Wyoming Department of Transportation

Risk and Resiliency Plan for Critical Freight Transportation Assets

Table of Contents

Wyoming Department of Transportation Risk and Resiliency Plan for Freight Assets

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 freight movement and its associated economic component on Wyoming Department of Transportation (WYDOT) assets.

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.

While concepts of freight's roles in economic risk and resiliency analyses have similar processes with their TAMP counterparts, they vary significantly having differing types of assets and performance processes. Figure 1 incorporates the following assets into a risk and resiliency framework for freight-related assets:

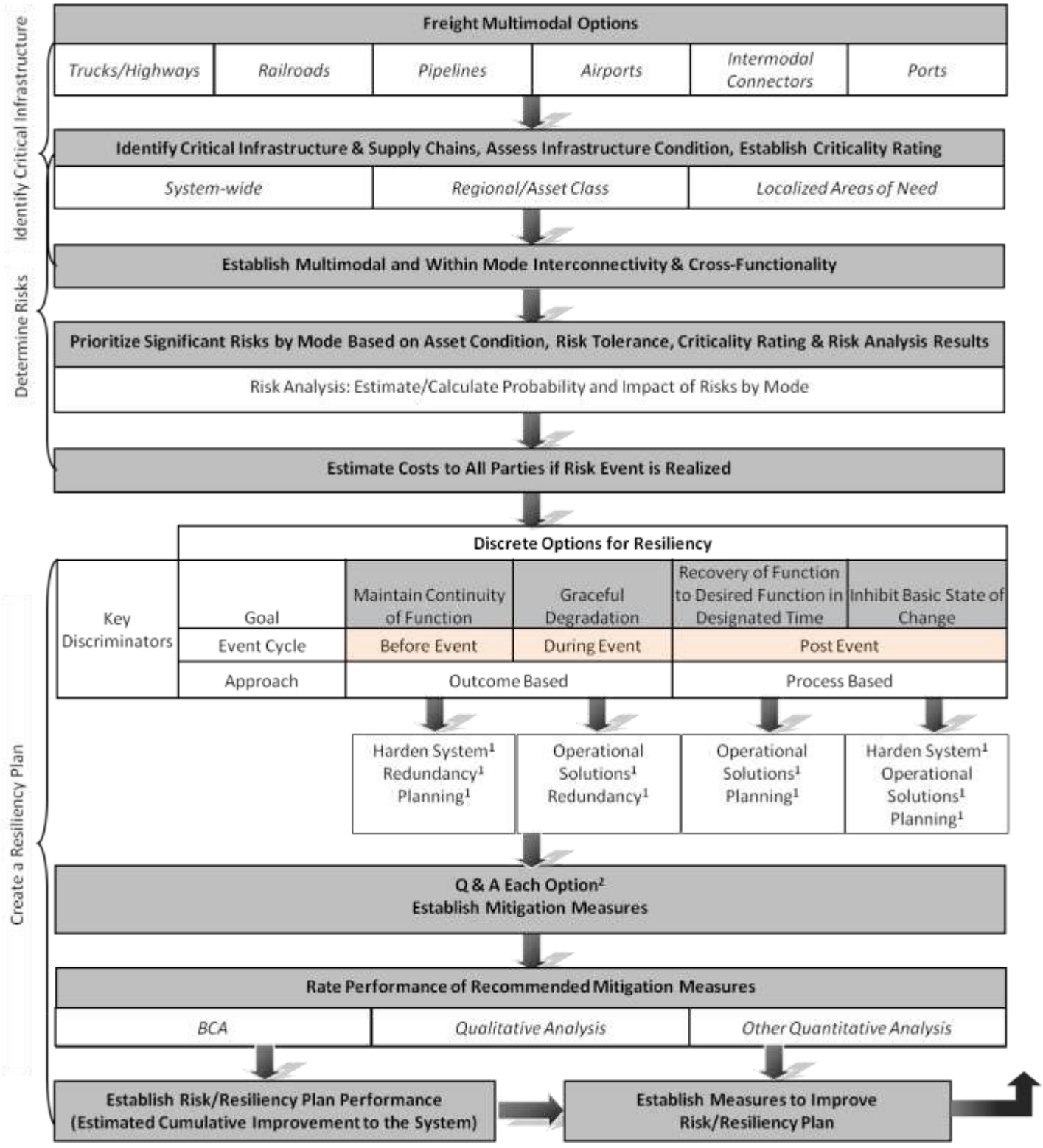
- Highways
- Railroads
- Pipelines
- Airports
- Intermodal connectors
- Ports

Each of these assets does not operate independently of each other. If the capacity is reached for one mode, operators of that asset may seek to supplement the lack in capacity by using another mode. For example, petroleum produced in a recently developed Wyoming location is hauled by truck 100 or more miles to an intermodal facility and loaded onto trains. In some cases, the trains will offload the petroleum to pipelines that are able to carry the additional capacity. The interdependence of each asset should be address in any risk and resilience plan involving freight movement to the level it may affect WYDOT controlled assets.

While WYDOT and the State of Wyoming have no ports, port facilities in other States can have significant effects on Wyoming's economy and freight movement. The risks associated with the decisions and conditions at those ports may increase or decrease the prosperity of Wyoming by reducing or increasing the cost to transport Wyoming's goods to market. For example, some West Coast states have banned the transport of coal to their port facilities causing Wyoming coal producers to find more distant and more costly alternate routes to ship coal to East Asian markets. This underscores the fact that the State is not an island unto itself and therefore WYDOT needs to remain aware of national and global trends and activities that may affect Wyoming freight movement processes.

Figure 1 outlines the WYDOT Freight Risk and Resiliency Plan. It provides the analytical steps and processes to establish critical freight 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.

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



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

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.

Pipeline, rail, and intermodal transfer facilities in Wyoming are privately owned. While risks can be partially assessed for these facilities, the determination of resiliency improvement activities should remain a function of the facilities' owners. WYDOT therefore addresses those facilities only where potential resiliency activities overlap into WYDOT controlled freight assets.

How WYDOT Establishes Critical Freight Infrastructure

WYDOT's first step in performing resiliency analysis on the State's freight network is to identify all critical freight infrastructure owned by the State. While not all freight infrastructure is owned and/or under control of the State, there is still value in being aware of its potential to disrupt to WYDOT transportation assets. WYDOT assesses freight 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.

Each item listed under "Freight Infrastructure Types" below has or could have interdependent relationships. For example, if capacity is limited for one type of infrastructure, producers may shift their freight transportation to another mode. In the event of a disruption, the State or private industry may seek to temporarily transfer freight to an alternative mode. The purpose of this portion of the analysis therefore is not to just identify the risks associated with each mode, but to identify potential alternative modes that may become critical should events warrant and to establish their codependent criticality. Only facilities on a fairly large scale may be assessed in this "critical facility" identification process.

Freight Infrastructure Types

WYDOT evaluates the following infrastructure types in its freight and resiliency planning.

- Highways, last-mile facilities, highway maintenance facilities, administrative facilities
- Railroads, trains and other rail facilities
- Pipelines and pipeline facilities
- Airports, airplanes and air facilities
- Intermodal facilities
- Ports (external ports and their interactions with Wyoming freight)
- Facilities at the origin or destination (producers and/or receivers)

For each freight multimodal option, 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 rapidly.

Lower "critically" 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. WYDOT used the following criteria to establish these "critical facilities":

- Is the facility identified as a Key Freight Corridor in the WYDOT Freight Plan?
- Is the facility on Wyoming's National Highway Freight Network?
- Is the facility on Wyoming's National Multimodal Freight Network?
- Is the facility considered national, regional or local in nature?
- What freight volumes are transferred via the facility? (truck volumes were used)

The following are potential additional criteria for future criticality analyses:

- What level of hardships would users face in a disrupting event?
- What is the approximate quantity and value of goods transported on the facility?
- What is the time-sensitivity of the freight moved on the facility?
- What level of non-freight activity occurs on the facility?
- How critical is the facility to non-freight users?
- What other freight critical facilities depend on this facility and to what level?
- How non-transferable are the facilities freight to other modes? (consider ease of transfer, alternate mode capacity and alternate mode costs)

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

Table 1: Scoring and Weighting Methods for Primary Critical Assets

Primary Facility Criterion	**Scoring Method**	**Weighting**
Is the facility identified as a Key Freight Corridor in the WYDOT Freight Plan?	Yes: 10 points No: 0 points	5
Is the facility on Wyoming's National Highway Freight Network?	Yes: 10 points Partially: 5 points No: 0 points	4
Is the facility on Wyoming's National Multimodal Freight Network?	Yes: 10 points Recommended: 5 points No: 0 points	1
Is the facility considered national, regional or local in nature? (Interstates = national, other NHS = regional and remaining facilities = local)	National: 10 points Regional: 5 points Local: 0 points	5
What freight volumes are transferred via the facility? (AADTT)	Values rescaled to 0 through 10 where possible 10 = very high value/quantity	10

A limited number of freight transportation facilities within WYDOT's control are deemed critical facilities to be included in 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 Freight 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 the analysis 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. Therefore, 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 freight facility that is under WYDOT control is assessed for the probability and consequence of potential risks. The following potential disrupting events may be used in the risk analysis for highway freight movement:

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. State, National and global shifts in economic development and the movement of goods
6. Shift in internal or external regulations or policies
7. Shift in priorities
8. Severe winter weather
9. Severe flooding
10. Regionalized wildfires
11. Technology failures
12. Acts of terror
13. Shifts in the economic and employment trends within the State
14. Rapid upward shift in truck usage of roads, increased demand
15. Significant traffic congestion and delays
16. Seismic activity

17. Crashes, bridge strikes, damage to infrastructure
18. Significant project delays
19. Hazardous material spills
20. Environmental issues
21. Utility caused disruptions
22. Events that attract inordinate traffic volumes

The following potential disrupting events may be used in the risk analysis for air freight movement:

1. Prolonged or extended severe weather
2. Funding shortfalls reducing WYDOT budget
3. Rapid construction and maintenance cost increases
4. Rapid unexpected deterioration of assets
5. Local, national & global shifts in economic development and the movement of goods
6. Shift in internal or external regulations or policies
7. Movement of hub routes to more distant locations
8. Cost increases for air cargo services
9. Severe weather or other acts of nature
10. Technology failures
11. Other acts of nature
12. Acts of terror
13. Significant project delays
14. Airplane crashes
15. Loss of air cargo service to key airports
16. Airport facilities become functionally obsolete for air cargo

Since some of the risks identified above may not reach the high risk level to be further analyzed, they are not analyzed for resilience planning. Also, WYDOT may not have enough data to adequately evaluate certain risks.

WYDOT considers potential problems caused by or resulting to nodal facilities not shown in the list of assets when establishing risk levels and resiliency needs. These facilities may include refineries, agricultural facilities, mining facilities, or forestry and timber facilities. While quantitative analyses are not always possible for these types of facilities due to the lack of applicable information and the excessive resources it would take to perform, they are recognized in the process as influential to freight risk and resiliency.

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 risks categorized as “High” are analyzed in the risk analysis process.

After all risks are established for each facility, WYDOT collects any applicable data associated with the risks for the normal condition and forecast condition associated with disruptions. 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) Stream flow 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) Stream flow 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 (from freight plan) 2) Non-closure winter weather delay (from travel time data) converted to frequency equivalent	1) Closure duration (from freight plan) 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 truck delay and summed.	Probability and consequence use a range of 1 to 5 based on percentile ranking.
Light High Profile Vehicle Blowover Risk	Light high profile blowover frequency (from freight plan)	Light high profile blowover duration (from freight plan) times AADTT	Probability is the number of light high profile vehicle closures. Consequence is the total annual hours of truck delay for light high profile vehicles (includes all trucks since no data were available for the number of light high profile vehicles)	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 occurring may be based upon the type of event, the temporal nature of the event, the location of the affected facility, and a variety of other possible conditions. The probability 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 Freight 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 process to the higher priority critical assets. The prioritization process combines the risk results, 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 Freight Corridors

The freight corridors shown in Table 6 were selected for criticality analysis based on their existence as a Key Freight Corridor in the Freight Plan, as a part of the National Highway Freight Network, or as a part of the National Multimodal Freight Network. Additional selection criteria included truck traffic volumes (AADTT) and whether they serve mostly National, Regional of Local interests. Only Interstate highways were considered National, while Regional included only non-Interstate NHS routes.

Table 6: Corridors Evaluated for Potential Critical Freight Corridors

Facility	From RM	To RM	Truck AADT	Key WY Freight Corridor	National Highway Freight Network (P=partial)	National Multimodal Freight Network (R= recommended)	Does the facility primarily serve National (N), Regional (R) or Local (L) interests?
5th Street	100.84	101.14	1250		X	X	L
A-209-2	5.02	5.087	NA		X	X	L
Burlington Tr	101.35	101.79	NA		X	X	L
Campstool Rd	0.08	5.02	166		X	X	L
Campstool Wy	0	0.265	459		X	X	L
Casper Future	0	4.987	NA		X	X	L
Christensen Rd	0	0.58	440		X	X	L
Christensen Rd	0.416	0.926	NA		X	X	L
College Dr	0	6.873	483		X	X	R
CR 927	0	0.214	120		X	X	L
Fox Farm Rd	0	1.84	282		X	X	L
Greeley Hwy	3.538	8.472	512		X	X	R
High Plains Rd	100	103.14	7		X	X	L
I 80 Service Rd	0	1.382	862		X	X	L
I-25	0	300	1515	X	X	X	N
I-80	0	402	6041	X	X	X	N
I-90	0	207	858	X	X	X	N
Lincolnway	358.01	361.44	619		X	X	L
Logan Av	100.30	100.71	522		X	X	L
Morrie Avenue	99.661	100.49	NA		X	X	L
Nationway	101.19	103.18	359		X	X	L
Round Top Rd	0	1.81	176		X	X	L
Casper Bypass	0	2.9	1040		X	X	R
US 20-26	0	0.087	158		X	X	R
US 20-26	0.087	2.34	202		X	X	R
US 20-26	4.518	11.733	588		X	X	R
US-191	0	110	418	X		R	R
US-20/US-26	0	100	385	X	P	R	R
US-20/WY-789	100	257	301	X		R	R
US-26	0	38	288	X		R	R
US-26	48	56	435	X		R	R
US-26/WY-789	104	127	556	X		R	R
US-287	0	44	506	X		R	R

US-30	0	100	836	X	X	R	R
US-85	17	230	267	X		R	R
Venture Drive	105.98	107.07	NA		X	X	L
Waterford	98.664	99.549	7		X	X	L
WY 220	0	0.04	NA		X	X	R
WY 220	113.36	117.21	627		X	X	R
WY 253	0	0.56	680		X	X	L
WY 254	1.336	4.06	568		X	X	L
WY 258	7.85	18.289	624		X	X	L
WY 258	18.289	18.44	720		X	X	L
WY 505	186.88	187.88	181		X	X	L
WY-220	44	117	711	X	P	R	R
WY-59	0	112	643	X		R	R

WYDOT scored critical freight corridors using the schema in Table 7. The weightings were set based on the perceived impact of each criterion on the importance of the freight route.

Table 7: Criteria for Scoring Critical Freight Routes

Criterion	**Scoring Method**	**Weighting**
Is the facility identified as a Key Freight Corridor in the WYDOT Freight Plan?	Yes: 10 points No: 0 points	5
Is the facility on Wyoming's National Highway Freight Network?	Yes: 10 points Partially: 5 points No: 0 points	4
Is the facility on Wyoming's National Multimodal Freight Network?	Yes: 10 points Recommended: 5 points No: 0 points	1
Is the facility considered national, regional or local in nature?	National: 10 points Regional: 5 points Local: 0 points	5
AADTT	Values rescaled to 0 through 10 where possible 10 = very high value/quantity	10

WYDOT selected the highest scoring 25% of all assessed corridors for risk analysis. They are shown in Table 8.

Table 8: The Highest 25% of Critical Freight Corridors

Rank	Facility	From RM	To RM	Miles	Score
1	I-80	0	402	402	10
2	I-25	0	300	300	7
3	I-90	0	207	207	6.56
4	US-30	0	100	100	5.35
5	WY-220	44	117	73	4.47
6	US-20/US-26	0	100	100	4.25
7	Casper Bypass	0	2.9	2.9	3.69
8	WY-59	0	112	112	3.62
9	US-26/WY-789	104	127	23	3.56
10	US-287	0	44	44	3.53
11	US-26	48	56	8	3.48
12	US-191	0	110	110	3.47
		TOTAL MILES:		1481.9	

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 if it were to occur. 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. Probability scores were calculated using the number of flooding events on the applicable stream since the last dam was built. Consequence scores were estimated per event based on their descriptions of the past flood events. Figure 2 is a flood risk map created from that analysis.

Stream flow flood event levels were assessed for individual bridges on the critical freight 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 9.

