Executive Summary

I-80 CORRIDOR STUDY

MASTER PLAN IMPLEMENTATION REPORT

Wyoming Department of Transportation

Final March 2018

Table of Contents

Study Overview

The overall goal of the Interstate 80 Master Plan is to improve the safety and mobility along I-80 throughout the State of Wyoming. The Plan analyzes the current and future conditions, identifies infrastructure needs, and explores funding options.

The study was prompted by the introduction of Senate File 140 (SF140) in the legislature in the spring of 2017. The Senate File recommended an I-80 master plan be developed to identify corridor needs, identify essential improvements, rank them in order of importance, and develop a financial plan for their implementation. Although the bill was not passed by the legislature, WYDOT proceeded with the study because of the importance of maintaining and improving I-80 within the state's transportation network.

The I-80 Master Plan builds on previous I-80 planning documents including the I-25/I-80 Interchange Study (November 2008), Recommended Interstate 80 Safety Improvements to Reduce Fatal and Serious Injury Crashes (August 2008) and the Interstate 80 Tolling Feasibility Study, Phase 2 (November 2009).

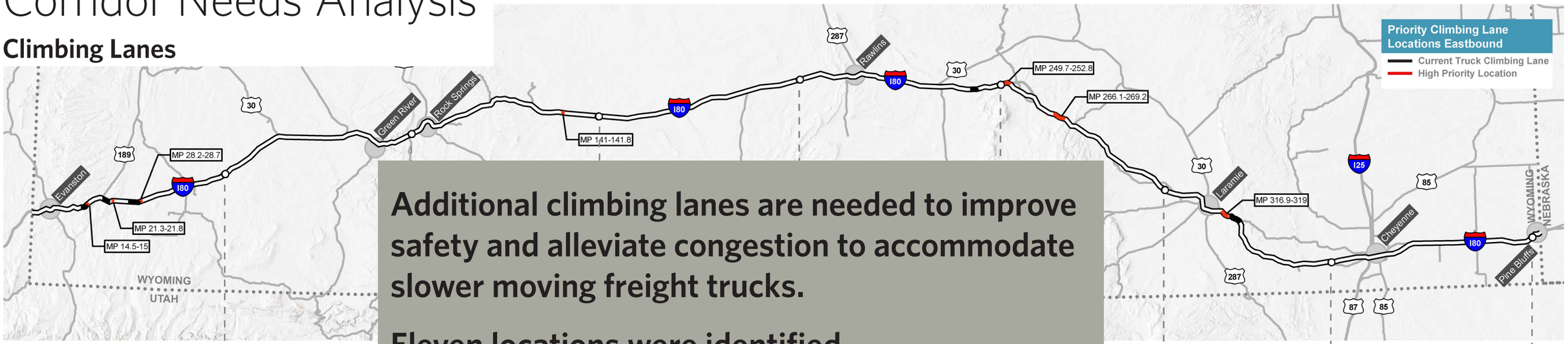
The study was conducted during the summer and fall of 2017. Final revisions based on comments received were completed in March 2018.

Project Schedule

Task/Activity	2017							
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Traffic Forecasts	●	→	→					
Roadway Analysis	●	→	→	→				
Alternatives Analysis	●	→	→	→	→	→	→	
Financial and Legislative Analysis	●	→	→	→	→			
Prior Studies	●	→	→	→	→●	→	→	→
Report	●	→	→	→	→	→	→	→

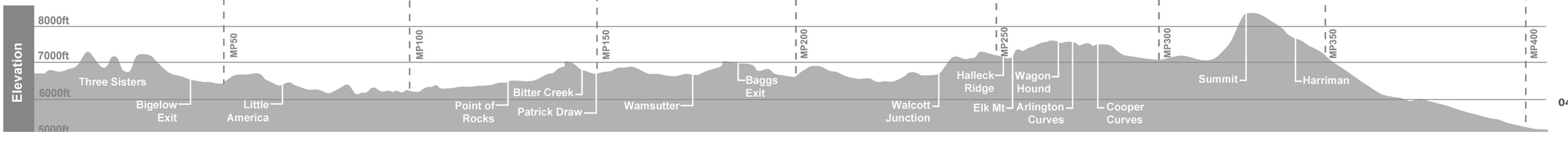
Corridor Needs Analysis

Climbing Lanes



Additional climbing lanes are needed to improve safety and alleviate congestion to accommodate slower moving freight trucks.

