Wyoming Department of Transportation

Risk and Resiliency Plan for Critical Tourism Transportation Assets

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US 14/16/20 – RM 15 to RM 47 ..... **Error! Bookmark not defined.**

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Wyoming Department of Transportation Risk and Resiliency Plan for Tourism

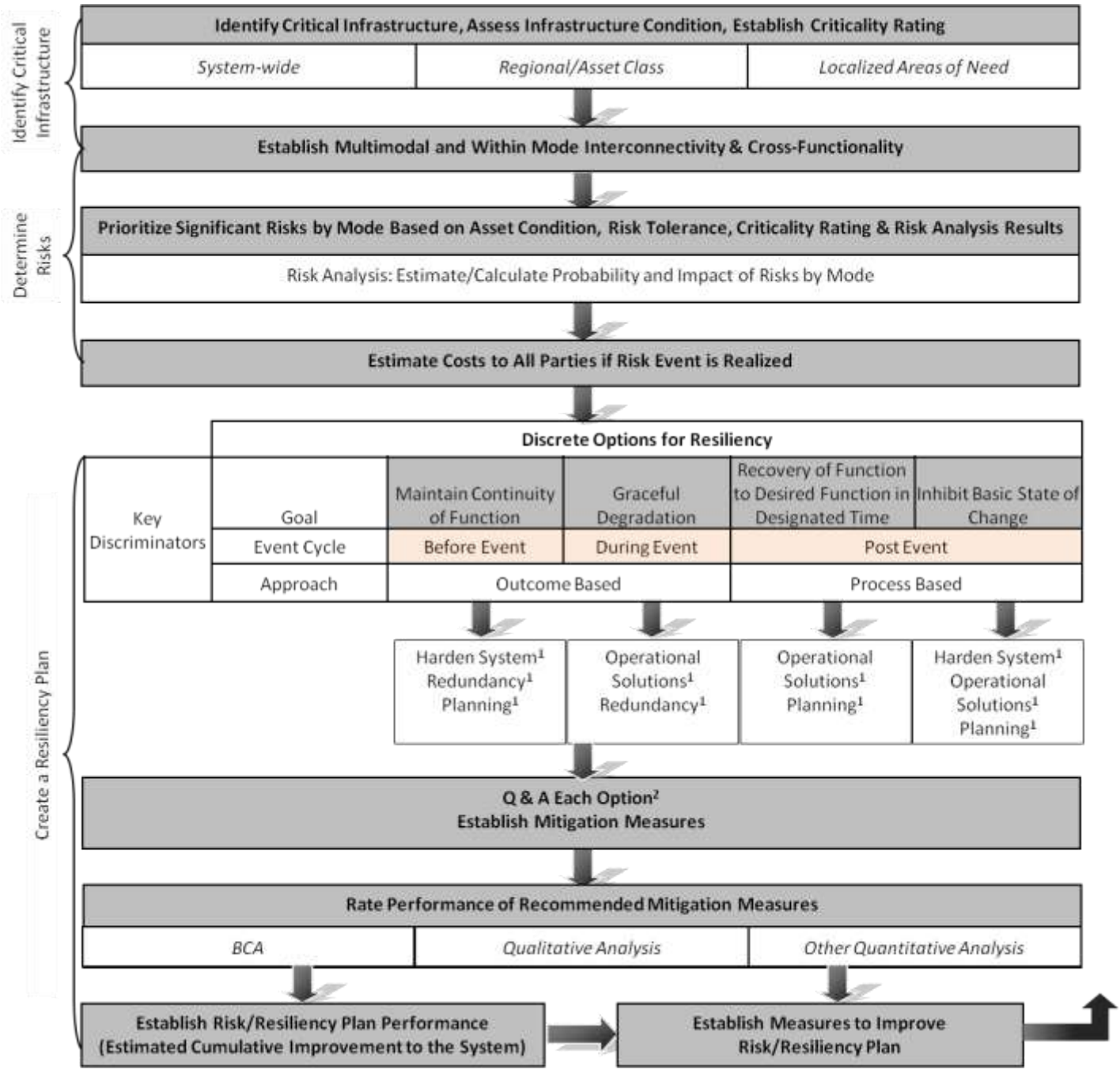
The Federal Highway Administration (FHWA) requires risk and resiliency planning for all State Transportation Asset Management Plans (TAMP). They require only pavement and bridge analyses, leaving states to decide which other assets and performance areas to assess. This document provides an overview of risk and resilience for the highest use tourism routes on Wyoming Department of Transportation (WYDOT) roads.

In the past, risk and resiliency were informally addressed on WYDOT roads. The process usually depended on staffs' knowledge of the condition of roads and the history of extreme events to assess the level of risk and determine the most suitable solutions. This method doesn't formally address potentially lower cost, more effective proactive measures, and relied on the memory of staff that often retired, thus losing that all important information.

Figure 1 outlines the WYDOT Tourism Risk and Resiliency Plan. It provides the analytical steps and processes to establish critical infrastructure, identify the highest potential risks on critical facilities, estimate the potential cost of each risk, develop prospective mitigation actions, identify processes to create resiliency associated with each risk, and determine future actions to improve the process. WYDOT has not applied all the steps in the process, but is currently enacting an interim process using most of these steps.

The "Discrete Options for Resiliency" portion of Figure 1 is derived from the "Resilience in Transportation Planning, Engineering, Management, Policy, and Administration", NCHRP Project 20-05, Synthesis Topic 48-13 report written by The National Academies Press and was obtained from the US Department of Homeland Security.

Figure 1: The WYDOT Risk and Resiliency Processes to Assess Tourism Needs



[1] Description available in Table 1: Resiliency Activity Options
[2] Description available in Table 2: Q & A for Each Resiliency Activity Option

How WYDOT Establishes Critical Tourism Infrastructure

WYDOT's first step in performing resiliency analysis on the State's tourism routes is to identify all critical tourism infrastructure owned by the State. While not all tourism infrastructure is owned and/or under control of the State, there is still value in being aware of its potential risks of disruption to WYDOT assets. WYDOT assesses infrastructure that is not under WYDOT control only to the level necessary to determine its potential effects on WYDOT owned infrastructure if disruptions were to occur on such facilities.

Tourism Infrastructure Types

WYDOT evaluates highways, and air service to a lesser extent, in its tourism resiliency planning. Critical portions of the system and individual assets are identified to reduce the process to manageable levels and focus on facilities where the consequences of failure are most extreme. WYDOT incorporates the condition and performance of assets in its decisions to determine the assets' criticality since a facility in poor condition generally has a much higher chance of failure than a facility in good condition. WYDOT will re-analyze the criticality of these infrastructure assets on a fairly regular basis since infrastructure and performance conditions can change over time.

Lower rated assets are removed from further analysis to reduce the list to the most serious potential problem areas and make the risk and resilience analysis process more manageable. Given the variability of potential risks and the unlikely chance that quantifiable data is available for each, qualitative- and quantitative-based criticality ratings are applied.

This report applies quantifiable measures when readily available and qualitative methods where adequate data is not available to establish asset criticality. The following criteria are used in the analysis to establish these "critical facilities":

- What is the approximate annual tourism dollars received in the county that that can be attributed to the facility?
- How many jobs does tourism provide to the county that that can be attributed to the facility?
- Is the facility on the National Highway System?

Table 1 shows each of the applied criteria along with weightings and the methods used to determine the value of each when applied to specific tourism assets. The resulting criticality index for each facility is a weighted calculation on a scale of 1 to 10. Their weightings are based on their estimated contribution to the overall criticality on significant tourism routes.

Table 1: Scoring and Weighting Methods for Primary Critical Assets

Primary Facility Criterion	Scoring Method	Weighting
What are the approximate annual tourism dollars received in the county that that can be attributed to the facility?	Percentage of the facility's AADT to all NHS AADT in the county times the annual tourism dollars received by the county.	10
How many jobs does tourism provide to the county that that can be attributed to the facility?	Percentage of the facility's AADT to all NHS AADT in the county times the annual tourism jobs in the county.	10
Is the facility on the National Highway System?	Yes: the facility is included in the analysis No: the facility is removed from the analysis	

Tourism dollars and jobs are from "Wyoming Travel Impacts: 2004 - 2017", Wyoming Office of Tourism, https://www.travelwyoming.com/sites/default/files/uploads/industry/State%20and%20County%20Economic%20Impact%20Report%202017.pdf

A limited number of all the analyzed facilities within WYDOT's control are deemed critical facilities and are forwarded for risk analysis. Alternate routes are assessed for their ability to provide relief in the event of a disruption and determine the intensity of the disruption. Facilities with no or poorly performing alternate routes should receive a higher risk rating than those that have better alternate routes.

A written discussion regarding the scoring, issues, and other comments is captured for each of the selected critical facilities that exhibit high risk factors. These discussions serve as potential guidance when disruptions occur and will be used to revised future updates to these analysis procedures.

How WYDOT Identifies High Risk Critical Tourism Infrastructure in Wyoming

The risk analysis estimates the probability and likely impact of the occurrence of the identified risk. WYDOT eliminates lower risk critical assets from further analysis to reduce their numbers to manageable levels. Risk analysis provides the necessary information to make the needed reductions.

Potentially high risk assets are more easily recognized and analyzed by grouping them into mode and geographical extent categories. Risks at state-wide and regional levels are often a different priority and a different nature than at a localized level. For example, a bridge may be at high risk for flood damage, but at a system-wide level the average risk of flood damage may be negligible. There would be little value to prioritize all bridges in the state as high priority because only one location is at high risk.

Each critical tourism facility that is under WYDOT control is assessed for probability and consequence of potential risks. WYDOT may use the following potential disrupting events in the risk analysis:

1. Funding shortfalls reducing WYDOT budget

2. Unexpected rapid construction and maintenance cost increases
3. Disruption in construction material supplies
4. Sudden deterioration of assets
5. Shift in internal or external regulations, policies or priorities
6. Severe winter weather
7. Severe flooding
8. Regionalized wildfires
9. Technology failures
10. Acts of terror
11. Shifts in the economic trends within the State
12. Sudden increase demand exceeding roadway capacity
13. Seismic activity
14. Crashes, bridge strikes, damage to infrastructure
15. Significant project delays
16. Environmental issues
17. Utility caused disruptions
18. Events that attract inordinate traffic volumes

Some of the potential risks identified above do not reach the high risk level to be further analyzed. Also, WYDOT may not have enough data to adequately evaluate some of these risks.

The Risk Analysis Process

WYDOT compares the list of potential risks to each facility to see if the risk is applicable and is significant enough to assume the possibility that such events might occur on that facility in the future. Only "High" risks are analyzed.

After risks are established for each facility, WYDOT collects any applicable data to analyze the risks for the normal and forecast conditions associated with the disruptions they may cause. One or more levels of disruption per risk type may be assessed for a single facility and the facility may therefore receive multiple risk ratings. Table 2 shows the measures, risk criteria, and risk scoring measures used in the analysis.

Table 2: Risk Analysis Scoring Schema for Establishing Risk "Probability" and "Consequence"

Measure	Probability Criteria	Consequence Criteria	Measure Scoring	Risk Measures
Bridge Strikes	Bridge strikes since 1994	AADT on the route carried by the bridge(s)	NA	Probability and consequence use a range of 1 to 5 based on percentile ranking.
Flood Damage to Bridges	1) Flood event capacity 2) Streamflow variability 3) Scour critical 4) PM2 condition score 5) County flood frequency score	1) County flood consequence score 2) Detour delay score 3) Deck area score	Weightings 1) Flood event capacity: 10 2) Streamflow variability: 5 3) Scour: 10 4) PM2 score: 3 5) County flood frequency: 4 6) County flood consequence: 3 7) Detour delay: 10 8) Deck Area: 3	Probability and consequence use a range of 1 to 5 based on percentile ranking.
Winter Weather	1) Closure frequency 2) Non-closure winter weather delay (from travel time data) converted to frequency equivalent	1) Closure duration 2) Non-closure delay costs (derived from travel time data)	Probability measures for non-closure delay were converted to equivalent hours of closure and summed with hours of closure. Consequence measures were converted to costs of traffic delay and summed.	Probability and consequence use a range of 1 to 5 based on percentile ranking.
Non-attainment Area Creation Risk by County	WY DEQ monitoring data for: 1) PM 10 2) PM 2.5 3) Nitrous oxide 4) Ozone	1) County population	For probability calculated the most current level of pollutants compared to exceedance levels using the highest readings of each site within the county.	Probability and consequence use a range of 1 to 5 based on percentile ranking
Non-attainment Area Creation Risk by Critical Road Segments	1) Average pollutant level (see above) for each pollutant. 2) Maximum pollutant level (see above) for each pollutant. 3) Total delay for each road segment (see "Winter Weather" section).	1) County population	For probability: • calculated the percentile ranking for each measure into percentages. • averaged the pollutant level percentiles then averaged the result with the delay measure percentiles.	Probability and consequence use a range of 1 to 5 based on percentile ranking

The probability of a disruptive event may be based upon its type, the temporal nature of the event, the location of the affected facility, and a variety of other potential conditions. The probability of a future disruptive event may best be approximated using the history of such events. WYDOT uses this history to apply a probability of the event reoccurring. A value of 1 to 5 is assigned to the facility based on the event type's frequency.

The consequence and probability scores are compared to the matrix in Table 3 to determine whether the risk is low, moderate or high. High risk, critical facilities are forwarded for the development of various resiliency improvement proposals.

Table 3: Risk Determination Matrix

		Consequence				
		1	2	3	4	5
Probability	1	L	L	L	L	M
	2	L	L	M	M	M
	3	L	M	M	H	H
	4	L	M	H	H	H
	5	M	M	H	H	H

Prioritized Critical Highway Tourism Facilities

WYDOT prioritizes each critical asset based on its criticality rating, condition/performance and risk analysis results for inclusion in resiliency planning. WYDOT applies a more thorough and comprehensive resiliency analysis to higher priority assets. The prioritization process combines the risk results, asset condition, and the facilities' criticality ratings. In this case, each variable is equally weighted to calculate a composite priority grade and score. The high ("H") priority locations are more thoroughly assessed in the resiliency analysis.

WYDOT assesses each high priority critical asset for its connectivity to other facilities, its adequacy to provide the desired relief from the extreme event's effects, and its resistance to cascading issues over a wider cross-section of the system. This may include determining whether transferring traffic to another mode is reasonable, improving the facility is cost-effective, and/or establishing operational plans for action during the disrupting event.

The "Discrete Options for Resiliency" table in Figure 1 organizes resiliency processes into resiliency response types or goals, and temporal performance of the processes (event cycle). WYDOT categorizes each goal/event cycle into the potential resiliency improvement types. Descriptions of those resiliency improvement types are shown in Table 4. For each high priority critical asset, each of these improvement types is assessed for applicability as a proposed solution type and against each corresponding question in Table 5.

Table 4: Resiliency Activity Options

Resiliency Activity	**Description**
Harden the System	Improve the condition and resiliency of the asset or corridor to withstand more severe events.
Create Redundancy	Identify or build flexible alternative routes and/or modes.
Operational Solutions	Repair and/or mitigate the undesirable conditions during and after the extreme event.
Planning	Establish advanced decisions and processes to effectively address future risk events. Assess and revise past activities as needed.

Table 5: Q & A for Each Resiliency Activity Option

Harden System	Create Redundancy	Operational Solutions	Planning
1. Where are the weakest points in the facility? 2. What improvements can be made to the facility to resist deterioration during extreme events? 3. How much better will the facility perform during extreme events if the improvement is implemented? 4. Will the improvement last through the life-cycle of the asset? 5. What are the costs and life-cycle costs of the proposed improvement?	1. What potential redundant facilities exist? 2. Do we have proper approvals to use the redundant facilities? 3. What event duration is expected? 4. Does the redundant facility provide adequate temporary capacity? 5. Are the redundant facilities structurally capable to handle the proposed traffic for the duration of the event and subsequent remediation? 6. Are there proper plans and infrastructure in place to efficiently use the redundant facility such as communication to users and operators, other agencies, communication to landowners along the route, etc.? 7. Are the proper plans in place to return traffic to the affected facility? 8. Will the use of the redundant facility be overly costly to WYDOT or others?	1. Who should be involved in the operational activities? 2. Who should take the lead? 3. What resources are needed? 4. What event duration is expected? 5. What conditions define "back to normal"? 6. How effectively and efficiently will the operational solution improve conditions during and after the event? 7. Can ITS or other technological solutions be applied?	1. Who should be involved in the planning and decisions associated with the remediation of the event? 2. Who should take the lead? 3. What resources are there available? 4. Which solutions provide the best performance outcome and which provide the most cost-effective outcome? 5. What does recovery look like? 6. What are the benefits versus costs of each proposed solution? 7. What are the social, economic, and environmental outcomes of each solution? 8. How does each proposed solution compare to all the other solutions? 9. Which solutions provide expected consistency to users? 10. Who should be involved in the planning processes? 11. What criteria should define success or failure?
1. How many people will be affected by the extreme event? 2. How many and which users will be affected by the extreme event? 3. What is the history of this extreme event in this area? 4. What are social and economic implications of the resiliency decision?			

Some of the questions in Table 5 are applicable to more than one resiliency activity option and should therefore be considered for each option.

WYDOT rates multiple proposed solutions for each high risk facility to estimate their comparative performance. Various analysis methods relevant to the risk type are created and performed as part of the process. The highest performing solutions are captured in the resiliency plan. The results of each highest rated solution is combined to assess the estimated cumulative effect of the plan and used to establish improvements to future risk and resilience plan revisions and expansions. Expansion may require seeking out third party data sources and/or developing additional knowledge, information and data in-house.

Resiliency recommendations are provided to project development decision-makers to be included in project development and project selection process. Each potential project is assessed for asset conditions, user needs and resiliency potential.

Critical Highway Tourism Corridors

The corridors shown in Table 6 were selected for criticality analysis based on their estimated contribution to providing tourism dollars and jobs created within their respective counties. Only NHS routes were considered in the analyses.

Table 6: Corridors Evaluated for Potential Critical Tourism Corridors

Facility	From RM	To RM	AADT	Approximate Annual Tourism Contribution (million)	Approximate Annual Number of Tourism Jobs Contributed
Casper Bypass	0	2.9	12,300	$73.48	660
Greeley Hwy	3.538	8.472	11,576	$107.07	918
I-25	0	47.153	11,103	$102.70	881
I-25	47.153	120.814	7,780	$28.69	296
I-25	120.814	175.11	9,211	$36.90	378
I-25	175.11	234.85	5,339	$31.89	286
I-25	234.85	300.261	1,844	$12.30	146
I-80	0	57.04	12,381	$91.80	950
I-80	57.04	199.05	13,642	$114.45	1,078
I-80	199.05	280.9	11,685	$110.91	995
I-80	280.9	336.61	12,556	$108.62	1,125
I-80	336.61	402.78	12,388	$114.58	982
I-90	0	41.96	6,901	$91.74	888
I-90	41.96	96.02	4,725	$31.52	373
I-90	96.02	147.45	5,970	$52.64	502
I-90	147.45	207.14	4,988	$31.90	360
US 20-26	0	0.087	5,000	$29.87	268
US 20-26	0.087	2.34	10,623	$63.46	570
US 20-26	4.518	11.733	8,209	$49.04	440
US-14	0	37.98	058	$4.88	55
US-14	37.98	89.95	261	$16.76	162
US-14/16/20	0	77.74	2,249	$112.29	1,184

US-14/16/20	77.74	100.75	1,328	$6.12	70
US-14A	0	33.71	3,023	$150.93	1,592
US-14A	33.71	43.52	2,171	$10.01	114
US-16	0	52.47	1,160	$8.00	86
US-16	52.47	92.12	1,286	$8.58	102
US-16	200	259.08	1,795	$9.98	85
US-18/20	0.103	17.4	2,112	$8.46	87
US-18/20	17.4	40.88	2,081	$5.19	66
US-191	0	51.62	3,303	$27.71	261
US-191	51.62	110	2,730	$24.76	204
US-191	110	154.83	1,812	$16.44	136
US-191	154.83	163.67	2,300	$261.73	1,949
US-20	41.39	63.24	646	$1.61	21
US-20/US-26	0	68.43	3,551	$21.21	190
US-20/US-26	68.43	100	2,315	$17.66	191
US-20/WY-789	100	117.28	1,257	$9.59	103
US-20/WY-789	117.28	147.85	1,294	$12.77	145
US-20/WY-789	147.85	176.71	1,812	$12.50	134
US-20/WY-789	176.71	257.026	2,123	$9.79	111
US-26	0	20.01	2,200	$8.11	84
US-26	20.01	38.42	2,096	$5.84	59
US-26	48.3	56.26	5,806	$16.19	164
US-26/287	0	26.838	1,285	$146.23	1,089
US-26/287	26.838	133.705	1,770	$13.50	146
US-26/WY-789	104	127	4,139	$31.58	341
US-287	0	44	2,789	$26.47	237
US-287	0	31.6	2,745	$20.94	226
US-287	0	81.05	1,132	$8.64	93
US-287	81.05	104	3,892	$29.69	320
US-30	0	89.31	1,744	$19.95	184
US-30	89.31	99.672	1,780	$14.93	141
US-30	235.23	278.98	710	$6.74	60
US-30	278.98	327.37	799	$6.91	72
US-30	327.37	425.41	4,943	$42.76	443
US-85	17.29	56.64	2,384	$22.05	189
US-85	56.64	139	2,032	$5.67	57
US-85	139	205.04	2,284	$5.70	73
US-85	205.04	256.56	1,372	$7.62	65
US-89	54.93	132.62	3,930	$44.95	416
US-89	132.62	184.572	6,707	$763.24	5,683
WY-114	29.57	40.62	1,448	$72.30	762
WY-120	0	43.1	1,209	$11.93	135
WY-120	43.1	81.21	1,656	$82.68	872
WY-220	0	44	2,789	$26.47	237
WY-220	44	117	4,010	$23.95	215
WY-59	0	56.51	2,083	$8.34	85
WY-59	56.51	112.147	6,268	$55.26	528

WYDOT scored critical tourism corridors using the schema in Table 1. The weightings were set based on the perceived impact of each criterion on the importance of the route.

WYDOT selected the highest scoring 25% of all assessed corridors for risk analysis. These roads consist of just over 750 miles of the NHS in Wyoming. They are shown in Table 7.

Table 7: The Highest 25% of Critical Tourism Corridors

Rank	Facility	LRS ID	From RM	To RM	Miles	Score
1	US-89	ML10B	132.62	184.572	51.952	10
2	US-191	ML13B	154.83	163.67	8.84	9.85
3	US-14A	ML29B	0	33.71	33.71	9.7
4	US-26/287	ML30B	0	26.838	26.838	9.405
5	US-14/16/20	ML31B	0	77.74	77.74	9.33
6	I-80	ML80B	57.04	199.05	142.01	9.185
7	I-80	ML80B	280.9	336.61	55.71	9.115
7	I-80	ML80B	336.61	402.78	66.17	9.115
9	I-80	ML80B	199.05	280.9	81.85	8.97
10	Greeley Hwy	ML180B	3.538	8.472	4.934	8.595
11	I-80	ML80B	0	57.04	57.04	8.525
12	I-25	ML25B	0	47.153	47.153	8.375
13	I-90	ML90B	0	41.96	41.96	8.305
14	WY-120	ML33B	43.1	81.21	38.11	8.08
15	WY-114	ML32B	29.57	40.62	11.05	7.865
15	Casper Bypass	ML47B	0	2.9	2.9	7.865
17	US 20-26	ML34B	0.087	2.34	2.253	7.64

Risk Analysis and Resiliency Action Plans

The risk analysis estimates the risks to assets based on the probability of a disrupting event and the consequence of the hazard. This process uses the matrix in Table 3 to assign high, medium or low risk levels.

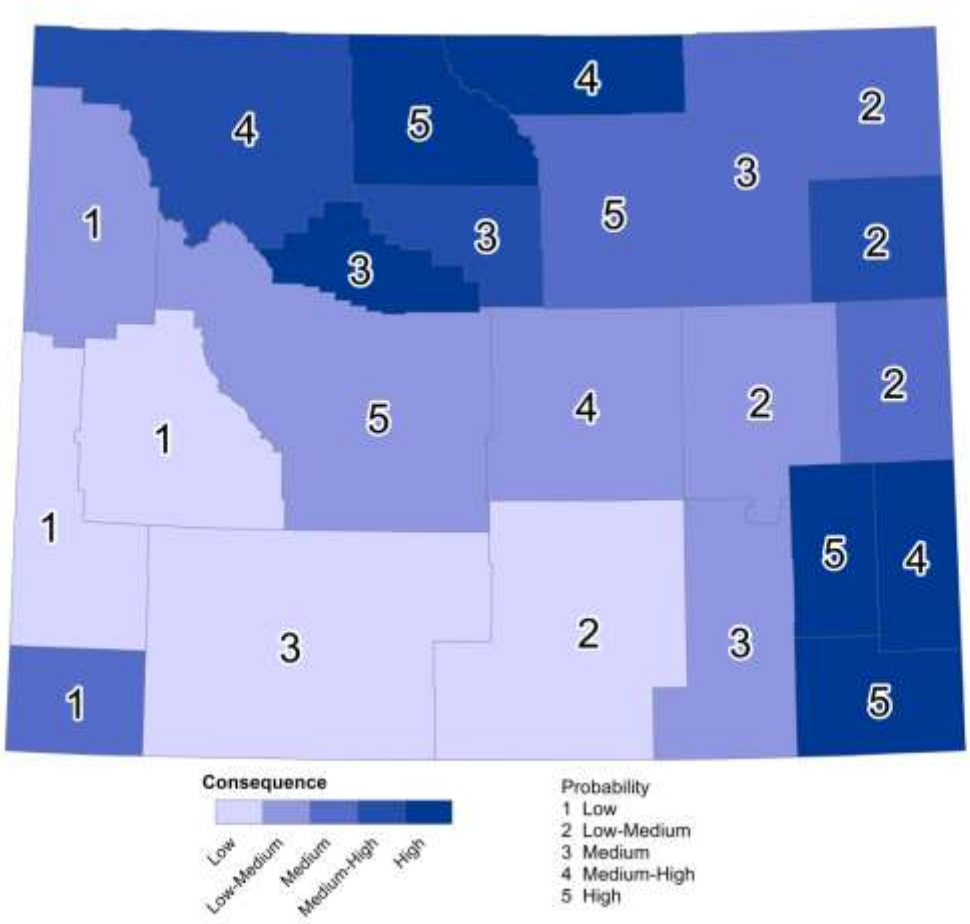
WYDOT created resiliency action plans to prioritize high risk locations. The resiliency action proposals fit into three temporal categories; 1) before the event, 2) during the event, and 3) after the event. They include the activity types shown in Table 4.

Bridge Flooding Resiliency

Bridge Flood Risks

WYDOT performed bridge flooding risk analyses over regional and individual asset scales. Flood risks were estimated using flood histories by county, and were obtained from the "*Wyoming Multi-Hazard Mitigation Plan*" Wyoming Office of Homeland Security, June 2011. WYDOT calculated probability scores using the number of flooding events on the applicable stream since the last dam was built. Consequence scores were estimated per event based on the descriptions of the past flood events. Figure 2 shows a flood risk map created from that analysis.

