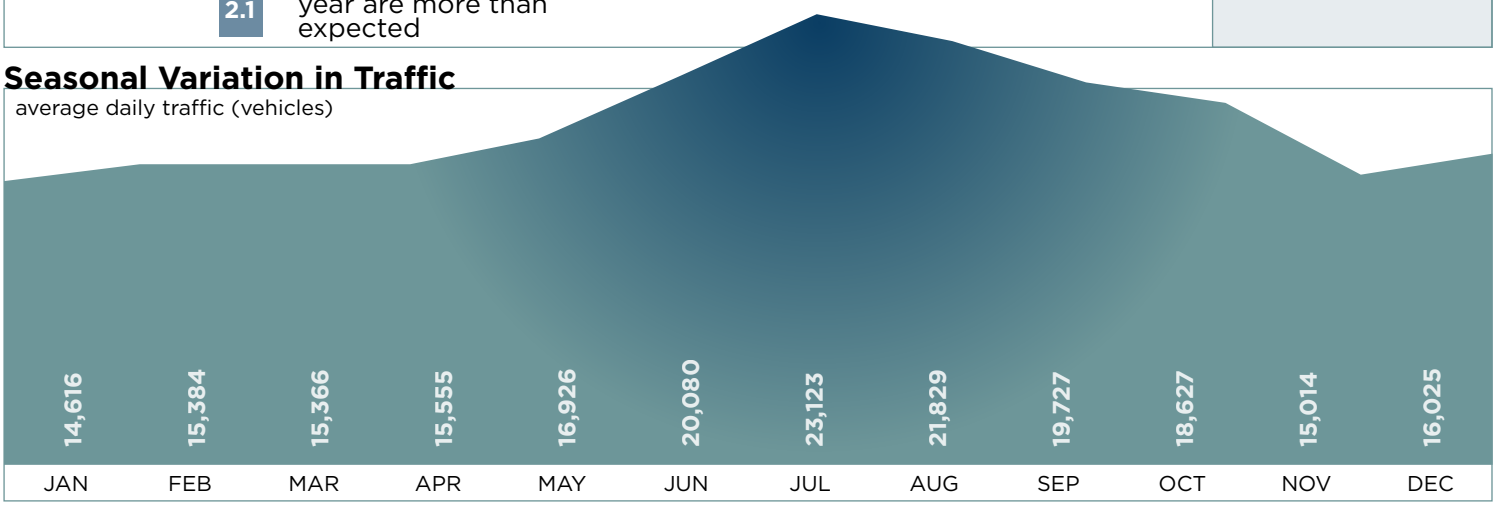
2.1 observed crashes/ year are more than expected

Contributing cause for all crashes was "failure to stop/yield"

All crashes were angle type

ZERO reported **fatalities at the intersection** in the past 15 years

Seasonal Variation in Traffic



ALTERNATIVE 1
NO BUILD

The existing lane configurations and two-way, stop control remain in place at the intersection.

ASSESSMENT OF FUTURE CONDITIONS

Costs

	Construction	Maintenance
Very High		
High		
Medium	None	
Low		
Very Low		

Safety Performance

2.4 expected crashes / year

With the no-build condition...

- proportion of injury crashes expected to remain high
- 'failure to stop' crashes expected to continue to be an issue

Future Traffic Operations (Year 2040)

SH-75	US-20	Expected Residual Capacity
A Level of Service	**D** Level of Service	**56%**
<1 Average Delay (sec/veh)	**27** Average Delay (sec/veh)	

Study Management Team (SMT) Feedback

- Recent improvements improved safety
- Adequate operations now and in the future
- Other alternatives are costly

SMT Recommendation:
Carry Forward

ALTERNATIVE 2A
REMOVE SKEW (SHIFT NORTH)

US-20 is realigned to intersect perpendicular to SH-75 approximately 100 feet to the north of the current intersection. A northbound right-turn lane is added on SH-75, while all other lane configurations remain unchanged. The existing two-way, stop control remains in place at the intersection.

ASSESSMENT OF FUTURE CONDITIONS

Costs

Safety Performance

2.3 expected crashes / year

Removing the skew from the intersection is expected to...