Figure 2: Map of County Flood Risks

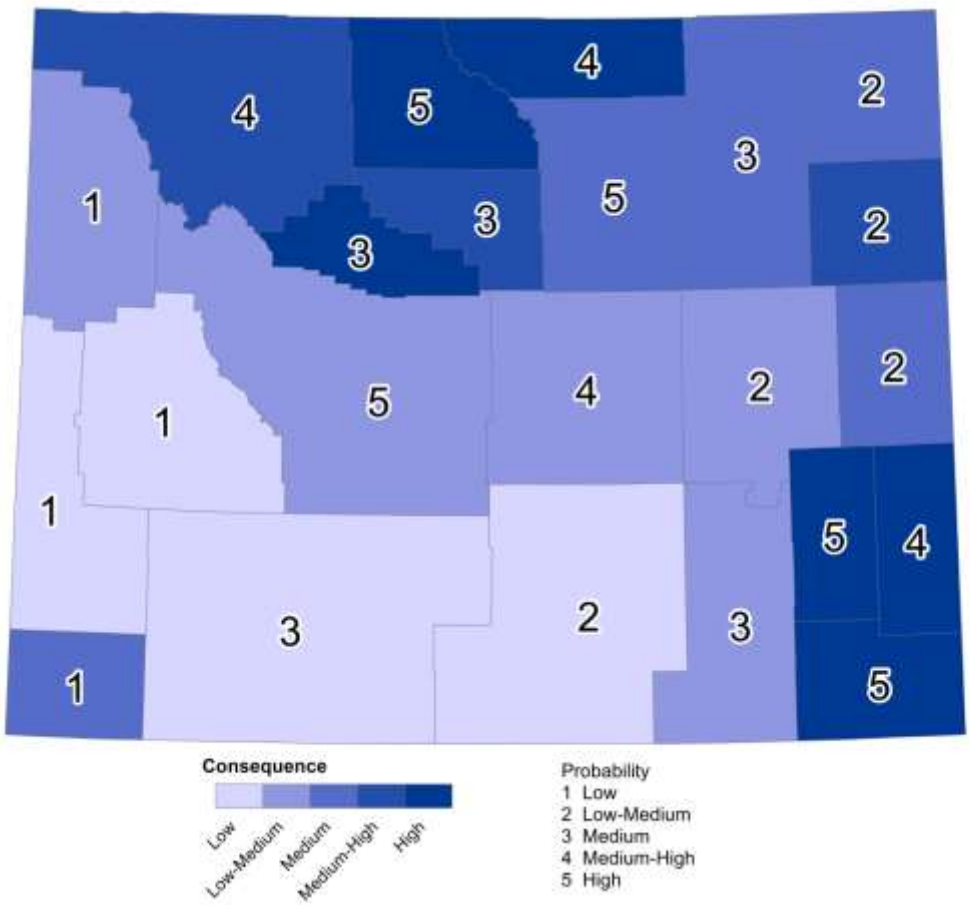


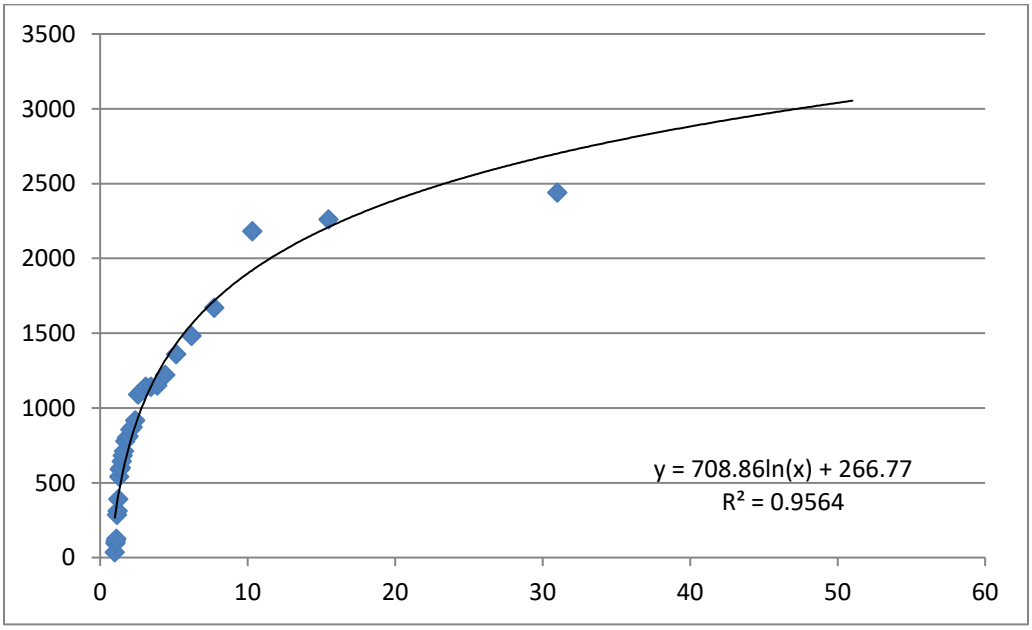
Table 9: Flood Return Interval and Stream Flow Variability for Significant Bridges on the Critical Freight Corridors

					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	347	466	536	585	623	654	681	704	724	742	861	114%
N. Platte River	I-25	125.52	CZT	CZS	10739	13477	15079	16216	17097	17817	18426	18954	19419	19836	22574	85%
N. Platte River	I-25	188.34	DKW	AIJ	6962	7635	8029	8308	8525	8702	8852	8981	9096	9198	9871	32%
N. Platte River	I-25	188.34	DKW	AIJ	6622	7852	8572	9083	9479	9802	10076	10313	10522	10709	11940	62%
M.F. Powder River	I-25	253.96	AKI	AKH	733	900	997	1066	1120	1164	1201	1233	1261	1287	1454	76%
N.F. Powder River	I-25	258.98	AKN	AKM	410	511	570	612	645	672	694	714	731	746	847	82%
Clear Creek	I-25	299.17	ALV		972	1170	1285	1367	1431	1483	1527	1565	1599	1629	1827	68%
Bear River	I-80	5.91	AMM	AML	2904	3481	3819	4059	4245	4397	4526	4637	4735	4823	5401	66%
Blacks Fork	I-80	44.85	ANV	ANU	1899	2390	2678	2882	3040	3169	3278	3373	3457	3531	4023	86%
Blacks Fork	I-80	77.48	AOS	AOR	5590	7127	8026	8664	9158	9563	9904	10200	10461	10695	12232	91%
Green River	I-80	86.38	APA	AOZ	12600	15617	17382	18635	19606	20400	21071	21652	22165	22624	25641	80%
N. Platte	I-80	229	LCQ	AUK	11975	14469	15928	16963	17766	18422	18977	19457	19881	20260	22754	69%

Rock Creek	I-80	258.95	AVD	AVC	1418	1676	1827	1934	2017	2085	2142	2192	2236	2275	2533	60%
Laramie River	I-80	312.44	AXK	AXJ	1860	2299	2556	2738	2880	2995	3093	3178	3252	3319	3758	78%
Crow Creek	I-80	363.87	DCA	DBZ	324	435	500	546	582	611	636	657	676	693	804	114%
Tongue River	I-90	15.01	BBA	BAZ	3700	4583	5100	5466	5751	5983	6179	6350	6500	6634	7517	79%
Goose Creek	I-90	20.59	BBK	BBJ	2255	2790	3103	3325	3498	3639	3758	3861	3952	4033	4569	79%
Clear Creek	I-90	58.38	BDI	BDH	972	1170	1285	1367	1431	1483	1527	1565	1599	1629	1827	68%
Crazy Woman Creek	I-90	73.18	BEC	BEB	1465	1907	2165	2348	2490	2606	2704	2789	2864	2931	3373	100%
Powder River	I-90	88.98	BEU	BET	8016	10526	11995	13037	13846	14506	15064	15548	15975	16356	18867	104%
Belle Fourche River	I-90	152.92	BGT	BGS	2443	3255	3729	4066	4328	4541	4722	4878	5016	5140	5952	110%
Sand Creek	I-90	205.35	DHQ	DHP	255	338	387	422	449	471	490	506	520	533	616	109%
Wind River	US26/ WY789	123.43	LCU		17433	21993	24660	26552	28020	29220	30234	31112	31887	32580	37140	87%
Blacks Fork	US-30	95.55	JBC		5590	7127	8026	8664	9158	9563	9904	10200	10461	10695	12232	91%
North Platte River	WY-59	0.71	FDB		6962	7635	8029	8308	8525	8702	8852	8981	9096	9198	9871	32%
Sweetwater River	WY-220	62.73	BUD		1627	2071	2331	2515	2658	2775	2874	2959	3035	3102	3546	91%
North Platte River	WY-220	94.33	LIK		5240	6055	6531	6869	7132	7346	7527	7684	7822	7946	8761	52%
North Platte River	WY-220	116.41	BUN		5240	6055	6531	6869	7132	7346	7527	7684	7822	7946	8761	52%

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: Example of a Return Interval Hydrograph



Each variable was weighted according to its assumed potential to measure forecast bridge damage during a flood. Table 10 shows the weightings.

Table 10: 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 10 (Table 11 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 weight 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 11 shows the results of the bridge flood risk analysis.

Table 11: 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 Rating	Consequence Rating	Risk Rating
N. Platte River	I-25	125.52	CZT	87	20	20	30	40	30	70	30	197	130	3	5	H
S.F. Powder River	I-25	246.3	AJW	87	25	20	27	40	18	50	21	199	89	4	3	H
Blacks Fork River	I-80	77.48	AOS	87	35	20	27	24	6	90	18	193	114	3	4	H
Blacks Fork River	I-80	77.48	AOR	87	35	20	27	24	6	90	18	193	114	3	4	H
Crazy Woman Creek	I-90	73.18	BEC	87	40	20	18	40	18	50	12	205	80	4	3	H
Crazy Woman Creek	I-90	73.18	BEB	87	40	20	18	40	18	50	12	205	80	4	3	H
Powder River	I-90	88.98	BEU	87	45	20	18	40	18	50	27	210	95	5	3	H
Powder River	I-90	88.98	BET	87	45	20	18	40	18	50	27	210	95	5	3	H
Wind River	US26/ WY789	123.43	LCU	100	35	20	3	40	12	80	27	198	119	4	4	H
Crow Creek	I-25	10.37	AAZ	87	45	20	18	40	30	40	3	210	73	5	2	M
Crow Creek	I-25	10.37	AAY	87	45	20	27	40	30	40	3	219	73	5	2	M
N Laramie River	I-25	87.03	AEB	87	15	20	18	40	30	70	12	180	112	2	4	M
N Laramie River	I-25	87.03	AED	87	15	20	27	40	30	70	0	189	100	2	3	M
N. Platte River	I-25	125.52	CZS	87	20	20	18	40	30	70	30	185	130	2	5	M
N. Platte River	I-25	188.34	DKW	87	5	50	27	32	12	30	30	201	72	4	2	M
N. Platte River	I-25	188.34	AIJ	87	5	50	27	32	12	30	24	201	66	4	2	M
S.F. Powder River	I-25	246.3	AJV	87	25	20	18	40	18	50	21	190	89	3	3	M
Green River	I-80	86.38	APA	87	30	20	18	24	6	90	21	179	117	2	4	M
N. Platte	I-80	229	LCQ	87	15	20	3	16	6	100	21	141	127	1	5	M
N. Platte	I-80	229	AUK	87	15	20	18	16	6	100	21	156	127	1	5	M
Crow Creek	I-80	363.87	DCA	87	50	20	3	40	30	30	6	200	66	4	2	M
Crow Creek	I-80	363.87	DBZ	87	50	20	3	40	30	30	6	200	66	4	2	M
Tongue River	I-90	15.01	BBA	87	30	20	18	32	30	80	21	187	131	2	5	M
Tongue River	I-90	15.01	BAZ	87	30	20	18	32	30	80	24	187	134	2	5	M
Belle Fourche River	I-90	152.92	BGT	87	40	20	27	16	18	70	15	190	103	3	3	M
Belle Fourche River	I-90	152.92	BGS	87	40	20	27	16	18	70	15	190	103	3	3	M
Blacks Fork River	US-30	95.55	JBC	100	35	20	18	24	6	60	12	197	78	3	2	M
Sweetwater River	WY-220	62.73	BUD	100	35	20	27	32	12	60	3	214	75	5	2	M
M.F. Powder River	I-25	253.96	AKI	87	15	20	27	40	18	40	18	189	76	2	2	L
M.F. Powder River	I-25	253.96	AKH	87	15	20	27	40	18	40	18	189	76	2	2	L
N.F. Powder River	I-25	258.98	AKN	87	25	20	18	40	18	10	3	190	31	3	1	L
N.F. Powder River	I-25	258.98	AKM	87	25	20	3	40	18	10	3	175	31	1	1	L
S Fork Crazy Woman Creek	I-25	278.26	AKZ	87	25	20	18	40	18	0	9	190	27	3	1	L
S Fork Crazy Woman Creek	I-25	278.26	AKY	87	25	20	18	40	18	0	9	190	27	3	1	L

M Fork Crazy Woman Creek	I-25	279.56	ALD	87	25	20	18	40	18	0	15	190	33	3	1	L
M Fork Crazy Woman Creek	I-25	279.56	ALC	87	25	20	18	40	18	0	15	190	33	3	1	L
Clear Creek	I-25	299.17	ALV	87	10	20	0	40	18	0	0	157	18	1	1	L
Bear River	I-80	5.91	AMM	87	10	20	27	8	18	60	27	152	105	1	4	L
Bear River	I-80	5.91	AML	87	10	20	27	8	18	60	27	152	105	1	4	L
Blacks Fork River	I-80	44.85	ANV	87	30	20	27	8	18	80	6	172	104	1	4	L
Blacks Fork River	I-80	44.85	ANU	87	30	20	30	8	18	80	6	175	104	1	4	L
Green River	I-80	86.38	AOZ	87	30	20	3	24	6	90	21	164	117	1	4	L
Rock Creek	I-80	258.95	AVD	87	5	20	18	16	6	90	3	146	99	1	3	L
Rock Creek	I-80	258.95	AVC	87	5	20	18	16	6	90	3	146	99	1	3	L
Laramie River	I-80	312.44	AXK	87	20	20	18	24	12	20	15	169	47	1	1	L
Laramie River	I-80	312.44	AXJ	87	20	20	18	24	12	20	15	169	47	1	1	L
Goose Creek	I-90	20.59	BBK	87	25	20	3	32	30	20	12	167	62	1	1	L
Goose Creek	I-90	20.59	BBJ	87	25	20	18	32	30	20	12	182	62	2	1	L
Clear Creek	I-90	58.38	BDI	87	10	20	18	40	18	10	9	175	37	1	1	L
Clear Creek	I-90	58.38	BDH	87	10	20	18	40	18	10	9	175	37	1	1	L
Sand Creek	I-90	205.35	DHQ	87	45	20	30	16	18	30	9	198	57	4	1	L
Sand Creek	I-90	205.35	DHP	87	45	20	30	16	18	30	9	198	57	4	1	L
Big Sandy River	US-191	40.8	BRL	100	5	20	18	24	6	60	0	167	66	1	2	L
North Platte River	WY-220	94.33	LIK	100	5	20	18	32	12	80	24	175	116	1	4	L
North Platte River	WY-220	116.41	BUN	100	5	50	18	32	12	20	24	205	56	4	1	L
North Platte River	WY-59	0.71	FDB	100	5	20	30	32	12	0	27	187	39	2	1	L

Table 12 shows the results of prioritizing all the high risk rated bridges. WYDOT prioritized these bridges by their risk ratings, bridge conditions and critical freight corridor rank. While resiliency analysis is performed and action plans created for all the bridges listed in Table 12, those with the "H" priority rating are proposed for more thorough mitigation, action development and resiliency planning than are lower rated bridges.

Table 12: 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
N. Platte River	I-25	125.5	CZT	15	30	2	4	5	4	4.3	1	H
Blacks Fork River	I-80	77.5	AOS	12	27	1	1	4	5	3.3	2	H
Blacks Fork River	I-80	77.5	AOR	12	27	1	1	4	5	3.3	2	H
S.F. Powder River	I-25	246.3	AJW	12	27	2	1	4	4	3.0	4	M
Powder River	I-90	89.0	BEU	15	18	3	4	2	3	3.0	4	M
Powder River	I-90	89.0	BET	15	18	3	4	2	3	3.0	4	M
Wind River	US26/WY789	123.4	LCU	16	3	6	5	1	1	2.3	7	L
Crazy Woman Creek	I-90	73.2	BEC	12	18	3	1	2	3	2.0	8	L
Crazy Woman Creek	I-90	73.2	BEB	12	18	3	1	2	3	2.0	8	L

Bridge Flood Action Plans

Action plans were created for each high risk bridge on the critical freight network (see Appendix A for the full action plans). Table 13 shows the potential actions to mitigate each bridge flood risk and the priority for each action.

Table 13: Action Plan Summary for "High" Flood Risk Rated Bridges

Bridge ID	Stream Name	Facility Carried	RM	Priority Rating	Potential Actions	Action Priority	Comments
CZT	N. Platte River	I-25	125.5	H	Replace with a higher capacity bridge. Upgrade approaches accordingly.	3	Too expensive. Wait until bridge condition warrants replacement.
					See if additional scour-related improvements can be added.	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 bridge is closed.	1	Appears to be the most cost-effective solution. Disruption to freight not extreme. Should plan alternative routing.
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.
					See if additional scour-related improvements can be added.	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.
AJW	S.F. Powder River	I-25	246.3	M	Replace with a higher capacity bridge(s). Upgrade approaches accordingly.	3	Too expensive. Wait until bridge condition warrants replacement.
					See if additional scour-related improvements can be added.	2	Scour Critical = 8. No significant issue with scour protection.
					Repair the bridge(s) following each incident. Establish and enact reroute procedures in the event the bridge(s) is closed.	1	Appears to be the most cost-effective solution. Disruption to freight not extreme. Should plan alternative routing.
BET, BEU	Powder River	I-90	89	M	Replace with higher capacity bridges. Upgrade approaches accordingly.	3	Too expensive. Wait until bridge conditions warrants replacement.
					See if additional scour-related improvements can be added.	2	Scour Critical = 8. No significant issue with scour protection.
					Repair the bridge(s) following each incident. Establish and enact reroute procedures in the event the bridge(s) is closed.	1	Appears to be the most cost-effective solution. Disruption to freight not extreme. Should plan alternative routing.
LCU	Wind River	US26/ WY789	123.4	L	Replace with a higher capacity bridge. Upgrade approaches accordingly.	3	Too expensive. Wait until bridge condition warrants replacement.
					See if additional scour-related improvements can be added.	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 bridge is closed.	1	Appears to be the most cost-effective solution. Disruption to freight not extreme. Should plan alternative routing.
BEB, BEC	Crazy Woman Creek	I-90	73.2	L	Replace with higher capacity bridges. Upgrade approaches accordingly.	3	Too expensive. Wait until bridge condition warrants replacement.
					See if additional scour-related improvements can be added.	2	Scour Critical = 8. No significant issue with scour protection.
					Repair the bridge(s) following each incident. Establish and enact reroute procedures in the event the bridges are closed.	1	Appears to be the most cost-effective solution. Disruption to freight not extreme. 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 truck 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 14 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 14: Risk Results for Bridge Strikes

Bridges	LRS_ID	RM	Bridge Strikes	AADTT	**Probability**	**Consequence**	**Risk**
ATO, ATN	I-80	210.99	3	3412	4	5	**H**
KJC, KJB	I-80	219.84	2	3556	4	5	**H**
AYR, AYS	I-80	357.68	2	3557	4	5	**H**
ASP, ASQ	I-80	187.19	4	2830	5	4	**H**
ANH	I-80	23.8	2	2938	4	4	**H**
AOQ	I-80	77.31	3	3293	4	4	**H**
AOX, AOY	I-80	85.35	3	3293	4	4	**H**
AQZ	I-80	130.84	3	2830	4	4	**H**
ARN	I-80	146.85	2	2830	4	4	**H**
ASV	I-80	196.16	2	2844	4	4	**H**
AUR	I-80	235.21	2	2984	4	4	**H**
AVG	I-80	260.24	2	2984	4	4	**H**
LBN	I-80	313.19	2	2984	4	4	**H**
AGI, AGH	I-25	146	15	1016	5	3	**H**
AGX, AGY	I-25	160.87	4	1016	5	3	**H**
FDH, FDG	I-25	188.60	5	1045	5	3	**H**
AAS, AAR	I-25	8.84	3	2314	4	3	**H**
ABC	I-25	10.59	3	1391	4	3	**H**
ADD	I-25	57.65	2	1044	4	3	**H**
AFY	I-25	137.56	2	1016	4	3	**H**
AGC	I-25	139.76	2	1016	4	3	**H**
AGW, AGV	I-25	156.18	2	1016	4	3	**H**
AHO, AHP	I-25	175.59	2	1016	4	3	**H**
AIH	I-25	188.19	3	1016	4	3	**H**
AZW	I-80	383.3	3	2431	4	3	**H**

ATI	I-80	206.18	1	3412	1	5	**M**
ATM	I-80	209.46	1	3412	1	5	**M**
ATS	I-80	212.73	1	3412	1	5	**M**
ATW	I-80	215	1	3556	1	5	**M**
KHZ	I-80	219.59	1	3556	1	5	**M**
AXU	I-80	326.6	1	3557	1	5	**M**
AXW	I-80	328.5	1	3557	1	5	**M**
AYE	I-80	340.64	1	3557	1	5	**M**
AYG	I-80	342.56	1	3557	1	5	**M**
AYO	I-80	352.8	1	3557	1	5	**M**
AZG	I-80	361.79	1	3557	1	5	**M**
AZI	I-80	362.04	1	3557	1	5	**M**
DBO	I-80	364.9	1	3557	1	5	**M**
DBR	I-80	367.42	1	3557	1	5	**M**
CZJ	I-25	117.68	4	811	5	2	**M**
CZV, CZU	I-25	126.06	5	811	5	2	**M**
BMA	I-25	186.45	9	557	5	2	**M**
DAI	I-90	128.09	5	484	5	2	**M**
ADZ, ADY	I-25	84	2	854	4	2	**M**
AER, AEQ	I-25	96.43	2	811	4	2	**M**
AEX	I-25	100.56	3	811	4	2	**M**
AFO, AFP	I-25	131.59	3	811	4	2	**M**
DEN	US-20/26	2.09	2	640	4	2	**M**
FDB	WY-59	0.72	3	578	4	2	**M**
CYL	WY-59	112.16	2	722	4	2	**M**
BBM	I-90	20.92	2	582	4	2	**M**
BCE, BCD	I-90	33.59	2	592	4	2	**M**
BDD	I-90	56.36	3	592	4	2	**M**
CDL, CDK	I-90	132.39	2	484	4	2	**M**
DOI	I-25	210.41	4	328	5	1	**M**
DBD	I-90	139.3	7	50	5	1	**M**
AMF	I-80	3.45	1	3250	1	4	**L**
AMT	I-80	12.6	1	2938	1	4	**L**
AMS	I-80	13	1	2938	1	4	**L**
AMU	I-80	13.95	1	2938	1	4	**L**
AMX	I-80	15.8	1	2938	1	4	**L**
ANK	I-80	30.3	1	2938	1	4	**L**
AOJ	I-80	61	1	3293	1	4	**L**
LEV	I-80	91.53	1	3293	1	4	**L**
ARC	I-80	135.1	1	2830	1	4	**L**
ARQ	I-80	150.81	1	2830	1	4	**L**
ARY	I-80	165.58	1	2830	1	4	**L**
ASE	I-80	172	1	2830	1	4	**L**