Figure 2: Map of County Flood Risks



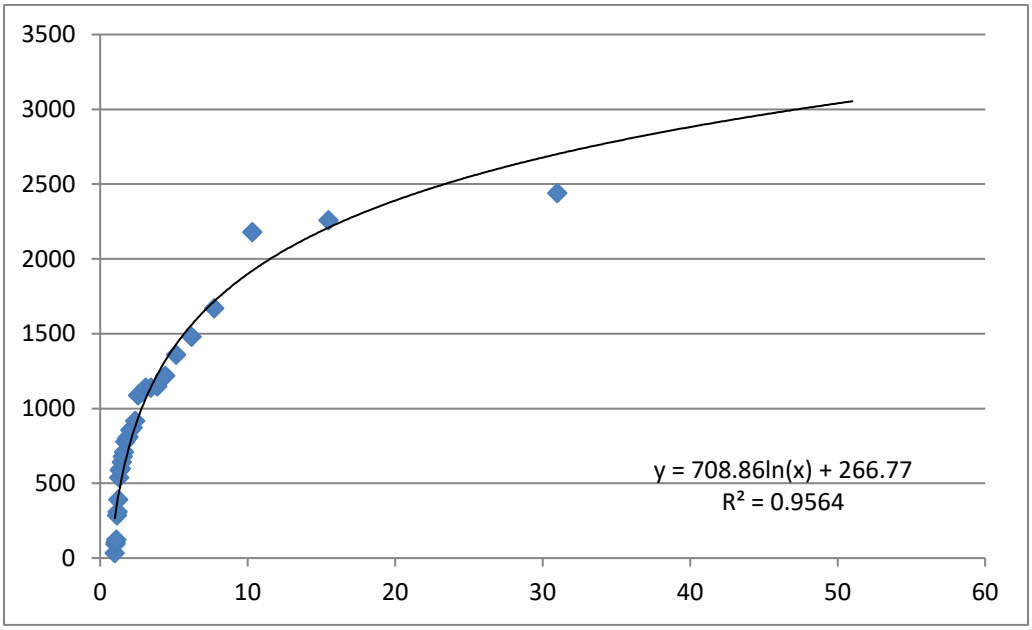
Daily peak stream flows and flood event levels were gathered for individual bridges on the critical tourism routes where adequate USGS stream flow data were available. Annual peak flows were extracted for each bridge location and graphed into flood return interval hydrographs using the Gumbel Distribution method (see https://serc.carleton.edu/hydromodules/steps/166250.html). Flood risks were assessed for the bridges in Table 8.

Table 8: Flood Return Interval and Stream Flow Variability for Significant Bridges on the Critical Tourism Corridors

					Flood Event											
Stream Name	Facility	RM	Bridge ID 1	Bridge ID 2	10-yr	20-yr	30-yr	40-yr	50-yr	60-yr	70-yr	80-yr	90-yr	100-yr	200-yr	% Stream Flow Variability
Crow Creek	I-25	10.37	AAZ	AAY	289	383	438	477	508	532	553	571	587	602	696	108%
Bear River	I-80	5.91	AMM	AML	2753	3291	3606	3829	4003	4144	4264	4368	4459	4541	5079	65%
Blacks Fork	I-80	44.85	ANV	ANU	1199	1496	1670	1794	1890	1968	2034	2091	2142	2187	2485	82%
Blacks Fork	I-80	77.48	AOS	AOR	5084	6389	7152	7694	8114	8457	8748	8999	9221	9419	10724	85%
Green River	I-80	86.38	APA	AOZ	12163	15119	16848	18075	19026	19804	20461	21031	21533	21982	24938	81%
N. Platte	I-80	229	LCQ	AUK	11737	14210	15657	16684	17480	18131	18681	19157	19578	19954	22427	70%
Rock Creek	I-80	258.95	AVD	AVC	1377	1618	1759	1859	1936	1999	2053	2099	2140	2177	2418	58%
Rock Creek	I-80	272.5	AVR	AVQ	1377	1618	1759	1859	1936	1999	2053	2099	2140	2177	2418	58%
Laramie River	I-80	312.44	AXK	AXJ	1757	2165	2405	2574	2706	2814	2904	2983	3053	3115	3524	77%
Crow Creek	I-80	363.87	DCA	DBZ	273	362	415	452	480	504	523	541	556	569	658	108%
Tongue River	I-90	15.01	BBA	BAZ	3293	4075	4532	4856	5108	5313	5487	5637	5770	5889	6670	79%
Goose Creek	I-90	20.59	BBK	BBJ	2094	2587	2876	3081	3240	3370	3480	3575	3659	3734	4228	78%
N Fork Shoshone River	US-14/16/20	2.26	JIM		8535	9868	10648	11202	11631	11981	12278	12535	12761	12964	14297	52%
N Fork Shoshone River	US-14/16/20	15.68	KTB		8535	9868	10648	11202	11631	11981	12278	12535	12761	12964	14297	52%
N Fork Shoshone River	US-14/16/20	15.83	KTC		8535	9868	10648	11202	11631	11981	12278	12535	12761	12964	14297	52%
N Fork Shoshone River	US-14/16/20	20.31	JJJ		8535	9868	10648	11202	11631	11981	12278	12535	12761	12964	14297	52%
N Fork Shoshone River	US-14/16/20	32	DZU		8535	9868	10648	11202	11631	11981	12278	12535	12761	12964	14297	52%
Shoshone River	US-14/16/20	46.69	BZT		10452	12951	14413	15450	16255	16912	17468	17950	18374	18754	21253	79%
Shoshone River	US-14A	6.52	CAE		8841	10919	12135	12998	13667	14214	14676	15076	15430	15746	17824	78%
Buffalo Fork Creek	US-26/287	3.59	LWC		5385	6327	6879	7270	7574	7822	8031	8213	8373	8516	9459	58%
Snake River	US-89	141.3	MGH		22029	25575	27649	29121	30262	31195	31983	32666	33269	33808	37353	53%
Snake River	US-89	142	BOL		22029	25575	27649	29121	30262	31195	31983	32666	33269	33808	37353	53%
Flat Creek	US-89	146	BON		283	325	349	366	380	391	400	408	415	421	463	49%
Snake River	US-89	146.09	BOM		22029	25575	27649	29121	30262	31195	31983	32666	33269	33808	37353	53%
Flat Creek	US-89	152.16	BOO		283	325	349	366	380	391	400	408	415	421	463	49%
Flat Creek	US-89	153.98	BOP		283	325	349	366	380	391	400	408	415	421	463	49%
Flat Creek	US-89	155.12	FFG		283	325	349	366	380	391	400	408	415	421	463	49%
Greybull River	WY-120	51.73	LBB		4097	5059	5622	6021	6331	6584	6798	6983	7147	7293	8255	78%

WYDOT plotted a best-fit logarithmic trend and the resulting trend line equation for each graph. The equation was used to estimate various flood events. The Figure 3 graph is an example of the return interval hydrographs.

Figure 3: Figure 3: Example of a Return Interval Hydrograph



Each variable was weighted according to its assumed potential to measure forecast bridge damage during a flood. Table 9 shows the weightings.

Table 9: Weighting Factors for Bridge Flood Risk Variables

	Probability	**Consequence**
Designed Bridge Capacity	10	
Stream Flow Variability	5	
Scour Critical Rating	10	
Bridge Condition	3	
County Flood Analysis Probability Rating	4	
Delay on Nearest Detour		10
Bridge Deck Area		3
County Flood Analysis Consequence Rating		3

The following are descriptions of the columns provided in Table 9 (Table 10 shows the comparable scores):

Probability Ratings

- Designed Bridge Capacity: A weighting given to the bridge's design to withstand certain flood events. For example, "the bridge is designed to withstand a 25-year flood event".
- Stream Flow Variability: A percentage measuring how inconsistent the flows of the stream the bridge spans. Typical stream flow data were taken from the time the last upstream dam was built.
- Scour Critical Rating: A weighting value based on its NBI Scour Critical Rating.

- Bridge Condition: A weighting value given to the bridge measure based on the FHWA PM2 performance measure for the condition of the bridge.
- County Flood Analysis Probability Rating: A weighting based on the historical frequency of flooding in the county it is located.

Consequence Ratings

- Delay on the Nearest Detour: A weighting based on the detour length and number of vehicles detoured if the bridge were to fail from flooding. This measure assumes the flooding will also cause the closure of nearby parallel bridges on the same stream.
- Bridge Deck Area: A weighting based on the size of the bridge. The measure assumes that larger bridges will take longer to repair than shorter bridges.
- County Flood Analysis Consequence Rating: A weighting based on the historical damage from flooding in the county it is located.

WYDOT categorized bridge flood risks into **H**igh, **M**edium or **L**ow for each bridge. Only "High" risk bridges were forwarded for further resiliency planning. Table 10 shows the results of the bridge flood risk analysis.

Table 10: Risk Results for Bridge Flood Locations

Stream Name	Facility	RM	Bridge ID	Capacity Score	Variability Score	Scour Score	Condition Score	County Probability	County Consequence	Detour Delay Score	Deck Area Score	Probability Score	Consequence Score	**Probability**	**Consequence**	**Risk Rating**
Blacks Fork	I-80	77.48	AOS	59	45	20	24	24	6	70	15	172	91	**4**	**4**	**H**
Blacks Fork	I-80	77.48	AOR	59	45	20	27	24	6	70	15	175	91	**4**	**4**	**H**
Green River	I-80	86.38	APA	59	40	20	24	24	6	60	21	167	87	**3**	**4**	**H**
Green River	I-80	86.38	AOZ	59	40	20	24	24	6	60	21	167	87	**3**	**4**	**H**
Tongue River	I-90	15.01	BBA	59	35	20	24	32	30	70	18	170	118	**3**	**5**	**H**
Tongue River	I-90	15.01	BAZ	59	35	20	24	32	30	70	24	170	124	**3**	**5**	**H**
N Fork Shoshone River	US-14/ 16/20	15.83	KTC	100	5	20	24	32	24	30	27	181	81	**4**	**3**	**H**
N Fork Shoshone River	US-14/ 16/20	20.31	JJJ	100	5	20	24	32	24	30	24	181	78	**4**	**3**	**H**
N Fork Shoshone River	US-14/ 16/20	32	DZU	100	5	20	27	32	24	40	21	184	85	**5**	**3**	**H**
Shoshone River	US-14/ 16/20	46.69	BZT	100	35	20	27	32	24	50	27	214	101	**5**	**4**	**H**
Buffalo Fork Creek	US-26/287	3.59	LWC	100	20	20	24	8	12	50	24	172	86	**4**	**3**	**H**
Snake River	US-89	142	BOL	100	10	20	24	8	12	80	27	162	119	**3**	**5**	**H**
Snake River	US-89	146.09	BOM	100	10	20	24	8	12	90	21	162	123	**3**	**5**	**H**
Flat Creek	US-89	152.16	BOO	100	5	20	27	8	12	100	0	160	112	**3**	**5**	**H**
Flat Creek	US-89	153.98	BOP	100	5	20	27	8	12	90	0	160	102	**3**	**4**	**H**

Crow Creek	I-25	10.37	AAZ	59	45	20	24	40	30	20	3	188	53	5	2	M
Crow Creek	I-25	10.37	AAY	59	45	20	27	40	30	20	3	191	53	5	2	M
Blacks Fork	I-80	44.85	ANV	59	40	20	24	8	18	50	9	151	77	2	3	M
Blacks Fork	I-80	44.85	ANU	59	40	20	24	8	18	50	9	151	77	2	3	M
N. Platte River	I-80	229	AUK	59	25	20	24	16	6	80	18	144	104	2	4	M
Crow Creek	I-80	363.87	DCA	59	50	20	24	40	30	10	9	193	49	5	1	M
Crow Creek	I-80	363.87	DBZ	59	50	20	24	40	30	10	9	193	49	5	1	M
N Fork Shoshone River	US-14/ 16/20	2.26	JIM	100	5	20	24	32	24	30	18	181	72	4	2	M
N Fork Shoshone River	US-14/ 16/20	15.68	KTB	100	5	20	24	32	24	30	15	181	69	4	2	M
Shoshone River	US-14A	6.52	CAE	100	30	20	24	32	24	10	30	206	64	5	2	M
Snake River	US-89	141.3	MGH	100	10	20	3	8	12	80	30	141	122	2	5	M
Flat Creek	US-89	146	BON	100	5	20	24	8	12	90	0	157	102	2	4	M
Flat Creek	US-89	155.12	FFG	100	5	20	3	8	12	90	6	136	108	1	5	M
Greybull River	WY-120	51.73	LBB	100	30	20	24	32	24	30	15	206	69	5	2	M
Bear River	I-80	5.91	AMM	59	20	20	30	8	18	20	27	137	65	1	2	L
Bear River	I-80	5.91	AML	59	20	20	30	8	18	20	24	137	62	1	2	L
N. Platte River	I-80	229	LCQ	59	25	20	3	16	6	80	18	123	104	1	4	L
Rock Creek	I-80	258.95	AVD	59	15	20	24	16	6	60	6	134	72	1	2	L
Rock Creek	I-80	258.95	AVC	59	15	20	24	16	6	60	6	134	72	1	2	L
Rock Creek	I-80	272.5	AVR	59	15	20	3	16	6	40	6	113	52	1	1	L
Rock Creek	I-80	272.5	AVQ	59	15	20	24	16	6	40	3	134	49	1	1	L
Laramie River	I-80	312.44	AXK	59	25	20	24	24	12	0	12	152	24	2	1	L
Laramie River	I-80	312.44	AXJ	59	25	20	24	24	12	0	12	152	24	2	1	L
Goose Creek	I-90	20.59	BBK	59	30	20	3	32	30	10	12	144	52	2	1	L
Goose Creek	I-90	20.59	BBJ	59	30	20	24	32	30	10	12	165	52	3	1	L

Table 11 shows the results of prioritizing all the high risk rated bridges. WYDOT prioritized these bridges by their risk ratings, bridge conditions and critical tourism corridor rank. While resiliency analysis is performed and action plans created for all the bridges listed in Table 11, those with the "H" priority rating are proposed for more thorough mitigation action development and resiliency planning than are lower rated bridges.

Table 11: Prioritized List of "High" Flood Risk Rated Bridges

Stream Name	Facility	RM	Bridge ID	Risk Score	Condition Score	Criticality Ranking	Risk Grade	Condition Grade	Criticality Grade	Composite Grade	**Priority Score**	**Priority Rating**
Blacks Fork	I-80	77.5	AOR	16	27	3	4	4	5	4.3	1	**H**
Shoshone River	US-14/16/20	46.7	BZT	20	27	11	5	4	2	3.7	2	**H**
Blacks Fork	I-80	77.5	AOS	16	24	2	4	1	5	3.3	3	**H**
N Fork Shoshone River	US-14/16/20	32.0	DZU	15	27	10	3	4	3	3.3	3	**H**
Tongue River	I-90	15.0	BBA	15	24	6	3	1	4	2.7	5	**H**
Tongue River	I-90	15.0	BAZ	15	24	7	3	1	4	2.7	5	**H**
Flat Creek	US-89	152.2	BOO	15	27	15	3	4	1	2.7	5	**H**
Green River	I-80	86.4	APA	12	24	4	1	1	4	2.0	8	**M**
Green River	I-80	86.4	AOZ	12	24	5	1	1	4	2.0	8	**M**
Snake River	US-89	142.0	BOL	15	24	13	3	1	2	2.0	8	**M**
Snake River	US-89	146.1	BOM	15	24	14	3	1	2	2.0	8	**M**
Flat Creek	US-89	154.0	BOP	12	27	16	1	4	1	2.0	8	**M**
N Fork Shoshone River	US-14/16/20	15.8	KTC	12	24	8	1	1	3	1.7	13	**L**
N Fork Shoshone River	US-14/16/20	20.3	JJJ	12	24	9	1	1	3	1.7	13	**L**
Buffalo Fork Creek	US-26/287	3.6	LWC	12	24	12	1	1	2	1.3	15	**L**

Bridge Flood Action Plans

Action plans were created for each high risk bridge on the critical tourism network (see Appendix A for the action plan reports). Table 12 shows the potential actions to mitigate each bridge flood risk and the priority for each action.

Table 12: Action Plan Summary for "High" Flood Risk Rated Bridges

Bridge ID	**Stream Name**	**Facility Carried**	**RM**	**Priority Rating**	**Potential Actions**	**Action Priority**	**Comments**
AOR, AOS	Blacks Fork River	I-80	77.5	H	Replace with higher capacity bridges. Upgrade approaches accordingly.	3	Too expensive. Wait until bridge conditions warrant replacement.
					Upgrade scour prone attributes of the bridges.	2	Scour Critical = 8. No significant issue with scour protection.
					Repair the bridges following each incident. Establish and enact reroute procedures in the event the bridges are closed.	1	Appears to be the most cost-effective solution. Should plan alternative routing.
BZT	Shoshone River	US-14/16/20	46.7	H	Replace with higher capacity bridge. Upgrade approaches accordingly.	3	Too expensive. Wait until bridge conditions warrant replacement.
					Upgrade scour prone attributes of the bridge.	2	Scour Critical = 8. No significant issue with scour protection.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridges is closed.	1	Appears to be the most cost-effective solution. Should plan alternative routing.
DZU	N Fork Shoshone	US-14/	32	H	Replace with higher capacity bridge. Upgrade approaches accordingly.	3	Too expensive. Wait until bridge conditions warrant replacement.

	River	16/20			Upgrade scour prone attributes of the bridge.	2	Scour Critical = 8. No significant issue with scour protection.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridges is closed.	1	Appears to be the most cost-effective solution. Should plan alternative routing.
BAZ, BBA.	Tongue River	I-90	15	H	Replace with higher capacity bridges. Upgrade approaches accordingly.	3	Too expensive. Wait until bridge conditions warrant replacement.
					Upgrade scour prone attributes of the bridges.	2	Scour Critical = 8. No significant issue with scour protection.
					Repair the bridges following each incident. Establish and enact reroute procedures in the event the bridges are closed.	1	Appears to be the most cost-effective solution. Should plan alternative routing.
BOO	Flat Creek	US-89	152.2	H	Replace with higher capacity bridge. Upgrade approaches accordingly.	3	Too expensive. Wait until bridge conditions warrant replacement.
					Upgrade scour prone attributes of the bridge.	2	Scour Critical = 8. No significant issue with scour protection.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridges is closed.	1	Appears to be the most cost-effective solution. Should plan alternative routing.
AOZ, APA	Green River	I-80	86.4	M	Upgrade scour prone attributes of the bridges.	2	Scour Critical = 8. No significant issue with scour protection.
					Repair the bridges following each incident. Establish and enact reroute procedures in the event the bridges are closed.	1	Appears to be the most cost-effective solution. Should plan alternative routing.
BOL	Snake River	US-89	142	M	Upgrade scour prone attributes of the bridge.	2	Scour Critical = 8. No significant issue with scour protection.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridges is closed.	1	Appears to be the most cost-effective solution. Should plan alternative routing.
BOM	Snake River	US-89	146.1	M	Upgrade scour prone attributes of the bridge.	2	Scour Critical = 8. No significant issue with scour protection.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridges is closed.	1	Appears to be the most cost-effective solution. Should plan alternative routing.
BOP	Flat Creek	US-89	154	M	Upgrade scour prone attributes of the bridge.	2	Scour Critical = 8. No significant issue with scour protection.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridges is closed.	1	Appears to be the most cost-effective solution. Should plan alternative routing.
KTC	N Fork Shoshone River	US-14/ 16/20	15.8	L	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridges is closed.	1	Appears to be the most cost-effective solution. Should plan alternative routing.
JJJ	N Fork Shoshone River	US-14/ 16/20	20.3	L	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridges is closed.	1	Appears to be the most cost-effective solution. Should plan alternative routing.
LWC	Buffalo Fork Creek	US-26/ 287	3.6	L	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridges is closed.	1	Appears to be the most cost-effective solution. Should plan alternative routing.

Bridge Strike Resiliency

Bridge Strike Risks

Bridge strikes (collisions with bridges from over-height loads) do not typically create a need for lengthy detouring of traffic when they occur on bridges crossing over the critical facility. In this case, WYDOT will often close the bridge until repairs are made. Bridge strikes to bridges that carry the critical facility can

create significant delays to traffic particularly when no parallel facility is available. WYDOT assessed only those bridges that carry the critical routes for resiliency planning.

WYDOT collected bridge strike records for the years 1994 through 2017 or beginning from when the bridge was built if after 1994. The number of bridge strikes represents the probability, and traffic volumes for the potential consequence of future bridge strikes. Paired bridges on Interstate highways were treated as a single bridge for the analysis since the second bridge usually poses the same hazard as the struck bridge. Table 13 shows the forecast risks of bridge strikes on the critical corridors. The bridges are paired on Interstate and adjacent parallel routes carrying the same crossing facility.

Table 13: Risk Results for Bridge Strikes

Bridges	LRS ID	Route	RM	Bridge Strikes	AADT	**Probability**	**Consequence**	**Risk**
AMT, AMS	ML80	I-80	12.65	2	6190	4	4	**H**
ANH	ML80	I-80	23.91	2	6190	4	4	**H**
AOQ	ML80	I-80	77.34	3	6821	5	5	**H**
AOY, AOX	ML80	I-80	85.7	3	6821	5	5	**H**
AQZ	ML80	I-80	130.84	3	6821	5	5	**H**
ARN	ML80	I-80	146.85	2	6821	4	5	**H**
LZW	ML80	I-80	173.89	3	6821	5	5	**H**
ASP, ASQ	ML80	I-80	187.2	4	6821	5	5	**H**
ASV	ML80	I-80	196.16	2	6821	4	5	**H**
ATO	ML80	I-80	210.98	3	5842	5	3	**H**
KJA, KHZ	ML80	I-80	219.59	3	5842	5	3	**H**
AUR	ML80	I-80	235.28	2	5842	4	3	**H**
AVG	ML80	I-80	260.23	2	5842	4	3	**H**
LBN, LBO	ML80	I-80	313.19	4	6278	5	5	**H**
AYR, AYS	ML80	I-80	357.68	2	6194	4	4	**H**
AZW	ML80	I-80	383.36	3	6194	5	4	**H**
AAR, AAS	ML25	I-25	8.84	3	5552	5	2	**M**
ABC	ML25	I-25	10.59	3	5552	5	2	**M**
MCK, MCJ	ML25	I-25	11.24	2	5552	4	2	**M**
FDH	ML25	I-25	188.6	4	2670	5	1	**M**
DEN	ML34	US-20/26	2.09	2	3551	4	2	**M**
AOJ	ML80	I-80	61.59	1	6821	1	5	**M**
LEV	ML80	I-80	91.53	1	6821	1	5	**M**
LRY	ML80	I-80	104.67	1	6821	1	5	**M**
LYD	ML80	I-80	106.7	1	6821	1	5	**M**
ARC	ML80	I-80	135.05	1	6821	1	5	**M**
ARQ	ML80	I-80	150.81	1	6821	1	5	**M**
ARY	ML80	I-80	165.58	1	6821	1	5	**M**

ASE	ML80	I-80	172.36	1	6821	1	5	**M**
LZT	ML80	I-80	173.41	1	6821	1	5	**M**
ASO	ML80	I-80	184.29	1	6821	1	5	**M**
AXB	ML80	I-80	308.65	1	6278	1	5	**M**
AXU	ML80	I-80	326.6	1	6278	1	5	**M**
AXW	ML80	I-80	329.32	1	6278	1	5	**M**
BCE, BCD	ML90	I-90	33.6	2	3450	4	2	**M**
AAA	ML25	I-25	0.39	1	5552	1	2	**L**
AAH	ML25	I-25	2.66	1	5552	1	2	**L**
AAI	ML25	I-25	3.29	1	5552	1	2	**L**
AAV	ML25	I-25	9.14	1	5552	1	2	**L**
ACN	ML25	I-25	39.24	1	5552	1	2	**L**
DCV	ML25	I-25	46.15	1	5552	1	2	**L**
AMF	ML80	I-80	3.45	1	6190	1	4	**L**
AMU	ML80	I-80	13.86	1	6190	1	4	**L**
AMX	ML80	I-80	15.64	1	6190	1	4	**L**
ANK	ML80	I-80	30.4	1	6190	1	4	**L**
ANP	ML80	I-80	37.02	1	6190	1	4	**L**
ANT	ML80	I-80	41.99	1	6190	1	4	**L**
ATI	ML80	I-80	206.18	1	5842	1	3	**L**
ATM	ML80	I-80	209.46	1	5842	1	3	**L**
ATS	ML80	I-80	212.74	1	5842	1	3	**L**
ATW	ML80	I-80	215.19	1	5842	1	3	**L**
AUP	ML80	I-80	234.58	1	5842	1	3	**L**
AVK	ML80	I-80	267.19	1	5842	1	3	**L**
AVP	ML80	I-80	271.06	1	5842	1	3	**L**
AYE	ML80	I-80	340.65	1	6194	1	4	**L**
AYG	ML80	I-80	342.56	1	6194	1	4	**L**
AYO	ML80	I-80	354	1	6194	1	4	**L**
AZG	ML80	I-80	361.79	1	6194	1	4	**L**
AZI	ML80	I-80	362.04	1	6194	1	4	**L**
AZI	ML80	I-80	362.04	1	6194	1	4	**L**
DBO	ML80	I-80	364.9	1	6194	1	4	**L**
DBO	ML80	I-80	365	1	6194	1	4	**L**
DBR	ML80	I-80	367.42	1	6194	1	4	**L**
DBR	ML80	I-80	367.42	1	6194	1	4	**L**
AZR	ML80	I-80	377.3	1	6194	1	4	**L**
AZR	ML80	I-80	377.35	1	6194	1	4	**L**
BAE	ML80	I-80	391.39	1	6194	1	4	**L**
BAE	ML80	I-80	391.39	1	6194	1	4	**L**
BAJ	ML80	I-80	401.13	1	6194	1	4	**L**

MUQ	ML80	I-80	401.16	1	6194	1	4	**L**
MUR	ML80	I-80	401.45	1	6194	1	4	**L**
BAM	ML80	I-80	401.456	1	6194	1	4	**L**
DZY	ML90	I-90	9.8	1	3450	1	2	**L**
DZY	ML90	I-90	9.88	1	3450	1	2	**L**
DZZ	ML90	I-90	11.01	1	3450	1	2	**L**
DZZ	ML90	I-90	11.01	1	3450	1	2	**L**
BAY	ML90	I-90	14.89	1	3450	1	2	**L**
EAF	ML90	I-90	14.9	1	3450	1	2	**L**
BBM	ML90	I-90	20.92	1	3450	1	2	**L**
BBM	ML90	I-90	20.92	1	3450	1	2	**L**
KKY	ML90	I-90	23.15	1	3450	1	2	**L**
KKY	ML90	I-90	23.16	1	3450	1	2	**L**
BCE	ML90	I-90	33	1	3450	1	2	**L**
BCD	ML90	I-90	34.23	1	3450	1	2	**L**

WYDOT prioritized the high risk bridge strike locations based on their risk, bridge condition, and their location on the critical tourism network within the State. Table 14 shows those results.