- reduce crashes overall by ~5%
- result in a minor decrease in injury crashes

Future Traffic Operations (Year 2040)

SH-75	US-20	Expected Residual Capacity
A	D	56%
Level of Service	Level of Service	
<1	27	
Average Delay (sec/veh)	Average Delay (sec/veh)	

Mobility Compared to No Build

	SH-75	US-20
Average Delay (sec/veh)	No Change	No Change
Stops	No Change	No Change
Travel Time through Intersection	Minimal Decrease	Minimal Increase

Study Management Team (SMT) Feedback

- Minimal safety benefit
- Extensive impacts

SMT Recommendation:
Eliminate

ALTERNATIVE 2B

REMOVE SKEW (SHIFT EAST)

SH-75 is realigned to intersect perpendicular to US-20 approximately 100 feet to the east of the current intersection. A northbound right-turn lane is added, while all other lane configurations remain unchanged. The existing two-way, stop control remains in place at the intersection.

ASSESSMENT OF FUTURE CONDITIONS

Costs

Safety Performance

2.3 expected crashes / year

Removing the skew from the intersection is expected to...

- reduce crashes overall by ~5%
- result in a minor decrease in injury crashes

Future Traffic Operations (Year 2040)

SH-75	US-20	Expected Residual Capacity
A Level of Service	D Level of Service	56%
<1 Average Delay (sec/veh)	27 Average Delay (sec/veh)	

Mobility Compared to No Build

	SH-75	US-20
Average Delay (sec/veh)	No Change	No Change
Stops	No Change	No Change
Travel Time through Intersection	Minimal Increase	No Change

Study Management Team (SMT) Feedback

- Minimal safety benefit
- Extensive impacts

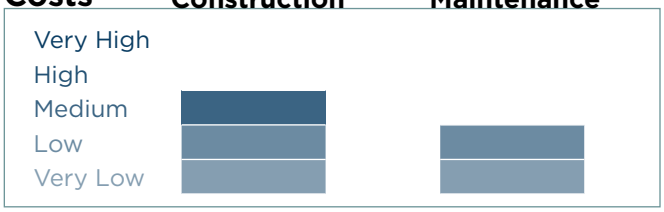
SMT Recommendation:
Eliminate

ALTERNATIVE 2C
REMOVE SKEW (CENTERED)

US-20 is realigned to intersect perpendicular to SH-75 at approximately the same intersection location. A northbound right-turn lane is added on SH-75, while all other lane configurations remain unchanged. The existing two-way, stop control remains in place at the intersection.

ASSESSMENT OF FUTURE CONDITIONS

Costs



Safety Performance

2.3 expected crashes / year

Removing the skew from the intersection is expected to...

- reduce crashes overall by ~5%
- result in a minor decrease in injury crashes

Future Traffic Operations (Year 2040)

SH-75	US-20	Expected Residual Capacity
A	D	56%
Level of Service	Level of Service	
<1	27	
Average Delay (sec/veh)	Average Delay (sec/veh)	

Mobility Compared to No Build

	SH-75	US-20
Average Delay (sec/veh)	No Change	No Change
Stops	No Change	No Change
Travel Time through Intersection	No Change	Minimal Increase

Study Management Team (SMT) Feedback

- Minimal safety benefit
- Least impactful skew removal option

SMT Recommendation:
Carry Forward

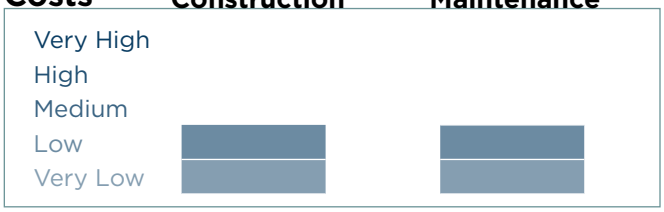
ALTERNATIVE 3A

ADD A NORTHBOUND RIGHT-TURN LANE ON SH-75

A northbound right-turn lane is added on SH-75, while all other lane configurations remain unchanged. The existing two-way, stop control remains in place at the intersection. Widening occurs only on the south leg of the intersection.