ASO	I-80	184.29	1	2830	1	4	L
AUP	I-80	234.56	1	2984	1	4	L
AVK	I-80	267.18	1	2984	1	4	L
AVP	I-80	271.6	1	2984	1	4	L
AXB	I-80	309.04	1	2984	1	4	L
LBL, LBM	I-80	312.97	1	2984	1	4	L
BUO	ML21	116.73	1	1045	1	3	L
AAA	I-25	0.34	1	2314	1	3	L
AAH	I-25	2.66	1	2314	1	3	L
AAI	I-25	3.26	1	2314	1	3	L
AAV	I-25	9.14	1	1391	1	3	L
DCV	I-25	45.21	1	1123	1	3	L
DCX	I-25	50.648	1	1123	1	3	L
AFU	I-25	137.41	1	1016	1	3	L
AFZ	I-25	138.65	1	1016	1	3	L
AGM	I-25	150	1	1016	1	3	L
AHJ	I-25	170.68	1	1016	1	3	L
AHX	I-25	185.75	1	1016	1	3	L
EWO	I-25	189.51	1	1016	1	3	L
ANP	I-80	37.01	1	2448	1	3	L
ANS	I-80	42	1	2448	1	3	L
AZR	I-80	377.3	1	2494	1	3	L
BAE	I-80	391.39	1	2431	1	3	L
BAJ	I-80	401.13	1	2431	1	3	L
BAM	I-80	401.46	1	2431	1	3	L
BRH	I-25	79.28	1	854	1	2	L
AEB	I-25	87.03	1	811	1	2	L
AFH	I-25	109.49	1	811	1	2	L
FDC	WY-59	1.16	1	578	1	2	L
DZY	I-90	9.8	1	522	1	2	L
DZZ	I-90	11.12	1	582	1	2	L
EAF	I-90	14.6	1	582	1	2	L
KKY	I-90	23.14	1	592	1	2	L
BCY	I-90	51.36	1	592	1	2	L
DAT	I-90	135.41	1	575	1	2	L
BGG	I-90	146.71	1	575	1	2	L
BGH	I-90	147.59	1	575	1	2	L
DHN	I-90	205.29	1	436	1	2	L
AJU, AJT	I-25	244.96	2	216	4	1	L
APR	I-80	101.16	3	50	4	1	L
BDN	I-90	63.51	2	291	4	1	L
ACN	I-25	39.2	1	20	1	1	L
AIT	I-25	191.64	1	328	1	1	L

DFL	I-25	227.99	1	328	1	1	**L**
AKF	I-25	249.69	1	216	1	1	**L**
AKO	I-25	261.43	1	198	1	1	**L**
ALX	I-25	299.32	1	188	1	1	**L**
BDJ	I-90	58.65	1	291	1	1	**L**
BDR	I-90	65.98	1	291	1	1	**L**
BDY	I-90	69.64	1	291	1	1	**L**
BDZ	I-90	72.99	1	291	1	1	**L**
BEX	I-90	91.49	1	291	1	1	**L**
BFD	I-90	102.52	1	291	1	1	**L**
BFF	I-90	106.14	1	291	1	1	**L**
BJH	I-90	187.53	1	316	1	1	**L**

WYDOT prioritized the high risk bridge strike locations based on their risk, bridge condition, and their location on the critical freight network within the State. Table 15 shows those results.

Table 15: Prioritized List of "High" Risk Bridge Strikes

Bridges	LRS ID	RM	Bridge Strikes	AADTT	Probability	Consequence	Risk Score	Condition Score	Criticality Score	Risk Grade	Condition Grade	Criticality Grade	Composite Grade	**Priority Score**	**Priority Rating**
ANH	I-80	23.8	2	2938	4	4	16	5	1	4	5	5	4.67	**1**	**H**
AQZ	I-80	130.84	3	2830	4	4	16	5	1	4	5	5	4.67	**1**	**H**
ASV	I-80	196.16	2	2844	4	4	16	4	1	4	5	5	4.67	**1**	**H**
AVG	I-80	260.24	2	2984	4	4	16	5	1	4	5	5	4.67	**1**	**H**
ATO, ATN	I-80	210.99	3	3412	4	5	20	6	1	5	3	5	4.33	**5**	**H**
AYR, AYS	I-80	357.68	2	3557	4	5	20	6	1	5	3	5	4.33	**5**	**H**
AOQ	I-80	77.31	3	3293	4	4	16	6	1	4	3	5	4.00	**7**	**H**
ARN	I-80	146.85	2	2830	4	4	16	6	1	4	3	5	4.00	**7**	**H**
LBN	I-80	313.19	2	2984	4	4	16	6	1	4	3	5	4.00	**7**	**H**
ASP, ASQ	I-80	187.19	4	2830	5	4	20	7	1	5	1	5	3.67	**10**	**M**
KJC, KJB	I-80	219.84	2	3556	4	5	20	7	1	5	1	5	3.67	**10**	**M**
AOX, AOY	I-80	85.35	3	3293	4	4	16	7	1	4	1	5	3.33	**12**	**M**
AUR	I-80	235.21	2	2984	4	4	16	7	1	4	1	5	3.33	**12**	**M**
AGX, AGY	I-25	160.87	4	1016	5	3	15	5	2	3	5	2	3.33	**12**	**M**
FDH, FDG	I-25	188.6	5	1045	5	3	15	5	5	3	5	1	3.00	**15**	**M**
AZW	I-80	383.3	3	2431	4	3	12	6	1	1	3	5	3.00	**15**	**M**
ABC	I-25	10.59	3	1391	4	3	12	5	2	1	5	2	2.67	**17**	**M**
AGC	I-25	139.76	2	1016	4	3	12	5	2	1	5	2	2.67	**17**	**M**
AGI, AGH	I-25	146	15	1016	5	3	15	6	2	3	3	2	2.67	**17**	**M**
AIH	I-25	188.19	3	1016	4	3	12	4	2	1	5	2	2.67	**17**	**M**
AAS, AAR	I-25	8.84	3	2314	4	3	12	7	1	1	1	5	2.33	**21**	**L**

AFY	I-25	137.56	2	1016	4	3	12	6	2	1	3	2	2.00	**22**	**L**
ADD	I-25	57.65	2	1044	4	3	12	6	2	1	3	2	2.00	**22**	**L**
AGW, AGV	I-25	156.18	2	1016	4	3	12	6	2	1	3	2	2.00	**22**	**L**
AHO, AHP	I-25	175.59	2	1016	4	3	12	6	2	1	3	2	2.00	**22**	**L**

Bridge Strike Action Plans

Action plans were created for each high risk bridge on the critical freight network (see Appendix B for the full action plans). Table 16 shows the potential actions to mitigate each bridge strike risk and the priority for each action.

Table 16: Action Plan Summary for "High" Bridge Strike Rated Bridges

Bridge ID	Facility Carried	RM	Crossing Feature	Priority Rating	Potential Actions	Action Priority	Comments
ANH	I-80	23.8	Leroy Rd	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 (Point of Rocks)	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.
ASV	I-80	196.16	Riner Rd	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.
AVG	I-80	260.24	County Rd 3	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.
ATO, ATN	I-80	210.99	Two Mile 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.
AYR, AYS	I-80	357.68	WY-222	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	High truck volumes pass under bridges to access Wal Mart Distribution Center. 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. High truck volumes pass under bridges to access Wal Mart Distribution Center. Would require rerouting these trucks during construction.
AOQ	I-80	77.31	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.
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.
LBN	I-80	313.19	US-287	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.
ASP, ASQ	I-80	187.19	WY-789	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	2	Moderate volume road crossing under the bridge. Parallel bridge available if this bridge

					event the bridge is closed.		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.
KJB, KJC	I-80	219.84	WY-76 and UPRR	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 and discuss with UPRR to discuss mitigation efforts.	1	Warning signage may be ineffective. Best to keep UPRR informed.
					Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed. Discuss with UPRR to discuss mitigation efforts.	2	Parallel bridge available if this bridge is damaged, though higher likelihood that both bridges would be damaged if struck by a train rather than a truck.
AOX, AOY	I-80	85.35	County Road 59	M	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.
					Lower the grade under the bridge.	3	Fairly costly with a few potential additional issues created if implemented including possible drainage issues.
AUR	I-80	235.21	US-30/WY-130	M	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.
					Lower the grade under the bridge.	3	Fairly costly with a few potential additional issues created if implemented including drainage and ramp grade changes.
AGX, AGY	I-25	160.87	US-87	M	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.
					Lower the grade under the bridge.	3	Fairly costly with a few potential additional issues created if implemented including drainage and ramp grade changes.
FDH, FDG	I-25	188.6	WY-220	M	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.
					Lower the grade under the bridge.	3	Fairly costly with a few potential additional issues created if implemented including drainage and ramp grade changes.
AZW	I-80	383.3	County Rd 146-1	M	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.
					Lower the grade under the bridge.	3	Fairly costly with a few potential additional issues created if implemented including possible drainage issues.
ABC	I-25	10.59	Missile Dr	M	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.
					Lower the grade under the bridge.	3	Fairly costly with a few potential additional issues created if implemented including drainage and ramp grade changes.
AGC	I-25	139.76	WY-94	M	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.
					Lower the grade under the bridge.	3	Fairly costly with a few potential additional issues created if implemented including drainage and ramp grade changes.
AGH, AGI	I-25	146	WY-96	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.
AIH	I-25	188.19	WY-255	M	Replace with a higher clearance bridge. Upgrade approaches accordingly.	1	Fairly high volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
					Replace with a higher clearance bridge. Upgrade approaches accordingly.	2	Fairly high volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
					Replace with a higher clearance bridge. Upgrade approaches accordingly.	3	Fairly costly with a few potential additional issues created if implemented including drainage and ramp grade changes.
AAS, AAR	I-25	8.84	I-80	L	Increase warning signage.	1	Very 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	Very high volume road crossing under the bridge. Parallel bridge available if this bridge is damaged.
AFY	I-25	137.56	County Road 1	L	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.
ADD	I-25	57.65	WY-321	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.
AGW, AGV	I-25	156.18	Bixby Rd	L	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.
AHO, AHP	I-25	175.59		L	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.

Winter Weather Closure and Delay Resiliency

Winter Weather Closure and Delay Risks

Winter weather road closure 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 17. The higher priority road segments will have more thorough resiliency planning applied.

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

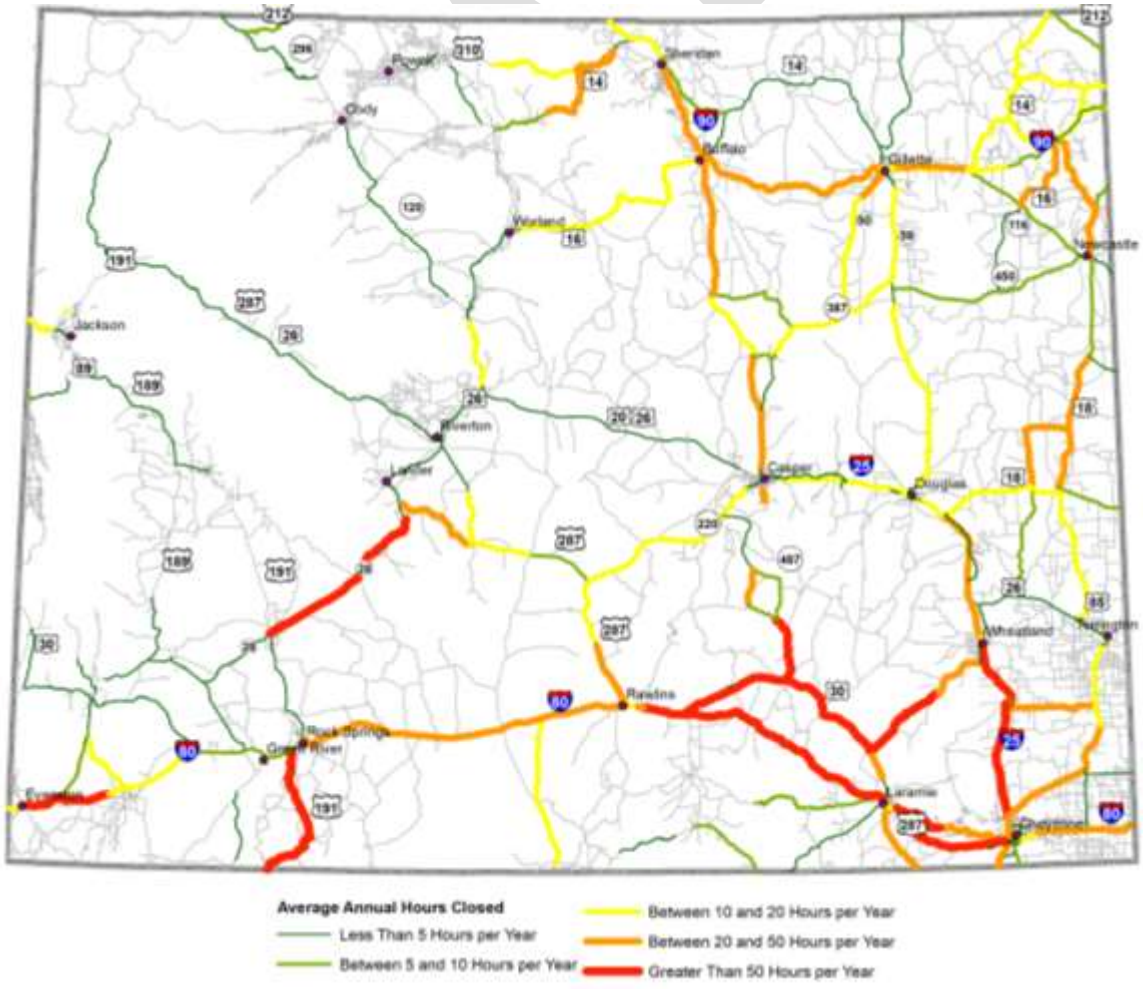


Figure 5: Annual Hours of Weather-Related Delay per Mile on Critical Freight Corridors

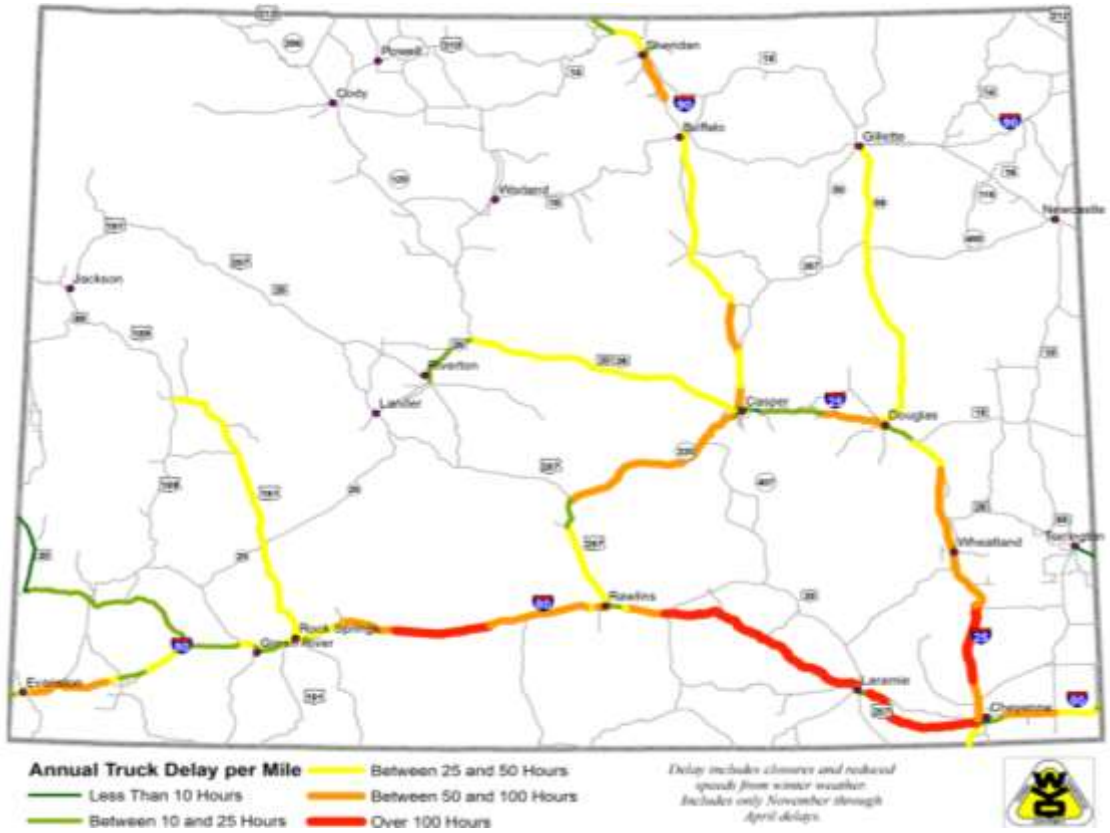


Figure 6: Annual Cost of Weather-Related Delay per Mile on Critical Freight Corridors