Table 14: Prioritized List of "High" Risk Bridge Strikes

Bridges	Route	RM	Strikes	AADT	Probability	Consequence	Risk Score	Condition Score	Criticality Ranking	Risk Grade	Condition Grade	Criticality Grade	Composite Grade	Priority Score	**Priority Rating**
AOY, AOX	I-80	85.7	3	6821	5	5	25	5	6	4	5	5	4.67	1	**H**
AQZ	I-80	130.8	3	6821	5	5	25	5	6	4	5	5	4.67	1	**H**
ARN	I-80	146.9	2	6821	4	5	20	5	6	3	5	5	4.33	3	**H**
AOQ	I-80	77.34	3	6821	5	5	25	6	6	4	3	5	4.00	4	**H**
ASV	I-80	196.2	2	6821	4	5	20	6	6	3	3	5	3.67	5	**H**
LBN, LBO	I-80	313.2	4	6278	5	5	25	6	7	4	3	3	3.33	6	**M**
ASP, ASQ	I-80	187.2	4	6821	5	5	25	7	6	4	0	5	3.00	7	**M**
LZW	I-80	173.9	3	6821	5	5	25	7	6	4	0	5	3.00	7	**M**
AZW	I-80	383.4	3	6194	5	4	20	6	8	3	3	3	3.00	8	**M**
AYR, AYS	I-80	357.7	2	6194	4	4	16	6	8	2	3	3	2.67	10	**M**
AMT, AMS	I-80	12.65	2	6190	4	4	16	5	11	2	5	1	2.67	11	**L**
ANH	I-80	23.91	2	6190	4	4	16	5	11	2	5	1	2.67	11	**L**
ATO	I-80	211	3	5842	5	3	15	6	7	2	3	3	2.67	13	**L**
AUR	I-80	235.3	2	5842	4	3	12	5	9	1	5	2	2.67	14	**L**
AVG	I-80	260.2	2	5842	4	3	12	5	9	1	5	2	2.67	14	**L**
KJA, KHZ	I-80	219.6	3	5842	5	3	15	6	9	2	3	2	2.33	16	**L**

Bridge Strike Action Plans

Action plans were created for each high risk bridge on the critical tourism network (see Appendix B for the full action plans). Table 15 shows the potential actions to mitigate each bridge strike risk and the priority for each action.

Table 15: Action Plan Summary for "High" Bridge Strike Rated Bridges

Bridge ID	Facility Carried	RM	Crossing Feature	Priority Rating	Potential Actions	Action Priority	Comments
AOX, AOY	I-80	85.7	County Rd 59	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	4	Very costly. WYDOT should monitor before taking such a stringent action.
					Increase warning signage.	1	Very low volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	2	Parallel bridge available if this bridge is damaged.
					Lower the grade under the bridge.	3	Fairly costly with a few potential additional issues created if implemented including drainage and ramp grade changes.
AQZ	I-80	130.84	WY-377	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	4	Very costly. WYDOT should monitor before taking such a stringent action.
					Increase warning signage.	1	Fairly low volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	2	Parallel bridge available if this bridge is damaged.
					Lower the grade under the bridge.	3	Fairly costly with a few potential additional issues created if implemented including drainage and ramp grade changes.
ARN	I-80	146.85	Patrick Draw	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	4	Very costly. WYDOT should monitor before taking such a stringent action.
					Increase warning signage.	1	Very low volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	2	Parallel bridge available if this bridge is damaged.
					Lower the grade under the bridge.	3	Fairly costly with a few potential additional issues created if implemented including drainage and ramp grade changes.
AOQ	I-80	77.34	Machinery Pass	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	4	Very costly. WYDOT should monitor before taking such a stringent action.

					Increase warning signage.	1	Very low volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	2	Parallel bridge available if this bridge is damaged.
					Lower the grade under the bridge.	3	Fairly costly with a few potential additional issues created if implemented.
ASV	I-80	196.16	County Road 47	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	4	Very costly. WYDOT should monitor before taking such a stringent action.
					Increase warning signage.	1	Very low volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	2	Parallel bridge available if this bridge is damaged.
					Lower the grade under the bridge.	3	Fairly costly with a few potential additional issues created if implemented.
LBN, LBO	I-80	313.19	US-287	M	Replace with a higher clearance bridge. Upgrade approaches accordingly.	3	Very costly. WYDOT should monitor before taking such a stringent action.
					Increase warning signage.	1	Fairly high volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	2	Fairly high volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
ASP, ASQ	I-80	187.2	WY-789	M	Increase warning signage.	1	Parallel bridge available if this bridge is damaged.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	2	Parallel bridge available if this bridge is damaged.
					Lower the grade under the bridge.	3	Fairly costly with a few potential additional issues created if implemented.
LZW	I-80	173.89	County Road 23	M	Increase warning signage.	1	Very low volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	2	Parallel bridge available if this bridge is damaged.
					Lower the grade under the bridge.	3	Fairly costly with a few potential additional issues created if implemented.
AZW	I-80	383.36	County Road 146-1	M	Increase warning signage.	1	Very low volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	2	Parallel bridge available if this bridge is damaged.

					Lower the grade under the bridge.	3	Fairly costly with a few potential additional issues created if implemented including drainage and ramp grade changes.
AYR, AYS	I-80	357.68	WY-222	M	Increase warning signage.	1	Moderate volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	2	Moderate volume road crossing under the bridge. High truck volumes pass under bridges to access Wal Mart Distribution Center. Parallel bridge available if this bridge is damaged.
					Lower the grade under the bridge.	3	Fairly costly with a few potential additional issues created if implemented including drainage and ramp grade changes.
AMT, AMS	I-80	12.65	Machinery Pass	L	Increase warning signage.	1	Very low volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	2	Parallel bridge available if this bridge is damaged.
ANH	I-80	23.91	County Road 141	L	Increase warning signage.	1	Low volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	2	Low volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
ATO	I-80	210.98	Two Mile Draw	L	Increase warning signage.	1	Low volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	2	Low volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
AUR	I-80	235.28	US-30/WY-130	L	Increase warning signage.	1	Moderate traffic volume crossing under the bridge. Parallel bridge available if this bridge is damaged.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	2	Moderate traffic volume crossing under the bridge. Parallel bridge available if this bridge is damaged.
AVG	I-80	260.23	County Rd 3	L	Increase warning signage.	1	Low volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	2	Low volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
KJA, KHZ	I-80	219.59	WY-76	L	Increase warning signage.	1	Fairly low volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	2	Fairly low volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.

Winter Weather Closure and Delay Resiliency

Winter Weather Closure and Delay Risks

Winter weather road closures and weather-related delay were analyzed for risks to the traveling public and to WYDOT. Road closure durations were derived from road closure information provided by WYDOT ITS from the years 2005 through 2014. Figure 4 shows the road closures for this time period for all NHS roads in the State. Approximate annual hours and costs of weather-related delay per mile were calculated from NPMRDS travel time data for the Critical Tourism routes. Those results are shown in Figures 5 and 6, respectively. Only winter months (November through April) were applied to remove the effects of construction-related delay. The total hours of delay are used to calculate the "probability" risk score for winter weather and the costs of those delays for the "consequence" risk score.

Winter weather risk levels were determined for each road segment based on the risk matrix in Table 3. Risk scores were calculated by multiplying the 1 through 5 frequency rating by the 1 through 5 consequence rating. The risk scores were then prioritized from the highest to the lowest to estimate and extract the highest risk facilities. The results can be seen in the Table 16. The higher priority road segments have more thorough resiliency planning applied.

Figure 4: Annual Hours of Winter Weather-Related Road Closures

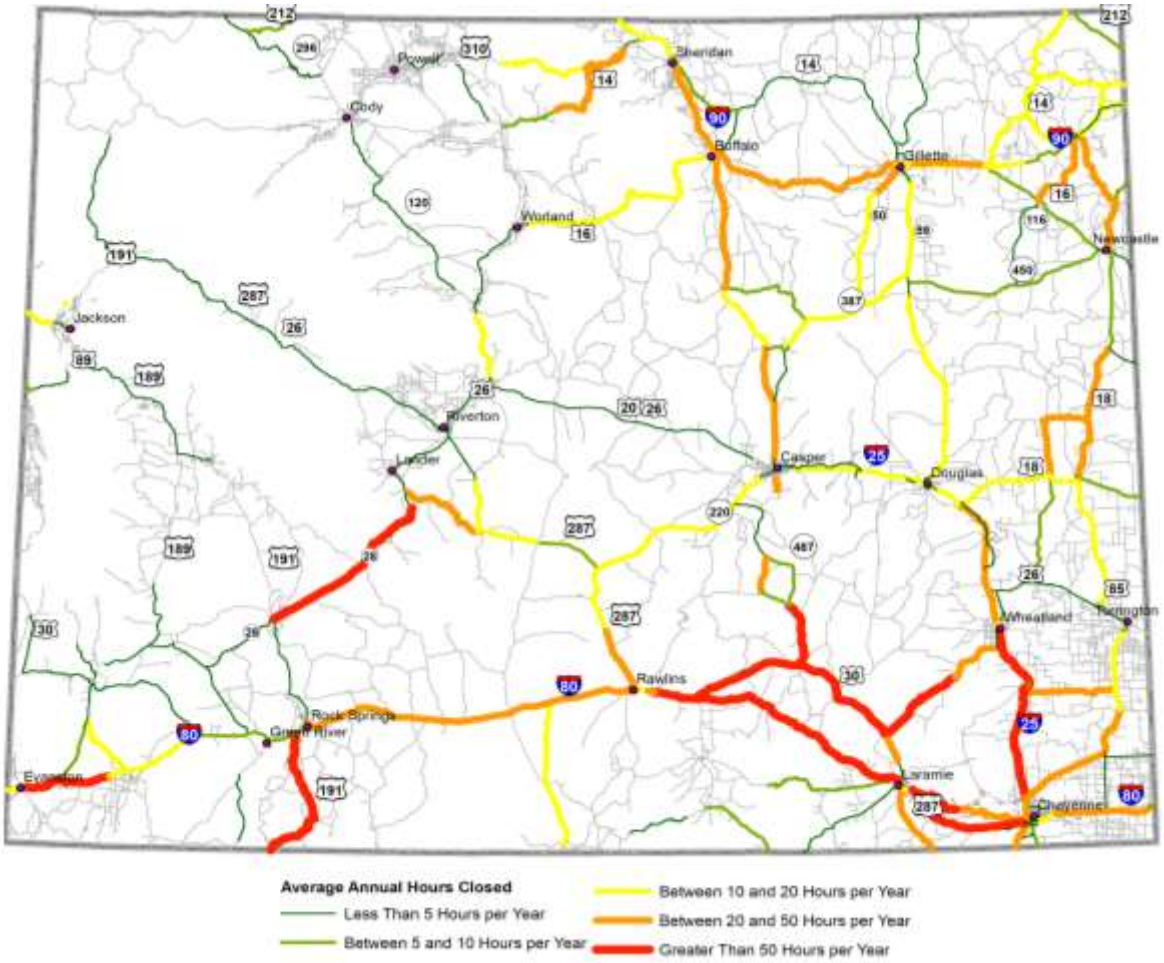


Figure 5: Annual Hours of Weather-Related Delay per Mile on Critical Tourism Corridors

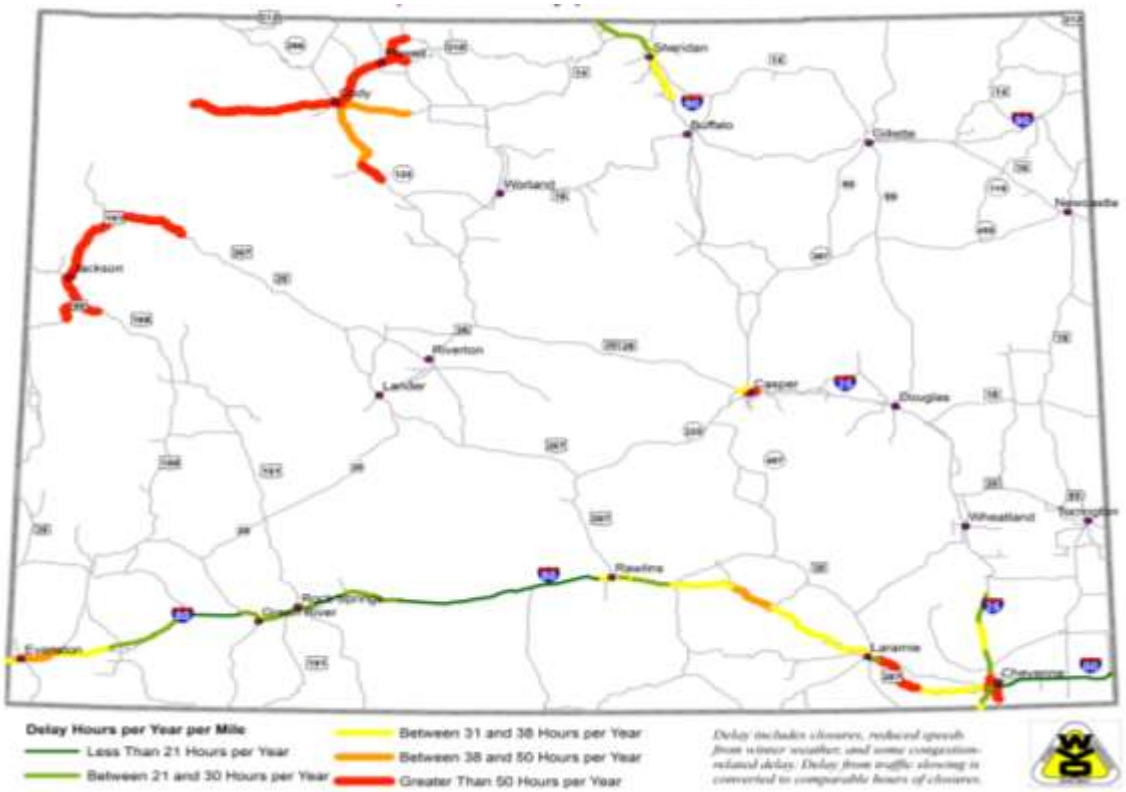


Figure 6: Annual Cost of Weather-Related Delay per Mile on Critical Tourism Corridors

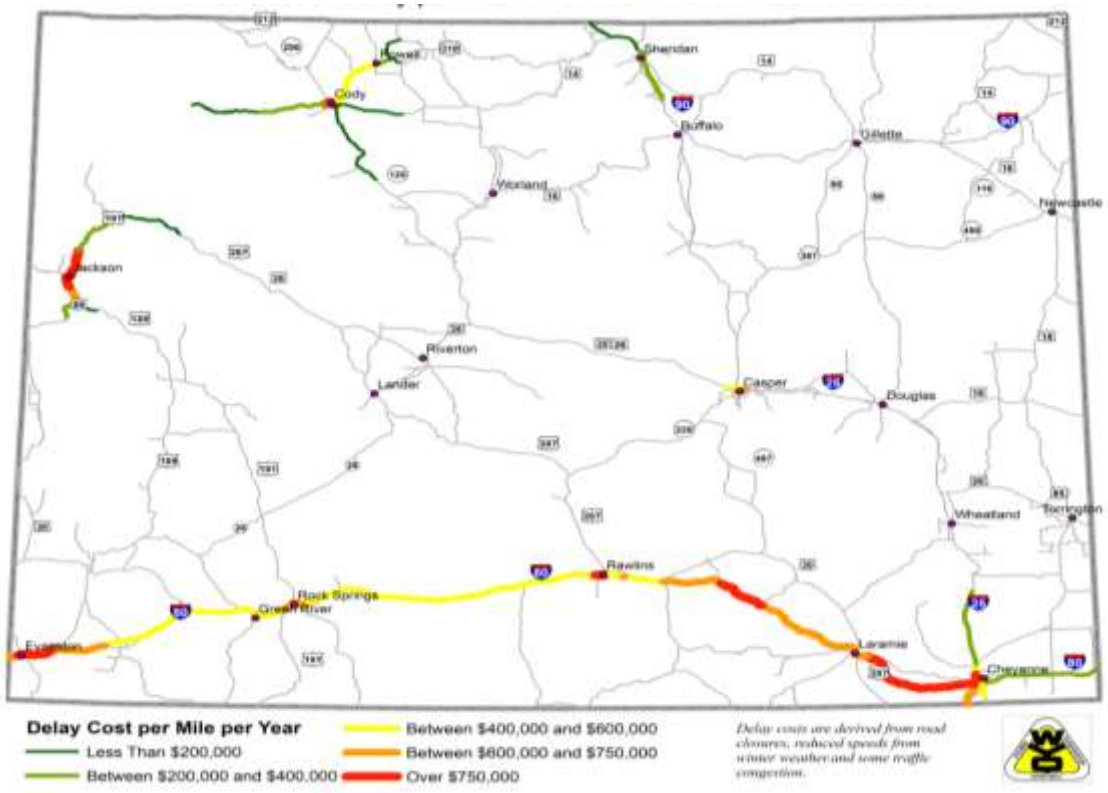


Table 16: Winter Weather Risk Evaluation for Critical Tourism Corridors

Facility	LRS ID	From RM	To RM	Total Annual Weather-Related Delay Hours per Mile	Total Annual Weather-Related Delay Cost per Mile	**Probability**	**Consequence**	**Risk Rating**
US-89	ML10B	151.918	154.848	115*	$2,094,574*	5	5	**H**
I-25	ML25B	7.85	8.845	69	$1,520,490	4	5	**H**
I-80	ML80B	322.741	334.86	64	$1,509,300	4	5	**H**
I-80	ML80B	316.48	322.741	61	$1,459,874	4	5	**H**
US-89	ML10B	148.704	151.918	103*	$1,334,191*	5	5	**H**
I-80	ML80B	255.269	272.13	49	$1,036,660	3	5	**H**
I-80	ML80B	6.033	18.098	46	$1,022,033	3	5	**H**
I-25	ML25B	10.586	12.697	59	$1,020,707	4	5	**H**
US-89	ML10B	154.848	164.926	146*	$958,324*	5	4	**H**
I-80	ML80B	3.235	6.033	39	$950,157	3	4	**H**
US-14/16/20	ML31B	49.87	54.587	102*	$913,768*	5	4	**H**
I-25	ML25B	8.845	10.586	52	$863,586	3	4	**H**
I-80	ML80B	334.86	359.195	36	$845,149	3	4	**H**
I-80	ML80B	234.786	255.269	35	$746,889	3	4	**H**
I-80	ML80B	272.13	310.12	35	$712,979	3	4	**H**
US-89	ML10B	141.222	148.704	72*	$702,445*	4	4	**H**
US 20-26	ML34B	0.087	2.34	67*	$644,365*	4	3	**H**
Greeley Hwy	ML180B	3.538	8.472	72*	$516,709*	4	3	**H**
US-14A	ML29B	2.695	22.837	111	$493,827	5	3	**H**
I-80	ML80B	211.28	215.304	31	$750,894	2	4	**M**
I-80	ML80B	89.13	91.475	31	$747,001	2	4	**M**
I-80	ML80B	310.12	311.367	34	$746,944	2	4	**M**
I-80	ML80B	219.12	221.493	31	$742,538	2	4	**M**
I-80	ML80B	209.19	211.28	31	$736,012	2	4	**M**
I-80	ML80B	18.098	34.428	33	$701,677	2	4	**M**
I-25	ML25B	0	2.662	30	$687,060	2	3	**M**
I-80	ML80B	0	3.235	30	$672,059	2	3	**M**
I-25	ML25B	2.662	7.85	29	$656,660	2	3	**M**
I-80	ML80B	34.428	39.612	29	$587,487	2	3	**M**
US-14A	ML29B	22.837	25.85	124	$474,316	5	2	**M**
Casper Bypass	ML47B	0	2.9	38	$447,890	3	2	**M**
US-14A	ML29B	25.85	29.522	123	$375,474	5	2	**M**
I-25	ML25B	25.442	34.45	35	$324,270	3	2	**M**
US-14/16/20	ML31B	27	45.323	103	$208,844	5	1	**M**
I-80	ML80B	311.367	313.32	27	$714,617	1	4	**L**
I-80	ML80B	98.787	104.774	23	$671,370	1	3	**L**

I-80	ML80B	313.32	316.48	27	$643,722	1	3	L
I-80	ML80B	104.774	110.913	25	$637,686	1	3	L
I-80	ML80B	359.195	361.64	23	$585,481	1	3	L
I-80	ML80B	91.475	98.787	22	$568,569	1	3	L
I-80	ML80B	215.304	219.12	23	$566,162	1	3	L
I-80	ML80B	82.608	89.13	23	$556,668	1	3	L
I-80	ML80B	221.493	234.786	24	$553,426	1	3	L
I-80	ML80B	122.049	142.006	21	$487,053	1	2	L
I-80	ML80B	47.962	65.537	21	$450,221	1	2	L
I-80	ML80B	174.066	209.19	19	$444,068	1	2	L
I-80	ML80B	39.612	47.962	22	$443,273	1	2	L
I-25	ML25B	12.697	17.042	30	$436,429	2	2	L
I-80	ML80B	110.913	122.049	18	$425,205	1	2	L
I-80	ML80B	361.64	363.617	17	$419,795	1	2	L
I-80	ML80B	142.006	174.066	18	$407,074	1	2	L
I-80	ML80B	65.537	82.608	17	$404,452	1	2	L
I-80	ML80B	363.617	370.083	18	$367,624	1	2	L
I-80	ML80B	401.2	402.78	29	$291,201	2	2	L
I-80	ML80B	370.083	386.067	17	$287,473	1	1	L
I-90	ML90B	20.634	22.902	37	$278,024	3	1	L
US-89	ML10B	132.62	141.222	57	$261,274	4	1	L
I-90	ML90B	22.902	24.961	29	$257,712	2	1	L
I-25	ML25B	17.042	25.442	24	$241,886	1	1	L
I-90	ML90B	33.334	41.96	34	$235,123	3	1	L
I-90	ML90B	24.961	33.334	34	$230,805	2	1	L
US-89	ML10B	164.926	184.572	51	$226,344	3	1	L
I-25	ML25B	34.45	47.153	25	$223,998	1	1	L
I-80	ML80B	386.067	401.2	13	$220,574	1	1	L
US-14/16/20	ML31B	45.323	49.87	86	$219,721	4	1	L
US-14/16/20	ML31B	54.587	57.362	94	$193,723	4	1	L
I-90	ML90B	9.485	20.634	28	$190,083	2	1	L
US-14A	ML29B	29.522	33.71	56	$149,785	4	1	L
I-90	ML90B	0	9.485	27	$129,331	1	1	L
US-191	ML13B	154.83	163.67	62	$112,584	4	1	L
WY-120	ML33B	43.1	51.76	67	$93,389	4	1	L
WY-114	ML32B	29.57	40.62	56	$91,107	4	1	L
US-26/287	ML30B	0	26.838	79	$85,430	4	1	L
WY-120	ML33B	51.76	81.21	43	$80,085	3	1	L
US-14/16/20	ML31B	0	27	55	$79,492	3	1	L
US-14/16/20	ML31B	57.362	77.74	43	$61,215	3	1	L

**Most of the identified delay is from traffic congestion in urban (mostly tourism) areas and is not winter weather related.*

WYDOT prioritized the high risk winter weather locations from Table 16 based on their risk, condition measure ("Total Annual Weather-Related Delay Hours per Mile"), and their location on the critical tourism network within the State. Table 17 shows those results.

Table 17: Prioritization of High Risk Winter Weather Critical Tourism Corridors

Facility	LRS ID	From RM	To RM	Risk Score	Condition Score	Criticality Ranking	Risk Grade	Condition Grade	Criticality Grade	Composite Grade	**Priority Score**	**Priority Rating**
US-89	ML10B	151.918	154.848	25	115	1	5	5	5	5.0	1	H*
US-89	ML10B	148.704	151.918	25	103	1	5	4	5	4.7	2	H*
US-89	ML10B	154.848	164.926	20	146	1	3	5	5	4.3	3	H*
US-89	ML10B	141.222	148.704	16	72	1	3	4	5	4.0	4	H*
US-14A	ML29B	2.695	22.837	15	111	3	3	5	4	4.0	4	H
US-14/16/20	ML31B	49.87	54.587	20	102	5	3	4	4	3.7	6	H*
I-80	ML80B	322.741	334.86	20	64	7	3	3	4	3.3	7	H
I-80	ML80B	316.48	322.741	20	61	7	3	3	4	3.3	7	H
I-25	ML25B	7.85	8.845	20	69	12	3	3	2	2.7	9	M
I-25	ML25B	10.586	12.697	20	59	12	3	3	2	2.7	9	M
I-80	ML80B	255.269	272.13	15	49	9	3	2	3	2.7	9	M
I-80	ML80B	6.033	18.098	15	46	11	3	2	2	2.3	12	M
Greeley Hwy	ML180B	3.538	8.472	12	72	10	1	4	2	2.3	12	M*
I-80	ML80B	272.13	310.12	12	35	7	1	1	4	2.0	14	M
US 20-26	ML34B	0.087	2.34	12	67	17	1	3	1	1.7	15	L*
I-25	ML25B	8.845	10.586	12	52	12	1	2	2	1.7	15	L
I-80	ML80B	3.235	6.033	12	39	11	1	2	2	1.7	15	L
I-80	ML80B	334.86	359.195	12	36	8	1	1	3	1.7	15	L
I-80	ML80B	234.786	255.269	12	35	9	1	1	3	1.7	15	L

**Most of the identified delay is from traffic congestion in urban (mostly tourism) areas and is not winter weather related.*

Winter Weather Action Plans

Action plans were created for each high risk, winter weather impacted road segment on the critical tourism network (see Appendix C for the full action plans). Table 18 shows the potential actions to mitigate each high risk, winter weather location and the priority for each action.

Table 18: Action Plan Summary for "High" Risk Winter Weather Critical Tourism Roads

Facility Name	**LRS ID**	**From RM**	**To RM**	**Priority Rating**	**Potential Actions**	**Action Priority**	**Comments**
US-89	ML10B	152	155	H	Assess and modify current snow removal and roadway management procedures as needed.	4	Lowest cost, though much is already done.
					Build snow fences	7	Urban area makes snow fence locations limited.

					Assess and modify traffic signals and controls to minimize congestion.	1	Very low cost. Likely to have minimal effect.
					Implement Connected Vehicle technology.	6	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Add additional lanes.	5	Very expensive. Jackson likely to resist.
					Establish existing alternative routes and procedures to implement during extreme weather events and relieve congestion related delays.	2	Limited alternatives exist.
					Build alternative routes to relieve traffic congestion.	3	Very expensive. Jackson likely to resist.
US-89	ML10B	149	152	H	Assess and modify current snow removal and roadway management procedures as needed.	4	Lowest cost, though much is already done.
					Build snow fences	5	Snow fence coverage on this road is already extensive.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective.
					Implement Connected Vehicle technology.	1	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Add additional lanes.	2	Very expensive. Jackson likely to resist.
					Establish existing alternative routes and procedures to implement during extreme weather events and relieve congestion related delays.	3	Limited alternatives exist.
					Build alternative routes to relieve traffic congestion.	7	Very expensive. Jackson likely to resist.
US-89	ML10B	155	165	H	Assess and modify current snow removal and roadway management procedures as needed.	4	Lowest cost, though much is already done.
					Build snow fences	5	Snow fence coverage on this road is already extensive.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective.
					Implement Connected Vehicle technology.	1	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Add additional lanes.	2	Very expensive. Jackson likely to resist.
					Establish existing alternative routes and procedures to implement during extreme weather events and relieve congestion related delays.	3	Limited alternatives exist.
					Build alternative routes to relieve traffic congestion.	7	Very expensive. Jackson likely to resist.
US-89	ML10B	141	149	H	Assess and modify current snow removal and roadway management procedures as needed.	4	Lowest cost, though much is already done.
					Build snow fences	5	Snow fence coverage on this road is already extensive.