Eleven locations were identified.



Climbing Lane Benefit-Cost Ratios

BCR Rank	Project	Total Benefits ($ millions)	Total Costs ($ millions)	Net Present Value ($ millions)	BCR
1	CL-01 EB (MP 14.529-15.029)	$3.4	$0.7	$2.7	5.0
2	CL-10 WB (MP 20.381-19.881)	$2.9	$0.8	$2.1	3.6
3	CL-02 EB (MP 21.268-21.768)	$2.3	$1.0	$1.3	2.2
4	CL-11 WB (MP 13.278-12.778)	$3.3	$1.9	$1.4	1.8
5	CL-07 EB (MP 316.89-318.97)	$8.4	$5.0	$3.4	1.7
6	CL-05 EB (MP 249.7-252.78)	$6.2	$4.2	$2.0	1.5
7	CL-06 EB (MP 266.052-269.2)	$7.2	$5.1	$2.2	1.4
8	CL-08 WB (MP 343-339.938)	$9.7	$7.1	$2.6	1.4
9	CL-04 EB (MP 140.676-142.15)	$2.6	$2.3	$0.3	1.2
10	CL-09 WB (MP 252.64-251.36)	$1.9	$2.5	-$0.6	0.8
11	CL-03 EB (MP 28.199-28.699)	$0.4	$1.0	-$0.6	0.4

A benefit-cost analysis was used to prioritize the additional climbing lane locations. This analysis is included in Appendix C of the *I-80 Corridor Study Master Plan Implementation Report*.

The 11 locations together would cost $32M to $46M (2017$).

Additional Lane Cost Estimate

Project Description	Low Cost (2017$)	High Cost (2017$)
3rd Lane Statewide (Asphalt)	$2.0 Billion	$2.9 Billion
3rd Lane Statewide (Concrete)	$3.0 Billion	$4.3 Billion

Right-of-way costs are inconsequential.

The cost of adding a third lane in both directions across Wyoming was estimated.

The third lane could be:

- **A general purpose lane.**
- **An exclusive lane for trucks**
- **A lane for autonomous and/or connected vehicles.**