ASSESSMENT OF FUTURE CONDITIONS

Costs



Safety Performance

2.0* expected crashes/year

Adding a right-turn lane to the intersection...

- ↓ expected minor reduction in the number of crashes overall
- ↑ proportion of angle and injury crashes expected to remain high

*Given historical crashes are primarily angle type, actual crashes/year may be higher than estimated.

Future Traffic Operations (Year 2040)

SH-75	US-20	Expected Residual Capacity
A Level of Service	D Level of Service	56%
<1 Average Delay (sec/veh)	27 Average Delay (sec/veh)	

Mobility Compared to No Build

	SH-75	US-20
Average Delay (sec/veh)	No Change	No Change
Stops	No Change	No Change
Travel Time through Intersection	Minimal Decrease	No Change

Study Management Team (SMT) Feedback

- Minor safety and mobility benefits
- Not a long-term solution

SMT Recommendation:
Eliminate

ALTERNATIVE 3B

ADD NORTHBOUND AND SOUTHBOUND LEFT- AND RIGHT-TURN LANES ON SH-75

Northbound left- and right-turn lanes are added on SH-75. A southbound left-turn lane is added on SH-75. All other lane configurations remain unchanged. The existing two-way, stop control remains in place at the intersection. Widening occurs on the north and south legs of the intersection.
Note that left-turn lanes are generally not warranted according to ITD Turn Lane Warrant Guidance

ASSESSMENT OF FUTURE CONDITIONS

Costs

	Construction	Maintenance
Very High		
High		
Medium		
Low	■	■
Very Low	■	■

Safety Performance

2.0* expected crashes/year

Adding left- and right-turn lanes to the intersection...

- ↓ expected minor reduction in the number of crashes overall
- ↑ proportion of angle and injury crashes expected to remain high

*Given historical crashes are primarily angle type, actual crashes/year may be higher than estimated.

Future Traffic Operations (Year 2040)

SH-75	US-20	Expected Residual Capacity
A Level of Service	**D** Level of Service	**56%**
<1 Average Delay (sec/veh)	**27** Average Delay (sec/veh)	

Mobility Compared to No Build

	SH-75	US-20
Average Delay (sec/veh)	Minimal Decrease	No Change
Stops	Minimal Decrease	No Change
Travel Time through Intersection	Minimal Decrease	No Change

Study Management Team (SMT) Feedback

- Potential safety and operations benefit
- Relatively low cost and easy to implement

SMT Recommendation:
Carry Forward

ALTERNATIVE 4A

ALL-WAY STOP-CONTROLLED INTERSECTION

Stop signs are added to the northbound and southbound approaches on SH-75. All lane configurations remain unchanged but the southbound right-turn channelization is removed.

Note that conversion to all-way stop-control is not warranted according to national guidance.

ASSESSMENT OF FUTURE CONDITIONS

Costs

	Construction	Maintenance
Very High		
High		
Medium		
Low	■	
Very Low	■	■

Safety Performance

1.3 expected crashes / year

Converting the intersection to all-way stop-control is expected to...

- ↓ reduce crashes overall by ~60%-75%%
- ↓ reduce injury and angle crashes by ~45%-55%
- ↑ result in an increase in rear-end crashes

Future Traffic Operations (Year 2040)

SH-75	US-20	Expected Residual Capacity
C Level of Service	**B** Level of Service	**34%**
16 Average Delay (sec/veh)	**11** Average Delay (sec/veh)	

Mobility Compared to No Build

	SH-75	US-20
Average Delay (sec/veh)	Significant Increase	Significant Decrease
Stops	Significant Increase	No Change
Travel Time through Intersection	Some Increase	Minor Decrease

Study Management Team (SMT) Feedback

- Could increase rear-end crashes
- Too much operational impact to SH-75
- Not a good long-term solution

SMT Recommendation:
Eliminate

ALTERNATIVE 4B

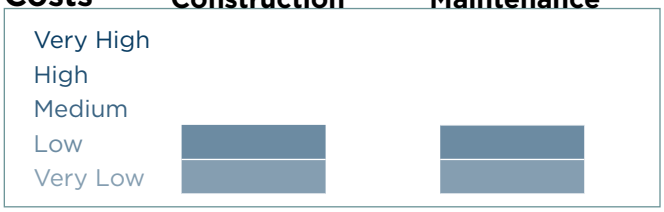
ALL-WAY STOP-CONTROLLED INTERSECTION AND REMOVE SOUTHBOUND RIGHT-TURN LANE

Stop signs are added to the northbound and southbound approaches on SH-75. The southbound right-turn lane is removed and all other lane configurations remain unchanged.