					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective.
					Implement Connected Vehicle technology.	1	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Add additional lanes.	2	Very expensive. Jackson likely to resist.
					Establish existing alternative routes and procedures to implement during extreme weather events and relieve congestion related delays.	3	Limited alternatives exist.
					Build alternative routes to relieve traffic congestion.	7	Very expensive. Jackson likely to resist.
US-14A	ML29B	3	23	H	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
					Build snow fences	2	Need to investigate potential snow fence areas.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	4	Likely to be expensive. May not have enough effect to be cost-effective.
					Implement Connected Vehicle technology.	3	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Establish alternative routing procedures to implement during extreme weather events.	5	Currently being applied by default. Districts typically know conditions and issues associated with rerouting traffic. Some negative side-effects may occur on alternative routes.
US-14/16/20	ML31B	50	55	H	Assess and modify current snow removal and roadway management procedures as needed.	5	Lowest cost, though much is already done.
					Build snow fences	7	Need to investigate potential snow fence areas.
					Assess and modify traffic signals and controls to minimize congestion.	1	Very low cost. Likely to have minimal effect.
					Implement Connected Vehicle technology.	6	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Add additional lanes.	4	Very expensive.
					Establish existing alternative routes and procedures to implement during extreme weather events and relieve congestion related delays.	2	Limited alternatives exist.
					Build alternative routes to relieve traffic congestion.	3	Very expensive. Limited viable options.
I-80	ML80B	323	335	H	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
					Build snow fences	4	Need to investigate potential snow fence areas.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective.

					Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	3	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from travelers. CV Pilot Project not complete.
					Establish alternative routing procedures to implement during extreme weather events.	5	Currently being applied by default. Districts typically know conditions and issues associated with rerouting traffic. Some negative side-effects may occur on alternative routes.
I-80	ML80B	316	323	H	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
					Build snow fences	4	Need to investigate potential snow fence areas.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective.
					Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	3	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from travelers. CV Pilot Project not complete.
					Establish alternative routing procedures to implement during extreme weather events.	5	Currently being applied by default. Districts typically know conditions and issues associated with rerouting traffic. Some negative side-effects may occur on alternative routes.
I-25	ML25B	8	9	M	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
					Build snow fences	5	Need to investigate potential snow fence areas.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective.
					Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	3	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from travelers. CV Pilot Project not complete.
					Establish alternative routing procedures to implement during extreme weather events.	4	Currently being applied by default. Districts typically know conditions and issues associated with rerouting traffic. Some negative side-effects may occur on alternative routes.
I-25	ML25B	11	13	M	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
					Build snow fences	5	Need to investigate potential snow fence areas.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective.

					Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	3	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from travelers. CV Pilot Project not complete.
					Establish alternative routing procedures to implement during extreme weather events.	4	Currently being applied by default. Districts typically know conditions and issues associated with rerouting traffic. Some negative side-effects may occur on alternative routes.
I-80	ML80B	255	272	M	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
					Build snow fences	4	Snow fence coverage on this road is already extensive.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective.
					Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	3	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from travelers. CV Pilot Project not complete.
					Establish alternative routing procedures to implement during extreme weather events.	5	Currently being applied by default. Districts typically know conditions and issues associated with rerouting traffic. Some negative side-effects may occur on alternative routes.
I-80	ML80B	6	18	M	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
					Build snow fences	4	Snow fence coverage on this road is already extensive.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective.
					Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	3	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from travelers. CV Pilot Project not complete.
					Establish alternative routing procedures to implement during extreme weather events.	5	Currently being applied by default. Districts typically know conditions and issues associated with rerouting traffic. Some negative side-effects may occur on alternative routes.
US-85	ML180B	4	8	M	Assess and modify current snow removal and roadway management procedures as needed.	4	Lowest cost, though much is already done.
					Build snow fences	5	Need to investigate potential snow fence areas.
					Assess and modify traffic signals and controls to minimize congestion.	1	Very low cost. Likely to have minimal effect.

					Implement Connected Vehicle technology.	7	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Add additional lanes.	6	Very expensive.
					Establish existing alternative routes and procedures to implement during extreme weather events and relieve congestion related delays.	2	
					Build alternative routes to relieve traffic congestion.	3	Very expensive.
I-80	ML80B	272	310	M	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
					Build snow fences	4	Snow fence coverage on this road is already extensive.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective.
					Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	3	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from travelers. CV Pilot Project not complete.
					Establish alternative routing procedures to implement during extreme weather events.	5	Currently being applied by default. Districts typically know conditions and issues associated with rerouting traffic. Some negative side-effects may occur on alternative routes.
US-20/26	ML34B	0	2	L	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done.
					Build snow fences	4	Urban area makes snow fence locations limited.
					Assess and modify traffic signals and controls to minimize congestion.	1	Very low cost. Likely to have minimal effect.
					Implement Connected Vehicle technology.	7	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Add additional lanes.	6	Very expensive.
					Establish existing alternative routes and procedures to implement during extreme weather events and relieve congestion related delays.	2	
					Build alternative routes to relieve traffic congestion.	5	Very expensive.
I-25	ML25B	9	11	L	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
					Build snow fences	5	Possible snow fence locations are limited.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective.

					Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	3	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from travelers. CV Pilot Project not complete.
					Establish alternative routing procedures to implement during extreme weather events.	4	Currently being applied by default. Districts typically know conditions and issues associated with rerouting traffic. Some negative side-effects may occur on alternative routes.
I-80	ML80B	3	6	L	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
					Build snow fences	3	Snow fence coverage on this road is already extensive. Urban location may limit installation in some areas.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting or vehicle skid.	4	Likely to be expensive. May not have enough effect to be cost-effective.
					Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	2	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Implement Connected Vehicle roadway condition communication technology.	5	Much of infrastructure is in place. Need buy-in from travelers. CV Pilot Project not complete.
					Establish alternative routing procedures to implement during extreme weather events.	6	Currently being applied by default. Districts typically know conditions and issues associated with rerouting traffic. Some negative side-effects may occur on alternative routes.
I-80	ML80B	335	359	L	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
					Build snow fences	4	Snow fence coverage on this road is already extensive.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective.
					Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	3	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from travelers. CV Pilot Project not complete.
					Establish alternative routing procedures to implement during extreme weather events.	5	Currently being applied by default. Districts typically know conditions and issues associated with rerouting traffic. Some negative side-effects may occur on alternative routes.
I-80	ML80B	235	255	L	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
					Build snow fences	4	Snow fence coverage on this road is already extensive.

					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective.
					Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	3	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve traffic movement.
					Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from travelers. CV Pilot Project not complete.
					Establish alternative routing procedures to implement during extreme weather events.	5	Currently being applied by default. Districts typically know conditions and issues associated with rerouting traffic. Some negative side-effects may occur on alternative routes.

Environmental Resiliency

Environmental Risks

WYDOT assessed the environmental risks of the creation of nonattainment areas within the State. Pollutant levels were obtained from Wyoming DEQ's Air Quality Monitoring Network, *Wyoming Ambient Air Monitoring Annual Network Plan* 2016 (http://deq.wyoming.gov/media/attachments/Air%20Quality/Monitoring/Annual%20Network%20Plans/Annual-Network-Plan_2016-Final.pdf). Staff calculated the percentages attained toward exceedance levels for each pollutant type by county then averaged the values for a "Nonattainment Score". WYDOT applied only the percentage for highest level pollutant to each county and to all critical tourism corridors within each county.

In addition to the pollutant levels, WYDOT incorporated the annual delay per mile on each road segment to the probability side of the risk analysis. The delay values were taken from the results of the winter weather risk analysis described earlier in this document. WYDOT assumes that traffic delay is a significant contributor to pollutant emissions and therefore is a reasonable predictor of potential pollutant increases.

WYDOT applied the population of each county as its consequence measure of risk, because WYDOT assumes that the people living within the county are the most negatively affected by pollutants. Table 19 shows the results of the environmental risk analysis.

Table 19: Risk Results for Nonattainment Area Creation

LRS ID	Facility	From RM	To RM	Population	Annual Delay Hours per Mile	PM10 (24-hr)	PM2.5 (24-hr)	NOx	Ozone	Nonattain Score	Delay Score	Probability Score	Probability	Consequence	Risk
ML25B	I-25	7.85	8.845	101,650	65,348	78%	43%	60%	90%	79%	99%	89%	5	5	H
ML25B	I-25	10.586	12.697	101,650	52,950	78%	43%	60%	90%	79%	96%	87%	5	5	H
ML31B	US-14/16/20	49.87	54.587	29,960	44,392	30%	66%	0%	0%	45%	93%	69%	4	3	H
ML25B	I-25	8.845	10.586	101,650	43,434	78%	43%	60%	90%	79%	92%	85%	5	5	H
ML80B	I-80	322.741	334.86	39,290	36,067	65%	38%	40%	87%	72%	91%	81%	5	4	H
ML80B	I-80	316.48	322.741	39,290	35,431	65%	38%	40%	87%	72%	89%	81%	5	4	H
ML34B	US-20/US-26	0.087	2.34	83,130	31,295	51%	47%	44%	90%	74%	87%	80%	5	5	H
ML180B	US-87	3.538	8.472	101,650	28,657	78%	43%	60%	90%	79%	85%	82%	5	5	H
ML29B	US-14A	2.695	22.837	29,960	28,106	30%	66%	0%	0%	45%	84%	64%	4	3	H
ML29B	US-14A	22.837	25.85	29,960	27,144	30%	66%	0%	0%	45%	83%	64%	4	3	H
ML25B	I-25	0	2.662	101,650	26,592	78%	43%	60%	90%	79%	81%	80%	5	5	H
ML25B	I-25	2.662	7.85	101,650	24,884	78%	43%	60%	90%	79%	77%	78%	5	5	H
ML80B	I-80	98.787	104.774	43,860	21,480	63%	54%	32%	96%	78%	76%	77%	5	4	H
ML80B	I-80	334.86	359.195	101,650	20,524	78%	43%	60%	90%	79%	72%	75%	5	5	H
ML80B	I-80	311.367	313.32	39,290	19,236	65%	38%	40%	87%	72%	71%	71%	5	4	H
ML80B	I-80	89.13	91.475	43,860	18,837	63%	54%	32%	96%	78%	68%	73%	5	4	H
ML47B	Casper Bypass	0	2.9	83,130	18,618	51%	47%	44%	90%	74%	67%	70%	4	5	H
ML80B	I-80	359.195	361.64	101,650	17,342	78%	43%	60%	90%	79%	65%	72%	5	5	H
ML80B	I-80	310.12	311.367	39,290	17,201	65%	38%	40%	87%	72%	63%	67%	4	4	H
ML80B	I-80	104.774	110.913	43,860	16,782	63%	54%	32%	96%	78%	61%	70%	4	4	H
ML80B	I-80	313.32	316.48	39,290	16,207	65%	38%	40%	87%	72%	60%	66%	4	4	H
ML25B	I-25	12.697	17.042	101,650	15,655	78%	43%	60%	90%	79%	56%	67%	4	5	H
ML80B	I-80	272.13	310.12	39,290	15,481	65%	38%	40%	87%	72%	53%	63%	3	4	H
ML80B	I-80	91.475	98.787	43,860	13,975	63%	54%	32%	96%	78%	51%	65%	4	4	H
ML80B	I-80	82.608	89.13	43,860	12,951	63%	54%	32%	96%	78%	48%	63%	3	4	H
ML90B	I-90	20.634	22.902	31,090	12,721	65%	99%	35%	80%	84%	45%	65%	4	3	H
ML80B	I-80	361.64	363.617	101,650	12,656	78%	43%	60%	90%	79%	44%	61%	3	5	H
ML90B	I-90	22.902	24.961	31,090	12,615	65%	99%	35%	80%	84%	43%	63%	4	3	H
ML80B	I-80	122.049	142.006	43,860	11,127	63%	54%	32%	96%	78%	40%	59%	3	4	H
ML25B	I-25	25.442	34.45	101,650	10,949	78%	43%	60%	90%	79%	37%	58%	3	5	H
ML10B	US-89	151.918	154.848	24,330	89,657	22%	43%	0%	0%	30%	100 %	65%	4	2	M

ML10B	US-89	148.704	151.918	24,330	58,089	22%	43%	0%	0%	30%	97%	63%	4	2	M
ML10B	US-89	154.848	164.926	24,330	46,382	22%	43%	0%	0%	30%	95%	62%	3	2	M
ML10B	US-89	141.222	148.704	24,330	32,973	22%	43%	0%	0%	30%	88%	59%	3	2	M
ML80B	I-80	3.235	6.033	20,610	25,504	34%	0%	13%	89%	61%	80%	71%	5	2	M
ML80B	I-80	6.033	18.098	20,610	25,118	34%	0%	13%	89%	61%	79%	70%	4	2	M
ML29B	US-14A	25.85	29.522	29,960	20,735	30%	66%	0%	0%	45%	73%	59%	3	3	M
ML80B	I-80	18.098	34.428	20,610	16,190	34%	0%	13%	89%	61%	59%	60%	3	2	M
ML80B	I-80	0	3.235	20,610	15,531	34%	0%	13%	89%	61%	55%	58%	3	2	M
ML80B	I-80	401.2	402.78	101,650	10,711	78%	43%	60%	90%	79%	35%	57%	2	5	M
ML90B	I-90	33.334	41.96	31,090	10,186	65%	99%	35%	80%	84%	33%	59%	3	3	M
ML80B	I-80	110.913	122.049	43,860	10,041	63%	54%	32%	96%	78%	31%	55%	2	4	M
ML90B	I-90	24.961	33.334	31,090	9,975	65%	99%	35%	80%	84%	29%	57%	3	3	M
ML80B	I-80	65.537	82.608	43,860	9,654	63%	54%	32%	96%	78%	25%	52%	2	4	M
ML80B	I-80	142.006	174.066	43,860	8,881	63%	54%	32%	96%	78%	20%	49%	2	4	M
ML80B	I-80	363.617	370.083	101,650	8,817	78%	43%	60%	90%	79%	19%	49%	2	5	M
ML25B	I-25	17.042	25.442	101,650	8,700	78%	43%	60%	90%	79%	17%	48%	2	5	M
ML90B	I-90	9.485	20.634	31,090	8,288	65%	99%	35%	80%	84%	16%	50%	2	3	M
ML25B	I-25	34.45	47.153	101,650	7,845	78%	43%	60%	90%	79%	13%	46%	2	5	M
ML80B	I-80	370.083	386.067	101,650	7,062	78%	43%	60%	90%	79%	12%	45%	2	5	M
ML80B	I-80	386.067	401.2	101,650	5,148	78%	43%	60%	90%	79%	9%	44%	1	5	M
ML90B	I-90	0	9.485	31,090	4,507	65%	99%	35%	80%	84%	8%	46%	2	3	M
ML80B	I-80	255.269	272.13	15,870	21,406	18%	49%	57%	67%	57%	75%	66%	4	1	L
ML80B	I-80	219.12	221.493	15,870	19,164	18%	49%	57%	67%	57%	69%	63%	3	1	L
ML80B	I-80	211.28	215.304	15,870	17,253	18%	49%	57%	67%	57%	64%	61%	3	1	L
ML80B	I-80	209.19	211.28	15,870	16,048	18%	49%	57%	67%	57%	57%	57%	3	1	L
ML80B	I-80	234.786	255.269	15,870	15,457	18%	49%	57%	67%	57%	52%	55%	2	1	L
ML80B	I-80	215.304	219.12	15,870	13,494	18%	49%	57%	67%	57%	49%	53%	2	1	L
ML80B	I-80	34.428	39.612	20,610	12,727	34%	0%	13%	89%	61%	47%	54%	2	2	L
ML80B	I-80	221.493	234.786	15,870	12,535	18%	49%	57%	67%	57%	41%	49%	2	1	L
ML31B	US-14/16/20	45.323	49.87	29,960	11,034	30%	66%	0%	0%	45%	39%	42%	1	3	L
ML10B	US-89	132.62	141.222	24,330	10,944	22%	43%	0%	0%	30%	36%	33%	1	2	L
ML80B	I-80	47.962	65.537	20,610	10,107	34%	0%	13%	89%	61%	32%	47%	2	2	L
ML80B	I-80	174.066	209.19	15,870	9,902	18%	49%	57%	67%	57%	28%	43%	1	1	L
ML10B	US-89	164.926	184.572	24,330	9,822	22%	43%	0%	0%	30%	27%	28%	1	2	L
ML80B	I-80	39.612	47.962	20,610	9,653	34%	0%	13%	89%	61%	24%	43%	1	2	L
ML31B	US-14/16/20	54.587	57.362	29,960	9,486	30%	66%	0%	0%	45%	23%	34%	1	3	L
ML31B	US-14/16/20	27	45.323	29,960	9,361	30%	66%	0%	0%	45%	21%	33%	1	3	L
ML29B	US-14A	29.522	33.71	29,960	8,162	30%	66%	0%	0%	45%	15%	30%	1	3	L

ML13B	US-191	154.83	163.67	24,330	5,412	22%	43%	0%	0%	30%	11%	20%	1	2	L
ML30B	US-26/287	0	26.838	24,330	4,074	22%	43%	0%	0%	30%	7%	18%	0	2	L
ML33B	WY-120	43.1	51.76	29,960	3,926	30%	66%	0%	0%	45%	5%	25%	1	3	L
ML32B	WY-114	29.57	40.62	29,960	3,827	30%	66%	0%	0%	45%	4%	24%	1	3	L
ML33B	WY-120	51.76	81.21	29,960	3,374	30%	66%	0%	0%	45%	3%	24%	1	3	L
ML31B	US-14/16/20	0	27	29,960	3,336	30%	66%	0%	0%	45%	1%	23%	1	3	L
ML31B	US-14/16/20	57.362	77.74	29,960	2,695	30%	66%	0%	0%	45%	0%	22%	1	3	L

WYDOT prioritized the high risk environmental roads based on their risk, condition measure (averaged pollutant levels in relation to exceedance levels for the four pollutants analyzed), and their priority on the critical tourism network. Table 20 shows those results.

Table 20: Prioritized Nonattainment Area Creation Roads

LRS ID	Facility	From RM	To RM	Risk Grade	Condition Grade	Criticality Grade	Composite Grade	Priority Score	**Priority Rating**
ML80B	I-80	89.13	91.475	4	3	5	4.00	**1**	**H**
ML80B	I-80	98.787	104.774	4	3	5	4.00	**1**	**H**
ML180B	US-87	3.538	8.472	5	3	3	3.67	**3**	**H**
ML80B	I-80	334.86	359.195	5	3	3	3.67	**3**	**H**
ML80B	I-80	359.195	361.64	5	3	3	3.67	**3**	**H**
ML80B	I-80	91.475	98.787	3	3	5	3.67	**3**	**H**
ML80B	I-80	104.774	110.913	3	3	5	3.67	**3**	**H**
ML25B	I-25	0	2.662	5	3	2	3.33	**8**	**H**
ML25B	I-25	2.662	7.85	5	3	2	3.33	**8**	**H**
ML25B	I-25	7.85	8.845	5	3	2	3.33	**8**	**H**
ML25B	I-25	8.845	10.586	5	3	2	3.33	**8**	**M**
ML25B	I-25	10.586	12.697	5	3	2	3.33	**8**	**M**
ML80B	I-80	311.367	313.32	4	1	4	3.00	**13**	**M**
ML80B	I-80	316.48	322.741	4	1	4	3.00	**13**	**M**
ML80B	I-80	322.741	334.86	4	1	4	3.00	**13**	**M**
ML25B	I-25	12.697	17.042	4	3	2	3.00	**13**	**M**
ML80B	I-80	82.608	89.13	1	3	5	3.00	**13**	**M**
ML80B	I-80	122.049	142.006	1	3	5	3.00	**13**	**M**
ML34B	US-20/US-26	0.087	2.34	5	2	1	2.67	**19**	**M**
ML80B	I-80	310.12	311.367	3	1	4	2.67	**19**	**M**
ML80B	I-80	313.32	316.48	3	1	4	2.67	**19**	**L**

ML80B	I-80	361.64	363.617	2	3	3	2.67	**19**	**L**
ML47B	Casper Bypass	0	2.9	4	2	1	2.33	**23**	**L**
ML25B	I-25	25.442	34.45	2	3	2	2.33	**23**	**L**
ML29B	US-14A	2.695	22.837	1	1	5	2.33	**23**	**L**
ML29B	US-14A	22.837	25.85	1	1	5	2.33	**23**	**L**
ML31B	US-14/16/20	49.87	54.587	1	1	5	2.33	**23**	**L**
ML90B	I-90	20.634	22.902	1	5	1	2.33	**23**	**L**
ML90B	I-90	22.902	24.961	1	5	1	2.33	**23**	**L**
ML80B	I-80	272.13	310.12	1	1	4	2.00	**30**	**L**

Environmental – Nonattainment Area Creation Action Plan

WYDOT formed action plans for each road segment with a high potential to cause the inadvertent creation of nonattainment areas in Wyoming (see Appendix D for the full action plans). Table 21 shows the potential actions to mitigate each high risk road and the priority for each action.

Table 21: Action Plan Summary for High Risk Environmental – Nonattainment Area Creation Roads

LRS ID	From RM	To RM	Facility Name	Priority Rating	Potential Actions	Action Priority	Comments
ML80B	122	142	I-80	H	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	4	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve vehicle movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide diesel retrofit incentives to the trucking industry.	5	Year round improvement. Could be very costly and may require future investments as truck fleets get replaced.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	142	174	I-80	H	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	4	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide diesel retrofit incentives to the trucking industry.	5	Year round improvement. Could be very costly and may require future investments as truck fleets get replaced.

					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	335	359	I-80	H	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	4	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide diesel retrofit incentives to the trucking industry.	5	Year round improvement. Could be very costly and may require future investments as truck fleets get replaced.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML25B	0	3	I-25	H	Assess and modify current snow removal and roadway management procedures as needed.	4	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	5	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	7	Likely to be expensive. May not have enough effect to be cost-effective. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	3	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide diesel retrofit incentives to the trucking industry.	6	Year round improvement. Could be very costly and may require future investments as truck fleets get replaced.
					Provide electrified truck parking areas to reduce truck idling.	1	Very low cost. Requires trucker buy-in.
					Incentivize PrePass for trucks at the port-of-entry.	2	Very low cost. Requires trucker buy-in.
ML25B	3	8	I-25	H	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	4	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide diesel retrofit incentives to the trucking industry.	5	Year round improvement. Could be very costly and may require future investments as truck fleets get replaced.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML25B	11	13	I-25	H	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	6	Urban area limits available snow fence sites.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	5	Likely to be expensive. May not have enough effect to be cost-effective. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.

					Provide diesel retrofit incentives to the trucking industry.	4	Year round improvement. Could be very costly and may require future investments as truck fleets get replaced.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML25B	13	17	I-25	H	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	6	Urban area limits available snow fence sites.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	5	Likely to be expensive. May not have enough effect to be cost-effective. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide diesel retrofit incentives to the trucking industry.	4	Year round improvement. Could be very costly and may require future investments as truck fleets get replaced.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML25B	17	25	I-25	H	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	4	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide diesel retrofit incentives to the trucking industry.	5	Year round improvement. Could be very costly and may require future investments as truck fleets get replaced.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML25B	25	34	I-25	H	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	4	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide diesel retrofit incentives to the trucking industry.	5	Year round improvement. Could be very costly and may require future investments as truck fleets get replaced.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	83	89	I-80	H	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	4	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.

					Provide diesel retrofit incentives to the trucking industry.	5	Year round improvement. Could be very costly and may require future investments as truck fleets get replaced.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	99	105	I-80	H	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	6	Urban area limits available snow fence sites.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	5	Likely to be expensive. May not have enough effect to be cost-effective. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide diesel retrofit incentives to the trucking industry.	4	Year round improvement. Could be very costly and may require future investments as truck fleets get replaced.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	105	111	I-80	H	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	4	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide diesel retrofit incentives to the trucking industry.	5	Year round improvement. Could be very costly and may require future investments as truck fleets get replaced.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	111	122	I-80	H	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	4	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide diesel retrofit incentives to the trucking industry.	5	Year round improvement. Could be very costly and may require future investments as truck fleets get replaced.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	370	386	I-80	H	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	4	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	6	Likely to be expensive. May not have enough effect to be cost-effective. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.

					Provide diesel retrofit incentives to the trucking industry.	5	Year round improvement. Could be very costly and may require future investments as truck fleets get replaced.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML25B	8	9	I-25	M	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	4	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML25B	9	11	I-25	M	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide diesel retrofit incentives to the trucking industry.	4	Year round improvement. Could be very costly and may require future investments as truck fleets get replaced.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML25B	34	47	I-25	M	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	4	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	272	310	I-80	M	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	4	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	316	323	I-80	M	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide diesel retrofit incentives to the trucking industry.	4	Year round improvement. Could be very costly and may require future investments as truck fleets get replaced.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	323	335	I-80	M	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	4	Snow fence coverage on this road is near maximum. Not effective in summer months.

					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	359	362	I-80	M	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide diesel retrofit incentives to the trucking industry.	4	Year round improvement. Could be very costly and may require future investments as truck fleets get replaced.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	364	370	I-80	M	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	4	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	386	401	I-80	M	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	4	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML90B	25	33	I-90	M	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide diesel retrofit incentives to the trucking industry.	4	Year round improvement. Could be very costly and may require future investments as truck fleets get replaced.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML90B	33	42	I-90	M	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	4	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	66	83	I-80	L	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.

					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	89	91	I-80	L	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	91	99	I-80	L	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML90B	9	21	I-90	H	Assess and modify current snow removal and roadway management procedures as needed.	4	Lowest cost, though much is already done. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	3	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide electrified truck parking areas to reduce truck idling.	1	Very low cost. Requires trucker buy-in.
					Incentivize PrePass for trucks at the port-of-entry.	2	Very low cost. Requires trucker buy-in.
ML80B	311	313	I-80	L	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	313	316	I-80	L	Assess and modify current snow removal and roadway management procedures as needed.	3	Lowest cost, though much is already done. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve traffic movement. Some of infrastructure is in place. Need buy-in from drivers.
					Provide electrified truck parking areas to reduce truck idling.	1	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.

Figure 7 shows the locations for high risk tourism assets. Most risks are concentrated along I-80 and I-25 in southeast Wyoming.

Figure 7: High Risk Highway Tourism Locations Map

Merged Tourism Resiliency Action Plans

WYDOT merged the tourism action plans to better identify, consolidate and revise propose action priorities. The plans were merged based on overlapping locations with location termini set based on changes in the combined risks. Table 22 shows consolidated road and bridge sections from the action plans.