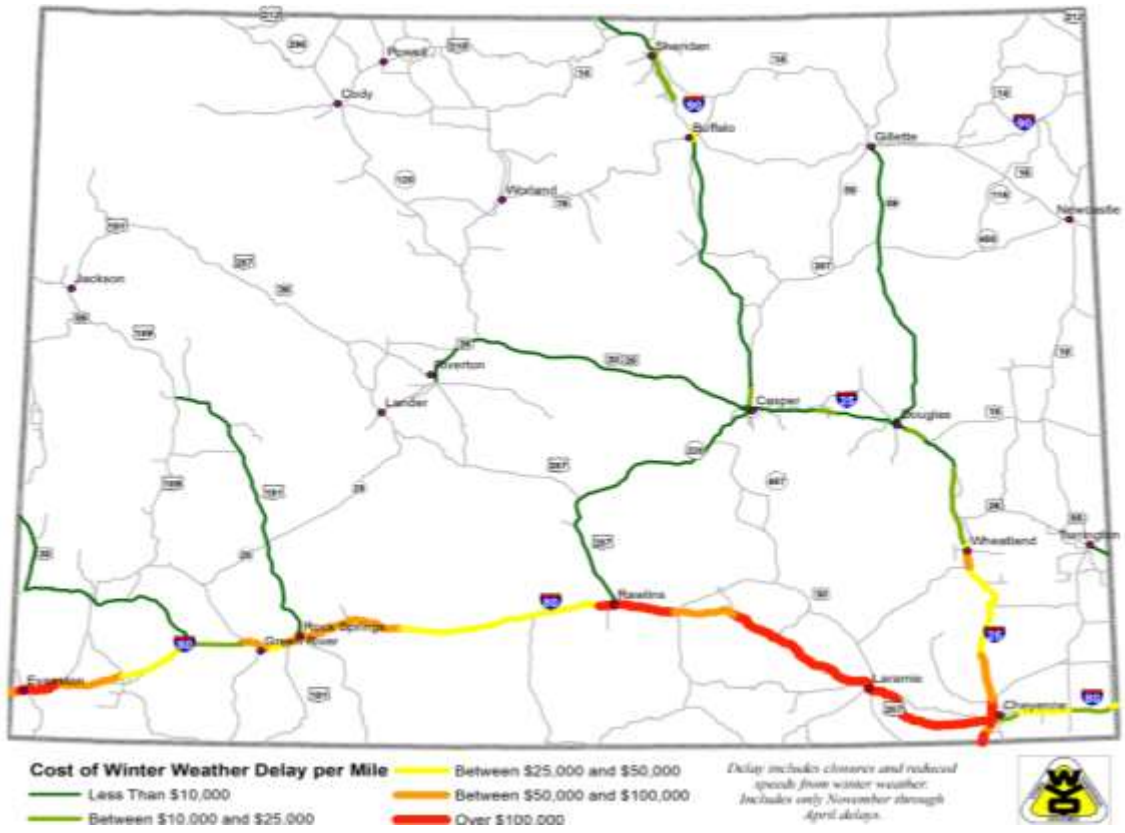


Table 17: Winter Weather Risk Evaluation for Critical Freight Corridors

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**
I-25	ML25B	7.85	8.845	40	$590,290	3	5	**H**
I-80	ML80B	322.741	334.86	254	$461,100	5	5	**H**
I-80	ML80B	316.48	322.741	127	$454,418	5	5	**H**
I-25	ML25B	10.586	12.697	89	$383,949	4	5	**H**
I-80	ML80B	211.28	215.304	52	$240,431	3	5	**H**
I-80	ML80B	255.269	272.13	245	$238,702	5	5	**H**
I-80	ML80B	334.86	359.195	258	$228,178	5	5	**H**
I-80	ML80B	272.13	310.12	375	$162,394	5	4	**H**
I-25	ML25B	0	2.662	39	$160,202	3	4	**H**
I-80	ML80B	221.493	234.786	98	$134,415	4	4	**H**
I-25	ML25B	8.845	10.586	44	$127,789	3	4	**H**
I-80	ML80B	6.033	18.098	78	$110,578	4	4	**H**
I-25	ML25B	12.697	17.042	57	$104,584	4	4	**H**
I-25	ML25B	2.662	7.85	40	$99,251	3	4	**H**
I-80	ML80B	234.786	255.269	125	$97,617	5	4	**H**
I-25	ML25B	25.442	34.45	137	$96,126	5	4	**H**
I-80	ML80B	104.774	110.913	32	$85,362	3	4	**H**
I-80	ML80B	122.049	142.006	90	$67,363	4	3	**H**
I-25	ML25B	17.042	25.442	82	$62,605	4	3	**H**
I-80	ML80B	18.098	34.428	75	$62,497	4	3	**H**
I-25	ML25B	73	78.93	75	$55,741	4	3	**H**
I-80	ML80B	142.006	174.066	114	$45,905	5	3	**H**
I-25	ML25B	65.26	73	87	$41,335	4	3	**H**
I-25	ML25B	34.45	54.591	130	$39,918	5	3	**H**
I-80	ML80B	174.066	209.19	94	$39,220	4	3	**H**
I-25	ML25B	54.591	65.26	72	$37,900	4	3	**H**
I-80	ML80B	219.12	221.493	32	$249,170	2	5	**M**
I-80	ML80B	209.19	211.28	25	$225,196	2	5	**M**
I-80	ML80B	3.235	6.033	31	$185,033	2	4	**M**
I-80	ML80B	215.304	219.12	22	$115,589	2	4	**M**
I-80	ML80B	34.428	39.612	28	$69,813	2	4	**M**
I-80	ML80B	98.787	104.774	31	$69,207	2	3	**M**
I-80	ML80B	82.608	89.13	25	$65,068	2	3	**M**
I-80	ML80B	110.913	122.049	42	$65,054	3	3	**M**
I-80	ML80B	370.083	386.067	52	$44,419	3	3	**M**
I-25	ML25B	299.331	300.261	32	$32,900	2	3	**M**

I-80	ML80B	47.962	65.537	38	$29,187	3	2	**M**
I-25	ML25B	298.018	299.331	33	$25,899	3	2	**M**
I-25	ML25B	189.52	197.51	52	$22,715	4	2	**M**
I-90	ML90B	24.961	33.334	52	$19,800	4	2	**M**
I-90	ML90B	33.334	41.96	55	$18,930	4	2	**M**
I-25	ML25B	80.856	92.38	52	$17,021	3	2	**M**
I-25	ML25B	92.38	111.69	76	$15,607	4	2	**M**
I-25	ML25B	140.1	160.88	54	$8,776	4	2	**M**
I-80	ML80B	310.12	311.367	13	$169,175	1	4	**L**
I-80	ML80B	311.367	313.32	14	$161,123	1	4	**L**
I-80	ML80B	313.32	316.48	20	$137,069	1	4	**L**
I-80	ML80B	0	3.235	16	$84,382	1	4	**L**
I-80	ML80B	89.13	91.475	13	$79,256	1	4	**L**
I-80	ML80B	359.195	361.64	6	$43,048	1	3	**L**
I-80	ML80B	91.475	98.787	12	$37,354	1	3	**L**
I-25	ML25B	78.93	80.856	18	$31,906	1	3	**L**
I-80	ML80B	401.2	402.78	12	$31,415	1	3	**L**
I-80	ML80B	39.612	47.962	21	$29,821	1	2	**L**
I-80	ML80B	386.067	401.2	29	$22,623	2	2	**L**
I-80	ML80B	363.617	370.083	19	$21,932	1	2	**L**
I-80	ML80B	361.64	363.617	6	$21,803	1	2	**L**
I-90	ML90B	22.902	24.961	13	$18,977	1	2	**L**
I-80	ML80B	65.537	82.608	19	$15,923	1	2	**L**
I-90	ML90B	20.634	22.902	14	$15,318	1	2	**L**
I-25	ML25B	160.88	165.88	15	$12,309	1	2	**L**
I-25	ML25B	126.48	135.47	22	$11,352	2	2	**L**
I-25	ML25B	135.47	140.1	11	$8,653	1	2	**L**
I-25	ML25B	111.69	126.48	28	$8,605	2	1	**L**
I-90	ML90B	9.485	20.634	40	$8,562	3	1	**L**
I-25	ML25B	185.35	189.52	22	$7,258	1	1	**L**
WY-220	ML21B	113.38	117	11	$6,912	1	1	**L**
I-90	ML90B	0	9.485	24	$6,755	2	1	**L**
I-25	ML25B	291.1	298.018	33	$5,302	3	1	**L**
I-25	ML25B	165.88	182.53	16	$4,654	1	1	**L**
I-25	ML25B	197.51	210.42	25	$4,161	2	1	**L**
I-25	ML25B	210.42	228	54	$3,994	4	1	**L**
WY-59	ML43B	61	112	46	$3,534	3	1	**L**
I-25	ML25B	182.53	185.35	5	$3,257	1	1	**L**
WY-220	ML21B	20	33.21	35	$3,047	3	1	**L**
US-30	ML12B	31	52.6	11	$2,652	1	1	**L**
US-191	ML13B	0	110	35	$2,170	3	1	**L**
I-25	ML25B	228	254.25	30	$1,588	2	1	**L**
US-20/US-26	ML34B	0	10	26	$1,565	2	1	**L**

WY-220	ML21B	44	113.38	58	$1,560	4	1	**L**
I-25	ML25B	254.25	291.1	38	$1,488	3	1	**L**
WY-220	ML21B	33.21	44	13	$1,484	1	1	**L**
WY-59	ML43B	0	61	34	$1,300	3	1	**L**
US-26/WY-789	ML20B	104	127	11	$1,233	1	1	**L**
US-30	ML12B	52.6	100	23	$1,140	2	1	**L**
Casper Bypass	ML47B	0	2.9	6	$1,054	1	1	**L**
WY-220	ML21B	0	20	25	$1,049	2	1	**L**
US-30	ML12B	0	31	8	$991	1	1	**L**
US-20/US-26	ML34B	10	100	29	$773	2	1	**L**
US-26	ML28B	48	56	3	$653	1	1	**L**

WYDOT prioritized the high risk winter weather locations from Table 17 based on their risk, condition measure ("Total Annual Weather-Related Delay Hours per Mile"), and their location on the critical freight network within the State. Table 18 shows those results.

Table 18: Prioritization of High Risk Winter Weather Critical Freight 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**
I-80	ML80B	322.741	334.86	25	294	1	4	5	5	4.7	1	H
I-80	ML80B	255.269	272.13	25	273	1	4	5	5	4.7	1	H
I-80	ML80B	272.13	310.12	20	390	1	4	5	5	4.7	1	H
I-80	ML80B	334.86	359.195	25	268	1	4	4	5	4.3	4	H
I-80	ML80B	316.48	322.741	25	167	1	4	4	5	4.3	4	H
I-80	ML80B	234.786	255.269	20	149	1	4	4	5	4.3	4	H
I-80	ML80B	6.033	18.098	20	112	1	4	3	5	4.0	7	H
I-80	ML80B	221.493	234.786	16	111	1	3	3	5	3.7	8	M
I-80	ML80B	18.098	34.428	16	88	1	3	2	5	3.3	9	M
I-80	ML80B	122.049	142.006	12	97	1	1	3	5	3.0	10	M
I-80	ML80B	142.006	174.066	12	96	1	1	3	5	3.0	10	M
I-25	ML25B	10.586	12.697	16	102	2	3	3	2	2.7	12	M
I-25	ML25B	25.442	34.45	15	151	2	2	4	2	2.7	12	M
I-25	ML25B	34.45	54.591	15	142	2	2	4	2	2.7	12	M
I-80	ML80B	3.235	6.033	15	57	1	2	1	5	2.7	12	M
I-80	ML80B	174.066	209.19	12	93	1	1	2	5	2.7	12	M
I-80	ML80B	211.28	215.304	12	67	1	1	1	5	2.3	17	L
I-25	ML25B	7.85	8.845	15	70	2	2	2	2	2.0	18	L
I-25	ML25B	17.042	25.442	12	89	2	1	2	2	1.7	19	L
WY-220	ML21B	113.38	117	12	87	5	1	2	1	1.3	20	L
I-25	ML25B	2.662	7.85	12	60	2	1	1	2	1.3	20	L

Winter Weather Action Plans

Action plans were created for each high risk, winter weather impacted road segment on the critical freight network (see Appendix C for the full action plans). Table 19 shows the potential actions to mitigate each high risk, winter weather location and the priority for each action.

Table 19: Action Plan Summary for "High" Risk Winter Weather Roads

Facility Name	From RM	To RM	Priority Rating	Potential Actions	Action Priority	Comments
I-80	322	334	H	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
				Build snow fences	5	Snow fence coverage on this road is near maximum.
				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 truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. 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 trucks. Some negative side-effects may occur on alternative routes.
I-80	255	272	H	Assess and modify current snow removal and roadway management procedures as needed.	1	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 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 truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. 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 trucks. Some negative side-effects may occur on alternative routes.
I-80	272	310	H	Assess and modify current snow removal and roadway management procedures as needed.	1	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 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 truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. 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 trucks. Some negative side-effects may occur on alternative routes. May not be available under certain conditions.
I-80	334	359	H	Assess and modify current snow removal and roadway management procedures as needed.	1	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 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 truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. 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 trucks. Some negative side-effects may occur on alternative routes.
I-80	316	322	H	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
				Build snow fences	6	Canyon area limits snow fence areas.
				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.
				Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	4	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
				Establish alternative routing procedures to implement during extreme weather events.	3	Currently being applied by default. Districts typically know conditions and issues associated with rerouting trucks. Some negative side-effects may occur on alternative routes. May not be available under certain conditions.
I-80	234	255	H	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 truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. 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 trucks. Some negative side-effects may occur on alternative routes. May not be available under certain conditions.
I-80	6	18	H	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 truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. 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 trucks. Some negative side-effects may occur on alternative routes. May not be available under certain conditions.
I-80	221	234	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.

				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 truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. 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 trucks. Some negative side-effects may occur on alternative routes. May not be available under certain conditions.
I-80	18	34	M	Assess and modify current snow removal and roadway management procedures as needed.	1	Need to investigate potential snow fence areas.
				Build snow fences	5	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	
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. 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 trucks. Some negative side-effects may occur on alternative routes. May not be available under certain conditions.
I-80	122	142	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	Snow fence coverage on this road is already extensive.
				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 truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. 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 trucks. Some negative side-effects may occur on alternative routes. May not be available under certain conditions.
I-80	142	174	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	Snow fence coverage on this road is already extensive.
				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 truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. 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 trucks. Some negative side-effects may occur on alternative routes. May not be available under certain conditions.
I-25	10	12	M	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
				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.
				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 truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. 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 trucks. Some negative side-effects may occur on alternative routes. May not be available under certain conditions.
I-25	25	34	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.
				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 truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. 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 trucks. Some negative side-effects may occur on alternative routes. May not be available under certain conditions.
I-25	34	54	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.
				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 truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. 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 trucks. Some negative side-effects may occur on alternative routes. May not be available under certain conditions.
I-80	3	6	M	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
				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.
				Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	4	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
				Establish alternative routing procedures to implement during extreme weather events.	3	Currently being applied by default. Districts typically know conditions and issues associated with rerouting trucks. Some negative side-effects may occur on alternative routes. May not be available under certain conditions.
I-80	174	209	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.
				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 truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. 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 trucks. Some negative side-effects may occur on alternative routes. May not be available under certain conditions.
I-80	211	215	L	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
				Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	4	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve truck movement.

				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
				Establish alternative routing procedures to implement during extreme weather events.	3	Currently being applied by default. Districts typically know conditions and issues associated with rerouting trucks. Some negative side-effects may occur on alternative routes. May not be available under certain conditions.
I-25	7	8	L	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
				Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	4	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
				Establish alternative routing procedures to implement during extreme weather events.	3	Currently being applied by default. Districts typically know conditions and issues associated with rerouting trucks. Some negative side-effects may occur on alternative routes. May not be available under certain conditions.
I-25	17	25	L	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
				Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	4	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
				Establish alternative routing procedures to implement during extreme weather events.	3	Currently being applied by default. Districts typically know conditions and issues associated with rerouting trucks. Some negative side-effects may occur on alternative routes. May not be available under certain conditions.
WY220	113	117	L	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
				Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	4	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
				Establish alternative routing procedures to implement during extreme weather events.	3	Currently being applied by default. Districts typically know conditions and issues associated with rerouting trucks. Some negative side-effects may occur on alternative routes. May not be available under certain conditions.
I-25	2	7	L	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done.
				Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	4	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve truck movement.
				Implement Connected Vehicle roadway condition communication technology.	2	Much of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
				Establish alternative routing procedures to implement during extreme weather events.	3	Currently being applied by default. Districts typically know conditions and issues associated with rerouting trucks. Some negative side-effects may occur on alternative routes. May not be available under certain conditions.

Light High-Profile Vehicle Blowover Resiliency

Light High-Profile Vehicle Blowover Risk

WYDOT assessed the risks of light high-profile vehicle blowover risks on roads that experience high wind events. The analysis did not include all the critical freight routes because only a few are capable of being posted for light high-profile vehicle closures.

Light high-profile vehicle crashes from high winds do not themselves significantly increase delay, but the associated road closures do cause significant delay to freight movement. Therefore, light high-profile vehicle closures were deemed significant enough for risk and resiliency assessment. Table 20 shows the results of that risk assessment.

Table 20: Light High-Profile Vehicle Blowover Risk Results for Critical Freight Corridors

LRS ID	Facility	From RM	To RM	Closure Frequency	AADTT	Total Closure Duration Hours	Total Annual Delay for Trucks (hours)	**Frequency**	**Consequence**	**Risk Rating**
ML25	I-25	0	8.84	25	4629	125	24,109	4	5	**H**
ML25	I-25	8.84	80.85	34	2206	170	15,626	5	4	**H**
ML80	I-80	224.3	316.71	8	5967	24	5,967	2	3	**M**
ML25	I-25	80.85	132	15	1622	15	1,014	3	1	**L**
ML80	I-80	316.71	370.39	3	7114	15	4,446	1	2	**L**
ML80	I-80	205.95	224.3	3	6968	15	4,355	1	1	**L**

Light High-Profile Vehicle Blowover Action Plans

Action plans were created for each significantly impacted road segment showing a high light high-profile vehicle blowover risk on the critical freight network (see Appendix D for the full action plans). Table 21 shows the potential actions to mitigate each high risk location and the priority for each action.

Table 21: Action Plan Summary for Roads with Light High-Profile Vehicle Blowover Risks

Facility LRS ID	From RM	To RM	Facility Name	Priority Rating	Potential Actions	Action Priority	Comments
ML25B	0	9	I-25	H	Establish alternative routing procedures to implement during extreme wind events.	1	Lowest cost. Currently being applied by default, though alternative routes are not being identified. May not be cost-effective for trucks.

					Significantly reduce truck speed limits during wind events using variable speed limit signage.	4	Reduced speeds may not be heeded by truck drivers.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause high wind gust areas.	5	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve truck movement.
					Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	3	Much of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					Implement Connected Vehicle roadway condition communication technology.	2	Currently being applied by default. Districts typically know conditions and issues associated with rerouting trucks. Some negative side-effects may occur on alternative routes.
ML25B	9	81	I-25	H	Establish alternative routing procedures to implement during extreme wind events.	1	Lowest cost. Currently being applied by default, though alternative routes are not being identified. May not be cost-effective for trucks.
					Significantly reduce truck speed limits during wind events using variable speed limit signage.	4	Reduced speeds may not be heeded by truck drivers.
					Assess and modify safety barriers, cuts, slopes and other geometrics that cause high wind gust areas.	5	May be expensive. Technology may not be up to standards yet. Potentially could significantly improve truck movement.
					Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	3	Much of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					Implement Connected Vehicle roadway condition communication technology.	2	Currently being applied by default. Districts typically know conditions and issues associated with rerouting trucks. Some negative side-effects may occur on alternative routes.
ML80B	224	317	I-80	M	Establish alternative routing procedures to implement during extreme wind events.	1	Lowest cost. Currently being applied by default, though alternative routes are not being identified. May not be cost-effective for trucks.
					Significantly reduce truck speed limits during wind events using variable speed limit signage.	4	Reduced speeds may not be heeded by truck drivers.
					Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	3	Much of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					Implement Connected Vehicle roadway condition communication technology.	2	Currently being applied by default. Districts typically know conditions and issues associated with rerouting trucks. Some negative side-effects may occur on alternative routes.
ML25B	81	132	I-25	L	Establish alternative routing procedures to implement during extreme wind events.	1	Lowest cost. Currently being applied by default, though alternative routes are not being identified. May not be cost-effective for trucks.
					Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	3	Much of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					Implement Connected Vehicle roadway condition communication technology.	2	Currently being applied by default. Districts typically know conditions and issues associated with rerouting trucks. Some negative side-effects may occur on alternative routes.
ML80B	317	370	I-80	L	Establish alternative routing procedures to implement during extreme wind events.	1	Lowest cost. Currently being applied by default, though alternative routes are not being identified. May not be cost-effective for trucks.
					Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	3	Much of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					Implement Connected Vehicle roadway condition communication technology.	2	Currently being applied by default. Districts typically know conditions and issues associated with rerouting trucks. Some negative side-effects may occur on alternative routes.