Note that conversion to all-way stop-control is not warranted according to national guidance.

ASSESSMENT OF FUTURE CONDITIONS

Costs



Safety Performance

1.3 expected crashes / year

Adding left- and right-turn lanes to the intersection...

- reduce crashes overall by ~45%-55%
- reduce injury and angle crashes by ~60%-75%
- result in an increase in rear-end crashes

Future Traffic Operations (Year 2040)

SH-75	US-20	Expected Residual Capacity
C	B	34%
Level of Service	Level of Service	
17	11	
Average Delay (sec/veh)	Average Delay (sec/veh)	

Mobility Compared to No Build

	SH-75	US-20
Average Delay (sec/veh)	Significant Increase	Significant Decrease
Stops	Significant Increase	No Change
Travel Time through Intersection	Some Increase	Some Decrease

Study Management Team (SMT) Feedback

- Could increase rear-end crashes
- Too much operational impact to SH-75
- Not a good long-term solution

SMT Recommendation:
Eliminate

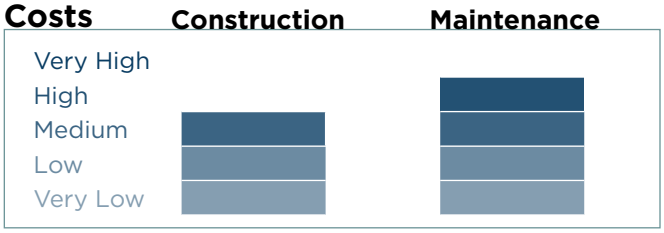
ALTERNATIVE 5

TRAFFIC SIGNAL WITH ADDITION OF TURN LANES

Install a traffic signal control with separate left-turn and right-turn lanes on all approaches. Installation of the turn lanes requires widening of all four legs of the intersection. The traffic signal is not expected to be warranted for at least 15 years.

ASSESSMENT OF FUTURE CONDITIONS

Costs



Safety Performance

1.3 expected crashes / year

Installation of a traffic signal is expected to....

- reduce angle crashes by ~70%-75%
- increase rear-end crashes on SH-75 by ~55%-60%

Future Traffic Operations (Year 2040)

SH-75	US-20	Expected Residual Capacity
A	C	59%
Level of Service	Level of Service	
8	26	
Average Delay (sec/veh)	Average Delay (sec/veh)	

Mobility Compared to No Build

	SH-75	US-20
Average Delay (sec/veh)	Minor Increase	Minimal Increase
Stops	Some Increase	Minor Decrease
Travel Time through Intersection	Minor Increase	Minor Increase

Study Management Team (SMT) Feedback

- Significant safety benefit
- Smaller relative impact
- Public likely to support

SMT Recommendation:
Carry Forward

ALTERNATIVE 6

SINGLE-LANE ROUNDABOUT WITH APPROACH CURVATURE

Install an approximately 160-foot diameter roundabout with single-lane entries and exits and a truck apron to allow large and oversized vehicles to negotiate the roundabout.

Successive approach curves are used in advance of each roundabout entry to improve speed consistency and visibility approaching the roundabout.

ASSESSMENT OF FUTURE CONDITIONS

Costs

Safety Performance

0.7 expected crashes / year

Converting the intersection to a single-lane roundabout is expected to...