Table 22: Risks at Consolidated Locations

Roadways						Bridges		
				Risks			Risks	
Facility Name	LRS ID	From RM	To RM	Weather	Environmental	Bridge RM	Bridge Flood	Bridge Strike
Casper Bypass	ML47B	0	3		X			
I-25	ML25B	0	8		X			
I-25	ML25B	8	13	X	X			
I-25	ML25B	13	17		X			
I-25	ML25B	25	34		X			
I-80	ML80B	3	18	X		12.65		X
I-80	ML80B	23.91	23.91			23.91		X
I-80	ML80B	77.34	77.34			77.34		X
I-80	ML80B	77.5	77.5			77.5	X	
I-80	ML80B	83	111		X	85.7		X
						86.4	X	
I-80	ML80B	122	142		X	130.84		X
I-80	ML80B	146.85	146.85			146.85		X
I-80	ML80B	173.89	173.89			173.89		X
I-80	ML80B	187.2	187.2			187.2		X
I-80	ML80B	196.16	196.16			196.16		X
I-80	ML80B	210.98	210.98			210.98		X
I-80	ML80B	219.59	219.59			219.59		X
I-80	ML80B	235	272	X		235.28		X
						260.23		X
I-80	ML80B	272	310	X	X			
I-80	ML80B	310	316		X	313.19		X
I-80	ML80B	316	359	X	X	357.68		X
I-80	ML80B	359	364		X			
I-80	ML80B	383.36	383.36			383.36		X
I-90	ML90B	15	15			15	X	
I-90	ML90B	21	25		X			
US-14/ 16/20	ML31B	15.8	15.8			15.8	X	
US-14/ 16/20	ML31B	20.3	20.3			20.3	X	
US-14/ 16/20	ML31B	32	32			32	X	
US-14/ 16/20	ML31B	46.7	46.7			46.7	X	
US-14/16/20	ML31B	50	55	X	X			

US-14A	ML29B	3	23	X	X		
US-14A	ML29B	23	26		X		
US-20/26	ML34B	0	2	X	X		
US-26/ 287	ML30B	3.6	3.6			3.6	X
US-85	ML180B	4	8	X	X		
US-89	ML10B	141	165	X			
US-89	ML10B	142	142			142	X
US-89	ML10B	146.1	146.1			146.1	X
US-89	ML10B	152.2	152.2			152.2	X
US-89	ML10B	154	154			154	X

Resiliency Task Plans

WYDOT merged the action plans according to common risk factors, prioritized each, and created a series of potential resiliency tasks. WYDOT prioritized the resiliency plans according to the weighting values shown in Table 23. The weighting values were established according to the perceived level of disruption that each risk poses to the movement of vehicles on critical tourism corridors. The tasks were assessed from highest to lowest priority, keeping only the highest priority tasks for the lower priority road sections. Multiple tasks are proposed for most locations based on the number and intensity of the risks. WYDOT does not intend for each task to be implemented, but to provide WYDOT engineers, maintenance personnel and planners a potential list of tasks to evaluate for feasibility. Other reasonable task development is encouraged to supplement or replace the tasks listed.

Table 23: Weighting Factors Used to Estimate Risk Location Priorities

Risk	Weight
Winter Weather	10
Environmental	3
Bridge Flood	7
Bridge Strike	5

US 89 – RM 141 to RM 165

Priority: 1

This highway section exhibits high risks for winter weather and bridge flooding at RM 142, 146.1, 152.2 and 154 (bridges BOL, BOM, BDO and BOP). These bridges carry US-89 and could lead to significant issues if a flood were to damage one of the bridges and close US-89 leading into Jackson. Daily traffic volumes are nearly 11,000 while estimated delay cost approximately $1,069,000 per mile per year. Much of the delay is likely from traffic congestion in the area. The following are recommended actions to mitigate the identified risks:

1. WYDOT should assess and modify traffic signals and controls to minimize congestion.
2. WYDOT should evaluate adding lanes and establishing alternative routes.
3. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to reduce the length of closures and decrease delay conditions
4. WYDOT should research and develop "Connected Vehicle" communication, vehicle to vehicle, and vehicle to infrastructure technology for winter weather issues.
5. WYDOT should investigate building snow fences to reduce snow drifting.
6. Alternate routing procedures should be established for US-89 in the event the bridges identified as high risk for flooding are flood damaged and closed. WYDOT should establish alternate routing procedures that convey to drivers the alternate route, oversize/overweight limitations, available services, and truck parking availability along the route. Alternate routes may include rerouting to parallel lanes or routing to highways in adjacent states. This process might also be conveyed through "Connected Vehicle" communication technology if available in the area. WYDOT should develop individual task plans assigning specific tasks to accomplish the smooth transition to and from the alternate route(s).
7. WYDOT should assess whether additional scour protection would reduce the risk at the bridges.

Interstate 80 – RM 83 to RM 111

Priority: 2

This roadway section exhibits high risks for air quality issues, bridge strikes at RM 85.7 (bridges AOX and AOY) and bridge flooding at RM 86.4 (bridges AOZ and APA). These bridges carry I-80 and could lead to significant issues if a bridge strike or flood were to close I-80. Daily traffic volumes are approximately 18,700. Estimated delay is approximately 16,400 hours per mile per year. The following are recommended actions to mitigate the identified risks:

1. To reduce tailpipe emissions, WYDOT should create or incentivize the electrification of truck parking areas.
2. WYDOT should research and develop "Connected Vehicle" communication, vehicle to vehicle and vehicle to infrastructure technology for tailpipe emission reductions.
3. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to reduce the length of closures, decrease delay conditions, and reduce tailpipe emissions from vehicle idling and acceleration-deceleration cycles.

4. WYDOT should investigate the need for more advanced warning and better height limit warning signage for the high strike risk bridges identified above. If the investigations show that improved signage won't likely decrease bridge strikes, then alternative routing procedures should be established for I-80 in the event of a bridge strike closure. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
5. WYDOT should establish alternative routing procedures in the event of serious flooding at the bridges identified above. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
6. WYDOT should assess the feasibility of increasing bridge scour protection for the flood prone bridges identified above. WYDOT should also consider a redesign to increase streamflow capacity for the bridges at RM 86.4 in the event it is seriously damaged in a flood.
7. Other lower priority potential mitigation efforts might include building snow fences to reduce snow drifting, provide or incentivize diesel retrofits to reduce emissions, modify road geometrics and safety barriers to reduce snow drifting, or lower the grade under high strike potential bridges.

Interstate 80 – RM 316 to RM 359

Priority: 3

This roadway section exhibits high risks for winter weather, air quality issues and bridge strikes at RM 357.68 (bridges AYR and AYS). These bridges carry I-80 and could lead to significant issues if a bridge strike were to close I-80. Daily traffic volumes are approximately 13,700 while estimated delay costs are approximately $1,124,000 per mile per year. The following are recommended actions to mitigate the identified risks:

1. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to reduce the length of closures, decrease delay conditions, and reduce tailpipe emissions from vehicle idling and acceleration-deceleration cycles.
2. To reduce tailpipe emissions, WYDOT should create or incentivize the electrification of truck parking areas.
3. WYDOT should research and develop "Connected Vehicle" vehicle to vehicle, vehicle to infrastructure and communication technology for winter weather delay and tailpipe emission mitigation issues.
4. WYDOT should investigate the need for more advanced warning and better height limit warning signage for the bridges identified above for bridge strike risk. If the investigations show that improved signage won't likely decrease bridge strikes, then alternative routing procedures should be established for I-80 in the event of a bridge strike closure. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
5. Other lower priority potential mitigation efforts might include building snow fences to reduce snow drifting, provide or incentivize diesel retrofits to reduce emissions, modify road geometrics and safety barriers to reduce snow drifting, or lower the grade under bridges.

US 14/16/20 – RM 50 to RM 55

Priority: 4

This urban roadway section exhibits high risks for winter weather and air quality issues Daily traffic volumes are approximately 10,500 while estimated delay costs are approximately $914,000 per mile per year. Much of the delay is likely from summertime traffic congestion in the area. The following are recommended actions to mitigate the identified risks:

1. WYDOT should assess and modify traffic signals and controls to minimize congestion.
2. WYDOT should evaluate adding lanes and establishing alternative routes.
3. WYDOT should establish alternative routing procedures in the event of serious weather. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
4. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to reduce the length of closures, decrease delay conditions, and reduce tailpipe emissions from vehicle idling and acceleration-deceleration cycles.
5. To reduce tailpipe emissions, WYDOT should create or incentivize the electrification of truck parking areas.
6. WYDOT should research and develop "Connected Vehicle" vehicle to vehicle, vehicle to infrastructure and communication technology for winter weather delay and tailpipe emission mitigation issues.
7. WYDOT might try providing or incentivizing diesel retrofits to reduce emissions.

US 14A – RM 3 to RM 23

Priority: 5

This roadway section exhibits high risks for winter weather and air quality issues Daily traffic volumes are approximately 6,100 while estimated delay costs are approximately $494,000 per mile per year. Some of the delay may be from summertime traffic congestion in the area. The following are recommended actions to mitigate the identified risks:

1. WYDOT should evaluate adding lanes.
2. WYDOT should evaluate locations for snow fence installations.
3. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to reduce the length of closures, decrease delay conditions, and reduce tailpipe emissions from vehicle idling and acceleration-deceleration cycles.
4. WYDOT should establish alternative routing procedures in the event of serious weather. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
5. To reduce tailpipe emissions, WYDOT should create or incentivize the electrification of truck parking areas.
6. WYDOT should research and develop "Connected Vehicle" vehicle to vehicle, vehicle to infrastructure and communication technology for winter weather delay and tailpipe emission mitigation issues.

Interstate 80 – RM 272 to RM 310

Priority: 6

This road section exhibits high risks for winter weather and air quality issues. Estimated traffic delays are 750 hours per mile per year. Daily traffic volumes are over 13,600 and daily truck volumes are over 5,600. Estimated delay costs are approximately $713,000 per mile per year. The following are recommended actions to mitigate the identified risks:

1. To reduce tailpipe emissions, WYDOT should create or incentivize the electrification of truck parking areas.
2. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to reduce the length of closures, decrease delay conditions, and reduce tailpipe emissions from vehicle idling and acceleration-deceleration cycles.
3. WYDOT should research the needs for Connected Vehicle technology in this area and implement CV technology if feasible.
4. WYDOT should assess the feasibility of snow fence installation and construct snow fence where reasonable.
5. Other lower priority potential mitigation efforts might include modifying road geometrics and safety barriers to reduce snow drifting.

Interstate 80 – RM 3 to RM 18

Priority: 7

This highway section exhibits high risks for winter weather and bridge strikes at RM 12.65 (bridges AMT and AMS). Each of these bridges carries I-80 and could lead to significant issues if a bridge strike were to close I-80. Daily traffic volumes are nearly 12,000. Estimated delay costs exceed $1,000,000 per mile per year. The following are recommended actions to mitigate the identified risks:

1. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to try to reduce the length of closures and decrease delay conditions.
2. WYDOT should research and develop “Connected Vehicle” communication, vehicle to vehicle, and vehicle to infrastructure technology for winter weather delay mitigation.
3. WYDOT should assess the feasibility of snow fence installation and construct snow fence where reasonable.
4. WYDOT should investigate the need for more advanced warning and better height limit warning signage for the bridges identified as high risk for bridge strikes. If the investigations show that improved signage won’t likely decrease bridge strikes, then alternate routing procedures should be established for I-80 in the event of a bridge strike closure. WYDOT should establish alternate routing procedures that convey to drivers the alternate route, available services along the alternate route, oversize/overweight limitations, and truck parking availability. Alternate routes may include rerouting to parallel lanes or routing to highways in adjacent states. This process might also be conveyed through “Connected Vehicle” communication technology if available in the area. WYDOT should develop individual task plans assigning specific tasks to accomplish the smooth transition to and from the alternate route(s).

Interstate 25 – RM 8 to RM 13

Priority: 8

This urban highway section exhibits high risks for winter weather delay and air quality. Daily traffic volumes average over 20,800. Estimated delay costs are about $950,000 per mile per year. The following are recommended actions to mitigate the identified risks:

1. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to try to reduce the length of closures, decrease delay conditions, and reduce tailpipe emissions from vehicle idling and acceleration-deceleration cycles.
2. WYDOT should research and develop "Connected Vehicle" communication, vehicle to vehicle, and vehicle to infrastructure technology for winter weather and tailpipe emission mitigation.
3. Alternate routing procedures should be established for I-25 North of Cheyenne in the event of significant weather-related closures. WYDOT should establish alternate routing procedures that convey to drivers the alternate route, oversize/overweight limitations, available services, and truck parking availability along the route in the event of bridge closure. Alternate routes may include rerouting to highways in adjacent states. This process might also be conveyed through "Connected Vehicle" communication technology if available in the area. WYDOT should develop individual task plans assigning specific tasks to accomplish the smooth transition to and from the alternate route(s).
4. WYDOT should create or incentivize the electrification of truck parking areas.
5. WYDOT should provide or incentivize diesel retrofits to reduce emissions.
6. WYDOT might modify road geometrics and safety barriers to reduce snow drifting.

Interstate 80 – RM 122 to RM 142

Priority: 9

This roadway section exhibits high risks for air quality issues and bridge strikes at RM 130.84 (bridge AQZ). This bridge carries I-80 and could lead to significant issues if it were struck and cause the closure of I-80. Daily traffic volumes are approximately 12,100. Estimated delay is approximately 11,100 hours per mile per year. The following are recommended actions to mitigate the identified risks:

1. To reduce tailpipe emissions, WYDOT should create or incentivize the electrification of truck parking areas.
2. WYDOT should research and develop "Connected Vehicle" communication, vehicle to vehicle and vehicle to infrastructure technology for tailpipe emission reductions.
3. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to reduce the length of closures, decrease delay conditions, and reduce tailpipe emissions from vehicle idling and acceleration-deceleration cycles.
4. WYDOT should assess the feasibility of snow fence installation and construct snow fence where reasonable.
5. WYDOT should investigate the need for more advanced warning and better height limit warning signage for the high strike risk bridge identified above. If the investigations show that improved signage won't likely decrease bridge strikes, then alternative routing procedures should be established for I-80 in the event of a bridge strike closure. The procedures should include

developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).

6. WYDOT should establish alternative routing procedures in the event of serious flooding at the bridges identified above. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
7. WYDOT should assess the feasibility of lowering the grade under the bridge.

Interstate 80 – at RM 77.5

Priority: 10

This roadway section exhibits high risks for bridge flooding at RM 77.5 (bridges AOR and AOS). These bridges carry I-80 and could lead to significant issues if one of the bridges were flood damaged and caused the closure of I-80. Daily traffic volumes are approximately 14,100. The following are recommended actions to mitigate the identified risks:

1. WYDOT should establish alternative routing procedures in the event of serious flooding at the bridges identified above. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
2. WYDOT should assess the feasibility of increasing bridge scour protection.
3. WYDOT should consider a redesigning the bridge for increased streamflow capacity in the event it is seriously damaged in a flood.

Interstate 90 – at RM 15

Priority: 11

This roadway section exhibits high risks for bridge flooding at RM 15 (bridges BAZ and BBA). These bridges carry I-90 and could lead to significant issues if the bridge were flood damaged and caused the closure of I-90. Daily traffic volumes are approximately 6,900. The following are recommended actions to mitigate the identified risks:

1. WYDOT should establish alternative routing procedures in the event of serious flooding at the bridges identified above. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
2. WYDOT should assess the feasibility of increasing bridge scour protection.
3. WYDOT should consider a redesigning the bridge for increased streamflow capacity in the event it is seriously damaged in a flood.

US 14/16/20 – at RM 32

Priority: 12

This roadway section exhibits high risks for bridge flooding at RM 32 (bridge DZU). This bridge carries US 14/16/20 and could lead to significant issues if the bridge were flood damaged and caused the closure of the road. Daily traffic volumes are approximately 2,300. The following are recommended actions to mitigate the identified risks:

1. WYDOT should establish alternative routing procedures in the event of serious flooding at the bridges identified above. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
2. WYDOT should assess the feasibility of increasing bridge scour protection.
3. WYDOT should consider a redesigning the bridge for increased streamflow capacity in the event it is seriously damaged in a flood.

US 14/16/20 – at RM 46.7

Priority: 13

This roadway section exhibits high risks for bridge flooding at RM 46.7 (bridge BZT). This bridge carries US 14/16/20 and could lead to significant issues if the bridge were flood damaged and caused the closure of the road. Daily traffic volumes are approximately 2,300. The following are recommended actions to mitigate the identified risks:

1. WYDOT should establish alternative routing procedures in the event of serious flooding at the bridges identified above. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
2. WYDOT should assess the feasibility of increasing bridge scour protection.
3. WYDOT should consider a redesigning the bridge for increased streamflow capacity in the event it is seriously damaged in a flood.

US 85 (Greeley Hwy) – RM 4 to RM 8

Priority: 14

This urban roadway section exhibits high risks for winter weather and air quality issues Daily traffic volumes are approximately 9,500 while estimated delay costs are approximately $517,000 per mile per year. Some of the delay may be from urban traffic congestion in the area. The following are recommended actions to mitigate the identified risks:

1. WYDOT should assess and modify traffic signals and controls to minimize congestion.
2. WYDOT should evaluate adding lanes and establishing alternative routes.
3. WYDOT should evaluate locations for snow fence installation.
4. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to reduce the length of closures, decrease delay conditions, and reduce tailpipe emissions from vehicle idling and acceleration-deceleration cycles.

5. WYDOT should encourage and incentivize the use of PrePass at the port-of-entry to reduce truck tailpipe emissions.
6. To reduce tailpipe emissions, WYDOT should create or incentivize the electrification of truck parking areas.
7. WYDOT should research and develop "Connected Vehicle" vehicle to vehicle, vehicle to infrastructure and communication technology for winter weather delay and tailpipe emission mitigation issues.
8. WYDOT should provide or incentivize diesel retrofits to reduce emissions.

Interstate 80 – RM 235 to RM 272

Priority: 15

This highway section exhibits high risks for winter weather and bridge strikes at RM 235.28 and 260.23 (bridges AUR and AVG). These bridges carry I-80 and could lead to significant issues if a bridge strike were to close I-80. Daily traffic volumes are over 10,500. Estimated delay costs are approximately $781,000 per mile per year. The following are recommended actions to mitigate the identified risks:

1. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to decrease delay conditions.
2. WYDOT should research and develop "Connected Vehicle" communication, vehicle to vehicle, and vehicle to infrastructure technology to reduce winter weather delay issues.
3. WYDOT should evaluate locations for snow fence installation.
4. WYDOT should investigate the need for more advanced warning and better height limit warning signage for the bridges identified above for bridge strike risk. If the investigations show that improved signage won't likely decrease bridge strikes, then alternative routing procedures should be established for I-80 in the event of a bridge strike closure. The procedures should develop individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).

US 20/26 – RM 0 to RM 2

Priority: 16

This urban roadway section exhibits high risks for winter weather and air quality issues Daily traffic volumes are approximately 11,200 while estimated delay costs are approximately $644,000 per mile per year. Most of the delay is likely from urban traffic congestion in the area. The following are recommended actions to mitigate the identified risks:

1. WYDOT should assess and modify traffic signals and controls to minimize congestion.
2. WYDOT should evaluate adding lanes and establishing alternative routes.
3. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to reduce the length of closures, decrease delay conditions, and reduce tailpipe emissions from vehicle idling and acceleration-deceleration cycles.
4. To reduce tailpipe emissions, WYDOT should create or incentivize the electrification of truck parking areas.

5. WYDOT should research and develop "Connected Vehicle" vehicle to vehicle, vehicle to infrastructure and communication technology for winter weather delay and tailpipe emission mitigation issues.
6. WYDOT should provide or incentivize diesel retrofits to reduce emissions.

Interstate 80 – at RM 77.34

Priority: 17

This roadway section exhibits high risks for bridge strikes at RM 77.34 (bridge AOQ). This bridge carries I-80 and could lead to significant issues if it were struck and damaged causing the closure of the road. Daily traffic volumes are approximately 14,000. The following are recommended actions to mitigate the identified risks:

1. WYDOT should investigate the need for more advanced warning and better height limit warning signage for the high strike risk bridge identified above. If the investigations show that improved signage won't likely decrease bridge strikes, then alternative routing procedures should be established for I-80 in the event of a bridge strike closure. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
2. WYDOT should assess the feasibility of lowering the grade under the bridge.

Interstate 80 – at RM 146.85

Priority: 18

This roadway section exhibits high risks for bridge strikes at RM 146.85 (bridge ARN). This bridge carries I-80 and could lead to significant issues if it were struck and damaged causing the closure of the road. Daily traffic volumes are approximately 13,600. The following are recommended actions to mitigate the identified risks:

1. WYDOT should investigate the need for more advanced warning and better height limit warning signage for the high strike risk bridge identified above. If the investigations show that improved signage won't likely decrease bridge strikes, then alternative routing procedures should be established for I-80 in the event of a bridge strike closure. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
2. WYDOT should assess the feasibility of lowering the grade under the bridge.

Interstate 80 – at RM 196.16

Priority: 19

This roadway section exhibits high risks for bridge strikes at RM 196.16 (bridge ASV). This bridge carries I-80 and could lead to significant issues if it were struck and damaged causing the closure of the road.

Daily traffic volumes are approximately 12,300. The following are recommended actions to mitigate the identified risks:

1. WYDOT should investigate the need for more advanced warning and better height limit warning signage for the high strike risk bridge identified above. If the investigations show that improved signage won't likely decrease bridge strikes, then alternative routing procedures should be established for I-80 in the event of a bridge strike closure. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
2. WYDOT should assess the feasibility of lowering the grade under the bridge.

Interstate 80 – RM 310 to RM 316

Priority: 20

This urban roadway section exhibits high risks for air quality issues and bridge strikes at RM 313.19 (bridges LBN and LBO). These bridges carry I-80 and could lead to significant issues if a bridge strike were to close I-80. Daily traffic volumes are approximately 12,500. Estimated delay is approximately 19,200 per mile per year. The following are recommended actions to mitigate the identified risks:

1. To reduce tailpipe emissions, WYDOT should create or incentivize the electrification of truck parking areas.
2. WYDOT should research and develop "Connected Vehicle" vehicle to vehicle, vehicle to infrastructure and communication technology reduce delay and tailpipe emission mitigation issues.
3. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to reduce the length of closures, decrease delay conditions, and reduce tailpipe emissions from vehicle idling and acceleration-deceleration cycles.
4. WYDOT should investigate the need for more advanced warning and better height limit warning signage for the bridges identified above for bridge strike risk. If the investigations show that improved signage won't likely decrease bridge strikes, then alternative routing procedures should be established for I-80 in the event of a bridge strike closure. The procedures should develop individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
5. WYDOT should assess the feasibility of lowering the grade under the bridge.

Interstate 80 – at RM 173.89

Priority: 21

This roadway section exhibits high risks for bridge strikes at RM 173.89 (bridge LZW). This bridge carries I-80 and could lead to significant issues if it were struck and damaged causing the closure of the road. Daily traffic volumes are approximately 12,100. The following are recommended actions to mitigate the identified risks:

1. WYDOT should investigate the need for more advanced warning and better height limit warning signage for the high strike risk bridge identified above. If the investigations show that improved signage won't likely decrease bridge strikes, then alternative routing procedures should be established for I-80 in the event of a bridge strike closure. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
2. WYDOT should assess the feasibility of lowering the grade under the bridge.

Interstate 80 – at RM 187.2

Priority: 22

This roadway section exhibits high risks for bridge strikes at RM 187.2 (bridges ASP and ASQ). These bridges carry I-80 and could lead to significant issues if one were struck and damaged causing the closure of the road. Daily traffic volumes are approximately 12,300. The following are recommended actions to mitigate the identified risks:

1. WYDOT should investigate the need for more advanced warning and better height limit warning signage for the high strike risk bridge identified above. If the investigations show that improved signage won't likely decrease bridge strikes, then alternative routing procedures should be established for I-80 in the event of a bridge strike closure. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
2. WYDOT should assess the feasibility of lowering the grade under the bridges.

Interstate 80 – at RM 383.36

Priority: 23

This roadway section exhibits high risks for bridge strikes at RM 383.36 (bridge AZW). This bridge carries I-80 and could lead to significant issues if it were struck and damaged causing the closure of the road. Daily traffic volumes are approximately 10,600. The following are recommended actions to mitigate the identified risks:

1. WYDOT should investigate the need for more advanced warning and better height limit warning signage for the high strike risk bridge identified above. If the investigations show that improved signage won't likely decrease bridge strikes, then alternative routing procedures should be established for I-80 in the event of a bridge strike closure. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
2. WYDOT should assess the feasibility of lowering the grade under the bridge.

Interstate 25 – RM 0 to RM 8

Priority: 24

This highway section exhibits high risks for air quality. Daily traffic volumes average over 22,100. Estimated delays are estimate at about 25,500 hours per mile per year. The following are recommended actions to mitigate the identified risks:

1. WYDOT should create or incentivize the electrification of truck parking areas.
2. WYDOT should encourage and incentivize the use of PrePass at the port-of-entry to reduce truck tailpipe emissions.
3. WYDOT should research and develop "Connected Vehicle" communication, vehicle to vehicle, and vehicle to infrastructure technology for winter weather and tailpipe emission mitigation.
4. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to try to reduce the length of closures, decrease delay conditions, and reduce tailpipe emissions from vehicle idling and acceleration-deceleration cycles.
5. WYDOT should provide or incentivize diesel retrofits to reduce emissions.
6. WYDOT should evaluate locations for snow fence installation.

US 14/16/20 – at RM 15.8

Priority: 25

This roadway section exhibits high risks for bridge flooding at RM 15.8 (bridge KTC). This bridge carries US 14/16/20 and could lead to significant issues if the bridge were flood damaged and caused the closure of the road. Daily traffic volumes are approximately 1,500. The following are recommended actions to mitigate the identified risks:

1. WYDOT should establish alternative routing procedures in the event of serious flooding at the bridges identified above. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
2. WYDOT should assess the feasibility of increasing bridge scour protection.
3. WYDOT should consider a redesigning the bridge for increased streamflow capacity in the event it is seriously damaged in a flood.

US 14/16/20 – at RM 20.3

Priority: 26

This roadway section exhibits high risks for bridge flooding at RM 20.3 (bridge JJJ). This bridge carries US 14/16/20 and could lead to significant issues if the bridge were flood damaged and caused the closure of the road. Daily traffic volumes are approximately 1,500. The following are recommended actions to mitigate the identified risks:

1. WYDOT should establish alternative routing procedures in the event of serious flooding at the bridges identified above. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
2. WYDOT should assess the feasibility of increasing bridge scour protection.

3. WYDOT should consider a redesigning the bridge for increased streamflow capacity in the event it is seriously damaged in a flood.

US 26/287 – at RM 3.6

Priority: 26

This roadway section exhibits high risks for bridge flooding at RM 3.6 (bridge JJJ). This bridge carries US 26/287 and could lead to significant issues if the bridge were flood damaged and caused the closure of the road. Daily traffic volumes are approximately 1,300. The following are recommended actions to mitigate the identified risks:

1. WYDOT should establish alternative routing procedures in the event of serious flooding at the bridges identified above. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
2. WYDOT should assess the feasibility of increasing bridge scour protection.
3. WYDOT should consider a redesigning the bridge for increased streamflow capacity in the event it is seriously damaged in a flood.