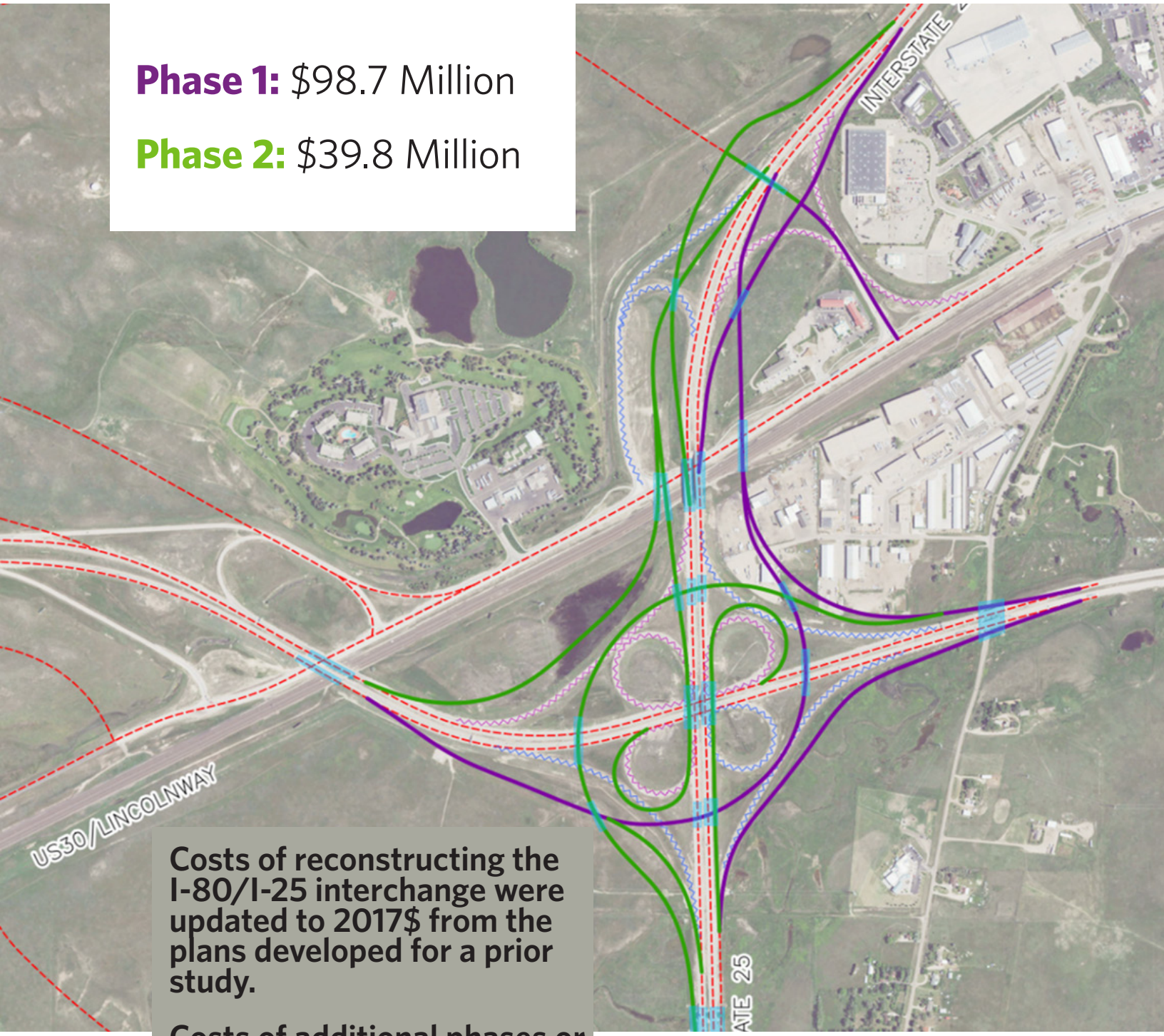
A life cycle cost comparison of pavement surface type showed that $301 million could be saved over the life of the program by using asphalt instead of concrete.

Appendix D of the *I-80 Corridor Study Master Plan Implementation Report* contains the life cycle cost analysis.

I-80/I-25 Cost Estimate (2017 Dollars)