- reduce crashes overall by ~65%-75%
- reduce injury crashes by ~80%-90%
- eliminate all key conflict points related to angle crashes

Future Traffic Operations (Year 2040)

SH-75	US-20	Expected Residual Capacity
A Level of Service	**A** Level of Service	**52%**
10 Average Delay (sec/veh)	**7** Average Delay (sec/veh)	

Mobility Compared to No Build

	SH-75	US-20
Average Delay (sec/veh)	Some Increase	Significant Decrease
Stops	Minor Increase	Some Decrease
Travel Time through Intersection	Minor Increase	Minor Decrease

Study Management Team (SMT) Feedback

- Significant safety benefits and US-20 operational benefit
- Aesthetic advantages
- Major physical impact and cost

SMT Recommendation:
Carry Forward

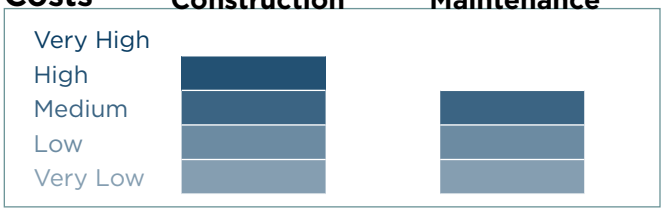
ALTERNATIVE 7

RESTRICTED CROSSING U-TURN (RCUT) INTERSECTION

Installation of a restricted crossing u-turn (RCUT) intersection eliminates the left-turn and through movements from the US-20 approaches. Instead, drivers turn right from US-20 onto SH-75 and then make a U-turn maneuver at a one-way median opening to then proceed through on SH-75 or right on US-20 (see yellow arrows). Movements on SH-75 remain free flow. The RCUT requires widening on SH-75 to accommodate the raised medians and the loons that allow for large trucks to make the U-turn maneuvers.

ASSESSMENT OF FUTURE CONDITIONS

Costs



Safety Performance

1.3 expected crashes / year

Installation of an RCUT is expected to...

- reduce crashes overall by ~35%-55%*
- result in some reduction in angle and injury crashes

*Actual crash reduction percentage could vary widely as crash reduction data for RCUT intersections is limited.

Future Traffic Operations (Year 2040)

SH-75	US-20*	Expected Residual Capacity
A	C	80%
Level of Service	Level of Service	
<1	22	
Average Delay (sec/veh)	Average Delay (sec/veh)	

*LOS and average delay are reported for the combination of right-turn and u-turn movements required for eastbound and westbound traffic.

Mobility Compared to No Build

	SH-75	US-20
Average Delay (sec/veh)	Minimal Decrease	Minor Decrease
Stops	Minimal Decrease	Some Increase*
Travel Time through Intersection	Minimal Decrease	Significant Increase

*Increase in stops is due to more than one stop now required for eastbound and westbound through and left-turn movements.

Study Management Team (SMT) Feedback

- Significant safety benefit
- Maintenance and driver understanding challenges
- Major physical impact and cost