Interstate 80 – RM 359 to RM 364

Priority: 28

This highway section exhibits high risks for air quality. Daily traffic volumes are over 18,000. Estimated traffic delays are approximately 15,200 hours per mile per year. The following are recommended actions to mitigate the identified risks:

1. To reduce tailpipe emissions, WYDOT should create or incentivize the electrification of truck parking areas.
2. WYDOT should research and develop “Connected Vehicle” technology for tailpipe emission mitigation.
3. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to reduce the length of closures, decrease delay conditions, and reduce tailpipe emissions from vehicle idling and acceleration-deceleration cycles.
4. Another lower priority potential mitigation effort might include incentivizing diesel retrofits.

Interstate 25 – RM 13 to RM 17

Priority: 29

This highway section exhibits high risks for air quality. Daily traffic volumes are over 11,800. Estimated traffic delays are approximately 15,700 hours per mile per year. The following are recommended actions to mitigate the identified risks:

1. To reduce tailpipe emissions, WYDOT should create or incentivize the electrification of truck parking areas.
2. WYDOT should research and develop “Connected Vehicle” technology for tailpipe emission mitigation.
3. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to reduce the length of closures, decrease delay conditions, and reduce tailpipe emissions from vehicle idling and acceleration-deceleration cycles.
4. WYDOT should incentivize diesel retrofits.

Interstate 80 – at RM 23.91

Priority: 30

This roadway section exhibits high risks for bridge strikes at RM 23.91 (bridge ANH). This bridge carries I-80 and could lead to significant issues if it were struck and damaged causing the closure of the road. Daily traffic volumes are approximately 12,000. The following are recommended actions to mitigate the identified risks:

1. WYDOT should investigate the need for more advanced warning and better height limit warning signage for the high strike risk bridge identified above. If the investigations show that improved signage won’t likely decrease bridge strikes, then alternative routing procedures should be established for I-80 in the event of a bridge strike closure. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
2. WYDOT should assess the feasibility of lowering the grade under the bridge.

Interstate 80 – at RM 210.98

Priority: 31

This roadway section exhibits high risks for bridge strikes at RM 210.98 (bridge ATO). This bridge carries I-80 and could lead to significant issues if it were struck and damaged causing the closure of the road. Daily traffic volumes are approximately 13,500. The following are recommended actions to mitigate the identified risks:

1. WYDOT should investigate the need for more advanced warning and better height limit warning signage for the high strike risk bridge identified above. If the investigations show that improved signage won’t likely decrease bridge strikes, then alternative routing procedures should be established for I-80 in the event of a bridge strike closure. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
2. WYDOT should assess the feasibility of lowering the grade under the bridge.

Interstate 80 – at RM 219.59

Priority: 32

This roadway section exhibits high risks for bridge strikes at RM 219.59 (bridges KJA and KHZ). These bridges carry I-80 and could lead to significant issues if one were struck and damaged causing the closure of the road. Daily traffic volumes are approximately 13,000. The following are recommended actions to mitigate the identified risks:

1. WYDOT should investigate the need for more advanced warning and better height limit warning signage for the high strike risk bridge identified above. If the investigations show that improved signage won't likely decrease bridge strikes, then alternative routing procedures should be established for I-80 in the event of a bridge strike closure. The procedures should include developing individual task plans assigning specific tasks to individuals to accomplish the smooth transitions to and from the alternate route(s).
2. WYDOT should assess the feasibility of lowering the grade under the bridge.

Interstate 25 – RM 25 to RM 34

Priority: 33

This highway section exhibits high risks for air quality. Daily traffic volumes average over 7,900. Estimated delays are estimated at about 12,600 hours per mile per year. The following are recommended actions to mitigate the identified risks:

1. WYDOT should create or incentivize the electrification of truck parking areas.
2. WYDOT should research and develop "Connected Vehicle" communication, vehicle to vehicle, and vehicle to infrastructure technology for winter weather and tailpipe emission mitigation.
3. WYDOT should continue to assess and modify their snow removal, winter weather management procedures and build snow fences to try to reduce the length of closures, decrease delay conditions, and reduce tailpipe emissions from vehicle idling and acceleration-deceleration cycles.
4. WYDOT should provide or incentivize diesel retrofits to reduce emissions.

Interstate 90 – RM 21 to RM 25

Priority: 34

This urban highway section exhibits high risks for air quality. Daily traffic volumes are nearly 8,800. Estimated delays are approximately 12,600 hours per mile per year. The following are recommended actions to mitigate the identified risks:

1. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to reduce the length of closures, decrease delay conditions, and reduce tailpipe emissions from vehicle idling and acceleration-deceleration cycles.

2. To reduce tailpipe emissions, WYDOT should create or incentivize the electrification of truck parking areas.
3. WYDOT should research and develop "Connected Vehicle" vehicle to vehicle, vehicle to infrastructure and communication technology for tailpipe emission mitigation issues.
4. WYDOT should provide or incentivize diesel retrofits to reduce emissions.

US 14A – RM 23 to RM 26

Priority: 35

This highway section exhibits high risks for air quality. Daily traffic volumes are approximately 12,800. Estimated delays are approximately 18,600 hours per mile per year. The following are recommended actions to mitigate the identified risks:

1. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to reduce the length of closures, decrease delay conditions, and reduce tailpipe emissions from vehicle idling and acceleration-deceleration cycles.
2. WYDOT should research and develop "Connected Vehicle" vehicle to vehicle, vehicle to infrastructure and communication technology for tailpipe emission mitigation issues.
3. WYDOT should assess construction of new snow fences to reduce snow drifting and therefore reduce acceleration/deceleration cycles of vehicles that increase pollution emissions.
4. WYDOT should provide or incentivize diesel retrofits to reduce emissions.

Casper Bypass (US 20/26 I 25 Connector) – RM 0 to RM 3

Priority: 35

This highway section exhibits high risks for air quality. Daily traffic volumes are approximately 1,500. Estimated delays are approximately 27,100 hours per mile per year. The following are recommended actions to mitigate the identified risks:

1. To reduce tailpipe emissions, WYDOT should create or incentivize the electrification of truck parking areas.
2. WYDOT should continue to assess and modify their snow removal and winter weather management procedures to reduce the length of closures, decrease delay conditions, and reduce tailpipe emissions from vehicle idling and acceleration-deceleration cycles.
3. WYDOT should research and develop "Connected Vehicle" vehicle to vehicle, vehicle to infrastructure and communication technology for tailpipe emission mitigation issues.
4. WYDOT should assess construction of new snow fences to reduce snow drifting and therefore reduce acceleration/deceleration cycles of vehicles that increase pollution emissions.
5. WYDOT should provide or incentivize diesel retrofits to reduce emissions.

Appendix A

Bridge Flooding Action Plans

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Flooding

Analysis Year:	2018		
Asset / Location:	I-80 at Blacks Fork River, ML80 at 77.5, Bridge IDs = AOS and AOR		
Ownership:	WYDOT	Criticality Rank:	6 of 70
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Infrastructural
Issues:	High traffic. A fairly long detour may be required if both bridges are damaged. The bridges are in fair condition. High stream flow variability.		

Vulnerabilities	Strengths	Objectives
Possible long detour	Paired bridges may provide a redundant route if not damaged also	Return I-80 traffic to normal conditions as quickly as possible.
The only Interstate route for the area		Minimize user, agency and societal costs.
Bridges carry 14,054 vehicles per day.	Scour Rating = 8.	Minimize delays.

Perform Action Before, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with higher capacity bridges. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	1. Inform WTA and municipalities in the area.
B	H	Upgrade scour prone attributes of the bridges.	1. Lower cost than full replacement. 2. Scour protection upgrades will protect both bridges.	1. May be expensive. 2. May not provide adequate protection for large floods. 3. Bridges already have good scour rating.	
D, A	R, O	Repair the bridges following each incident. Establish and enact reroute procedures in the event the bridges are closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement(s).	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Flooding

Analysis Year:	2018		
Asset / Location:	US-14/16/20 at Shoshone River, ML31 at 46.7, Bridge ID(s) = BZT		
Ownership:	WYDOT	Criticality Rank:	5 of 70
Risk Probability Rtg:	5	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Infrastructural
Issues:	A fairly long detour may be required if bridge is damaged. The bridge is in fair condition. Fairly high stream flow variability. Redundant routes would have to be through Yellowstone Park.		

Vulnerabilities	Strengths	Objectives
Possible long, problematic detour.	Scour Rating = 8.	Return traffic to normal conditions as quickly as possible.
Limited roadway alternatives in the area.		Minimize user, agency and societal costs.
Bridge carries 2523 vehicles per day.		Minimize closure length.

Perform Action Before, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with higher capacity bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	1. Inform National Parks Service (NPS) and municipalities in the area.
B	H	Upgrade scour prone attributes of the bridge.	1. Lower cost than full replacement. 2. Scour protection upgrades will protect both bridges.	1. May be expensive. 2. May not provide adequate protection for large floods. 3. Bridge already has good scour rating.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridges is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement(s).	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform NPS.

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Flooding

Analysis Year:	2018		
Asset / Location:	US-14/16/20 at N Fork Shoshone River, ML31 at 32, Bridge ID(s) = DZU		
Ownership:	WYDOT	Criticality Rank:	5 of 70
Risk Probability Rtg:	5	Risk Consequence Rtg:	3
Priority Rtg:	High	Issue Type:	Infrastructural
Issues:	A fairly long detour may be required if bridge is damaged. The bridge is in fair condition. Fairly high stream flow variability. Redundant routes would have to go through Yellowstone Park.		

Vulnerabilities	Strengths	Objectives
Possible long, problematic detour.	Scour Rating = 8.	Return traffic to normal conditions as quickly as possible.
Limited roadway alternatives in the area.		Minimize user, agency and societal costs.
Bridge carries 2259 vehicles per day.		Minimize closure length.

Perform Action Before, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with higher capacity bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	1. Inform National Parks Service (NPS) and municipalities in the area.
B	H	Upgrade scour prone attributes of the bridge.	1. Lower cost than full replacement. 2. Scour protection upgrades will protect both bridges.	1. May be expensive. 2. May not provide adequate protection for large floods. 3. Bridge already has good scour rating.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridges is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement(s).	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform NPS.

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Flooding

Analysis Year:	2018		
Asset / Location:	I-90 at Tongue River, ML90 at 15, Bridge IDs = BAZ and BBA.		
Ownership:	WYDOT	Criticality Rank:	13 of 70
Risk Probability Rtg:	3	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Infrastructural
Issues:	Fairly high traffic. A long detour may be required if both bridges are damaged. The bridges are in fair condition. High stream flow variability.		

Vulnerabilities	Strengths	Objectives
Possible long detour	Paired bridges may provide a redundant route if not damaged also	Return I-90 traffic to normal conditions as quickly as possible.
The only Interstate route for the area		Minimize user, agency and societal costs.
Bridges carry 6,945 vehicles per day.	Scour Rating = 8.	Minimize delays.

Perform Action Before, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with higher capacity bridges. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	1. Inform WTA and municipalities in the area.
B	H	Upgrade scour prone attributes of the bridges.	1. Lower cost than full replacement. 2. Scour protection upgrades will protect both bridges.	1. May be expensive. 2. May not provide adequate protection for large floods. 3. Bridges already have good scour rating.	
D, A	R, O	Repair the bridges following each incident. Establish and enact reroute procedures in the event the bridges are closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement(s).	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Flooding

Analysis Year:	2018		
Asset / Location:	US-89 at Flat Creek, ML10 at 152.2, Bridge ID(s) = BOO		
Ownership:	WYDOT	Criticality Rank:	1 of 70
Risk Probability Rtg:	3	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Infrastructural
Issues:	Very high traffic volumes. A very long detour may be required if bridge is damaged. The bridge is in fair condition.		

Vulnerabilities	Strengths	Objectives
Possible long detour.	Scour Rating = 8.	Return traffic to normal conditions as quickly as possible.
Limited roadway alternatives in the area.	Low stream flow variability.	Minimize user, agency and societal costs.
Bridge carries 33,632 vehicles per day.		Minimize closure length.

Perform Action Before, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with higher capacity bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	1. Inform municipalities in the area.
B	H	Upgrade scour prone attributes of the bridge.	1. Lower cost than full replacement. 2. Scour protection upgrades will protect both bridges.	1. May be expensive. 2. May not provide adequate protection for large floods. 3. Bridge already has good scour rating.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridges is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement(s).	1. Establish procedures with WHP and local transportation departments along the redundant route.

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Flooding

Analysis Year:	2018		
Asset / Location:	I-80 at Green River, ML80 at 86.4, Bridge IDs = AOZ and APA		
Ownership:	WYDOT	Criticality Rank:	6 of 70
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	High traffic. A long detour may be required if both bridges are damaged. The bridges are in fair condition. High stream flow variability.		

Vulnerabilities	Strengths	Objectives
Possible long detour	Paired bridges may provide a redundant route if not damaged also	Return I-80 traffic to normal conditions as quickly as possible.
The only Interstate route for the area		Minimize user, agency and societal costs.
Bridges carry 15,175 vehicles per day.	Scour Rating = 8.	Minimize delays.

Perform Action Before, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with higher capacity bridges. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	1. Inform WTA and municipalities in the area.
B	H	Upgrade scour prone attributes of the bridges.	1. Lower cost than full replacement. 2. Scour protection upgrades will protect both bridges.	1. May be expensive. 2. May not provide adequate protection for large floods. 3. Bridges already have good scour rating.	
D, A	R, O	Repair the bridges following each incident. Establish and enact reroute procedures in the event the bridges are closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement(s).	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Flooding

Analysis Year:	2018		
Asset / Location:	US-89 at Snake River, ML10 at 142, Bridge ID(s) = BOL		
Ownership:	WYDOT	Criticality Rank:	1 of 70
Risk Probability Rtg:	3	Risk Consequence Rtg:	5
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	High traffic volumes. A very long detour may be required if bridge is damaged. The bridge is in fair condition.		

Vulnerabilities	Strengths	Objectives
Possible long detour.	Scour Rating = 8.	Return traffic to normal conditions as quickly as possible.
Limited roadway alternatives in the area.	Low streamflow variability.	Minimize user, agency and societal costs.
Bridge carries 8,500 vehicles per day.		Minimize closure length.

Perform Action Before, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with higher capacity bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	1. Inform municipalities in the area.
B	H	Upgrade scour prone attributes of the bridge.	1. Lower cost than full replacement. 2. Scour protection upgrades will protect both bridges.	1. May be expensive. 2. May not provide adequate protection for large floods. 3. Bridge already has good scour rating.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridges is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement(s).	1. Establish procedures with WHP and local transportation departments along the redundant route.

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Flooding

Analysis Year:	2018		
Asset / Location:	US-89 at Snake River, ML10 at 146.1, Bridge ID(s) = BOM		
Ownership:	WYDOT	Criticality Rank:	1 of 70
Risk Probability Rtg:	2	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	High traffic volumes. A very long detour may be required if bridge is damaged. The bridge is in fair condition.		

Vulnerabilities	Strengths	Objectives
Possible long detour.	Scour Rating = 8.	Return traffic to normal conditions as quickly as possible.
Limited roadway alternatives in the area.	Low streamflow variability.	Minimize user, agency and societal costs.
Bridge carries 9,566 vehicles per day.		Minimize closure length.

Perform Action Before, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with higher capacity bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	1. Inform municipalities in the area.
B	H	Upgrade scour prone attributes of the bridge.	1. Lower cost than full replacement. 2. Scour protection upgrades will protect both bridges.	1. May be expensive. 2. May not provide adequate protection for large floods. 3. Bridge already has good scour rating.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridges is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement(s).	1. Establish procedures with WHP and local transportation departments along the redundant route.

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Flooding

Analysis Year:	2018		
Asset / Location:	US-89 at Flat Creek, ML10 at 154, Bridge ID(s) = BOP		
Ownership:	WYDOT	Criticality Rank:	1 of 70
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	Very high traffic volumes. A very long detour may be required if bridge is damaged. The bridge is in fair condition.		

Vulnerabilities	Strengths	Objectives
Possible long detour.	Scour Rating = 8.	Return traffic to normal conditions as quickly as possible.
Limited roadway alternatives in the area.	Low stream flow variability.	Minimize user, agency and societal costs.
Bridge carries 8,868 vehicles per day.		Minimize closure length.

Perform Action Before, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with higher capacity bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	1. Inform municipalities in the area.
B	H	Upgrade scour prone attributes of the bridge.	1. Lower cost than full replacement. 2. Scour protection upgrades will protect both bridges.	1. May be expensive. 2. May not provide adequate protection for large floods. 3. Bridge already has good scour rating.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridges is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement(s).	1. Establish procedures with WHP and local transportation departments along the redundant route.

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Flooding

Analysis Year:	2018		
Asset / Location:	US-14/16/20 at N Fork Shoshone River, ML31 at 15.8, Bridge ID(s) = KTC		
Ownership:	WYDOT	Criticality Rank:	5 of 70
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Infrastructural
Issues:	A fairly long detour may be required if bridge is damaged. The bridge is in fair condition. Redundant routes would have to go through Yellowstone Park.		

Vulnerabilities	Strengths	Objectives
Possible long, problematic detour.	Scour Rating = 8.	Return traffic to normal conditions as quickly as possible.
Limited roadway alternatives in the area.		Minimize user, agency and societal costs.
Bridge carries 1509 vehicles per day.		Minimize closure length.

Perform **Action B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with higher capacity bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	1. Inform National Parks Service (NPS) and municipalities in the area.
B	H	Upgrade scour prone attributes of the bridge.	1. Lower cost than full replacement. 2. Scour protection upgrades will protect both bridges.	1. May be expensive. 2. May not provide adequate protection for large floods. 3. Bridge already has good scour rating.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridges is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement(s).	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform NPS.

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Flooding

Analysis Year:	2018		
Asset / Location:	US-14/16/20 at N Fork Shoshone River, ML31 at 20.3, Bridge ID(s) = JJJ		
Ownership:	WYDOT	Criticality Rank:	5 of 70
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Infrastructural
Issues:	A fairly long detour may be required if bridge is damaged. The bridge is in fair condition. Redundant routes would have to go through Yellowstone Park.		

Vulnerabilities	Strengths	Objectives
Possible long, problematic detour.	Scour Rating = 8.	Return traffic to normal conditions as quickly as possible.
Limited roadway alternatives in the area.		Minimize user, agency and societal costs.
Bridge carries 1509 vehicles per day.		Minimize closure length.

Perform Action Before, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with higher capacity bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	1. Inform National Parks Service (NPS) and municipalities in the area.
B	H	Upgrade scour prone attributes of the bridge.	1. Lower cost than full replacement. 2. Scour protection upgrades will protect both bridges.	1. May be expensive. 2. May not provide adequate protection for large floods. 3. Bridge already has good scour rating.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridges is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement(s).	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform NPS.

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Flooding

Analysis Year:	2018		
Asset / Location:	US-26/287 at Buffalo Fork Creek, ML30 at 154, Bridge ID(s) = LWC		
Ownership:	WYDOT	Criticality Rank:	4 of 70
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Infrastructural
Issues:	A very long detour may be required if bridge is damaged. The bridge is in fair condition.		

Vulnerabilities	Strengths	Objectives
Possible long detour.	Scour Rating = 8.	Return traffic to normal conditions as quickly as possible.
Limited roadway alternatives in the area.		Minimize user, agency and societal costs.
Bridge carries 1,252 vehicles per day.		Minimize closure length.

Perform Action Before, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with higher capacity bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	1. Inform municipalities in the area.
B	H	Upgrade scour prone attributes of the bridge.	1. Lower cost than full replacement. 2. Scour protection upgrades will protect both bridges.	1. May be expensive. 2. May not provide adequate protection for large floods. 3. Bridge already has good scour rating.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridges is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement(s).	1. Establish procedures with WHP and local transportation departments along the redundant route.

Appendix B

Bridge Strike Action Plans

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at County Rd 59, ML80 at 85.7, Bridge ID = AOX, AOY		
Ownership:	WYDOT	Criticality Rank:	6 of 70
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Infrastructural
Issues:	Underclearance is 17.59 ft.. Very high traffic. 3 bridge strikes since 1994 (AOX hit twice).		

Vulnerabilities	Strengths	Objectives
Possible long detour if both bridges damaged (unkikely).	Parallel bridge is available if not damaged also.	Return I-80 traffic to normal conditions as quickly as possible.
The only Interstate route for the area.		Minimize user, agency and societal costs.
Bridge carries 6,821 vehicles per day per bridge.		Minimize delays.
		Maintain safety and mobility in the region.

Perform **Action B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	
B	H	Increase warning signage.	1. Lowest cost alternative.	1. May not be adequate to stop bridge strikes.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement.	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.
B	H	Lower the grade under the bridge.	1. Likely to be a lower cost than bridge replacement.	1. May not be feasible given the current conditions. 2. May be drainage issues. 3. May create vertical sight issues.	

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at WY-377, ML80 at 130.84, Bridge ID = AQZ		
Ownership:	WYDOT	Criticality Rank:	6 of 70
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Infrastructural
Issues:	Underclearance is 14.5 ft. The bridge is in moderate condition (NHPP rating of 5). Very high traffic. 3 strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Possible long detour if both bridges (AQZ & AQY) damaged (unkikely).	Parallel bridge is available if not damaged also.	Return I-80 traffic to normal conditions as quickly as possible.
The only Interstate route for the area.		Minimize user, agency and societal costs.
Bridge carries 6821 vehicles per day.		Minimize delays.
		Maintain safety and mobility in the region.

Perform Action Before, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	
B	H	Increase warning signage.	1. Lowest cost alternative.	1. May not be adequate to stop bridge strikes.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement.	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.
B	H	Lower the grade under the bridge.	1. Likely to be a lower cost than bridge replacement.	1. May not be feasible given the current conditions. 2. May be drainage issues. 3. May create vertical sight issues.	

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at Patrick Draw, ML80 at 146.85, Bridge ID = ARN		
Ownership:	WYDOT	Criticality Rank:	6 of 70
Risk Probability Rtg:	4	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Infrastructural
Issues:	Underclearance is 15.16 ft. The bridges are in moderate condition (NHPP rating of 5). Very high traffic. 2 bridge strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Possible long detour if both bridges (ARN & ARM) damaged (unkikely).	Parallel bridge is available if not damaged also.	Return I-80 traffic to normal conditions as quickly as possible.
The only Interstate route for the area.		Minimize user, agency and societal costs.
Bridge carries 6,821 vehicles per day.		Minimize delays.
		Maintain safety and mobility in the region.

Perform Action Before, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	
B	H	Increase warning signage.	1. Lowest cost alternative.	1. May not be adequate to stop bridge strikes.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement.	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.
B	H	Lower the grade under the bridge.	1. Likely to be a lower cost than bridge replacement.	1. May not be feasible given the current conditions. 2. May be drainage issues. 3. May create vertical sight issues.	

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at Machinery Pass, ML80 at 77.31, Bridge ID = AOQ		
Ownership:	WYDOT	Criticality Rank:	6 of 70
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Infrastructural
Issues:	Underclearance is 14.24 ft. The bridge is in moderate condition (NHPP rating of 6). Very high traffic. 3 bridge strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Possible long detour if both bridges (AOP & AOQ) damaged (unkikely).	Parallel bridge is available if not damaged also.	Return I-80 traffic to normal conditions as quickly as possible.
The only Interstate route for the area.		Minimize user, agency and societal costs.
Bridge carries 6,821 vehicles per day.		Minimize delays.
		Maintain safety and mobility in the region.

Perform Action Before, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	
B	H	Increase warning signage.	1. Lowest cost alternative.	1. May not be adequate to stop bridge strikes.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement.	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.
B	H	Lower the grade under the bridge.	1. Likely to be a lower cost than bridge replacement.	1. May not be feasible given the current conditions. 2. May be drainage issues. 3. May create vertical sight issues.	

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at County Road 47, ML80 at 196.16, Bridge ID = ASV		
Ownership:	WYDOT	Criticality Rank:	6 of 70
Risk Probability Rtg:	4	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Infrastructural
Issues:	Underclearance is 14.24 ft. The bridge is in fair condition (NHPP rating of 6). Very high traffic. 2 strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Possible long detour if both bridges (ASV & ASW) damaged (unkikely).	Parallel bridge is available if not damaged also.	Return I-80 traffic to normal conditions as quickly as possible.
The only Interstate route for the area.		Minimize user, agency and societal costs.
Bridge carries 6,821 vehicles per day.		Minimize delays.
		Maintain safety and mobility in the region.

Perform Action Before, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	
B	H	Increase warning signage.	1. Lowest cost alternative.	1. May not be adequate to stop bridge strikes.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement.	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.
B	H	Lower the grade under the bridge.	1. Likely to be a lower cost than bridge replacement.	1. May not be feasible given the current conditions. 2. May be drainage issues. 3. May create vertical sight issues.	

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at US-287, ML80 at 313.19, Bridge ID = LBN and LBO		
Ownership:	WYDOT	Criticality Rank:	7 of 70
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	Underclearance is 18.57 ft. for LBN. Very high traffic. 4 bridge strikes since 1994 (2 per bridge).		

Vulnerabilities	Strengths	Objectives
The only Interstate route for the area.	Parallel bridge is available if not damaged also.	Return I-80 traffic to normal conditions as quickly as possible.
Bridge carries 6,278 vehicles per day per bridge.	Fairly short detour, but through Laramie.	Minimize user, agency and societal costs.
The only Interstate route for the area.		Minimize delays.
		Maintain safety and mobility in the region.

Perform **Action B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	
B	H	Increase warning signage.	1. Lowest cost alternative.	1. May not be adequate to stop bridge strikes.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement.	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.
B	H	Lower the grade under the bridge.	1. Likely to be a lower cost than bridge replacement.	1. May not be feasible given the current conditions. 2. May be drainage issues. 3. May create vertical sight issues.	

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at WY-789, ML80 at 187.2, Bridge ID = ASP & ASQ		
Ownership:	WYDOT	Criticality Rank:	6 of 70
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	Underclearance is 15.49 and 15.16 ft.. Very high traffic. 4 bridge strikes since 1994 (2 per bridge).		

Vulnerabilities	Strengths	Objectives
Possible long detour if both bridges damaged (unkikely).	Parallel bridge is available if not damaged also.	Return I-80 traffic to normal conditions as quickly as possible.
The only Interstate route for the area.		Minimize user, agency and societal costs.
Bridge carries 6,821 vehicles per day per bridge.		Minimize delays.
		Maintain safety and mobility in the region.

Perform **Action B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	
B	H	Increase warning signage.	1. Lowest cost alternative.	1. May not be adequate to stop bridge strikes.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement.	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.
B	H	Lower the grade under the bridge.	1. Likely to be a lower cost than bridge replacement.	1. May not be feasible given the current conditions. 2. May be drainage issues. 3. May create vertical sight issues.	

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at County Road 23, ML80 at 173.89, Bridge ID = LZW		
Ownership:	WYDOT	Criticality Rank:	6 of 70
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	Underclearance is 16.01 ft. Very high traffic. 3 bridge strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Possible long detour if both bridges (LZV & LZW) damaged (unkikely).	Parallel bridge is available if not damaged also.	Return I-80 traffic to normal conditions as quickly as possible.
The only Interstate route for the area.		Minimize user, agency and societal costs.
Bridge carries 6,821 vehicles per day.		Minimize delays.
		Maintain safety and mobility in the region.

Perform Action Before, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	
B	H	Increase warning signage.	1. Lowest cost alternative.	1. May not be adequate to stop bridge strikes.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement.	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.
B	H	Lower the grade under the bridge.	1. Likely to be a lower cost than bridge replacement.	1. May not be feasible given the current conditions. 2. May be drainage issues. 3. May create vertical sight issues.	