Phase 1: $98.7 Million

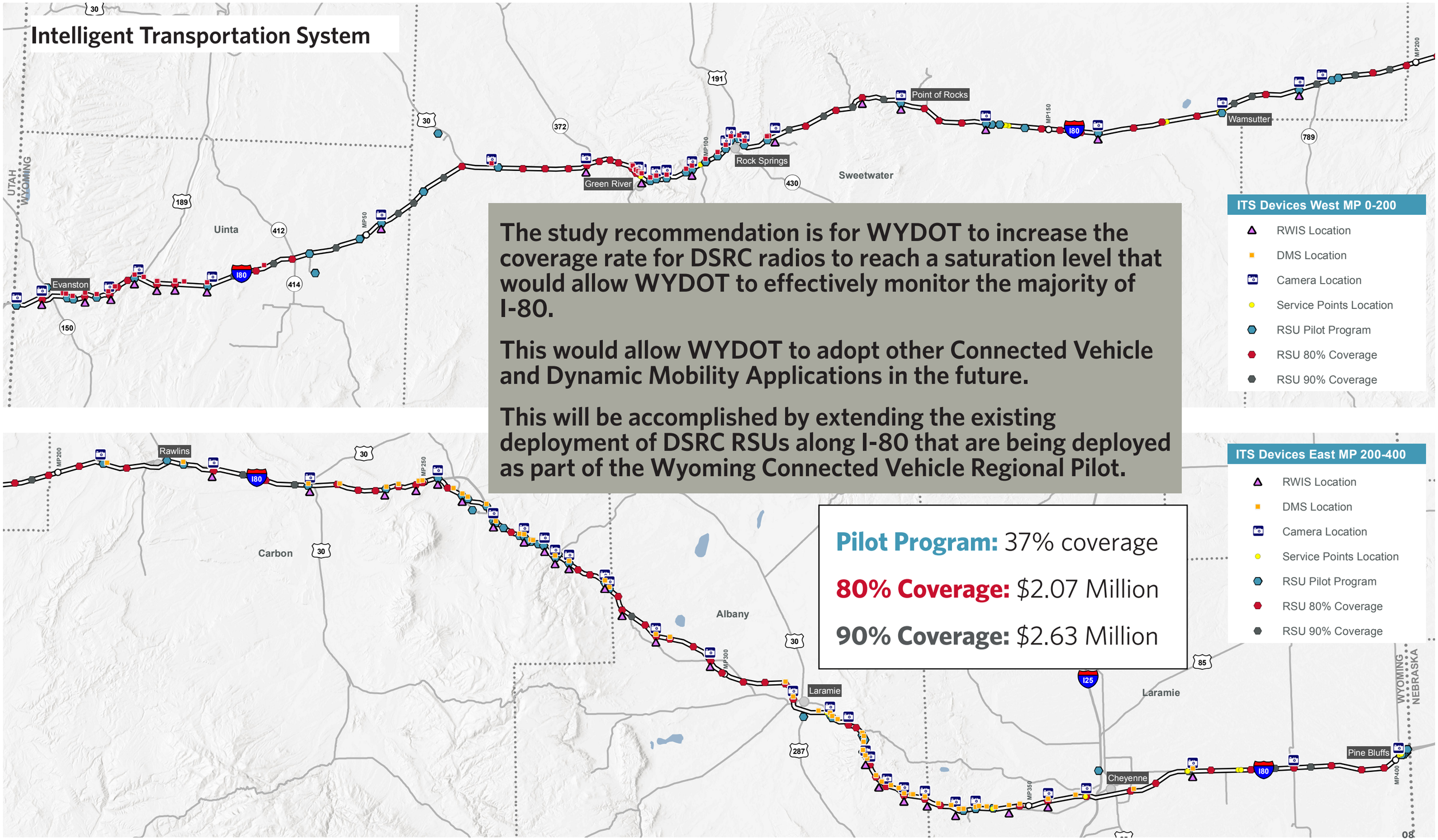
Phase 2: $39.8 Million



Costs of reconstructing the I-80/I-25 interchange were updated to 2017$ from the plans developed for a prior study.

Costs of additional phases or arterial improvements were not updated.

Intelligent Transportation System



The study recommendation is for WYDOT to increase the coverage rate for DSRC radios to reach a saturation level that would allow WYDOT to effectively monitor the majority of I-80.

This would allow WYDOT to adopt other Connected Vehicle and Dynamic Mobility Applications in the future.

This will be accomplished by extending the existing deployment of DSRC RSUs along I-80 that are being deployed as part of the Wyoming Connected Vehicle Regional Pilot.