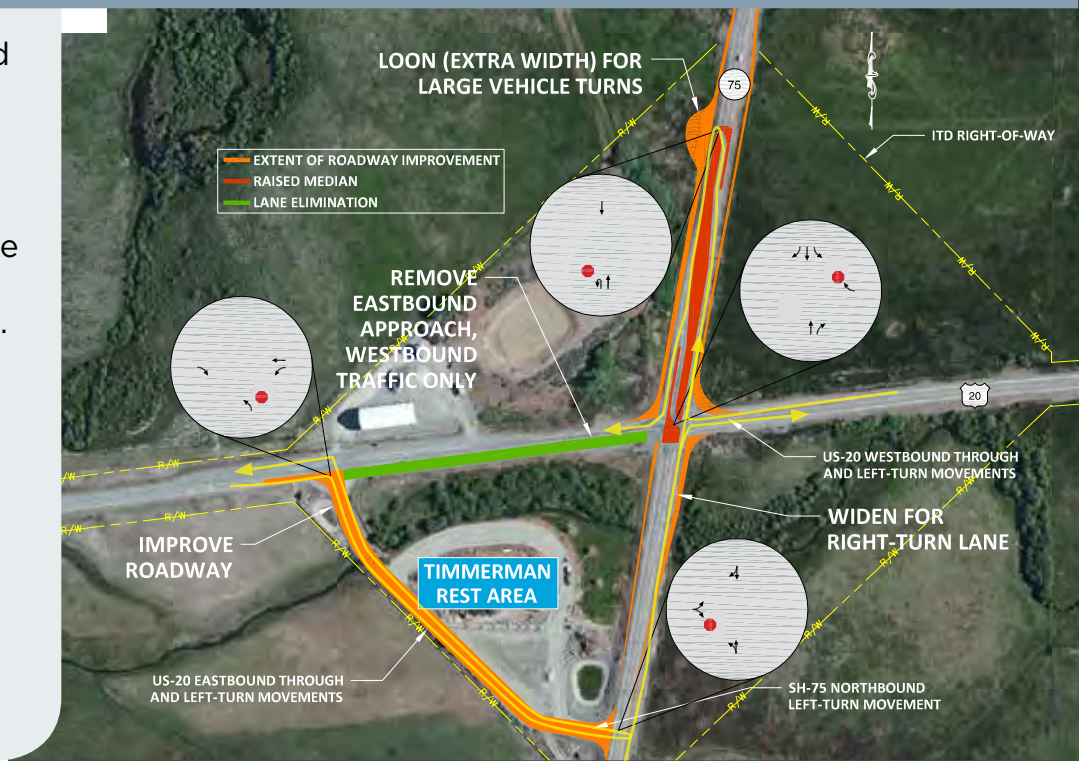
SMT Recommendation:

Carry Forward

ALTERNATIVE 8

QUADRANT INTERSECTION WITH PARTIAL RESTRICTED CROSSING U-TURN (RCUT)

Elimination of the eastbound US-20 approach and improvement of the existing rest area roadway in the southwest quadrant of the intersection to accommodate eastbound US-20 traffic and northbound SH-75 left-turns. Installation of a restricted crossing u-turn for left-turn and through movements from the westbound US-20 approach as described in Alternative 7. See yellow arrows for re-routed traffic movements.



ASSESSMENT OF FUTURE CONDITIONS

Costs

Safety Performance

1.8
expected crashes / year

Installation of a quadrant with a partial RCUT is expected to....

- eliminate some key conflict points related to angle crashes
- result in some reduction in angle and injury crashes

Future Traffic Operations (Year 2040)

SH-75	US-20	Expected Residual Capacity
A Level of Service	C Level of Service	75%
<1 Average Delay (sec/veh)	21 Average Delay (sec/veh)	

Mobility Compared to No Build

	SH-75	US-20
Average Delay (sec/veh)	Minimal Decrease	Minor Decrease
Stops	Minimal Decrease	Minor Increase*
Travel Time through Intersection	Minimal Decrease	Significant Increase

*Increase in stops is due to more than one stop now required for westbound through and left-turn movements.

Study Management Team (SMT) Feedback

- Not enough safety benefit
- Maintenance and driver understanding challenges
- Major physical impact and cost

SMT Recommendation:
Eliminate

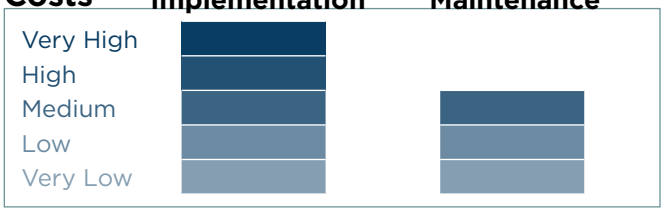
ALTERNATIVE 9A

GRADE-SEPARATED DIAMOND INTERCHANGE

Convert the existing at-grade intersection to a grade-separated diamond interchange with US-20 elevated above SH-75. Two unsignalized, stop-controlled intersections would be installed at the ramp terminal intersections with US-20.

ASSESSMENT OF FUTURE CONDITIONS

Costs



Safety Performance

1.4 expected crashes / year

Converting the intersection to a grade-separated diamond interchange is expected to....