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at County Road 146-1, ML80 at 383.36, Bridge ID =AZW		
Ownership:	WYDOT	Criticality Rank:	8 of 70
Risk Probability Rtg:	5	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	Underclearance is 14.57 ft. Very high traffic. 3 bridge strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Possible long detour if both bridges (AZW & AZV) damaged (unkikely).	Parallel bridge is available if not damaged also.	Return I-80 traffic to normal conditions as quickly as possible.
The only Interstate route for the area.		Minimize user, agency and societal costs.
Bridge carries 6,194 vehicles per day.		Minimize delays.
		Maintain safety and mobility in the region.

Perform Action Before, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	
B	H	Increase warning signage.	1. Lowest cost alternative.	1. May not be adequate to stop bridge strikes.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement.	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.
B	H	Lower the grade under the bridge.	1. Likely to be a lower cost than bridge replacement.	1. May not be feasible given the current conditions. 2. May be drainage issues. 3. May create vertical sight issues.	

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at WY-222, ML80 at 357.68, Bridge ID = AYR & AYS		
Ownership:	WYDOT	Criticality Rank:	8 of 70
Risk Probability Rtg:	4	Risk Consequence Rtg:	5
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	Underclearance is 16.08 ft. High truck volumes pass under bridges to access Wal Mart Distribution Center. The bridges are in moderate condition (NHPP rating of 6). Very high traffic. 1 strike on each bridge since 1994.		

Vulnerabilities	Strengths	Objectives
Possible long detour if both bridges (AYR & AYS) damaged (unkikely).	Parallel bridge is available if not damaged also.	Return I-80 traffic to normal conditions as quickly as possible.
The only Interstate route for the area.		Minimize user, agency and societal costs.
Bridge carries 6,194 vehicles per day per bridge.		Minimize delays.
		Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents. Significant rerouting of trucks on WY-222 may be needed.	
B	H	Increase warning signage.	1. Lowest cost alternative.	1. May not be adequate to stop bridge strikes.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement.	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.
B	H	Lower the grade under the bridge.	1. Likely to be a lower cost than bridge replacement.	1. May not be feasible given the current conditions. 2. May be drainage issues. 3. May create vertical sight issues. 4. Significant rerouting of trucks on WY-222 would be needed.	1. High truck volumes pass under bridges to access Wal Mart Distribution Center. Would require rerouting these trucks during construction.

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at Machinery Pass, ML80 at 12.65, Bridge ID = AMS & AMT		
Ownership:	WYDOT	Criticality Rank:	11 of 70
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Infrastructural

Issues: Underclearance is unknown. The bridges are in moderate condition (NHPP rating of 5). Very high traffic. 1 strike on each bridge since 1994.

Vulnerabilities	Strengths	Objectives
Possible long detour if both bridges (AMS & AMT) damaged (unkikely).	Parallel bridge is available if not damaged also.	Return I-80 traffic to normal conditions as quickly as possible.
The only Interstate route for the area.		Minimize user, agency and societal costs.
Bridge carries 6,190 vehicles per day per bridge.		Minimize delays.
		Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents. Significant rerouting of trucks on WY-222 may be needed.	
B	H	Increase warning signage.	1. Lowest cost alternative.	1. May not be adequate to stop bridge strikes.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement.	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.
B	H	Lower the grade under the bridge.	1. Likely to be a lower cost than bridge replacement.	1. May not be feasible given the current conditions. 2. May be drainage issues. 3. May create vertical sight issues. 4. Significant rerouting of trucks on WY-222 would be needed.	1. High truck volumes pass under bridges to access Wal Mart Distribution Center. Would require rerouting these trucks during construction.

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at County Road 141, ML80 at 23.91, Bridge ID = ANH		
Ownership:	WYDOT	Criticality Rank:	11 of 70
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Infrastructural
Issues:	Underclearance is 14.17 ft. The bridge is in moderate condition (NHPP rating of 5). Very high traffic. 2 strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Possible long detour if both bridges (ANH & ANK) damaged (unkikely).	Parallel bridge is available if not damaged also.	Return I-80 traffic to normal conditions as quickly as possible.
The only Interstate route for the area.		Minimize user, agency and societal costs.
Bridge carries 6,190 vehicles per day.		Minimize delays.
		Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	
B	H	Increase warning signage.	1. Lowest cost alternative.	1. May not be adequate to stop bridge strikes.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement.	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.
B	H	Lower the grade under the bridge.	1. Likely to be a lower cost than bridge replacement.	1. May not be feasible given the current conditions. 2. May be drainage issues. 3. May create vertical sight issues.	

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at Two Mile Draw, ML80 at 210.98, Bridge ID = ATO		
Ownership:	WYDOT	Criticality Rank:	7 of 70
Risk Probability Rtg:	5	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Infrastructural
Issues:	Underclearance is 14.17 ft. The bridges are in moderate condition (NHPP rating of 6). Very high traffic. 3 strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Possible long detour if both bridges are damaged (unkikely).	Parallel bridge is available if not damaged also.	Return I-80 traffic to normal conditions as quickly as possible.
The only Interstate route for the area.		Minimize user, agency and societal costs.
Bridge carries 5,842 vehicles per day.		Minimize delays.
		Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	
B	H	Increase warning signage.	1. Lowest cost alternative.	1. May not be adequate to stop bridge strikes.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement.	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.
B	H	Lower the grade under the bridge.	1. Likely to be a lower cost than bridge replacement.	1. May not be feasible given the current conditions. 2. May be drainage issues. 3. May create vertical sight issues.	

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at US-30/WY-130, ML80 at 235.28, Bridge ID =AUR		
Ownership:	WYDOT	Criticality Rank:	9 of 70
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Infrastructural
Issues:	Underclearance is 16..4 ft. Very high traffic. 2 bridge strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Possible long detour if both bridges (AUR & AUQ) damaged (unkikely).	Parallel bridge is available if not damaged also.	Return I-80 traffic to normal conditions as quickly as possible.
The only Interstate route for the area.		Minimize user, agency and societal costs.
Bridge carries 5,842 vehicles per day.		Minimize delays.
		Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	
B	H	Increase warning signage.	1. Lowest cost alternative.	1. May not be adequate to stop bridge strikes.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement.	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.
B	H	Lower the grade under the bridge.	1. Likely to be a lower cost than bridge replacement.	1. May not be feasible given the current conditions. 2. May be drainage issues. 3. May create vertical sight issues.	

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at County Rd 3, ML80 at 260.23, Bridge ID = AVG		
Ownership:	WYDOT	Criticality Rank:	9 of 70
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Infrastructural
Issues:	Underclearance is 17.32 ft. The bridges are in moderate condition (NHPP rating of 5). Very high traffic. 2 strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Possible long detour if both bridges (AVH & AVG) damaged (unkikely).	Parallel bridge is available if not damaged also.	Return I-80 traffic to normal conditions as quickly as possible.
The only Interstate route for the area.		Minimize user, agency and societal costs.
Bridge carries 5,842 vehicles per day.		Minimize delays.
		Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	
B	H	Increase warning signage.	1. Lowest cost alternative.	1. May not be adequate to stop bridge strikes.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement.	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.
B	H	Lower the grade under the bridge.	1. Likely to be a lower cost than bridge replacement.	1. May not be feasible given the current conditions. 2. May be drainage issues. 3. May create vertical sight issues.	

Wyoming Department of Transportation Tourism Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at WY-76, ML80 at 219.59, Bridge ID = KJA & KHZ		
Ownership:	WYDOT	Criticality Rank:	9 of 70
Risk Probability Rtg:	5	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Infrastructural
Issues:	Underclearance is 19.91 ft. The bridges are in moderate condition (NHPP rating of 6). Very high traffic. 3 strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Possible long detour if both bridges are damaged (unkikely).	Parallel bridge is available if not damaged also.	Return I-80 traffic to normal conditions as quickly as possible.
The only Interstate route for the area.		Minimize user, agency and societal costs.
Bridge carries 5,842 vehicles per day per bridge.		Minimize delays.
		Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
B	H	Replace with a higher clearance bridge. Upgrade approaches accordingly.	1. Permanent fix. Shouldn't have to address later.	1. Expensive. 2. Requires temporary rerouting solution. 3. May create long-term hardships for users, businesses and residents.	
B	H	Increase warning signage.	1. Lowest cost alternative.	1. May not be adequate to stop bridge strikes.	
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed.	1. Fast recovery of facility function. 2. Short-term lower agency cost compared to bridge replacement. 3. Fairly low user cost during repair.	1. Multiple closures may be cumbersome to users, businesses and residents. 2. Damage may be extensive requiring bridge replacement.	1. Establish procedures with WHP and local transportation departments along the redundant route. 2. Inform WTA.
B	H	Lower the grade under the bridge.	1. Likely to be a lower cost than bridge replacement.	1. May not be feasible given the current conditions. 2. May be drainage issues. 3. May create vertical sight issues.	

Appendix C

Winter Weather Closure and Delay Action Plans

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	US-89 Through Jackson, ML10B from 151.918 to 154.848		
Ownership:	WYDOT	Criticality Rank:	1 of 76
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Performance
Issues:	Very high traffic, 18,760 vehicles per day. Estimated delay cost is approximately $2,095,000 per mile per year. **Most of the delay is likely congestion caused**.		

Vulnerabilities	Strengths	Objectives
Route carries 18,760 vehicles per day of which 2,738 are trucks.		Return US-89 traffic to normal conditions as quickly as possible.
High elevation route causes worse weather.		Minimize user, agency and societal costs.
In narrow valley which offers few alternative routes.		Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Most delays are probably not winter weather related. 2. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	1. Work with local government to coordinate snow removal activities.
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. Most delays are probably not winter weather related. 2. Urban area alows for few snow fence locations.	1. Work with local government to incorporate improvements.
B	H	Assess and modify traffic signals and controls to minimize congestion.	1. Low cost.	1. May have a limited effect since most traffic controls are typically optimized by WYDOT.	1. Work with local government to make needed adjustments.
B	H	Implement Connected Vehicle technology.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the drivers with important information compared to prior methods.	1. May have minimal effect in an urban area. 2. The technology is new and not fully tested. Issues may arise. 3. Implementation costs may be fairly high. 4. Requires cooperation and acceptance from motorists.	1. Work with local government to advertise and encourage use of the technology.
B	H	Add additional lanes.	1. Very effective at reducing congestion leading to reduced delays.	1. Urban area limits widening without very high costs. 2. Jackson has been resistant to widening of roads.	1. Work with local government to incorporate improvements.
B,D	R,O	Establish existing alternative routes and procedures to implement during extreme weather events and relieve congestion related delays.	1. Low agency cost. 2. Can be fairly easily implemented.	1. Alternative routes may also be experiencing similar weather conditions. 2. Requires buy-in from Jackson. Jackson doesn't want potential income to be lost from bypassing traffic.	1. Organize winter weather emergency routing procedures with local jurisdictions.
B,D	R,O	Build alternative routes to relieve traffic congestion.	1. Can be fairly effective relieving congestion. 2. Separates pass-through traffic from tourism traffic.	1. Can be very costly 2. Requires buy-in from Jackson. Jackson doesn't want potential income to be lost from bypassing traffic.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	US-89 South of Jackson, ML10B from 148.704 to 151.918		
Ownership:	WYDOT	Criticality Rank:	1 of 76
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Performance
Issues:	Very high traffic, 13,509 vehicles per day. Estimated delay cost is approximately $1,334,000 per mile per year. **Most of the delay is likely congestion caused**.		

Vulnerabilities	Strengths	Objectives
Route carries 13,509 vehicles per day of which 1,874 are trucks.		Return US-89 traffic to normal conditions as quickly as possible.
High elevation route causes worse weather.		Minimize user, agency and societal costs.
In narrow valley which offers few alternative routes.		Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Most delays are probably not winter weather related. 2. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. Most delays are probably not winter weather related.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed.	
B	H	Implement Connected Vehicle technology.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the drivers with important information compared to prior methods.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from motorists.	1. Work with local government to advertise and encourage use of the technology.
B	H	Add additional lanes.	1. Very effective at reducing congestion leading to reduced delays.	1. Widening may be difficult in environmentally sensitive area.	1. Work with local government to incorporate improvements.
B,D	R,O	Establish existing alternative routes and procedures to implement during extreme weather events and relieve congestion related delays.	1. Low agency cost. 2. Can be fairly easily implemented.	1. Existing alternative routes would not likely handle the traffic.. 2. Requires buy-in from Jackson. Jackson doesn't want potential income to be lost from bypassing traffic.	1. Organize winter weather emergency routing procedures with local jurisdictions.
B,D	R,O	Build alternative routes to relieve traffic congestion.	1. Can be fairly effective relieving congestion. 2. Separates pass-through traffic from tourism traffic.	1. Can be very costly 2. Requires buy-in from Jackson. Jackson doesn't want potential income to be lost from bypassing traffic.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	US-89 North of Jackson, ML10B from 154.848 to 164.926		
Ownership:	WYDOT	Criticality Rank:	1 of 76
Risk Probability Rtg:	5	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Performance
Issues:	High traffic, 7,814 vehicles per day on this 2-lane section. Estimated delay cost is approximately $958,000 per mile per year. **Most of the delay is likely congestion caused**.		

Vulnerabilities	Strengths	Objectives
Route carries 7,814 vehicles per day of which 734 are trucks.		Return US-89 traffic to normal conditions as quickly as possible.
High elevation route causes worse weather.		Minimize user, agency and societal costs.
In narrow valley which offers few alternative routes.		Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Most delays are probably not winter weather related. 2. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. Most delays are probably not winter weather related.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed.	
B	H	Implement Connected Vehicle technology.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the drivers with important information compared to prior methods.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from motorists.	1. Work with local government to advertise and encourage use of the technology.
B	H	Add additional lanes.	1. Very effective at reducing congestion leading to reduced delays.	1. Widening may be difficult in environmentally sensitive area.	1. Work with local government to incorporate improvements.
B,D	R,O	Establish existing alternative routes and procedures to implement during extreme weather events and relieve congestion related delays.	1. Low agency cost. 2. Can be fairly easily implemented.	1. Existing alternative routes are very limited. 2. Requires buy-in from Jackson. Jackson doesn't want potential income to be lost from bypassing traffic.	1. Organize winter weather emergency routing procedures with local jurisdictions.
B,D	R,O	Build alternative routes to relieve traffic congestion.	1. Can be fairly effective relieving congestion. 2. Separates pass-through traffic from tourism traffic.	1. Can be very costly 2. Requires buy-in from Jackson. Jackson doesn't want potential income to be lost from bypassing traffic.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	US-89 Hoback Jct to South of Jackson, ML10B from 141.222 to 148.704		
Ownership:	WYDOT	Criticality Rank:	1 of 76
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Performance
Issues:	Very high traffic, 11,037 vehicles per day. Estimated delay cost is approximately $702,000 per mile per year. **Most of the delay is likely congestion caused**.		

Vulnerabilities	Strengths	Objectives
Route carries 11,037 vehicles per day of which 1,194 are trucks.		Return US-89 traffic to normal conditions as quickly as possible.
High elevation route causes worse weather.		Minimize user, agency and societal costs.
In narrow valley which offers few alternative routes.		Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Most delays are probably not winter weather related. 2. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. Most delays are probably not winter weather related.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed.	
B	H	Implement Connected Vehicle technology.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the drivers with important information compared to prior methods.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from motorists.	1. Work with local government to advertise and encourage use of the technology.
B	H	Add additional lanes.	1. Very effective at reducing congestion leading to reduced delays.	1. Widening may be difficult in environmentall sensitive area..	1. Work with local government to incorporate improvements.
B,D	R,O	Establish existing alternative routes and procedures to implement during extreme weather events and relieve congestion related delays.	1. Low agency cost. 2. Can be fairly easily implemented.	1. Existing alternative routes would not likely handle the traffic.. 2. Requires buy-in from Jackson. Jackson doesn't want potential income to be lost from bypassing traffic.	1. Organize winter weather emergency routing procedures with local jurisdictions.
B,D	R,O	Build alternative routes to relieve traffic congestion.	1. Can be fairly effective relieving congestion. 2. Separates pass-through traffic from tourism traffic.	1. Can be very costly 2. Requires buy-in from Jackson. Jackson doesn't want potential income to be lost from bypassing traffic.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	US-14A from Cody to Powell, ML29B from 2.695 to 22.837		
Ownership:	WYDOT	Criticality Rank:	3 of 76
Risk Probability Rtg:	5	Risk Consequence Rtg:	3
Priority Rtg:	High	Issue Type:	Performance
Issues:	Very high traffic, 6,099 vehicles per day. Estimated delay cost is approximately $494,000 per mile per year. **Some of the delay is likely congestion caused**.		

Vulnerabilities	Strengths	Objectives
Route carries 6,099 vehicles per day of which 242 are trucks.		Return US-14A traffic to normal conditions as quickly as possible.
Alternative routes add significant mileage.		Minimize user, agency and societal costs.
		Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Some delays are probably not winter weather related. 2. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. Some delays are probably not winter weather related.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed.	
B	H	Implement Connected Vehicle technology.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the drivers with important information compared to prior methods.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from motorists.	1. Work with local government to advertise and encourage use of the technology.
B,D	R,O	Establish alternative routing procedures to implement during extreme weather events.	1. Low agency cost. 2. Fairly easily implemented.	1. Alternative routes are distant and may also be experiencing similar weather conditions. 2. WYDOT maintenance personnel have already addressed most alternative routing procedures (may not be fully assessed and formalized). 3. Some WYDOT Districts report that detouring trucks during weather-related crash closures often result in crashes on the detour route, causing emergency services to be split.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	US-14/16/20 Through Cody, ML31B from 49.87 to 54.587		
Ownership:	WYDOT	Criticality Rank:	1 of 76
Risk Probability Rtg:	5	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Performance
Issues:	Very high traffic, 10,476 vehicles per day. Estimated delay cost is approximately $914,000 per mile per year. **Most of the delay is likely congestion caused**.		

Vulnerabilities	Strengths	Objectives
Route carries 10,476 vehicles per day of which 995 are trucks.		Return US-14/16/20 traffic to normal conditions as quickly as possible.
Alternative routes are long and thru Yellowstone National Park.		Minimize user, agency and societal costs.
		Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Most delays are probably not winter weather related. 2. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	1. Work with local government to coordinate snow removal activities.
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. Most delays are probably no winter weather related. 2. Urban area allows for few snow fence locations.	1. Work with local government to incorporate improvements.
B	H	Assess and modify traffic signals and controls to minimize congestion.	1. Low cost.	1. May have a limited effect since most traffic controls are typically optimized by WYDOT.	1. Work with local government to make needed adjustments.
B	H	Implement Connected Vehicle technology.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the drivers with important information compared to prior methods.	1. May have minimal effect in an urban area. 2. The technology is new and not fully tested. Issues may arise. 3. Implementation costs may be fairly high. 4. Requires cooperation and acceptance from motorists.	1. Work with local government to advertise and encourage use of the technology.
B	H	Add additional lanes.	1. Very effective at reducing congestion leading to reduced delays.	1. Urban area limits widening without very high costs.	1. Work with local government to incorporate improvements.
B,D	R,O	Establish existing alternative routes and procedures to implement during extreme weather events and relieve congestion related delays.	1. Low agency cost. 2. Can be fairly easily implemented.	1. Alternative routes may be only partially viable and require routing through YNP. 2. Alternative routes may also be experiencing similar weather conditions. 3. Requires buy-in from Cody.	1. Organize winter weather emergency routing procedures with local jurisdictions.
B,D	R,O	Build alternative routes to relieve traffic congestion.	1. Can be fairly effective relieving congestion. 2. Separates pass-through traffic from tourism traffic.	1. Can be very costly 2. Requires buy-in from Cody. 3. There are significant impediments to building alternative routes.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from Happy Jack Rd to Buford, ML80 from 322.741 to 334.86		
Ownership:	WYDOT	Criticality Rank:	7 of 76
Risk Probability Rtg:	4	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Performance
Issues:	Very high traffic, 13,441 vehicles per day. Estimated delay cost is approximately $1,509,000 per mile per year.		

Vulnerabilities	Strengths	Objectives
Very limited services available on the stretch of road. Viable alternative routes are fairly distant. Route carries 13,441 vehicles per day of which 5,990 are trucks. High elevation route causes worse weather.		Return I-80 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways, especially I-80.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed.	
B	H	Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from the trucking industry.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B	H	Implement Connected Vehicle roadway condition communication technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce some risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. Requires cooperation and acceptance from the trucking industry. 2. Judgment of information received by individual truckers may be inconsistent.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B,D	R,O	Establish alternative routing procedures to implement during extreme weather events.	1. Low agency cost. 2. Fairly easily implemented.	1. Alternative routes may also be experiencing similar weather conditions. Only one nearby alternative route. 2. WYDOT maintenance personnel have already addressed most alternative routing procedures (may not be fully assessed and formalized). 3. Some WYDOT Districts report that detouring trucks during weather-related crash closures often result in crashes on the detour route, causing emergency services to be split.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from Laramie to Happy Jack Rd, ML80 from 316.48 to 322.741		
Ownership:	WYDOT	Criticality Rank:	7 of 76
Risk Probability Rtg:	4	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Performance
Issues:	Very high traffic, 13,940 vehicles per day. Estimated delay cost is approximately $1,460,000 per mile per year.		

Vulnerabilities	Strengths	Objectives
Viable alternative routes are fairly distant. Route carries 13,940 vehicles per day of which 5,990 are trucks. High elevation route with long, steep grade.		Return I-80 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways, especially I-80.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed.	
B	H	Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from the trucking industry.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B	H	Implement Connected Vehicle roadway condition communication technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce some risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. Requires cooperation and acceptance from the trucking industry. 2. Judgment of information received by individual truckers may be inconsistent.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B,D	R,O	Establish alternative routing procedures to implement during extreme weather events.	1. Low agency cost. 2. Fairly easily implemented.	1. Alternative routes may also be experiencing similar weather conditions. Only one nearby alternative route. 2. WYDOT maintenance personnel have already addressed most alternative routing procedures (may not be fully assessed and formalized). 3. Some WYDOT Districts report that detouring trucks during weather-related crash closures often result in crashes on the detour route, causing emergency services to be split.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-25 from College Dr to I-80, ML25 from 7.85 to 8.845		
Ownership:	WYDOT	Criticality Rank:	12 of 76
Risk Probability Rtg:	4	Risk Consequence Rtg:	5
Priority Rtg:	Medium	Issue Type:	Performance
Issues:	High traffic, 22,664 vehicles per day. Estimated delay cost approximately $1,520,000 per mile per year.		

Vulnerabilities	Strengths	Objectives
Route carries 22,664 vehicles per day of which 3,871 are trucks.	Multiple nearby services available.	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. WYDOT already has much snow fence along I-25. 2. Urban location limits snow available fence placement.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed.	
B	H	Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from the trucking industry.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B	H	Implement Connected Vehicle roadway condition communication technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce some risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. Requires cooperation and acceptance from the trucking industry. 2. Judgment of information received by individual truckers may be inconsistent.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B,D	R,O	Establish alternative routing procedures to implement during extreme weather events.	1. Low agency cost. 2. Fairly easily implemented.	1. Alternative routes may also be experiencing similar weather conditions. Only one nearby alternative route that doesn't detour entire problem section. Other routes are fairly distant. 2. WYDOT maintenance personnel have already addressed most alternative routing procedures (may not be fully assessed and formalized). 3. Some WYDOT Districts report that detouring trucks during weather-related crash closures often result in crashes on the detour route, causing emergency services to be split.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-25 from Missle Dr to Central Ave, ML25 from 10.586 to 12.697		
Ownership:	WYDOT	Criticality Rank:	12 of 76
Risk Probability Rtg:	4	Risk Consequence Rtg:	5
Priority Rtg:	Medium	Issue Type:	Performance
Issues:	High traffic, 21,430 vehicles per day. Estimated delay cost approximately $1,021,000 per mile per year.		

Vulnerabilities	Strengths	Objectives
Route carries 21,430 vehicles per day of which 3,034 are trucks.	Multiple nearby available services	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Maintain safety and mobility in the region.

Perform **Action B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. WYDOT already has much snow fence along I-25. 2. Urban location limits snow available fence placement.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed.	
B	H	Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from the trucking industry.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B	H	Implement Connected Vehicle roadway condition communication technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce some risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. Requires cooperation and acceptance from the trucking industry. 2. Judgment of information received by individual truckers may be inconsistent.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B,D	R,O	Establish alternative routing procedures to implement during extreme weather events.	1. Low agency cost. 2. Fairly easily implemented.	1. Alternative routes may also be experiencing similar weather conditions. Only one nearby alternative route that doesn't detour entire problem section. Other routes are fairly distant. 2. WYDOT maintenance personnel have already addressed most alternative routing procedures (may not be fully assessed and formalized). 3. Some WYDOT Districts report that detouring trucks during weather-related crash closures often result in crashes on the detour route, causing emergency services to be split.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from Elk Mountain to Arlington, ML80 from 255.269 to 272.13		
Ownership:	WYDOT	Criticality Rank:	9 of 76
Risk Probability Rtg:	3	Risk Consequence Rtg:	5
Priority Rtg:	Medium	Issue Type:	Performance
Issues:	Very high traffic, 10,463 vehicles per day. Estimated delay cost is approximately $823,000 per mile per year.		

Vulnerabilities	Strengths	Objectives
Viable alternative routes are fairly distant. Route carries 10,463 vehicles per day of which 6,584 are trucks. High elevation route with steep grades.		Return I-80 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways, especially I-80.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed.	
B	H	Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from the trucking industry.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B	H	Implement Connected Vehicle roadway condition communication technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce some risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. Requires cooperation and acceptance from the trucking industry. 2. Judgment of information received by individual truckers may be inconsistent.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B,D	R,O	Establish alternative routing procedures to implement during extreme weather events.	1. Low agency cost. 2. Fairly easily implemented.	1. Alternative routes may also be experiencing similar weather conditions. Only one nearby alternative route. 2. WYDOT maintenance personnel have already addressed most alternative routing procedures (may not be fully assessed and formalized). 3. Some WYDOT Districts report that detouring trucks during weather-related crash closures often result in crashes on the detour route, causing emergency services to be split.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from Evanston to US-189, ML80 from 6.033 to 18.098		
Ownership:	WYDOT	Criticality Rank:	11 of 76
Risk Probability Rtg:	3	Risk Consequence Rtg:	5
Priority Rtg:	Medium	Issue Type:	Performance
Issues:	Very high traffic, 13,191 vehicles per day. Estimated delay cost over $1,022,000 per mile per year.		