Pilot Program: 37% coverage

80% Coverage: $2.07 Million

90% Coverage: $2.63 Million

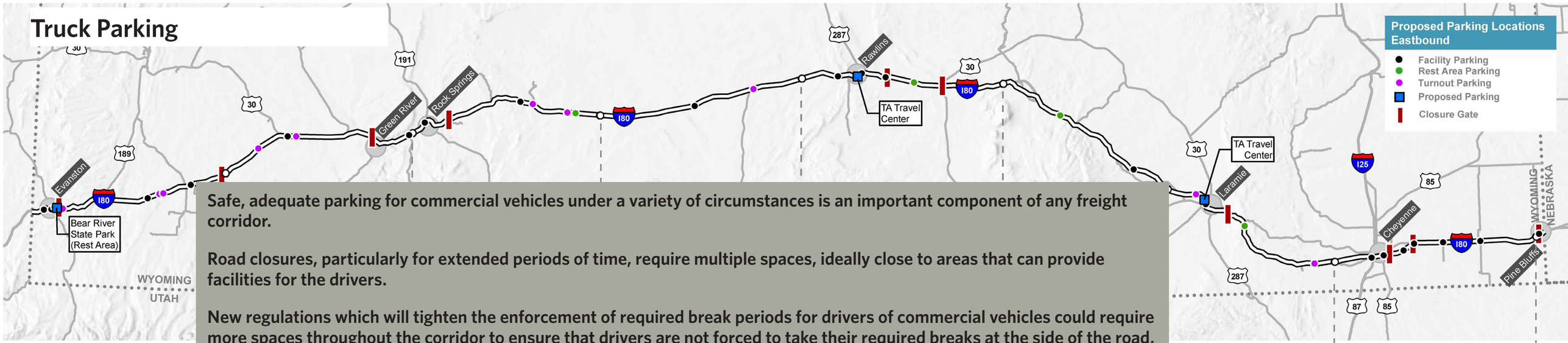
Truck Parking

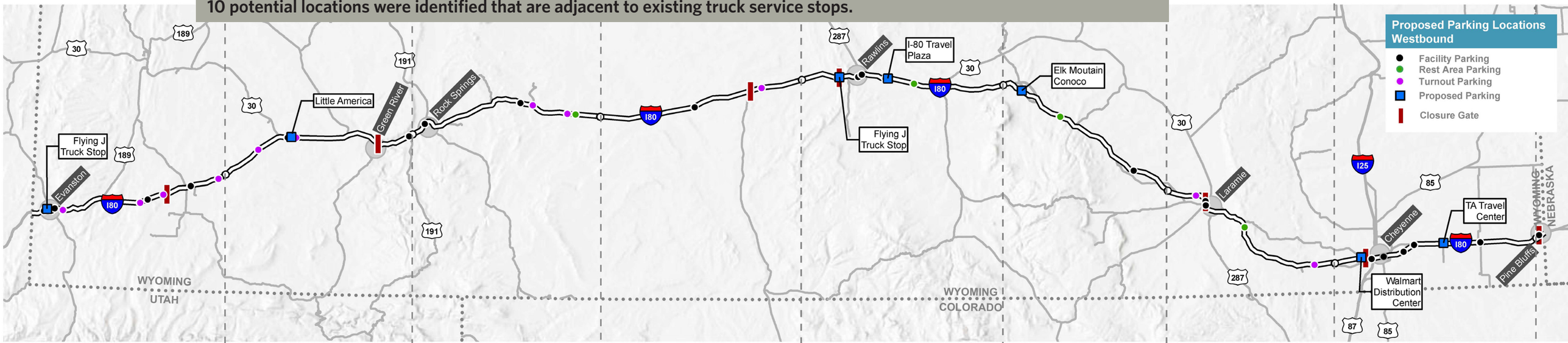
Safe, adequate parking for commercial vehicles under a variety of circumstances is an important component of any freight corridor.

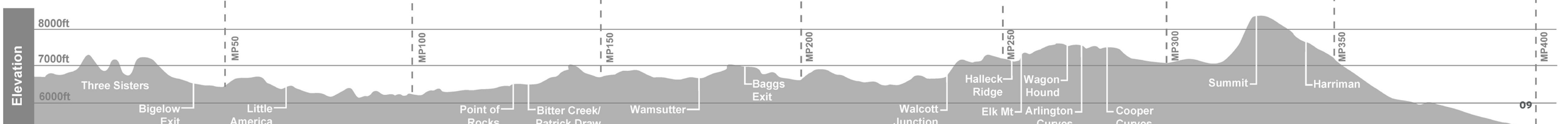
Road closures, particularly for extended periods of time, require multiple spaces, ideally close to areas that can provide facilities for the drivers.

New regulations which will tighten the enforcement of required break periods for drivers of commercial vehicles could require more spaces throughout the corridor to ensure that drivers are not forced to take their required breaks at the side of the road, potentially creating an unsafe condition.