- reduce crashes overall by ~30%-50%
- reduce injury crashes by ~50%-60%
- Eliminate some key conflict points related to angle crashes

Future Traffic Operations (Year 2040)

SH-75 Mainline	SH-75 Off-Ramps	US-20 Mainline	US-20 Off-Ramps	Expected Residual Capacity
A Level of Service	A Level of Service	A Level of Service	A Level of Service	85%
<1 Average Delay (sec/veh)	10 Average Delay (sec/veh)	<1 Average Delay (sec/veh)	8 Average Delay (sec/veh)	

Mobility Compared to No Build

	SH-75 Mainline	US-20
Average Delay (sec/veh)	Minimal Decrease	Significant Decrease
Stops	Minimal Decrease	Significant Decrease
Travel Time through Intersection	Minimal Decrease	Significant Decrease

Study Management Team (SMT) Feedback

- Great safety and mobility performance
- Common highway-to-highway treatment
- Tremendous physical impact and cost

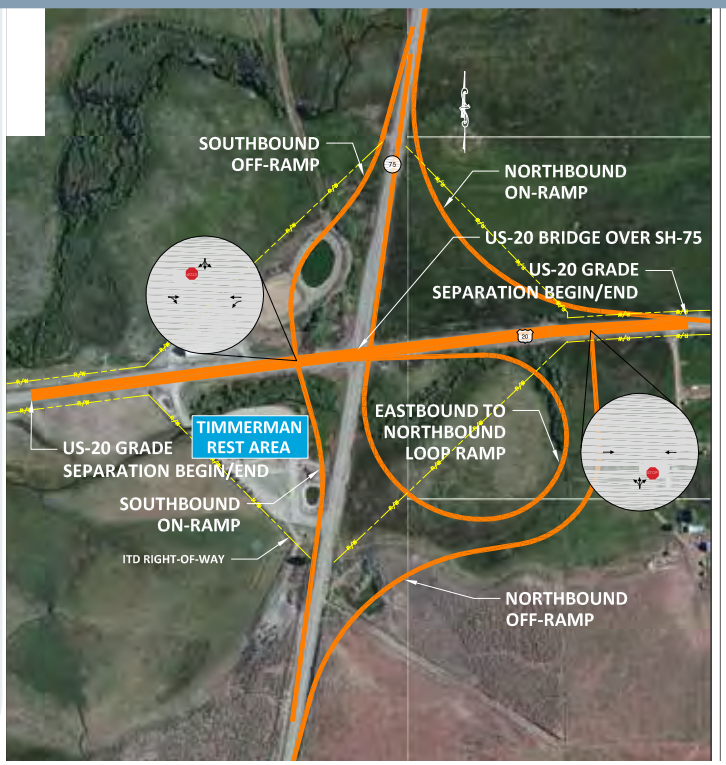
SMT Recommendation:

Carry Forward

ALTERNATIVE 9B

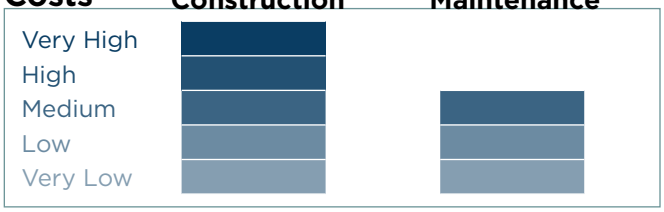
GRADE-SEPARATED DIAMOND INTERCHANGE WITH A LOOP RAMP

Convert the existing at-grade intersection to a grade-separated diamond interchange with a loop ramp in the southeast quadrant for eastbound to northbound movements. US-20 would be elevated above SH-75. Two unsignalized, stop-controlled intersections would be installed at the ramp terminal intersections with US-20.



ASSESSMENT OF FUTURE CONDITIONS

Costs



Safety Performance

1.4 expected crashes / year

Converting the intersection to a grade-separated diamond interchange with a loop ramp is expected to....