ML80B	206	224	I-80	L	Establish alternative routing procedures to implement during extreme wind events.	1	Lowest cost. Currently being applied by default, though alternative routes are not being identified. May not be cost-effective for trucks.
					Implement vehicle to vehicle and vehicle to infrastructure Connected Vehicle technology.	3	Much of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					Implement Connected Vehicle roadway condition communication technology.	2	Currently being applied by default. Districts typically know conditions and issues associated with rerouting trucks. 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 freight corridors within each county.

In addition to the pollutant levels, WYDOT incorporated the annual truck 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 truck 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 22 shows the results of the environmental risk analysis.

Table 22: 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	Nonattainment Score	Delay Score	Probability Score	Probability	Consequence	Risk
ML80	I-80	280.9	316.71	39290	81052	65%	38%	40%	87%	72%	100%	86%	5	3	H
ML80	I-80	316.71	336.6	39290	74993	65%	38%	40%	87%	72%	98%	85%	5	3	H
ML80	I-80	336.6	370.39	101650	55726	78%	43%	60%	90%	79%	97%	88%	5	5	H
ML80	I-80	3.45	33.39	20610	23255	34%	0%	13%	89%	61%	94%	77%	5	3	H
ML80	I-80	187.25	199.05	43860	22041	63%	54%	32%	96%	78%	90%	84%	5	4	H
ML80	I-80	105.1	187.25	43860	20518	63%	54%	32%	96%	78%	89%	84%	5	4	H
ML80	I-80	48.33	57.04	20610	13995	34%	0%	13%	89%	61%	84%	73%	4	3	H

ML80	I-80	370.39	377.37	101650	12883	78%	43%	60%	90%	79%	79%	79%	5	5	H
ML25	I-25	0	8.84	101650	11380	78%	43%	60%	90%	79%	78%	78%	5	5	H
ML80	I-80	0	3.45	20610	11375	34%	0%	13%	89%	61%	76%	69%	4	3	H
ML80	I-80	57.04	105.1	43860	10153	63%	54%	32%	96%	78%	75%	77%	4	4	H
ML25	I-25	8.84	25.27	101650	9505	78%	43%	60%	90%	79%	73%	76%	4	5	H
ML80	I-80	377.37	402.78	101650	9116	78%	43%	60%	90%	79%	71%	75%	4	5	H
ML80	I-80	33.39	48.33	20610	8978	34%	0%	13%	89%	61%	70%	66%	4	3	H
ML90	I-90	119.2	132.94	49730	6662	75%	54%	32%	90%	76%	67%	72%	4	4	H
ML90	I-90	132.94	147.45	49730	4121	75%	54%	32%	90%	76%	60%	68%	4	4	H
ML21	WY-220	113.38	117	83130	3788	51%	47%	44%	90%	74%	59%	66%	4	4	H
ML90	I-90	23.07	41.96	31090	3601	65%	114%	35%	80%	94%	57%	75%	4	3	H
ML25	I-25	175.1	191.62	83130	2962	51%	47%	44%	90%	74%	49%	62%	3	4	H
ML20	US26/WY789	104	127	40070	2734	27%	66%	4%	89%	68%	46%	57%	3	4	H
ML43	WY-59	61	112	49730	2680	75%	54%	32%	90%	76%	44%	60%	3	4	H
ML90	I-90	9.92	23.07	31090	2476	65%	114%	35%	80%	94%	43%	68%	4	3	H
ML90	I-90	0	9.92	31090	1872	65%	114%	35%	80%	94%	41%	67%	4	3	H
ML34	US-20/US-26	0	10	83130	1787	51%	47%	44%	90%	74%	38%	56%	3	4	H
ML21	WY-220	57	113.38	83130	1671	51%	47%	44%	90%	74%	35%	54%	3	4	H
ML25	I-25	191.62	228.25	83130	1560	51%	47%	44%	90%	74%	33%	54%	3	4	H
ML90	I-90	96	119.2	49730	1528	75%	54%	32%	90%	76%	30%	53%	3	4	H
ML13	US-191	0	51.62	43860	1107	63%	54%	32%	96%	78%	21%	50%	3	4	H
ML80	I-80	224.3	280.9	15870	53703	18%	49%	57%	67%	57%	95%	76%	4	2	M
ML80	I-80	199.05	205.95	15870	22041	18%	49%	57%	67%	57%	90%	74%	4	2	M
ML80	I-80	205.95	214.1	15870	20188	18%	49%	57%	67%	57%	87%	72%	4	2	M
ML80	I-80	214.1	224.3	15870	18963	18%	49%	57%	67%	57%	86%	72%	4	2	M
ML25	I-25	135.49	175.1	14480	3470	81%	28%	24%	87%	71%	54%	62%	3	2	M
ML28	US-26	48	56	13360	3343	73%	32%	25%	84%	69%	52%	61%	3	2	M
ML25	I-25	132	135.49	14480	2986	81%	28%	24%	87%	71%	51%	61%	3	2	M
ML25	I-25	120.82	132	14480	2771	81%	28%	24%	87%	71%	48%	59%	3	2	M
ML21	WY-220	44	57	15870	1671	18%	49%	57%	67%	57%	35%	46%	3	2	M
ML43	WY-59	0	56.51	14480	1252	81%	28%	24%	87%	71%	24%	47%	3	2	M
ML43	WY-59	56.51	61	14480	1252	81%	28%	24%	87%	71%	24%	47%	3	2	M
ML13	US-191	51.62	110	9590	1039	37%	46%	24%	90%	70%	19%	44%	3	2	M
ML12	US-30	89.3	100	43860	684	63%	54%	32%	96%	78%	6%	42%	2	4	M
ML25	I-25	228.25	234.84	83130	595	51%	47%	44%	90%	74%	3%	39%	2	4	M
ML34	US-20/US-26	10	68.43	83130	549	51%	47%	44%	90%	74%	0%	37%	2	4	M
ML34	US-20/US-26	68.43	100	40070	549	27%	66%	4%	89%	68%	0%	34%	2	4	M
ML25	I-25	25.27	47.25	8810	13570	0%	0%	0%	0%	0%	83%	41%	2	2	L
ML25	I-25	47.25	53.96	8810	13289	0%	0%	0%	0%	0%	81%	40%	2	2	L
ML25	I-25	53.96	60.54	8810	7830	0%	0%	0%	0%	0%	68%	34%	2	2	L
ML25	I-25	60.54	84.75	8810	5910	0%	0%	0%	0%	0%	65%	33%	2	2	L
ML25	I-25	84.75	120.82	8810	4461	0%	0%	0%	0%	0%	63%	32%	2	2	L
ML90	I-90	147.45	155.24	7700	4121	0%	0%	0%	0%	0%	60%	30%	2	1	L

ML90	I-90	41.96	56.74	8480	3503	0%	0%	0%	0%	0%	56%	28%	2	1	L
ML90	I-90	155.24	189.6	7700	1788	0%	0%	0%	0%	0%	40%	20%	2	1	L
ML90	I-90	56.74	96	8480	1528	0%	0%	0%	0%	0%	30%	15%	2	1	L
ML90	I-90	189.6	207.14	7700	1455	0%	0%	0%	0%	0%	29%	14%	1	1	L
ML12	US-30	31	52.6	19960	1307	0%	0%	0%	0%	0%	27%	13%	1	3	L
ML21	US-287	20	33.21	15870	1180	18%	49%	57%	67%	57%	22%	40%	2	2	L
ML25	I-25	297.74	300.091	8480	987	0%	0%	0%	0%	0%	17%	9%	1	1	L
ML12	US-30	0	31	19960	834	0%	0%	0%	0%	0%	16%	8%	1	3	L
ML25	I-25	280.27	297.74	8480	813	0%	0%	0%	0%	0%	14%	7%	1	1	L
ML25	I-25	254.66	280.27	8480	792	0%	0%	0%	0%	0%	13%	6%	1	1	L
ML21	US-287	0	20	15870	709	18%	49%	57%	67%	57%	11%	34%	2	2	L
ML21	US-287	33.21	44	15870	688	18%	49%	57%	67%	57%	10%	33%	2	2	L
ML12	US-30	52.6	89.3	19960	684	0%	0%	0%	0%	0%	6%	3%	1	3	L
ML25	I-25	234.84	254.66	8480	613	0%	0%	0%	0%	0%	5%	2%	1	1	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 freight network. Table 23 shows those results.

Table 23: Prioritized Nonattainment Area Creation Roads

LRS ID	Facility	From RM	To RM	Risk Grade	Condition Grade	Criticality Grade	Composite Grade	**Priority Score**	**Priority Rating**
ML80	I-80	336.6	370.39	6	4	5	5.00	**1**	**H**
ML80	I-80	370.39	377.37	6	4	5	5.00	**1**	**H**
ML80	I-80	377.37	402.78	5	4	5	4.67	**3**	**H**
ML25	I-25	0	8.84	6	4	3	4.33	**4**	**H**
ML80	I-80	105.1	187.25	5	3	5	4.33	**4**	**H**
ML80	I-80	187.25	199.05	5	3	5	4.33	**4**	**H**
ML25	I-25	8.84	25.27	5	4	3	4.00	**7**	**H**
ML80	I-80	57.04	105.1	4	3	5	4.00	**7**	**H**
ML80	I-80	280.9	316.71	4	2	5	3.67	**9**	**H**
ML80	I-80	316.71	336.6	4	2	5	3.67	**9**	**H**
ML80	I-80	3.45	33.39	4	1	5	3.33	**11**	**M**
ML90	I-90	119.2	132.94	4	3	3	3.33	**11**	**M**
ML90	I-90	132.94	147.45	4	3	3	3.33	**11**	**M**
ML90	I-90	0	9.92	1	5	3	3.00	**14**	**M**
ML90	I-90	9.92	23.07	1	5	3	3.00	**14**	**M**
ML90	I-90	23.07	41.96	1	5	3	3.00	**14**	**M**
ML21	WY-220	113.38	117	4	2	2	2.67	**17**	**M**
ML80	I-80	0	3.45	1	1	5	2.33	**18**	**L**
ML80	I-80	33.39	48.33	1	1	5	2.33	**18**	**L**
ML80	I-80	48.33	57.04	1	1	5	2.33	**18**	**L**
ML90	I-90	96	119.2	1	3	3	2.33	**18**	**L**
ML25	I-25	175.1	191.62	1	2	3	2.00	**22**	**L**
ML25	I-25	191.62	228.25	1	2	3	2.00	**22**	**L**
ML13	US-191	0	51.62	1	3	1	1.67	**24**	**L**
ML21	WY-220	57	113.38	1	2	2	1.67	**24**	**L**
ML43	WY-59	61	112	1	3	1	1.67	**24**	**L**
ML20	US26/WY789	104	127	1	2	1	1.33	**27**	**L**
ML34	US-20/US-26	0	10	1	2	1	1.33	**27**	**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 24 shows the potential actions to mitigate each high risk road and the priority for each action.

Table 24: Action Plan Summary for High Risk Environmental – Nonattainment Area Creation Roads

Facility LRS ID	From RM	To RM	Facility Name	Priority Rating	Potential Actions	Action Priority	Comments
ML80B	336	370	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 truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					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	377	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 truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					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	377	402	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.	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.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					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.
					Increase the use of PrePass at the port of entry.	1	Very low cost. Requires trucker buy-in.

					Provide electrified truck parking areas to reduce truck idling.	5	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML25B	0	8	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 truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					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.
					Increase the use of PrePass at the port of entry.	1	Very low cost. Requires trucker buy-in.
					Provide electrified truck parking areas to reduce truck idling.	2	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	105	187	I-80	H	Assess and modify current snow removal and roadway management procedures as needed.	2	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	3	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.	1	May be expensive. Technology may not be up to standards yet. Could significantly improve truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					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.	5	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	187	199	I-80	H	Assess and modify current snow removal and roadway management procedures as needed.	2	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	3	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.	1	May be expensive. Technology may not be up to standards yet. Could significantly improve truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					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.	5	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.

					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.
ML25B	8	25	I-25	H	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 truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					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.
					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.
ML80B	57	105	I-80	H	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 truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					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.
					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.
ML80B	280	316	I-80	H	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 truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					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	316	336	I-80	H	Assess and modify current snow removal and roadway management procedures as needed.	2	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	3	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.	1	May be expensive. Technology may not be up to standards yet. Could significantly improve truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					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.	5	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	3	33	I-80	M	Assess and modify current snow removal and roadway management procedures as needed.	2	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	3	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	1	May be expensive. Technology may not be up to standards yet. Could significantly improve truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					Provide electrified truck parking areas to reduce truck idling.	4	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML90B	119	132	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 truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					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	132	147	I-90	M	Assess and modify current snow removal and roadway management procedures as needed.	2	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	3	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	1	May be expensive. Technology may not be up to standards yet. Could significantly improve truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					Provide electrified truck parking areas to reduce truck idling.	4	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML90B	0	9	I-90	M	Assess and modify current snow removal and roadway management procedures as needed.	2	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	3	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	1	May be expensive. Technology may not be up to standards yet. Could significantly improve truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.

					Provide electrified truck parking areas to reduce truck idling.	4	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML90B	9	23	I-90	M	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.
					Implement Connected Vehicle technology on the road.	3	May be expensive. Technology may not be up to standards yet. Could significantly improve truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					Increase the use of PrePass at the port of entry.	1	Very low cost. Requires trucker buy-in.
					Provide electrified truck parking areas to reduce truck idling.	2	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML90B	23	41	I-90	M	Assess and modify current snow removal and roadway management procedures as needed.	2	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	3	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	1	May be expensive. Technology may not be up to standards yet. Could significantly improve truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					Provide electrified truck parking areas to reduce truck idling.	4	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML21B	113	117	WY-220	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 truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					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	0	3	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 truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					Increase the use of PrePass at the port of entry.	1	Very low cost. Requires trucker buy-in.
					Provide electrified truck parking areas to reduce truck idling.	4	Provides emission reductions and improved safety. Mostly effective in winter months. Requires buy-in from truckers.
ML80B	33	48	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 truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					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	48	57	I-80	L	Assess and modify current snow removal and roadway management procedures as needed.	2	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	3	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	1	May be expensive. Technology may not be up to standards yet. Could significantly improve truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
ML90B	96	119	I-90	L	Assess and modify current snow removal and roadway management procedures as needed.	2	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	3	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	1	May be expensive. Technology may not be up to standards yet. Could significantly improve truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
ML25B	175	191	I-25	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 truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					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	191	228	I-25	L	Assess and modify current snow removal and roadway management procedures as needed.	2	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	3	Snow fence coverage on this road is near maximum. Not effective in summer months.
					Implement Connected Vehicle technology on the road.	1	May be expensive. Technology may not be up to standards yet. Could significantly improve truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
ML13B	0	51	US-191	L	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	2	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 truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
ML21B	57	113	WY-220	L	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	2	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 truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
ML43B	61	112	WY-59	L	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	2	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 truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
ML20B	104	127	US-26/ WY-789	L	Assess and modify current snow removal and roadway management procedures as needed.	1	Lowest cost, though much is already done. Not effective in summer months.
					Build snow fences	2	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 truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
ML34B	0	10	US-20/ US-26	L	Implement Connected Vehicle technology on the road.	2	May be expensive. Technology may not be up to standards yet. Could significantly improve truck movement. Some of infrastructure is in place. Need buy-in from truckers. CV Pilot Project not complete.
					Provide diesel retrofit incentives to the trucking industry.	3	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.

Figure 7 shows the locations for high risk highway freight assets. The highest combined risks are concentrated along I-80 and I-25 in southeast Wyoming, particularly the weather-related risks.

Figure 7: Highest Risk Highway Freight Locations

Merging of Freight Resiliency Action Plans

WYDOT merged freight 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 25 shows 22 consolidated road sections from the action plans.

Table 25: Risks at Consolidated Locations

Roadways							Bridges		
			Risks					Risks	
Facility	From	To	Winter Weather	Light High-Profile Vehicle Blowover		Environment	Bridge RM	Bridge Flood	Bridge Strike
I-25	0	25	X	X		X	8.84		X
							10.59		X
I-25	25	54	X	X					
I-25	54	132		X			57.65		X
							125.5	X	
I-25	132	175					137.56		X
							139.76		X
							146		X
							156.18		X
							160.87		X
I-25	175	228				X	175.59		X
							188.19		X
							188.6		X
I-25	246.3	246.3					246.3	X	
I-80	0	34	X			X	23.8		X
I-80	34	122				X	77.31		X
							77.5	X	
							85.35		X
I-80	122	199	X			X	130.84		X
							146.85		X
							187.19		X
							196.16		X
I-80	199	206	X						
I-80	206	209	X	X					
I-80	209	280	X	X			210.99		X
							219.84		X
							235.21		X
							260.24		X
I-80	280	359	X	X		X	313.19		X
							357.68		X
I-80	359	402				X	383.3		X
I-90	0	41				X			
I-90	73	89					73.2	X	
							89	X	
I-90	96	147				X			
US-191	0	51				X			
US-20/ US-26	0	10				X			
US-26/ WY-789	104	127				X	123.4	X	
WY-220	57	113				X			
WY-220	113	117	X			X			
WY-59	61	112				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 26. The weighting values were established according to the perceived level of disruption that each risk poses to the movement of vehicles on critical freight 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 and planners a potential list of tasks to evaluate for feasibility.

Table 26: Weighting Factors Used to Estimate Risk Location Priorities

Risk	Weight
Winter Weather	10
Light High-Profile Vehicle Blowover	3
Environmental	3
Bridge Flood	7
Bridge Strike	5

Interstate 80 – RM 280 to RM 359

Priority: 1

This roadway section exhibits high risks for winter weather, air quality and bridge strikes at RM 313.91 and 357.68 (bridges LBN, AYR and AYS). These bridges carry I-80 and could lead to significant issues if a bridge strike were to close I-80. Daily truck volumes are nearly 7,800 and daily vehicle volumes exceed 14,200. Estimated truck delay cost exceeds $724,000 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 develop and implement “Connected Vehicle” communication, vehicle to vehicle, and vehicle to infrastructure technology for long-term winter weather and light high-profile vehicle closures.
3. WYDOT should establish alternate routing procedures for long-term winter weather and light high-profile vehicle closures. These procedures should convey to truckers 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 should also be conveyed through "Connected Vehicle" communication technology.

4. WYDOT should investigate the need for more advanced warning and better height limit warning signage. If the investigations show that improved signage won't likely decrease bridge strikes, then alternate routing procedures should be established for I-80. The procedures should include those alternate routing procedures described in point 3 above along with developing individual task plans assigning specific tasks to accomplish the smooth transition to and from the alternate route(s).
5. WYDOT should create or incentivize the electrification of truck parking areas to reduce truck emissions.
6. WYDOT should assess the practicality of lowering the grade under each high risk strike bridge.
7. WYDOT should investigate the installation of snow fences.

Interstate 80 - RM 209 to RM 280

Priority: 2

This highway section exhibits high risks for winter weather, light high-profile vehicle blowover and bridge strikes at RM 210.99, 219.84, 235.21, and 260.24 (bridges ATO, ATN, ASP, ASQ, AUR and AVG). These bridges carry I-80 and could lead to significant issues if a bridge strike were to close the road. Daily truck volumes are over 5,500 and average daily traffic is over 10,500. Estimated truck delay cost exceeds $645,000 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 and decrease delay conditions.
2. WYDOT should establish alternative routing procedures for long-term winter weather and light high-profile vehicle closures. These procedures should convey to truckers the alternate route, oversize/overweight limitations, available services, and truck parking availability along the alternate route. Alternate routes may include rerouting to parallel lanes or routing to highways in adjacent states. This process should also be conveyed through "Connected Vehicle" communication technology.
3. WYDOT should develop and implement "Connected Vehicle" communication, vehicle to vehicle, and vehicle to infrastructure technology for long-term winter weather, light high-profile vehicle closure and tailpipe emission mitigation.
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. The procedures should include those alternative routing procedures described in point 2 above along with developing 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 practicality of lowering the grade under each high risk strike bridge.