10 potential locations were identified that are adjacent to existing truck service stops.







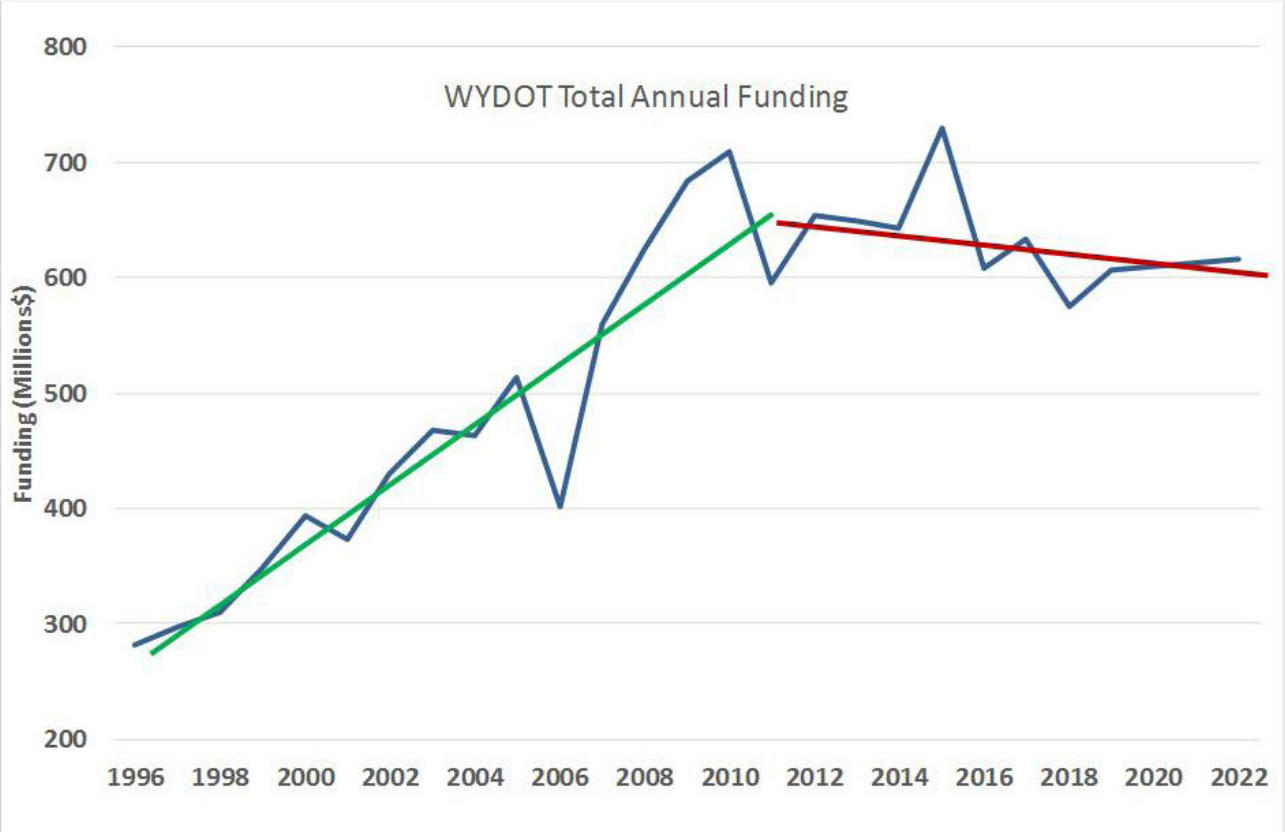
Financial Strategies

WYDOT Funding Trends

Between the mid-1990s and 2010, WYDOT's annual funding increased steadily, as indicated by the green trendline. Much of this increasing trend was because of increases in federal funding and infusions of money from Wyoming's General Fund.

The red trendline shows that since 2011, WYDOT's annual funding trend has moderated, because of reduced federal funding growth and reduced contributions from Wyoming's General Fund. The four major sources of WYDOT funding (federal formula funds, registration fees, federal mineral royalties, and motor fuel taxes) lack significant growth potential and, therefore, cannot keep pace with construction cost inflation and infrastructure that becomes more and more expensive to maintain as it ages.