- reduce crashes overall by ~30%-50%
- reduce injury crashes by ~50%-60%
- Eliminate some key conflict points related to angle crashes

Future Traffic Operations (Year 2040)

SH-75 Mainline	SH-75 Off-Ramps	US-20 Mainline	US-20 Off-Ramps	Expected Residual Capacity
A Level of Service	A Level of Service	A Level of Service	A Level of Service	85%
<1 Average Delay (sec/veh)	10 Average Delay (sec/veh)	<1 Average Delay (sec/veh)	8 Average Delay (sec/veh)	

Mobility Compared to No Build

	SH-75 Mainline	US-20
Average Delay (sec/veh)	Minimal Decrease	Significant Decrease
Stops	Minimal Decrease	Significant Decrease
Travel Time through Intersection	Minimal Decrease	Significant Decrease

Study Management Team (SMT) Feedback

- Great safety and mobility performance
- Tremendous physical impact and cost
- Traffic volumes do not justify impact

SMT Recommendation:
Eliminate

COMMENT SHEET

CAC MEETING #1 - APRIL 7TH, 2016

US 20 & SH 75 TIMMERMAN JUNCTION Intersection Study

Name: _____ **Email:** _____

Organization: _____

****PLEASE TURN IN YOUR FORM PRIOR TO LEAVING TODAY'S MEETING.****

If you are unable to do so, please email your comment sheet to Yuri Mereszczak at yuri@kittelson.com or mail to 101 S Capitol Blvd, Suite 301, Boise, ID 83702 by no later than April 14th.

Intersection Alternatives (Tier 1) Evaluation

Please identify whether you would like to see the alternative carried forward for Tier 2 evaluation or whether you think the alternative should be eliminated from further consideration. Please explain your choice.

Alt. No.	Intersection Alternative	Desired Action (Circle One)	Please Explain Your Choice
1	No Build	Carry Forward Eliminate	
2A	Remove Skew (Shift North)	Carry Forward Eliminate	
2B	Remove Skew (Shift East)	Carry Forward Eliminate	
2C	Remove Skew (Centered)	Carry Forward Eliminate	
3A	Add a Northbound Right-Turn Lane on SH-75	Carry Forward Eliminate	
3B	Add Northbound and Southbound Right- and Left-Turn Lanes on SH-75	Carry Forward Eliminate	
4A	All-Way Stop-Controlled Intersection	Carry Forward Eliminate	
4B	All-Way Stop-Controlled Intersection with Removal of Southbound Right-Turn Lane	Carry Forward Eliminate	
5	Traffic Signal with Addition of Turn Lanes	Carry Forward Eliminate	
6	Single-Lane Roundabout with Approach Curvature	Carry Forward Eliminate	
7	Restricted Crossing U-Turn (RCUT) Intersection	Carry Forward Eliminate	
8	Quadrant Intersection with Partial Restricted Crossing U-Turn (RCUT)	Carry Forward Eliminate	
9A	Grade-Separated Diamond Interchange	Carry Forward Eliminate	
9B	Grade-Separated Diamond Interchange with a Loop Ramp	Carry Forward Eliminate	

--OVER--

Please use the space below to add and describe any additional alternatives you believe should be considered and why you believe the alternative(s) should be considered.

Alternatives Evaluation Criteria for Tier 2 Alternatives

Please rank the six evaluation criteria listed below from #1 to #5 in order of importance to your organization's interests. Please use each number only once (#1 is top priority).

Rank	Evaluation Criteria	Description
	Safety Performance	• Expected influence on the type, frequency, and severity of crashes (especially angle type crashes)
	Mobility	• Expected influence on the movement of all types of traffic through the intersection
	Physical and Environmental Impacts	• Physical impact on the landscape, environment (e.g., wetlands), and properties in the vicinity of the intersection.
	Implementation & Maintenance	• Level of maintenance effort, and the feasibility of phasing an alternative (i.e., interim improvements to long-term solution)
	Cost	• Construction and right-of-way costs

Please use the space below to add any evaluation criteria you believe should be considered and to provide comments to help explain your ranking of the proposed evaluation criteria.

MEETING EVALUATION

CAC MEETING #1 - APRIL 7TH, 2016

US 20 & SH 75
TIMMERMAN JUNCTION
Intersection Study

Please provide feedback regarding today's meeting.

What worked well for this meeting?

What did not work so well?

What suggestions do you have for our next CAC meeting?

Other comments