Vulnerabilities	Strengths	Objectives
Very steep grades on most of section. Route carries 13,191 vehicles per day of which 6,111 are trucks. Nearest alternative route is very distant.		Return I-80 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways, especially I-80.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed.	
B	H	Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from the trucking industry.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B	H	Implement Connected Vehicle roadway condition communication technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce some risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. Requires cooperation and acceptance from the trucking industry. 2. Judgment of information received by individual truckers may be inconsistent.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B,D	R,O	Establish alternative routing procedures to implement during extreme weather events.	1. Low agency cost. 2. Fairly easily implemented.	1. Alternative routes may also be experiencing similar weather conditions. Only one nearby alternative route that doesn't detour entire problem section. Other routes are fairly distant. 2. WYDOT maintenance personnel have already addressed most alternative routing procedures (may not be fully assessed and formalized). 3. Some WYDOT Districts report that detouring trucks during weather-related crash closures often result in crashes on the detour route, causing emergency services to be split.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	US-85 Terry Ranch Rd to I-80, ML180B from 3.538 to 8.472		
Ownership:	WYDOT	Criticality Rank:	10 of 76
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Medium	Issue Type:	Performance
Issues:	High traffic, 9,526 vehicles per day. Estimated delay cost is approximately $517,000 per mile per year. **Most of the delay is likely congestion caused**.		

Vulnerabilities	Strengths	Objectives
Route carries 9,526 vehicles per day of which 498 are trucks.		Return US-85 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Most delays are probably not winter weather related. 2. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	1. Work with local government to coordinate snow removal activities.
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. Most delays are probably not winter weather related. 2. Urban area alows for few snow fence locations.	1. Work with local government to incorporate improvements.
B	H	Assess and modify traffic signals and controls to minimize congestion.	1. Low cost.	1. May have a limited effect since most traffic controls are typically optimized by WYDOT.	1. Work with local government to make needed adjustments.
B	H	Implement Connected Vehicle technology.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the drivers with important information compared to prior methods.	1. May have minimal effect in an urban area. 2. The technology is new and not fully tested. Issues may arise. 3. Implementation costs may be fairly high. 4. Requires cooperation and acceptance from motorists.	1. Work with local government to advertise and encourage use of the technology.
B	H	Add additional lanes.	1. Very effective at reducing congestion leading to reduced delays.	1. Urban area limits widening without very high costs.	1. Work with local government to incorporate improvements.
B,D	R,O	Establish existing alternative routes and procedures to implement during extreme weather events and relieve congestion related delays.	1. Low agency cost. 2. Can be fairly easily implemented.	1. Alternative routes may also be experiencing similar weather or congestion conditions. 2. Requires buy-in from Cheyenne	1. Organize winter weather emergency routing procedures with local jurisdictions.
B,D	R,O	Build alternative routes to relieve traffic congestion.	1. Can be fairly effective relieving congestion. 2. Separates pass-through traffic from tourism traffic.	1. Can be very costly 2. Requires buy-in from Cheyenne.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from Arlington to Laramie, ML80 from 272.13 to 310.12		
Ownership:	WYDOT	Criticality Rank:	7 of 70
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Performance
Issues:	Very high traffic, 10,707 vehicles per day. Estimated delay cost approximately $713,000 per mile per year.		

Vulnerabilities	Strengths	Objectives
Very limited services available on the stretch of road.		Return I-80 traffic to normal conditions as quickly as possible.
Nearest alternative route becomes congested with I-80 closure traffic.		Minimize user, agency and societal costs.
Route carries 10,707 vehicles per day of which 6,154 are trucks.		Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways, particularly I-80.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed.	
B	H	Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from the trucking industry.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B	H	Implement Connected Vehicle roadway condition communication technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce some risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. Requires cooperation and acceptance from the trucking industry. 2. Judgment of information received by individual truckers may be inconsistent.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B,D	R,O	Establish alternative routing procedures to implement during extreme weather events.	1. Low agency cost. 2. Fairly easily implemented.	1. Alternative routes may also be experiencing similar weather conditions. 2. WYDOT maintenance personnel have already addressed most alternative routing procedures (may not be fully assessed and formalized). 3. Some WYDOT Districts report that detouring trucks during weather-related crash closures often result in crashes on the detour route, causing emergency services to be split.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	US-20/26 in Casper, ML34B from 0.087 to 2.34		
Ownership:	WYDOT	Criticality Rank:	11 of 76
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Performance
Issues:	High traffic, 11,210 vehicles per day. Estimated delay cost is approximately $644,000 per mile per year. **Most of the delay is likely congestion caused**.		

Vulnerabilities	Strengths	Objectives
Route carries 11,210 vehicles per day of which 1,066 are trucks.		Return US-20/26 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Most delays are probably not winter weather related. 2. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	1. Work with local government to coordinate snow removal activities.
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. Most delays are probably not winter weather related. 2. Urban area alows for few snow fence locations.	1. Work with local government to incorporate improvements.
B	H	Assess and modify traffic signals and controls to minimize congestion.	1. Low cost.	1. May have a limited effect since most traffic controls are typically optimized by WYDOT.	1. Work with local government to make needed adjustments.
B	H	Implement Connected Vehicle technology.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the drivers with important information compared to prior methods.	1. May have minimal effect in an urban area. 2. The technology is new and not fully tested. Issues may arise. 3. Implementation costs may be fairly high. 4. Requires cooperation and acceptance from motorists.	1. Work with local government to advertise and encourage use of the technology.
B	H	Add additional lanes.	1. Very effective at reducing congestion leading to reduced delays.	1. Urban area limits widening without very high costs.	1. Work with local government to incorporate improvements.
B,D	R,O	Establish existing alternative routes and procedures to implement during extreme weather events and relieve congestion related delays.	1. Low agency cost. 2. Can be fairly easily implemented.	1. Alternative routes may also be experiencing similar weather or congestion conditions. 2. Requires buy-in from Cheyenne	1. Organize winter weather emergency routing procedures with local jurisdictions.
B,D	R,O	Build alternative routes to relieve traffic congestion.	1. Can be fairly effective relieving congestion. 2. Separates pass-through traffic from tourism traffic.	1. Can be very costly 2. Requires buy-in from Cheyenne.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-25 from I-80 to Missile Dr, ML25 from 8.845 to 10.586		
Ownership:	WYDOT	Criticality Rank:	12 of 76
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Performance
Issues:	High traffic, 20,085 vehicles per day. Estimated delay cost approximately $864,000 per mile per year.		

Vulnerabilities	Strengths	Objectives
Route carries 20,085 vehicles per day of which 3,193 are trucks.	Multiple nearby services available.	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. WYDOT already has much snow fence along I-25. 2. Urban location limits snow available fence placement.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed.	
B	H	Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from the trucking industry.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B	H	Implement Connected Vehicle roadway condition communication technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce some risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. Requires cooperation and acceptance from the trucking industry. 2. Judgment of information received by individual truckers may be inconsistent.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B,D	R,O	Establish alternative routing procedures to implement during extreme weather events.	1. Low agency cost. 2. Fairly easily implemented.	1. Alternative routes may also be experiencing similar weather conditions. Only one nearby alternative route that doesn't detour entire problem section. Other routes are fairly distant. 2. WYDOT maintenance personnel have already addressed most alternative routing procedures (may not be fully assessed and formalized). 3. Some WYDOT Districts report that detouring trucks during weather-related crash closures often result in crashes on the detour route, causing emergency services to be split.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year: 2018
Asset / Location: I-80 Evanston Marginal, ML80 from 3.235 to 6.033

Ownership:	WYDOT	Criticality Rank:	11 of 76
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Performance
Issues:	Very high traffic, 15,575 vehicles per day. Estimated delay cost over $950,000 per mile per year.		

Vulnerabilities	Strengths	Objectives
Fairly sharp curves in an urban section. Route carries 15,575 vehicles per day of which 5,989 are trucks.	Multiple nearby services available.	Return I-80 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways, especially I-80. 2. Urban location limits snow available fence placement.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting or vehicle skid.	1. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed.	
B	H	Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from the trucking industry.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B	H	Implement Connected Vehicle roadway condition communication technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce some risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. Requires cooperation and acceptance from the trucking industry. 2. Judgment of information received by individual truckers may be inconsistent.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B,D	R,O	Establish alternative routing procedures to implement during extreme weather events.	1. Low agency cost. 2. Fairly easily implemented.	1. Alternative routes may also be experiencing similar weather conditions. Only one nearby alternative route that doesn't detour entire problem section. Other routes are fairly distant. 2. WYDOT maintenance personnel have already addressed most alternative routing procedures (may not be fully assessed and formalized). 3. Some WYDOT Districts report that detouring trucks during weather-related crash closures often result in crashes on the detour route, causing emergency services to be split.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from Buford to Cheyenne, ML80 from 334.86 to 359.195		
Ownership:	WYDOT	Criticality Rank:	8 of 76
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Performance
Issues:	Very high traffic, 13,721 vehicles per day. Estimated delay cost is approximately $845,000 per mile per year.		

Vulnerabilities	Strengths	Objectives
Very limited services available on the stretch of road. Viable alternative routes are fairly distant. Route carries 13,721 vehicles per day of which 5,984 are trucks. High elevation route causes worse weather.		Return I-80 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways, especially I-80.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed.	
B	H	Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from the trucking industry.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B	H	Implement Connected Vehicle roadway condition communication technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce some risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. Requires cooperation and acceptance from the trucking industry. 2. Judgment of information received by individual truckers may be inconsistent.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B,D	R,O	Establish alternative routing procedures to implement during extreme weather events.	1. Low agency cost. 2. Fairly easily implemented.	1. Alternative routes may also be experiencing similar weather conditions. Only one nearby alternative route. 2. WYDOT maintenance personnel have already addressed most alternative routing procedures (may not be fully assessed and formalized). 3. Some WYDOT Districts report that detouring trucks during weather-related crash closures often result in crashes on the detour route, causing emergency services to be split.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Tourism Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from Walcott Jct to Elk Mountain, ML80 from 234.786 to 255.269		
Ownership:	WYDOT	Criticality Rank:	9 of 76
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Performance
Issues:	Very high traffic, 10,599 vehicles per day. Estimated delay cost is approximately $747,000 per mile per year.		

Vulnerabilities	Strengths	Objectives
Nearest alternative route has limited viability during storm events.		Return I-80 traffic to normal conditions as quickly as possible.
Route carries 10,599 vehicles per day of which 6,584 are trucks.		Minimize user, agency and societal costs.
High elevation route with steep grades.		Maintain safety and mobility in the region.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures.	
B	H	Build snow fences	1. Fairly low cost alternative which reduces operational costs. 2. Can improve visibility along with minimizing snow accumulation on the road.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways, especially I-80.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed.	
B	H	Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from the trucking industry.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B	H	Implement Connected Vehicle roadway condition communication technology.	1. CV technology promises a new method to mitigate trucking delays and crashes. 2. Technology can reduce some risk taking behaviors. 3. Can better saturate the trucking industry with important information compared to prior methods.	1. Requires cooperation and acceptance from the trucking industry. 2. Judgment of information received by individual truckers may be inconsistent.	1. Contact shippers and WTA to advertise and encourage use of the technology.
B,D	R,O	Establish alternative routing procedures to implement during extreme weather events.	1. Low agency cost. 2. Fairly easily implemented.	1. Alternative routes may also be experiencing similar weather conditions. Only one nearby alternative route. 2. WYDOT maintenance personnel have already addressed most alternative routing procedures (may not be fully assessed and formalized). 3. Some WYDOT Districts report that detouring trucks during weather-related crash closures often result in crashes on the detour route, causing emergency services to be split.	1. Organize winter weather emergency routing procedures with local jurisdictions.

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Appendix D

Environmental – Nonattainment Area Creation Risk Action Plans

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 from W Green River Interchange to E Green River Interchange, ML80 from 89.13 to 91.475		
Ownership:	WYDOT	Criticality Rank:	6 of 76
Risk Probability Rtg:	5	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Environmental
Issues:	Ozone level is about 96% of exceedance level.		

Vulnerabilities	Strengths	Objectives
About 44,000 population affected in Sweetwater County.		Reduce delays and subsequent pollutant emissions.
Annual vehicle delay approximately 18,800 hours per mile.		Provide alternatives to vehicle idling.
		Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 from WY-372 to W. Green River, ML80 from 98.787 to 104.774		
Ownership:	WYDOT	Criticality Rank:	6 of 76
Risk Probability Rtg:	5	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Environmental
Issues:	Ozone level is about 96% of exceedance level.		

Vulnerabilities	Strengths	Objectives
About 44,000 population affected in Sweetwater County. Annual vehicle delay approximately 21,500 hours per mile.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-180 from Terry Ranch Rd to I-80, ML180 from 3.538 to 104.774		
Ownership:	WYDOT	Criticality Rank:	6 of 76
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Environmental
Issues:	Ozone level is about 90% of exceedance level. **Most of delay is congestion related.**		

Vulnerabilities	Strengths	Objectives
Over 100,000 population affected in Laramie County. Annual vehicle delay approximately 28,700 hours per mile.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Urban area limits snow fence placement. 2. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.
B	H	Incentivize PrePass for trucks at the port-of-entry.	1. Reduces truck slowing and idling.	1. There may not be enough trucks to qualify. 2. Nearly all trucks are from out-of-state so Incentives may be ineffectively distributed.	1. Inform shippers and WTA of incentives.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 Buford to Cheyenne, ML80 from 334.86 to 359.195		
Ownership:	WYDOT	Criticality Rank:	8 of 76
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Environmental
Issues:	Ozone level is about 90% of exceedance level and PM10 is at 78%.		

Vulnerabilities	Strengths	Objectives
Over 100,000 population affected in Laramie County. Annual vehicle delay approximately 20,500 hours per mile. Affects the highest population concentration in the State.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 from I-25 to Greeley Hwy, ML80 from 359.195 to 361.64		
Ownership:	WYDOT	Criticality Rank:	8 of 76
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Environmental
Issues:	Ozone level is about 90% of exceedance level and PM10 is at 78%.		

Vulnerabilities	Strengths	Objectives
Over 100,000 population affected in Laramie County.		Reduce delays and subsequent pollutant emissions.
Annual vehicle delay approximately 17,300 hours per mile.		Provide alternatives to vehicle idling.
Affects the highest population concentration in the State.		Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months. 3. Urban area limits snow fence placement.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 from E Green River Interchange to E Flaming Gorge Rd, ML80 from 91.475 to 98.787		
Ownership:	WYDOT	Criticality Rank:	6 of 76
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Environmental
Issues:	Ozone level is about 96% of exceedance level.		

Vulnerabilities	Strengths	Objectives
About 44,000 population affected in Sweetwater County. Annual vehicle delay approximately 14,000 hours per mile.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 from Rock Springs to Baxter Rd, ML80 from 104.774 to 110.913		
Ownership:	WYDOT	Criticality Rank:	6 of 76
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Environmental
Issues:	Ozone level is about 96% of exceedance level.		

Vulnerabilities	Strengths	Objectives
About 44,000 population affected in Sweetwater County. Annual vehicle delay approximately 16,800 hours per mile.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-25 Colorado State Line North, ML25 from 0 to 2.662		
Ownership:	WYDOT	Criticality Rank:	12 of 76
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Environmental
Issues:	Ozone level is about 90% of exceedance level and PM10 is at 78%.		

Vulnerabilities	Strengths	Objectives
Over 100,000 population affected in Laramie County. Annual vehicle delay approximately 26,600 hours per mile. Affects the highest population concentration in the State.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Many of the trucks are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.
B	H	Incentivize PrePass for trucks at the port-of-entry.	1. Reduces truck slowing and idling.	1. There may not be enough trucks to qualify. 2. Nearly all trucks are from out-of-state so Incentives may be ineffectively distributed.	1. Inform shippers and WTA of incentives.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-25 Terry Ranch Rd to College Dr, ML25 from 2.662 to 7.85		
Ownership:	WYDOT	Criticality Rank:	12 of 78
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Environmental
Issues:	Ozone level is about 90% of exceedance level and PM10 is at 78%.		

Vulnerabilities	Strengths	Objectives
Over 100,000 population affected in Laramie County.		Reduce delays and subsequent pollutant emissions.
Annual vehicle delay approximately 24,900 hours per mile.		Provide alternatives to vehicle idling.
Affects the highest population concentration in the State.		Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Many of the trucks are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-25 College Dr to I-80, ML25 from 7.85 to 8.845		
Ownership:	WYDOT	Criticality Rank:	12 of 76
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Environmental
Issues:	Ozone level is about 90% of exceedance level and PM10 is at 78%.		

Vulnerabilities	Strengths	Objectives
Over 100,000 population affected in Laramie County. Annual vehicle delay approximately 65,300 hours per mile. Affects the highest population concentration in the State.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months. 3. Urban area limits snow fence placement.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-25 from I-80 to Missle Dr, ML25 from 8.845 to 10.586		
Ownership:	WYDOT	Criticality Rank:	12 of 76
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	Medium	Issue Type:	Environmental
Issues:	Ozone level is about 90% of exceedance level and PM10 is at 78%.		

Vulnerabilities	Strengths	Objectives
Over 100,000 population affected in Laramie County.		Reduce delays and subsequent pollutant emissions.
Annual vehicle delay approximately 43,400 hours per mile.		Provide alternatives to vehicle idling.
Affects the highest population concentration in the State.		Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months. 3. Urban area limits snow fence placement.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-25 Missle Dr to Central Ave, ML25 from 10.586 to 12.697		
Ownership:	WYDOT	Criticality Rank:	12 of 76
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	Medium	Issue Type:	Environmental
Issues:	Ozone level is about 90% of exceedance level and PM10 is at 78%.		

Vulnerabilities	Strengths	Objectives
Over 100,000 population affected in Laramie County. Annual vehicle delay approximately 53,000 hours per mile. Affects the highest population concentration in the State.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Many of the trucks are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 from Snowy Range Rd to US-287, ML80 from 311.367 to 313.32		
Ownership:	WYDOT	Criticality Rank:	7 of 76
Risk Probability Rtg:	5	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Environmental
Issues:	Ozone level is about 87% of exceedance level.		

Vulnerabilities	Strengths	Objectives
Over 39,000 population affected in Albany County. Annual vehicle delay approximately 19,200 hours per mile.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months. 3. Urban area limits snow fence placement.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 from Grand Ave to Happy Jack Rd, ML80 from 316.48 to 322.741		
Ownership:	WYDOT	Criticality Rank:	7 of 76
Risk Probability Rtg:	5	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Environmental
Issues:	Ozone level is about 87% of exceedance level.		

Vulnerabilities	Strengths	Objectives
Over 39,000 population affected in Albany County. Annual vehicle delay approximately 35,400 hours per mile.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months. 3. Most of section in canyon which limits snow fence placement.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 from Happy Jack Rd to Buford, ML80 from 322.741 to 334.86		
Ownership:	WYDOT	Criticality Rank:	7 of 76
Risk Probability Rtg:	5	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Environmental
Issues:	Ozone level is about 87% of exceedance level.		

Vulnerabilities	Strengths	Objectives
Over 39,000 population affected in Albany County. Annual vehicle delay approximately 36,000 hours per mile.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-25 Central Ave to US-85, ML25 from 12.697 to 17.042		
Ownership:	WYDOT	Criticality Rank:	12 of 70
Risk Probability Rtg:	4	Risk Consequence Rtg:	5
Priority Rtg:	Medium	Issue Type:	Environmental
Issues:	Ozone level is about 90% of exceedance level and PM10 is at 78%.		

Vulnerabilities	Strengths	Objectives
Over 100,000 population affected in Laramie County. Annual vehicle delay approximately 15,700 hours per mile. Affects the highest population concentration in the State.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Many of the trucks are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 from WY-372 to W. Green River, ML80 from 82.608 to 89.13		
Ownership:	WYDOT	Criticality Rank:	6 of 76
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Environmental
Issues:	Ozone level is about 96% of exceedance level.		

Vulnerabilities	Strengths	Objectives
About 44,000 population affected in Sweetwater County. Annual vehicle delay approximately 13,000 hours per mile.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 Superior to Bitter Creek, ML80 from 122.049 to 142.006		
Ownership:	WYDOT	Criticality Rank:	6 of 76
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Environmental
Issues:	Ozone level is about 96% of exceedance level.		

Vulnerabilities	Strengths	Objectives
About 44,000 population affected in Sweetwater County. Annual vehicle delay approximately 11,100 hours per mile.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	US-20/26 in Casper, ML34 from 0.087 to 2.34		
Ownership:	WYDOT	Criticality Rank:	17 of 76
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	Medium	Issue Type:	Environmental
Issues:	Ozone level is about 90% of exceedance level.		

Vulnerabilities	Strengths	Objectives
About 83,000 population affected in Natrona County. Annual vehicle delay approximately 31,300 hours per mile.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months. 3. Urban area provides no snow fence placement.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 from Curtis St to WY-130, ML80 from 310.12 to 311.367		
Ownership:	WYDOT	Criticality Rank:	7 of 76
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Environmental
Issues:	Ozone level is about 87% of exceedance level.		

Vulnerabilities	Strengths	Objectives
Over 39,000 population affected in Albany County. Annual vehicle delay approximately 17,200 hours per mile.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months. 3. Urban area limits snow fence placement.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 from US-287 to Grand Ave, ML80 from 313.32 to 316.48		
Ownership:	WYDOT	Criticality Rank:	7 of 76
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	Ozone level is about 87% of exceedance level.		

Vulnerabilities	Strengths	Objectives
Over 39,000 population affected in Albany County. Annual vehicle delay approximately 16,200 hours per mile.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months. 3. Urban area limits snow fence placement.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 from Greeley Hwy to College Dr, ML80 from 361.64 to 363.617		
Ownership:	WYDOT	Criticality Rank:	8 of 76
Risk Probability Rtg:	3	Risk Consequence Rtg:	5
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	Ozone level is about 90% of exceedance level and PM10 is at 78%.		

Vulnerabilities	Strengths	Objectives
Over 100,000 population affected in Laramie County. Annual vehicle delay approximately 12,700 hours per mile. Affects the highest population concentration in the State.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	Casper Bypass from I-25 to US-20/26, ML47 from 0 to 2.9		
Ownership:	WYDOT	Criticality Rank:	16 of 76
Risk Probability Rtg:	4	Risk Consequence Rtg:	5
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	Ozone level is about 90% of exceedance level. Some of the delay is likely caused by urban traffic controls.		

Vulnerabilities	Strengths	Objectives
Over 83,000 population affected in Natrona County. Annual vehicle delay approximately 18,600 hours per mile. Affects the highest population concentration in the State.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-25 from Exit 25 to Nimmo Rd, ML25 from 25.442 to 34.45		
Ownership:	WYDOT	Criticality Rank:	12 of 76
Risk Probability Rtg:	3	Risk Consequence Rtg:	5
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	Ozone level is about 90% of exceedance level and PM10 is at 78%.		

Vulnerabilities	Strengths	Objectives
Over 100,000 population affected in Laramie County. Annual vehicle delay approximately 10,900 hours per mile. Affects the highest population concentration in the State.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Many of the trucks are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	US-14A from Cody to Powell, ML29 from 2.695 to 22.837		
Ownership:	WYDOT	Criticality Rank:	3 of 76
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	PM2.5 level is about 66% of exceedance level.		

Vulnerabilities	Strengths	Objectives
Over 30,000 population affected in Park County. Annual vehicle delay approximately 28,100 hours per mile. Affects the highest population concentration in the State.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	US-14A from Powell to Byron, ML29 from 22.837 to 25.85		
Ownership:	WYDOT	Criticality Rank:	3 of 76
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	PM2.5 level is about 66% of exceedance level.		

Vulnerabilities	Strengths	Objectives
Over 30,000 population affected in Park County. Annual vehicle delay approximately 27,100 hours per mile. Affects the highest population concentration in the State.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	US-14/16/20 in Cody, ML31 from 49.87 to 54.587		
Ownership:	WYDOT	Criticality Rank:	5 of 76
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	PM2.5 level is about 66% of exceedance level. **Most delay is caused by urban congestion.**		

Vulnerabilities	Strengths	Objectives
Over 30,000 population affected in Park County.		Reduce delays and subsequent pollutant emissions.
Annual vehicle delay approximately 44,400 hours per mile.		Provide alternatives to vehicle idling.
Affects the highest population concentration in the State.		Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Not effective at reducing pollutants in summer months. 2. Urban area restricts snow fence installation significantly.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-90 from N Sheridan Interchange to WY-336, ML90 from 20.634 to 22.902		
Ownership:	WYDOT	Criticality Rank:	13 of 76
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	High PM2.5 and Ozone levels..		

Vulnerabilities	Strengths	Objectives
Over 31,000 population affected in Sheridan County. Annual vehicle delay approximately 12,700 hours per mile.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months. 3. Urban area limits snow fence placement.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Many of the trucks are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-90 from WY-336 to US-14, ML90 from 22.902 to 24.961		
Ownership:	WYDOT	Criticality Rank:	13 of 76
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	High PM2.5 and Ozone levels..		

Vulnerabilities	Strengths	Objectives
Over 31,000 population affected in Sheridan County. Annual vehicle delay approximately 12,600 hours per mile.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months. 3. Urban area limits snow fence placement.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Many of the trucks are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.

Wyoming Department of Transportation Tourism Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 from Arlington to Curtis St, ML80 from 272.13 to 310.12		
Ownership:	WYDOT	Criticality Rank:	7 of 76
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	Ozone level is about 87% of exceedance level.		

Vulnerabilities	Strengths	Objectives
Over 39,000 population affected in Albany County. Annual vehicle delay approximately 15,500 hours per mile.		Reduce delays and subsequent pollutant emissions. Provide alternatives to vehicle idling. Provide incentives for lower emissions vehicles.

Perform Action **B**efore, **D**uring or **A**fter the Event	**H**arden, **R**edundant, **O**perational, **P**lan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Assess and modify current snow removal and roadway management procedures as needed.	1. Fairly low cost fix. 2. WYDOT already has much of this implemented and likely would not require many changes. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. Probably little improvement remaining to be gained since WYDOT is already assessing and improving procedures. 2. Not effective at reducing pollutants in summer months.	
B	H	Build snow fences	1. Fairly low cost and reduces operational costs. 2. Can improve visibility and minimize snow accumulation on the road. 3. Could reduce inefficient slowing of vehicles thereby improving emissions reductions.	1. WYDOT is nearing effective saturation of snow fences along Interstate highways. 2. Not effective at reducing pollutants in summer months.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of vehicles thereby improving emissions reductions. 2. A very few modifications may be easily accomplished at low cost.	1. Can be very expensive. 2. Safety issues need to be carefully assessed. 3. Limited improvement locations limit emission reductions. 4. Not effective at reducing pollutants in summer months.	
B	H	Implement Connected Vehicle technology on the road.	1. CV technology promises a new method to mitigate delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize vehicle movement efficiencies and dissuade drivers from approaching conditions that create increased vehicle emissions.	1. The technology is new and not fully tested. Issues may arise. 2. Implementation costs may be fairly high. 3. Requires cooperation and acceptance from vehicle owners.	1. Contact automotive organizations, shippers and WTA to advertise and encourage use of the technology.
B	H	Provide diesel retrofit incentives to the trucking industry.	1. Reduces emissions. 2. Effective year round rather than just in winter months.	1. Could become very expensive. 2. Most of the trucks on I-80 are from out of state likely causing the effectiveness of retrofits to be minimal. It would require retrofitting a very large number of trucks to see significant results. 3. As trucking fleet is replaced action will loses effectiveness..	1. Contact shippers and WTA to advertise and encourage retrofitting their trucks.
B	H	Provide electrified truck parking areas to reduce truck idling.	1. Reduces truck idling during winter weather events thus reducing emissions. 2. Provides additional safety features to the road.	1. Requires trucks to be equipped with applicable equipment to be able to shut down their diesel engines. 2. Less effective at reducing pollutants in summer months.	1. Inform shippers and WTA of electrification availability.