Interstate 80 – RM 0 to RM 34

Priority: 3

This roadway section exhibits high risks for winter weather, air quality and bridge strike at RM 23.8 (bridge ANH). This bridge carries I-80 and could lead to significant issues if a bridge strike were to close I-80. Daily truck volumes are over 6,000 and daily vehicle volumes are nearly 13,300. Estimated truck delay cost is nearly $689,000 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 and decrease delay conditions.
2. WYDOT should establish alternate routing procedures for long-term winter weather and light high-profile vehicle closures. These procedures should convey to truckers 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 should also be conveyed through "Connected Vehicle" communication technology.
3. WYDOT should develop and implement "Connected Vehicle" communication, vehicle to vehicle, and vehicle to infrastructure technology for long-term winter weather and light high-profile vehicle closures.
4. To reduce tailpipe emissions, WYDOT should investigate and implement the expansion of PrePass to more trucks approaching the port-of-entry.
5. WYDOT should investigate the need for more advanced warning and better height limit warning signage. If the investigations show that improved signage won't likely decrease bridge strikes, then alternate routing procedures should be established for I-80. The procedures should include those alternate routing procedures described in point 2 above and WYDOT should develop individual task plans assigning specific tasks to accomplish the smooth transition to and from the alternate route(s).
6. WYDOT might assess the practicality of lowering the grade under the high risk bridge to mitigate further bridge strikes.

Interstate 80 – RM 122 to RM 199

Priority: 4

This roadway section exhibits high risks for winter weather, air quality and bridge strikes at RM 130.84, 146.85, 187.19 and 196.16 (bridges AQZ, ARN, ASV, ASP and ASQ). These bridges carry I-80 and could lead to significant issues if a bridge strike were to close I-80. Daily truck volumes are nearly 5,300 and daily vehicle volumes are over 11,500. Estimated truck delay cost is nearly $324,000 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 and decrease delay conditions.
2. WYDOT should develop and implement "Connected Vehicle" communication, vehicle to vehicle, and vehicle to infrastructure technology to establish safety parameters to reduce closures or allow more trucks to operate during high wind events.

3. WYDOT should investigate the need for more advanced warning and better height limit warning signage for high risk bridge strike locations. If the investigations show that improved signage won't likely decrease bridge strikes, WYDOT should establish alternate routing procedures to mitigate bridge strike events. These procedures should convey to truckers 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 should also be conveyed through "Connected Vehicle" communication technology. WYDOT should develop individual task plans assigning specific tasks to accomplish the smooth transition to and from the alternate route(s).
4. WYDOT should assess the practicality of lowering the grade under the high risk strike bridges.
5. WYDOT should investigate the installation of snow fences.

Interstate 80 – RM 34 to RM 122

Priority: 5

This highway section exhibits high risks for air quality, bridge flooding at RM 77.5 (bridges AOR and AOS) and bridge strikes at RM 77.31 and 85.35 (bridges AOQ, AOX and AOY). Each of these bridges carries I-80 and could lead to significant issues if a bridge strike were to close I-80. Daily truck volumes are over 7,100 and daily vehicle volumes are over 14,000. Estimated truck delay is nearly 12,333 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 develop and implement "Connected Vehicle" communication, vehicle to vehicle, and vehicle to infrastructure technology for long-term winter weather, light high-profile vehicle closure and tailpipe emission mitigation.
3. 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.
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. WYDOT should establish alternate routing procedures that convey to truckers the alternate route, oversize/overweight limitations, available services, 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).
5. 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.
6. WYDOT should assess the practicality of lowering the grade under each bridge that is high risk for bridge strikes.
7. Alternate routing procedures should be established for I-80 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 truckers 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).

8. WYDOT should investigate the installation of snow fences.

Interstate 25 – RM 0 to RM 25

Priority: 6

This highway section exhibits high risks for winter weather, light high-profile vehicle blowover, air quality and bridge strikes at RM 8.84 and 10.59 (bridges ABC, AAS and AAR). Each of these bridges carries I-25 and could lead to significant issues if a bridge strike were to close I-25. Daily truck volumes are over 3,400 and daily vehicle volumes are over 11,800. Estimated truck delay cost is nearly $552,000 per mile per year. The following are recommended actions to mitigate the identified risks:

1. WYDOT should develop and implement "Connected Vehicle" communication, vehicle to vehicle, and vehicle to infrastructure technology for long-term winter weather, light high-profile vehicle closure and tailpipe emission mitigation.
2. 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.
3. WYDOT should create or incentivize the electrification of truck parking areas.
4. To reduce tailpipe emissions, WYDOT should investigate and implement the expansion of PrePass to more trucks approaching the port-of-entry.
5. 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-25. WYDOT should establish alternate routing procedures that convey to truckers the alternate route, oversize/overweight limitations, available services, 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).
6. WYDOT should assess the practicality of lowering the grade under each high risk strike bridge.

Interstate 25 – RM 54 to RM 132

Priority: 7

This highway section exhibits high risks for light high-profile vehicle blowover, bridge strikes at RM 57.65 (bridge ADD) and bridge flooding at RM 125.5 (bridge CZT). These bridges carry I-25 and could lead to significant issues if a bridge strike or flood were to close I-25. Daily truck volumes are over 1,600 and daily traffic volumes exceed 8,000. 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 bridges identified for high risk strike potential above. If the investigations show that improved signage won't likely decrease bridge strikes, then alternate routing procedures

should be established for I-25. Alternate routing procedures should convey to truckers 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).

2. WYDOT should develop and implement "Connected Vehicle" communication, vehicle to vehicle, and vehicle to infrastructure technology for long-term winter weather, light high-profile vehicle closure and tailpipe emission mitigation.
3. WYDOT should create or incentivize the electrification of truck parking areas.
4. WYDOT should investigate increasing scour prone attributes and/or replacing the high risk of flooding bridge.

Interstate 25 – RM 25 to RM 54

Priority: 8

This highway section exhibits high risks for winter weather and light high-profile vehicle blowover. Daily truck volumes are over 2,200 and daily vehicle volumes are nearly 7,800. Estimated truck delay cost is nearly $200,000 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 and decrease delay conditions.
2. WYDOT should develop and implement "Connected Vehicle" communication, vehicle to vehicle, and vehicle to infrastructure technology to establish safety parameters to reduce closures or allow more trucks to operate during high wind events.
3. WYDOT should establish alternative routing procedures for long-term winter weather and light high-profile vehicle closures. These procedures should convey to truckers the alternate route, oversize/overweight limitations, available services, and truck parking availability along the alternate route. Alternate routes may include rerouting to parallel lanes or routing to highways in adjacent states. This process should also be conveyed through "Connected Vehicle" communication technology.

Interstate 80 – RM 206 to RM 209

Priority: 9

This highway section exhibits high risks for winter weather and light high-profile vehicle blowover. Daily truck volumes are nearly 6,500 and daily vehicle volumes are over 12,300. Estimated truck delay cost is nearly $331,000 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 and decrease delay conditions.

2. WYDOT should develop and implement "Connected Vehicle" communication, vehicle to vehicle, and vehicle to infrastructure technology to establish safety parameters to reduce closures or allow more trucks to operate during high wind events.
3. WYDOT should establish alternative routing procedures for long-term winter weather and light high-profile vehicle closures. These procedures should convey to truckers the alternate route, oversize/overweight limitations, available services, and truck parking availability along the alternate route. Alternate routes may include rerouting to parallel lanes or routing to highways in adjacent states. This process should also be conveyed through "Connected Vehicle" communication technology.

Interstate 80 – RM 199 to RM 206

Priority: 10

This highway section exhibits high risks for winter weather. Daily truck volumes are over 5,600 and daily vehicle volumes are over 12,300. Estimated truck delay cost is nearly $331,000 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 and decrease delay conditions.
2. WYDOT should research and develop "Connected Vehicle" communication, vehicle to vehicle, and vehicle to infrastructure technology to establish safety parameters to reduce closures or allow more trucks to operate during high wind events.

Interstate 80 - RM 359 to RM 402

Priority: 11

This highway section exhibits high risks for air quality and bridge strikes at RM 383.3 (bridge AZW). Daily truck volumes are approximately 500, daily vehicle volumes nearly 3,000 and truck delay is approximately 21,600 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, develop and implement "Connected Vehicle" technology on this road.
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. To reduce tailpipe emissions, WYDOT should investigate and implement the expansion of PrePass to more trucks approaching the port-of-entry.
5. WYDOT should build snow fences in higher drift and reduced visibility areas.
6. WYDOT should investigate the need for more advanced warning and better height limit warning signage for the bridge identified for high risk strike potential above. If the investigations show that improved signage won't likely decrease bridge strikes, then alternate routing procedures should be established for I-80. Alternate routing procedures should convey to truckers 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 the practicality of lowering the grade under the high risk bridge.

WY 220 - RM 113 to RM 117

Priority: 12

This roadway section exhibits high risks for winter weather and air quality. Daily truck volumes are over 1,000 and daily vehicle volumes are nearly 18,200. Estimated truck delay cost is over $261,000 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 continue to assess and modify their snow removal and winter weather management procedures to reduce the length of closures and decrease delay conditions.
3. WYDOT should develop and implement "Connected Vehicle" communication, vehicle to vehicle, and vehicle to infrastructure technology for long-term winter weather and light high-profile vehicle closures.
4. WYDOT should establish alternate routing procedures. These procedures should convey to truckers the alternate route, oversize/overweight limitations, available services, and truck parking availability along the route. This process should also be conveyed through "Connected Vehicle" communication technology.

Interstate 25 at RM 246.3

Priority: 13

This road section exhibits high risks for bridge flooding at RM 246.3 (bridge AJW). This bridge carries I-25 and could lead to significant issues if a flood were to close I-25. Daily truck volumes are 435 and daily vehicle volumes are nearly 2,000. The following are recommended actions to mitigate the identified risks:

1. WYDOT should investigate the possibility of adding additional scour protection to the bridge.
2. Alternate routing procedures should be established for I-25. The alternate routing procedures should convey to truckers the alternate route, oversize/overweight limitations, available services, and truck parking availability. Alternate routes may include rerouting to parallel lanes. 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).
3. WYDOT might consider replacing the bridge with a bridge that can convey a higher streamflow capacity.

Interstate 25 – RM 175 to RM 228

Priority: 14

This highway section exhibits high risks for air quality and bridge strikes at RM 175.59, 188.19 and 188.6 (bridges AHO, AHP, AIH, FDH and FDG). These bridges carry I-25 and could lead to significant issues if a bridge strike were to close I-25. Daily truck volumes are nearly 700 and daily vehicle volumes exceed 3,100. Estimated truck delays are 1,953 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 develop and implement "Connected Vehicle" technology for long-term winter weather, light high-profile vehicle closure and 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 investigate the feasibility of building additional snow fences.
5. 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. WYDOT should establish alternate routing procedures that convey to truckers 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).
6. WYDOT should assess the practicality of lowering the grade under each high risk strike bridge.

Interstate 90 - RM 73 to RM 89

Priority: 15

These bridges are at high risk for flooding. They are located at RM 73.2 and 89 (bridges BEB, BEC, BET and BEU). These bridges carry I-90 and could lead to significant issues if a flood were to damage the bridge and close I-90. Daily truck volume estimates are 539 and daily vehicle volumes are nearly 3,500. The following are recommended actions to mitigate the identified risks:

1. WYDOT should establish alternate routing procedures that convey to truckers the alternate route, oversize/overweight limitations, available services, and truck parking availability along the route. Alternate routes may include 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).
2. WYDOT should upgrade scour prone features in the South Fork of the Powder River if feasible.
3. WYDOT should investigate whether replacing the bridges with higher streamflow capacity bridges is feasible.

US-26/WY-789 - RM 104 to RM 127

Priority: 16

This highway section exhibits high risks for air quality and bridge flooding at RM 123.4 (bridge LCU). The bridge is on the causeway crossing Boysen Reservoir. Daily truck volumes are approximately 460, daily vehicle volumes over 900 and annual truck delay is approximately 2,700 hours per mile. 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, develop and implement "Connected Vehicle" technology on this road.
3. WYDOT should build snow fences in higher drift and reduced visibility areas.
4. WYDOT should establish alternate routing procedures for bridge flooding closures. These procedures should convey to truckers the alternate route, oversize/overweight limitations, available services, and truck parking availability along the route. WYDOT should develop individual task plans assigning specific tasks to accomplish the smooth transition to and from the alternate route(s). This process should also be conveyed through "Connected Vehicle" communication technology.
5. WYDOT should investigate the possibility of adding additional scour protection to the bridge.

Interstate 25 – RM 132 to RM 175

Priority: 17

This highway section exhibits high risk for bridge strikes at RM 137.56, 139.76, 146, 156.18 and 160.87 (bridges AFY, AGC, AGH, AGI, AGW, AGV, AGX and AGY). These bridges carry I-25 and could lead to significant issues if a bridge strike were to close I-25. Daily truck volumes are over 1,800 and daily vehicle volumes exceed 9,900. 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 these bridges. If the investigations show that improved signage won't likely decrease bridge strikes, then alternate routing procedures should be established for I-25. Alternate routing procedures should convey to truckers the alternate route, oversize/ overweight limitations, available services, and truck parking availability along the route. Alternate routes may include rerouting to parallel lanes. 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).
2. WYDOT should assess the practicality of lowering the grade under the high risk bridges or replacing the bridges.

Interstate 90 – RM 0 to RM 41

Priority: 18

This highway section exhibits high risks for air quality. Daily truck volumes are approximately 1,200, daily vehicle volumes over 7,700 and annual truck delay is approximately 2,850 hours per mile. 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 develop and implement "Connected Vehicle" technology for long-term winter weather, light high-profile vehicle closure and tailpipe emission mitigation.
3. To reduce tailpipe emissions, WYDOT should investigate and implement the expansion of PrePass to more trucks approaching the port-of-entry.
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 investigate the feasibility of building additional snow fences.

Interstate 90 – RM 96 to RM 147

Priority: 19

This highway section exhibits high risks for air quality issues. Daily truck volumes are over 600, daily vehicle volumes are over 4,400 and annual truck delay is approximately 3,600 hours per mile. The following are recommended actions to mitigate the identified risks:

1. WYDOT should develop and implement "Connected Vehicle" technology.
2. WYDOT should create or incentivize the electrification of truck parking areas.
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 feasibility of building additional snow fences.

WY 59 – RM 61 to RM 112

Priority: 20

This highway section exhibits high risks for air quality issues. Daily truck volumes are over 1,200, daily vehicle volumes are over 8,900 and annual truck delay is approximately 2,700 hours per mile. The following are recommended actions to mitigate the identified risks:

1. WYDOT should develop and implement "Connected Vehicle" technology.
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 investigate the feasibility of building additional snow fences.

US 191 – RM 0 to RM 51

Priority: 21

This highway section exhibits high risks for air quality issues. Daily truck volumes are over 600, daily vehicle volumes are nearly 3,200 and annual truck delay is approximately 1,100 hours per mile. The following are recommended actions to mitigate the identified risks:

1. WYDOT should develop and implement "Connected Vehicle" technology.
2. WYDOT should investigate the feasibility of building additional snow fences.
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.

WY 220 – RM 57 to RM 113

Priority: 22

This highway section exhibits high risks for air quality issues. Daily truck volumes are approximately 400, daily vehicle volumes nearly 3,000 and annual truck delay is approximately 1,700 hours per mile. 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 investigate the feasibility of building additional snow fences.
3. WYDOT should research "Connected Vehicle" technology for this road and implement applicable technologies.

US 20/26 – RM 0 to RM 10

Priority: 23

This urban highway section exhibits high risks for air quality issues. Daily truck volumes are approximately 780, daily vehicle volumes nearly 13,200 and annual truck delay is approximately 1,800 hours per mile. The following are recommended actions to mitigate the identified risks:

1. WYDOT should provide electrified truck parking areas to reduce truck idling.
2. WYDOT should research "Connected Vehicle" technology for this road and implement applicable technologies.
3. WYDOT should provide incentives for diesel retrofits.

This page is intentionally left blank.

Appendix A

Bridge Flooding Action Plans

Wyoming Department of Transportation Freight Resilience Action Plans - Bridge Flooding

Analysis Year:	2018		
Asset / Location:	I-25 at N Platte River, ML25 at 125.5, Bridge ID = CZT		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	3	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Infrastructural
Issues:	A fairly long detour may be required if damage is extensive. The bridge is in fairly poor condition (NHPP rating of 4). Large deck area. In a high risk county.		

Vulnerabilities	Strengths	Objectives
Possible long detour	Redundant route is available if not damaged also	Return I-25 traffic to normal conditions as quickly as possible.
The only Interstate route for the area		Minimize user, agency and societal costs.
Bridge carries 1449 trucks per day		Minimize truck delays.
Large bridge over a large river		
Bridge condition is fairly poor. Scour Rating = 8.		

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 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 WTA and municipalities in the area..
B	H	Upgrade scour prone attributes of the bridge.	1. Lower cost than full replacement.	1. May be expensive. 2. May not provide adequate protection for large floods.	
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.

Wyoming Department of Transportation Freight 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:	1 of 46
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Infrastructural
Issues:	Very high truck 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 7151 trucks per day. Scour Rating = 8.		Minimize truck 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.	
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 Freight Resilience Action Plans - Bridge Flooding

Analysis Year:	2018		
Asset / Location:	I-25 at S.F. Powder River, ML25 at 246.3, Bridge ID = AJW		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	A fairly long detour may be required if both bridges are damaged. The bridge is in fair condition (NHPP rating of 5). In a high risk county for probability.		

Vulnerabilities	Strengths	Objectives
Possible long detour	Redundant route is available if not damaged also	Return I-25 traffic to normal conditions as quickly as possible.
The only Interstate route for the area		Minimize user, agency and societal costs.
Bridge carries 218 trucks per day. Scour Rating = 8.		Minimize truck 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 a higher capacity bridge(s). 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. Some scour protection upgrades will also protect the adjacent bridge.	1. May be expensive. 2. May not provide adequate protection for large floods.	
D, A	R, O	Repair the bridge(s) following each incident. Establish and enact reroute procedures in the event the bridge(s) 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 WTA.

Wyoming Department of Transportation Freight Resilience Action Plans - Bridge Flooding

Analysis Year:	2018		
Asset / Location:	I-90 at Powder River, ML90 at 89.0, Bridge IDs = BET and BEU		
Ownership:	WYDOT	Criticality Rank:	3 of 46
Risk Probability Rtg:	5	Risk Consequence Rtg:	3
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	A fairly long detour may be required if both bridges are damaged. High stream flow variability. In a high flood probability county.		

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 572 trucks per day. Scour Rating = 8.		Minimize truck 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.	
D, A	R, O	Repair the bridge(s) following each incident. Establish and enact reroute procedures in the event the bridge(s) 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 WTA.

Wyoming Department of Transportation Freight Resilience Action Plans - Bridge Flooding

Analysis Year:	2018		
Asset / Location:	US-26 at Wind River, ML20 at 123.4, Bridge ID = LCU		
Ownership:	WYDOT	Criticality Rank:	3 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Infrastructural
Issues:	25-year flood event capacity. A very long detour may be required. Fairly high stream flow variability. In a high flood probability county.		

Vulnerabilities	Strengths	Objectives
Possible long detour	Upstream portion of Boysen Reservoir may provide a buffer to flooding.	Return US-26 traffic to normal conditions as quickly as possible.
Chokepoint in the system		Minimize user, agency and societal costs.
Bridge carries 413 trucks per day. Scour Rating = 8.		Minimize truck 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 a 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 WTA and municipalities in the area..
B	H	Upgrade scour prone attributes of the bridge.	1. Lower cost than full replacement.	1. May be expensive. 2. May not provide adequate protection for large floods.	
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.

Wyoming Department of Transportation Freight Resilience Action Plans - Bridge Flooding

Analysis Year:	2018		
Asset / Location:	I-90 at Crazy Woman Creek, ML90 at 73.2, Bridge IDs = BEB and BEC		
Ownership:	WYDOT	Criticality Rank:	3 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Infrastructural
Issues:	A fairly long detour may be required if both bridges are damaged. High stream flow variability. In a high flood probability county.		

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 520 trucks per day. Scour Rating = 8.		Minimize truck 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.	
D, A	R, O	Repair the bridge(s) 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.

Appendix B

Bridge Strike Action Plans

Wyoming Department of Transportation Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at Leroy Rd, ML80 at 23.8, Bridge ID = ANH		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Infrastructural
Issues:	Underclearance is 14.17 ft. The bridge is in moderate condition (NHPP rating of 5). Very high truck 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 2938 trucks per day.		Minimize truck 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 Freight 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:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Infrastructural
Issues:	Underclearance is 14.5 ft. The bridge is in moderate condition (NHPP rating of 5). Very high truck 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 2830 trucks per day.		Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at Riner Rd, ML80 at 196.16, Bridge ID = ASV		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Infrastructural
Issues:	Underclearance is 14.24 ft. The bridge is in fairly poor condition (NHPP rating of 4). Very high truck 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 2844 trucks per day.		Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at County Rd 3, ML80 at 260.24, Bridge ID = AVG		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Infrastructural
Issues:	Underclearance is 17.32 ft. The bridges are in moderate condition (NHPP rating of 5). Very high truck 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 2984 trucks per day.		Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at Two Mile Draw, ML80 at 210.99, Bridge ID = ATO & ATN		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Infrastructural
Issues:	Underclearance is 14.17 ft. The bridges are in moderate condition (NHPP rating of 6). Very high truck traffic. 2 strikes on ATO and 1 on ATN 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 3412 trucks per day per bridge.		Minimize truck 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 Freight 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:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	5
Priority Rtg:	High	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 truck 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 3557 trucks per day per bridge.		Minimize truck 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. 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 Freight 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:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	Underclearance is 14.24 ft. The bridges are in moderate condition (NHPP rating of 6). Very high truck 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 3293 trucks per day.		Minimize truck 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 Freight 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:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	Underclearance is 15.16 ft. The bridges are in moderate condition (NHPP rating of 5). Very high truck 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 2830 trucks per day.		Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at US-287, ML80 at 313.19, Bridge ID = LBN		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	Underclearance is 18.57 ft. Very high truck traffic. 2 bridge strikes since 1994.		

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 2984 trucks per day.	Fairly short detour, but through Laramie.	Minimize user, agency and societal costs.
		Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at WY-789, ML80 at 187.19, Bridge ID = ASP & ASQ		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	Underclearance is 15.49 and 15.16 ft.. Very high truck 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 2830 trucks per day per bridge.		Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at WY-76 and UPRR, ML80 at 219.84, Bridge ID = KJC, KJB		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	5
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	Underclearance is 18.93 and 17.85 ft. **Most likely train hits**. Very high truck traffic. 2 bridge strikes since 1994 (1 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 3556 trucks per day per bridge.	Detour could be made through Sinclair.	Minimize user, agency and societal costs.
		Minimize truck 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.	1. Work with UPRR an mitigation plans and efforts.
B	H	Increase warning signage and discuss with UPRR to discuss mitigation efforts.	1. Lowest cost alternative.	1. May not be adequate to stop bridge strikes.	1. Work with UPRR an mitigation plans and efforts.
D, A	R, O	Repair the bridge following each incident. Establish and enact reroute procedures in the event the bridge is closed. Discuss with UPRR to discuss mitigation efforts.	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. 3. Work with UPRR an mitigation plans and efforts.
B	H	Lower the grade under the bridge.	1. Permanent fix. Shouldn't have to address later.	1. Cost may be prohibitive.	1. Work with UPRR.

Wyoming Department of Transportation Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at County Rd 59, ML80 at 85.35, Bridge ID = AOX, AOY		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	Underclearance is 17.59 ft.. Very high truck 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 3293 trucks per day per bridge.		Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at US-30/WY-130, ML80 at 235.21, Bridge ID =AUR		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	Underclearance is 16..4 ft. Very high truck 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 2984 trucks per day.		Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-25 at US-87 , ML25 at 160.87, Bridge ID =AGX, AGY		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	5	Risk Consequence Rtg:	3
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	Underclearance is 16.01 ft. Fairly high truck traffic. 4 bridge strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Bridge carries 1016 trucks per day.	Parallel bridge is available if not damaged also.	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-25 at WY-220, ML25 at 188.6, Bridge ID = FDG, FDH		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	5	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Infrastructural
Issues:	Underclearance is 16.24 ft.. Fairly high truck traffic. 5 bridge strikes since 1994 (4 hits on FDH).		

Vulnerabilities	Strengths	Objectives
Alternate detours may create traffic problems.	Parallel bridge is available if not damaged also.	Return I-25 traffic to normal conditions as quickly as possible.
The only Interstate route for the area.	Alternate detours available.	Minimize user, agency and societal costs.
Carries 1045 trucks per day per bridge.		Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-80 at County Rd 146-1, ML80 at 383.3, Bridge ID =AZW		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	Underclearance is 14.57 ft. Very high truck traffic. 2 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 2431 trucks per day.		Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-25 at Missle Dr , ML25 at 10.59, Bridge ID =ABC		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Infrastructural
Issues:	Underclearance is 14.76 ft. Fairly high truck traffic. 3 bridge strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Possible moderate detour if both bridges (ABB & ABC) damaged (unkikely). Bridge carries 1391 trucks per day.	Parallel bridge is available if not damaged also.	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-25 at WY-94, ML25 at 139.76, Bridge ID =AGC		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	Underclearance is 16.67 ft. Fairly high truck traffic. 2 bridge strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Bridge carries 1016 trucks per day.	Parallel bridge is available if not damaged also.	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-25 at WY-96, ML25 at 146, Bridge ID =AGH, AGI		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	5	Risk Consequence Rtg:	3
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	Underclearance is 12.99 ft. Fairly high truck traffic. 15 bridge strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Bridge carries 1016 trucks per day.	Parallel bridge is available if not damaged also.	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-25 at WY-255 , ML25 at 188.19, Bridge ID =AIH		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Medium	Issue Type:	Infrastructural
Issues:	Underclearance is 14.17 ft. Fairly high truck traffic. 3 bridge strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Bridge carries 1016 trucks per day.	Parallel bridge is available if not damaged also.	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-25 at I-80, ML25 at 8.84, Bridge ID =AAS, AAR		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Infrastructural
Issues:	Underclearance is 16.93 ft for AAS and 18.5 ft for AAR. Very high truck traffic. 3 bridge strikes since 1994 (2 on AAS).		

Vulnerabilities	Strengths	Objectives
Bridges carries 2314 trucks per day per bridge.	Parallel bridge is available if not damaged also.	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-25 at County Road 1 , ML25 at 137.56, Bridge ID = AFY		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Infrastructural
Issues:	2 bridge strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Bridge carries 1016 trucks per day.	Parallel bridge is available if not damaged also.	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-25 at WY-321 , ML25 at 57.65, Bridge ID =ADD		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Infrastructural
Issues:	Underclearance is 14.24 ft. Fairly high truck traffic. 2 bridge strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Bridge carries 1044 trucks per day.	Parallel bridge is available if not damaged also.	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-25 at Bixby Rd, ML25 at 156.18, Bridge ID = AGV, AGW		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Infrastructural
Issues:	Underclearance is 15.26 ft. Fairly high truck traffic. 2 bridge strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Bridge carries 1016 trucks per day.	Parallel bridge is available if not damaged also.	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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 Freight Resilience Action Plans - Bridge Strike

Analysis Year:	2018		
Asset / Location:	I-25 at Unknown, ML25 at 175.59, Bridge ID = AHO, AHP		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Infrastructural
Issues:	Underclearance is 17.49 ft. Fairly high truck traffic. 2 bridge strikes since 1994.		

Vulnerabilities	Strengths	Objectives
Bridge carries 1016 trucks per day.	Parallel bridge is available if not damaged also.	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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.	

Appendix C

Winter Weather Closure and Delay Action Plans

Wyoming Department of Transportation Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from Happy Jack Rd to Buford, ML80 from 322.74 to 334.86		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Performance
Issues:	Very high truck traffic, 7,553 trucks per day. Estimated truck delay cost approximately $1,457,813 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 often has the same issues.		Minimize user, agency and societal costs.
Route carries 7,553 trucks per day		Maintain safety and mobility in the region.
High elevation route causes worse weather.		

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.	
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 Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from Elk Mountain to Arlington, ML80 from 255.27 to 272.13		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Performance
Issues:	Very high truck traffic, 5,629 trucks per day. Estimated truck delay cost approximately $823,417 per mile per year.		

Vulnerabilities	Strengths	Objectives
Fairly limited services available on the stretch of road. Nearest alternative route often has the same issues. Route carries 5,629 trucks per day		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.	
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 Freight 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:	1 of 46
Risk Probability Rtg:	5	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Performance
Issues:	Very high truck traffic, 5,617 trucks per day. Estimated truck delay cost approximately $597,933 per mile per year.		

Vulnerabilities	Strengths	Objectives
Very limited services available on the stretch of road. Nearest alternative route often has the same issues. Route carries 5,617 trucks per day		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.	
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 Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from Buford to I-25 in Cheyenne, ML80 from 334.86 to 359.2		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Performance
Issues:	Very high truck traffic, 7,708 trucks per day. Estimated truck delay cost approximately $832,530 per mile per year.		

Vulnerabilities	Strengths	Objectives
Very limited services available on the stretch of road. Nearest alternative route often has the same issues. Route carries 7,708 trucks per day 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.	
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 Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from Laramie to Happy Jack Rd, ML80 from 316.48 to 322.74		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	5	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Performance
Issues:	Very high truck traffic, 7,759 trucks per day. Estimated truck delay cost approximately $1,428,845 per mile per year.		

Vulnerabilities	Strengths	Objectives
Very limited services available on the stretch of road. Nearest alternative route often has the same issues. Route carries 7,759 trucks per day Steep grade and 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. 2. Most of this section is in a Canyon, so ptoential snow fence locations are very limited.	
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 Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from Walcott Jct to Elk Mountain, ML80 from 234.79 to 255.27		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	5	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Performance
Issues:	Very high truck traffic, 5,508 trucks per day. Estimated truck delay cost approximately $582.268 per mile per year.		

Vulnerabilities	Strengths	Objectives
Fairly limited services available on the stretch of road. Nearest alternative route often has the same issues. Route carries 5,508 trucks per day		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.	
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 Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from Evanston to US 189, ML80 from 6.03 to 18.1		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Performance
Issues:	Very high truck traffic, 6,091 trucks per day. Estimated truck delay cost approximately $862,465 per mile per year.		

Vulnerabilities	Strengths	Objectives
Very limited services available on the stretch of road. Steep grades. Route carries 6,091 trucks per day.		Return I-80 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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
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.	
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 Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from Sinclair to Walcott Jct, ML80 from 221.49 to 234.79		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Performance
Issues:	Very high truck traffic, 6,495 trucks per day. Estimated truck delay cost approximately $489,924 per mile per year.		

Vulnerabilities	Strengths	Objectives
Fairly limited services available on the stretch of road.		Return I-80 traffic to normal conditions as quickly as possible.
Nearest alternative route often has the same issues.		Minimize user, agency and societal costs.
Route carries 6,495 trucks per day		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.	
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 Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from US 189 to Ft Bridger, ML80 from 18.1 to 34.43		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Performance
Issues:	Very high truck traffic, 5,426 trucks per day. Estimated truck delay cost approximately $537,517 per mile per year.		

Vulnerabilities	Strengths	Objectives
Very limited services available on the stretch of road. Steep grades. Route carries 5,426 trucks per day.	Nearest alternative route does not have grade issues.	Return I-80 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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
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.	
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 Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from Point of Rocks to Bitter Creek, ML80 from 122.05 to 142.01		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Medium	Issue Type:	Performance
Issues:	Very high truck traffic, 5,523 trucks per day. Estimated truck delay cost approximately $362,237 per mile per year.		

Vulnerabilities	Strengths	Objectives
Very limited services available on the stretch of road. Nearest alternative route is very distant. Route carries 5,523 trucks per day	Few steep grades.	Return I-80 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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
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.	
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 Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from Bitter Creek to Wamsutter, ML80 from 142.01 to 174.07		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Medium	Issue Type:	Performance
Issues:	Very high truck traffic, 5,276 trucks per day. Estimated truck delay cost approximately $296,090 per mile per year.		

Vulnerabilities	Strengths	Objectives
Very limited services available on the stretch of road. Nearest alternative route is very distant. Route carries 5,276 trucks per day	Few steep grades.	Return I-80 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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
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.	
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 Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-25 from Pershing Ave to Central Ave, ML80 from 10.59 to 12.7		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Performance
Issues:	High truck traffic, 3,407 trucks per day. Estimated truck delay cost approximately $584,384 per mile per year.		

Vulnerabilities	Strengths	Objectives
Nearest alternatives are urban surface streets. Route carries 3,407 trucks per day Significant urban route	No steep grades.	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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
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. In an urban area where snow fence locations are limited.	
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 can experience similar weather conditions. Nearby 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 split of emergency services.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Freight Resilience Action Plans - Winter Weather

Analysis Year: 2018
Asset / Location: I-25 from Exit 25 to Nimmo Rd, ML80 from 25.44 to 34.45

Ownership: WYDOT
Risk Probability Rtg: 5
Priority Rtg: Medium
Issues: 2,276 trucks per day. Estimated truck delay cost approximately $236,938 per mile per year.

Criticality Rank: 2 of 46
Risk Consequence Rtg: 3
Issue Type: Performance

Vulnerabilities	Strengths	Objectives
Very limited services available on the stretch of road. Nearest alternative often has the same issues. Route carries 2,276 trucks per day Very high wind location.	No steep grades.	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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
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.	
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. 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 Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-25 from Nimmo Rd to Chugwater, ML80 from 34.45 to 54.59		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	5	Risk Consequence Rtg:	3
Priority Rtg:	Medium	Issue Type:	Performance
Issues:	2,234 trucks per day. Estimated truck delay cost approximately $183,794 per mile per year.		

Vulnerabilities	Strengths	Objectives
Very limited services available on the stretch of road. Nearest alternative often has the same issues. Route carries 2,234 trucks per day Very high wind location.	No steep grades.	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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
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.	
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. 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 Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from Evanston Marginal, ML80 from 3.24 to 6.03		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	3	Risk Consequence Rtg:	5
Priority Rtg:	Medium	Issue Type:	Performance
Issues:	Very high truck traffic, 6,819 trucks per day. Estimated truck delay cost approximately $802,032 per mile per year.		

Vulnerabilities	Strengths	Objectives
Alternative routes are busy urban surface streets. Route carries 6,819 trucks per day.	Several available services adjacent to route.	Return I-80 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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
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. 2. Urban area limits snow fence location availability.	
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 Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 from Wamsutter to Johnson Rd, ML80 from 174.07 to 209.19		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Medium	Issue Type:	Performance
Issues:	Very high truck traffic, 5,590 trucks per day. Estimated truck delay cost approximately $330,966 per mile per year.		

Vulnerabilities	Strengths	Objectives
Somewhat limited services available on the stretch of road. Nearest alternative route is very distant. Route carries 5,590 trucks per day		Return I-80 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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
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.	
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 Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-80 Rawlins Marginal, ML80 from 211.28 to 215.3		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Performance
Issues:	Very high truck traffic, 7,119 trucks per day. Estimated truck delay cost approximately $667,354 per mile per year.		

Vulnerabilities	Strengths	Objectives
Alternative routes are urban surface streets. Route carries 7,119 trucks per day	Nearby services available.	Return I-80 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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
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. 2. Urban area limits snow fence location availability.	
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. 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 Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-25 from College Dr to I-80, ML80 from 7.85 to 8.85		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	3	Risk Consequence Rtg:	5
Priority Rtg:	Low	Issue Type:	Performance
Issues:	High truck traffic, 5,533 trucks per day. Estimated truck delay cost approximately $1,125,651 per mile per year.		

Vulnerabilities	Strengths	Objectives
Nearest alternatives are urban surface streets. Route carries 5,533 trucks per day Significant urban route	Several trucking services available.	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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
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.	
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 urban alternative routes. Other rural 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 Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-25 from US-85 to Exit 25, ML80 from 17.04 to 25.44		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Performance
Issues:	2,426 trucks per day. Estimated truck delay cost approximately $174,725 per mile per year.		

Vulnerabilities	Strengths	Objectives
Nearest alternative route often has the same issues. Route carries 2,426 trucks per day Very high wind location.	No steep grades.	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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
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.	
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. No nearby alternative. 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 Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	WY-220 in Casper, ML21 from113.38 to 117		
Ownership:	WYDOT	Criticality Rank:	5 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Performance
Issues:	1,069 trucks per day. Estimated truck delay cost approximately $261,114 per mile per year.		

Vulnerabilities	Strengths	Objectives
Route carries 1,069 trucks per day	Many trucking services available.	Return WY-220 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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
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. 3. Not much snow fence already built.	1. Urban area severely limits snow fance location availability.	
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. 4. Not on a high priority CV route.	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 likely to be experiencing similar weather conditions. 2. WYDOT maintenance personnel have already addressed most alternative routing procedures (may not be fully assessed and formalized).	1. Organize winter weather emergency routing procedures with local jurisdictions.

Wyoming Department of Transportation Freight Resilience Action Plans - Winter Weather

Analysis Year:	2018		
Asset / Location:	I-25 from Terry Ranch Rd to College Dr, ML80 from 2.66 to 7.85		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Performance
Issues:	High truck traffic, 4,779 trucks per day. Estimated truck delay cost approximately $424,167 per mile per year.		

Vulnerabilities	Strengths	Objectives
Route carries 4,779 trucks per day	Several trucking services available at College Dr.	Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck 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
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.	
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 urban alternative routes. 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 splitting of emergency services.	1. Organize winter weather emergency routing procedures with local jurisdictions.

Appendix D

Light High-Profile Vehicle Blowover Risk Action Plans

Wyoming Department of Transportation Freight Resilience Action Plans - Light High-Profile Vehicle Blowover Risk

Analysis Year:	2018		
Asset / Location:	I-25 from Colorado State Line to I-80, ML25 from 0 to 9		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Performance
Issues:	Very high truck traffic, 4629 trucks per day. Averages 25 closures per year at 5 hours per closure.		

Vulnerabilities	Strengths	Objectives
Route carries 4629 trucks per day		Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck delays and closures. 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	Establish alternative routing procedures to implement during extreme wind events.	1. Fairly low cost fix.	1. Wind events can sometimes last a very short time, are difficult to predict the duration and can vary considerably over a short time period. Rerouting could increase truck delay as a result.	
D	O	Significantly reduce truck speed limits during wind events.	1. Improves safety while maintaining a portion of mobility.	1. May require installing variable speed limit signs for trucks. 2. Could create high speed variability between cars and trucks.	1. Inform shippers and WTA.
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause high wind gust areas.	1. A very few modifications may be easily accomplished at low cost. 2. High wind gust locations are well established.	1. Can be very expensive. 2. Other 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.

Wyoming Department of Transportation Freight Resilience Action Plans - Light High-Profile Vehicle Blowover Risk

Analysis Year:	2018		
Asset / Location:	I-25 from I-80 to N of Wheatland, ML25 from 9 to 81		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	5	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Performance
Issues:	Fairly high truck traffic, 2206 trucks per day. Averages 34 closures per year at 5 hours per closure.		

Vulnerabilities	Strengths	Objectives
Route carries 2206 trucks per day		Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck delays and closures. 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	Establish alternative routing procedures to implement during extreme wind events.	1. Fairly low cost fix.	1. Wind events can sometimes last a very short time, are difficult to predict the duration and can vary considerably over a short time period. Rerouting could increase truck delay as a result.	
D	O	Significantly reduce truck speed limits during wind events.	1. Improves safety while maintaining a portion of mobility.	1. May require installing variable speed limit signs for trucks. 2. Could create high speed variability between cars and trucks.	1. Inform shippers and WTA.
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause high wind gust areas.	1. A very few modifications may be easily accomplished at low cost. 2. High wind gust locations are well established.	1. Can be very expensive. 2. Other 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.

Wyoming Department of Transportation Freight Resilience Action Plans - Light High-Profile Vehicle Blowover Risk

Analysis Year:	2018		
Asset / Location:	I-80 from Walcott Jct to Laramie, ML80 from 224 to 317		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	2	Risk Consequence Rtg:	3
Priority Rtg:	Medium	Issue Type:	Performance
Issues:	Very high truck traffic, 5967 trucks per day. Averages 8 closures per year at 3 hours per closure.		

Vulnerabilities	Strengths	Objectives
Route carries 5967 trucks per day		Return I-80 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck delays and closures. 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	Establish alternative routing procedures to implement during extreme wind events.	1. Fairly low cost fix.	1. Wind events can sometimes last a very short time, are difficult to predict the duration and can vary considerably over a short time period. Rerouting could increase truck delay as a result.	
D	O	Significantly reduce truck speed limits during wind events.	1. Improves safety while maintaining a portion of mobility.	1. May require installing variable speed limit signs for trucks. 2. Could create high speed variability between cars and trucks.	1. Inform shippers and WTA.
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause high wind gust areas.	1. A very few modifications may be easily accomplished at low cost. 2. High wind gust locations are well established.	1. Can be very expensive. 2. Other 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.

Wyoming Department of Transportation Freight Resilience Action Plans - Light High-Profile Vehicle Blowover Risk

Analysis Year:	2018		
Asset / Location:	I-25 from N of Wheatland to S of Douglas, ML25 from 81 to 132		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	3	Risk Consequence Rtg:	1
Priority Rtg:	Low	Issue Type:	Performance
Issues:	Fairly high truck traffic, 1622 trucks per day. Averages 15 closures per year at 1 hour per closure.		

Vulnerabilities	Strengths	Objectives
Route carries 1622 trucks per day		Return I-25 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck delays and closures. Maintain safety and mobility in the region.

Perform Action Before, During or After the Event	Harden, Redundant, Operational, Plan	Actions	Pros	Cons	Potential Tasks Involving Stakeholders
D	O	Establish alternative routing procedures to implement during extreme wind events.	1. Fairly low cost fix.	1. Wind events can sometimes last a very short time, are difficult to predict the duration and can vary considerably over a short time period. Rerouting could increase truck delay as a result.	
D	O	Significantly reduce truck speed limits during wind events using variable speed limit signage.	1. Improves safety while maintaining a portion of mobility.	1. May require installing variable speed limit signs for trucks. 2. Could create high speed variability between cars and trucks.	1. Inform shippers and WTA.
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause high wind gust areas.	1. A very few modifications may be easily accomplished at low cost. 2. High wind gust locations are well established.	1. Can be very expensive. 2. Other 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.

Wyoming Department of Transportation Freight Resilience Action Plans - Light High-Profile Vehicle Blowover Risk

Analysis Year:	2018		
Asset / Location:	I-80 from Laramie to Cheyenne, ML80 from 317 to 370		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	1	Risk Consequence Rtg:	2
Priority Rtg:	Low	Issue Type:	Performance
Issues:	Very high truck traffic, 7114 trucks per day. Averages 8 closures per year at 3 hours per closure.		

Vulnerabilities	Strengths	Objectives
Route carries 7114 trucks per day		Return I-80 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck delays and closures. 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	Establish alternative routing procedures to implement during extreme wind events.	1. Fairly low cost fix.	1. Wind events can sometimes last a very short time, are difficult to predict the duration and can vary considerably over a short time period. Rerouting could increase truck delay as a result.	
D	O	Significantly reduce truck speed limits during wind events using variable speed limit signage.	1. Improves safety while maintaining a portion of mobility.	1. May require installing variable speed limit signs for trucks. 2. Could create high speed variability between cars and trucks.	1. Inform shippers and WTA.
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause high wind gust areas.	1. A very few modifications may be easily accomplished at low cost. 2. High wind gust locations are well established.	1. Can be very expensive. 2. Other 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.

Wyoming Department of Transportation Freight Resilience Action Plans - Light High-Profile Vehicle Blowover Risk

Analysis Year:	2018		
Asset / Location:	I-80 from W of Rawlins to Walcott Jct, ML80 from 206 to 224		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	1	Risk Consequence Rtg:	1
Priority Rtg:	Low	Issue Type:	Performance
Issues:	Very high truck traffic, 6968 trucks per day. Averages 8 closures per year at 3 hours per closure.		

Vulnerabilities	Strengths	Objectives
Route carries 6968 trucks per day		Return I-80 traffic to normal conditions as quickly as possible. Minimize user, agency and societal costs. Minimize truck delays and closures. 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	Establish alternative routing procedures to implement during extreme wind events.	1. Fairly low cost fix.	1. Wind events can sometimes last a very short time, are difficult to predict the duration and can vary considerably over a short time period. Rerouting could increase truck delay as a result.	
D	O	Significantly reduce truck speed limits during wind events using variable speed limit signage.	1. Improves safety while maintaining a portion of mobility.	1. May require installing variable speed limit signs for trucks. 2. Could create high speed variability between cars and trucks.	1. Inform shippers and WTA.
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause high wind gust areas.	1. A very few modifications may be easily accomplished at low cost. 2. High wind gust locations are well established.	1. Can be very expensive. 2. Other 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.

Appendix E

Environmental – Nonattainment Area Creation Risk Action Plans

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

Analysis Year:	2018		
Asset / Location:	I-80 Buford to East of Cheyenne, ML80 from 336.6 to 370.39		
Ownership:	WYDOT	Criticality Rank:	1 of 46
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 truck delay estimate at 55,700 hours per mile.		Reduce delays and subsequent pollutant emissions on I-80. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 East of Cheyenne, ML80 from 370 to 377		
Ownership:	WYDOT	Criticality Rank:	1 of 46
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 truck delay estimate at 12,883 hours per mile.		Reduce delays and subsequent pollutant emissions on I-80. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 East of Cheyenne to Nebraska State Line, ML80 from 377.37 to 402.78		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	5
Priority Rtg:	High	Issue Type:	Environmental
Issues:	Ozone level is about 90% of exceedance level and PM10 is at 78%. Port of entry west of Cheyenne delays trucks.		

Vulnerabilities	Strengths	Objectives
Over 100,000 population affected in Laramie County. Annual truck delay estimate at 9,100 hours per mile.		Reduce delays and subsequent pollutant emissions on I-80. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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,O	Increase the use of PrePass at the port of entry.	1. Reduces truck idling at the port of entry. 2. Effective year round rather than just in winter months.	1. Requires buy-in from truckers.	1. Promote with WTA and truckers.
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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year: 2018
Asset / Location: I-25 from Colorado State Line to I-80, ML25 from 0 to 8.84
Ownership: WYDOT
Risk Probability Rtg: 5
Priority Rtg: High
Criticality Rank: 2 of 46
Risk Consequence Rtg: 5
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 truck delay estimate at 11,400 hours per mile.		Reduce delays and subsequent pollutant emissions on I-25. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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,O	Increase the use of PrePass at the port of entry.	1. Reduces truck idling at the port of entry. 2. Effective year round rather than just in winter months.	1. Requires buy-in from truckers.	1. Promote with WTA and truckers.
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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 from Rock Springs to Creston Jct, ML80 from 105.1 to 187.25		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	5	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Environmental
Issues:	Ozone level is about 96% of exceedance level and PM10 is at 63%.		

Vulnerabilities	Strengths	Objectives
About 44,000 population affected in Sweetwater County. Annual truck delay estimate at 20,500 hours per mile.		Reduce delays and subsequent pollutant emissions on I-80. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 from Creston Jct to W of Rawlins, ML80 from 187.25 to 199.05		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	5	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Environmental
Issues:	Ozone level is about 96% of exceedance level and PM10 is at 63%.		

Vulnerabilities	Strengths	Objectives
About 44,000 population affected in Sweetwater County. Annual truck delay estimate at 22,000 hours per mile.		Reduce delays and subsequent pollutant emissions on I-80. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-25 from I-80 to N of Cheyenne, ML25 from 9 to 25		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	4	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 truck delay estimate at 9,500 hours per mile.		Reduce delays and subsequent pollutant emissions on I-25. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 Uinta County Line to Rock Springs, ML80 from 57.04 to 105.1		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	High	Issue Type:	Environmental
Issues:	Ozone level is about 96% of exceedance level and PM10 is at 63%.		

Vulnerabilities	Strengths	Objectives
About 44,000 population affected in Sweetwater County. Annual truck delay estimate at 10,100 hours per mile.		Reduce delays and subsequent pollutant emissions on I-80. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 West of Laramie, ML80 from 280.9 to 316.71		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	5	Risk Consequence Rtg:	3
Priority Rtg:	High	Issue Type:	Environmental
Issues:	Ozone level is about 87% of exceedance level and PM10 is at 65%.		

Vulnerabilities	Strengths	Objectives
Over 39,000 population affected in Albany County. Annual truck delay estimate at 81,000 hours per mile.		Reduce delays and subsequent pollutant emissions on I-80. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 East of Laramie, ML80 from 316.71 to 336.6		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	5	Risk Consequence Rtg:	3
Priority Rtg:	High	Issue Type:	Environmental
Issues:	Ozone level is about 87% of exceedance level and PM10 is at 65%.		

Vulnerabilities	Strengths	Objectives
Over 39,000 population affected in Albany County. Annual truck delay estimate at 75,000 hours per mile.		Reduce delays and subsequent pollutant emissions on I-80. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 Evanston to Ft Bridger, ML80 from 3.45 to 33.39		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	5	Risk Consequence Rtg:	3
Priority Rtg:	Medium	Issue Type:	Environmental
Issues:	Ozone level is about 89% of exceedance level.		

Vulnerabilities	Strengths	Objectives
About 21,000 population affected in Uinta County. Annual truck delay estimate at 23,300 hours per mile.		Reduce delays and subsequent pollutant emissions on I-80. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-90 through Gillette, ML90 from 119.2 to 132.94		
Ownership:	WYDOT	Criticality Rank:	3 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Environmental
Issues:	Ozone level is about 90% of exceedance level and PM10 is at 54%.		

Vulnerabilities	Strengths	Objectives
Over 49,000 population affected in Campbell County. Annual truck delay estimate at 6,600 hours per mile.		Reduce delays and subsequent pollutant emissions on I-90. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-90 Gillette to Crook County Line, ML90 from 132.94 to 147.45		
Ownership:	WYDOT	Criticality Rank:	3 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Environmental
Issues:	Ozone is near 90% of exceedance and PM10 is near 75%.		

Vulnerabilities	Strengths	Objectives
Nearly 50,000 population affected in Campbell County. Annual truck delay estimate at 4,100 hours per mile.		Reduce delays and subsequent pollutant emissions on I-90. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-90 South of Montana State Line, ML90 from 0 to 9.92		
Ownership:	WYDOT	Criticality Rank:	3 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Medium	Issue Type:	Environmental
Issues:	PM2.5 is near 100% of exceedance and ozone is at 80%.		

Vulnerabilities	Strengths	Objectives
Over 31,000 population affected in Campbell County. Annual truck delay estimate at 1,900 hours per mile.		Reduce delays and subsequent pollutant emissions on I-90. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-90 South of Montana State Line to Sheridan, ML90 from 9.92 to 23.07		
Ownership:	WYDOT	Criticality Rank:	3 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Medium	Issue Type:	Environmental
Issues:	PM2.5 is near 100% of exceedance and ozone is at 80%. Port of entry may cause some of the delay.		

Vulnerabilities	Strengths	Objectives
Over 31,000 population affected in Campbell County.		Reduce delays and subsequent pollutant emissions on I-90.
Annual truck delay estimate at 2,500 hours per mile.		Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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,O	Increase the use of PrePass at the port of entry.	1. Reduces truck idling at the port of entry. 2. Effective year round rather than just in winter months.	1. Requires buy-in from truckers.	1. Promote with WTA and truckers.
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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-90 South of Sheridan, ML90 from 23.07 to 41.96		
Ownership:	WYDOT	Criticality Rank:	3 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Medium	Issue Type:	Environmental
Issues:	PM2.5 is near 100% of exceedance and ozone is at 80%.		

Vulnerabilities	Strengths	Objectives
Over 31,000 population affected in Sheridan County. Annual truck delay estimate at 3,600 hours per mile.		Reduce delays and subsequent pollutant emissions on I-90. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	WY-220 in Casper, ML21 from 113.38 to 117		
Ownership:	WYDOT	Criticality Rank:	5 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	4
Priority Rtg:	Medium	Issue Type:	Environmental
Issues:	Ozone is at about 90% of exceedance level.		

Vulnerabilities	Strengths	Objectives
Over 83,000 population affected in Natrona County. Annual truck delay estimate at 3,800 hours per mile.		Reduce delays and subsequent pollutant emissions on WY-220. Provide alternatives to truck idling.

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 trucks 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 trucks thereby improving emissions reductions.	1. Since this is mostly in an urban area, snow fence may not be practical.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 Utah State Line to Evanston, ML80 from 0 to 3.45		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	Ozone level is about 89% of exceedance level. Port of entry may cause some of the delay.		

Vulnerabilities	Strengths	Objectives
About 21,000 population affected in Uinta County.		Reduce delays and subsequent pollutant emissions on I-80.
Annual truck delay estimate at 11,400 hours per mile.		Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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,O	Increase the use of PrePass at the port of entry.	*1. Reduces truck idling at the port of entry.* *2. Effective year round rather than just in winter months.*	1. Requires buy-in from truckers.	1. Promote with WTA and truckers.
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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 Ft Bridger to Lyman, ML80 from 33 to 48		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	Ozone level is about 89% of exceedance level.		

Vulnerabilities	Strengths	Objectives
About 21,000 population affected in Uinta County.		Reduce delays and subsequent pollutant emissions on I-80.
Annual truck delay estimate at 9,000 hours per mile.		Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-80 East of Lyman, ML80 from 48.33 to 57.04		
Ownership:	WYDOT	Criticality Rank:	1 of 46
Risk Probability Rtg:	4	Risk Consequence Rtg:	3
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	Ozone level is about 89% of exceedance level.		

Vulnerabilities	Strengths	Objectives
About 21,000 population affected in Uinta County. Annual truck delay estimate at 14,000 hours per mile.		Reduce delays and subsequent pollutant emissions on I-80. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-90 West of Gillette, ML90 from 96 to 119.2		
Ownership:	WYDOT	Criticality Rank:	3 of 46
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	Ozone is near 90% of exceedance and PM10 is near 75%.		

Vulnerabilities	Strengths	Objectives
Nearly 50,000 population affected in Campbell County. Annual truck delay estimate at 1,500 hours per mile.		Reduce delays and subsequent pollutant emissions on I-90. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-25 through Casper, ML25 from 175.1 to 191.62		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	Ozone level is about 90% of exceedance level.		

Vulnerabilities	Strengths	Objectives
Over 83,000 population affected in Natrona County. Annual truck delay estimate at 3,000 hours per mile.		Reduce delays and subsequent pollutant emissions on I-25. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	I-25 N of Casper, ML25 from 191.62 to 228.25		
Ownership:	WYDOT	Criticality Rank:	2 of 46
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	Ozone level is about 90% of exceedance level.		

Vulnerabilities	Strengths	Objectives
Over 83,000 population affected in Natrona County.		Reduce delays and subsequent pollutant emissions on I-25.
Annual truck delay estimate at 1,500 hours per mile.		Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	US-191 from Rock Springs to N of Farson, ML13B from 0 to 51.62		
Ownership:	WYDOT	Criticality Rank:	12 of 46
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	Ozone is at about 96% of exceedance level.		

Vulnerabilities	Strengths	Objectives
About 44,000 population affected in Sweetwater County. Annual truck delay estimate at 1,100 hours per mile.		Reduce delays and subsequent pollutant emissions on US-191. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	WY-220 N of Muddy Gap to Casper, ML21 from 57 to 113.38		
Ownership:	WYDOT	Criticality Rank:	5 of 46
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	Ozone is at about 90% of exceedance level.		

Vulnerabilities	Strengths	Objectives
Over 83,000 population affected in Natrona County. Annual truck delay estimate at 1,700 hours per mile.		Reduce delays and subsequent pollutant emissions on WY-220. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	WY-59 south of Gillette, ML43 from 61 to 112		
Ownership:	WYDOT	Criticality Rank:	8 of 46
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	Ozone is at about 90% of exceedance level and PM10 is near 75%.		

Vulnerabilities	Strengths	Objectives
Nearly 50,000 population affected in Campbell County. Annual truck delay estimate at 2,700 hours per mile.		Reduce delays and subsequent pollutant emissions on WY-59. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	WY-59 south of Gillette, ML43 from 61 to 112		
Ownership:	WYDOT	Criticality Rank:	8 of 46
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	Ozone is at about 90% of exceedance level and PM10 is near 75%.		

Vulnerabilities	Strengths	Objectives
Nearly 50,000 population affected in Campbell County. Annual truck delay estimate at 2,700 hours per mile.		Reduce delays and subsequent pollutant emissions on WY-59. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	US-26/WY-789 from Riverton to Shoshoni, ML20B from 104 to 127		
Ownership:	WYDOT	Criticality Rank:	9 of 46
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	Ozone is at about 89% of exceedance level and PM2.5 is near 66%.		

Vulnerabilities	Strengths	Objectives
Over 40,000 population affected in Fremont County. Annual truck delay estimate at 2,700 hours per mile.		Reduce delays and subsequent pollutant emissions on US-26/WY-789. Provide alternatives to truck idling.

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 trucks 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 trucks 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 trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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 Freight Resilience Action Plans - Nonattainment Area Creation (Environmental)

Analysis Year:	2018		
Asset / Location:	US-20/26 in Casper, ML34B from 0 to 10		
Ownership:	WYDOT	Criticality Rank:	6 of 46
Risk Probability Rtg:	3	Risk Consequence Rtg:	4
Priority Rtg:	Low	Issue Type:	Environmental
Issues:	Ozone is at about 90% of exceedance level.		

Vulnerabilities	Strengths	Objectives
Over 83,000 population affected in Natrona County. Annual truck delay estimate at 1,800 hours per mile.		Reduce delays and subsequent pollutant emissions on US-20/26. Provide alternatives to truck idling.

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 trucks 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 trucks thereby improving emissions reductions.	1. Since this is mostly in an urban area, snow fence may not be practical.	
B	H	Assess and modify safety barriers, cuts, slopes and other geometrics that cause snow drifting.	1. Could reduce inefficient slowing of trucks 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 trucking delays and crashes. 2. Technology can reduce risk taking behaviors. 3. Can optimize truck movement efficiencies and dissuade truckers from approaching conditions that create increased emissions thereby reducing 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 the trucking industry.	1. Contact 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.