This funding dilemma for WYDOT trickles down to individual assets, like I-80, that have unmet funding needs for maintenance and capital improvements, which impact safety and mobility.



Current Funding Sources

Federal Funding Sources

$300 million

Not expected to change during FAST Act
Potential for additional funding through discretionary programs

Vehicle Registration Fees

$85 million

Opportunity = Consider variable structure or indexing/increasing

Motor Fuel Taxes

$115 million

Opportunity = Consider indexing/increasing

Federal Mineral Royalties

$67 million

Increasing WYDOT share would reduce funding to other departments

Other Sources

Operators fees, special permits and others could be increased or restructured but would not have a major revenue impact

Four funding sources constitute about 95 percent of WYDOT funding. Federal funding levels are not likely to change during the current federal highway authorization, nor are federal mineral royalty allocations, which are provided to WYDOT based on a formula established by Wyoming legislature. Fuel taxes and vehicle registration fees are two sources that could be increased by raising or restructuring the rates/fees that are charged. Wyoming's fuel taxes are in line with other states but its registration fee is considerably lower, particularly for newer and heavier vehicles that are often charged a higher fee in other states.

Potential Funding Sources

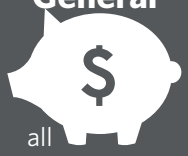
Potential funding sources that are used in other states include sales taxes, property taxes, and emissions reduction approaches, though the linkage between these taxing mechanisms and the transportation system may be weak, depending on how they are structured. Property taxes, for instance, would place the burden of funding transportation on property owners in Wyoming, when everyone, including out-of-state drivers, enjoy the use of the roads.

Discretionary federal grant programs are important funding sources for project-specific needs, and I-80 improvements could be competitive for certain programs that stress interstate commerce and projects of national significance. These programs are very competitive, however, and do not represent predictable flows of funding.

Sales Tax Approaches

Statewide or Localized

General



all goods

A 0.2 percent tax increase would yield $23M/year.

Motor Fuels

A 4 percent tax increase would yield $74M/year.

Transient

A 5 percent tax increase would yield $1M/year.

Alcohol & Tobacco

A 5 percent tax increase would yield $1M/year.

Personal or Real Property Tax

Property tax has a weak link to transportation but is used in some states. Five percent increase would yield $3M/year.

Cap and Trade

Experimental but proven in some markets

Mileage-Based User Fees

Several states are conducting pilot studies

Discretionary Federal Grants

Project-specific funding; US DOT reducing the required match for rural projects would help WYDOT

I-80 Tolling Analysis Results

Tolling at very low rates (10 cents per mile for five-axel trucks) could generate funding for a significant capital program, pay for all I-80 operations and maintenance, and contribute to funding other WYDOT properties statewide. Tolling could be done with or without the use of debt, but would require Wyoming to adopt tolling legislation and establish an organization within WYDOT to implement toll projects. Tolling at high rates can cause diversion of traffic to other free routes, particularly cross-country truck traffic, though the diversion impacts would be relatively low if toll rates were kept in the five to ten-cent per mile range for five-axle trucks.

Toll Rate Assumption (per mile)	$0.25 (heavy trucks) / $0.025 (cars)	
Toll Rate Escalation Assumption:	2.50% annual	1.00% annual
Gross Revenue Potential	$223.0 million	$190.5 million
Operating Expenses	$19.8 million	$19.6 million
Roadway Maintenance Expenses	$21.0 million	$21.0 million
Net Revenue Potential	$182.2 million	$149.9 million
Total Net revenues (2025 to 2054)	$12.4 billion	$7.7 billion
Indicative Net Bond Proceeds	$2.2 billion	$1.7 billion

Toll Rate Assumption (per mile)	$0.10 (heavy trucks) / $0.01 (cars)	
Toll Rate Escalation Assumption:	2.50% annual	1.00% annual
Gross Revenue Potential	$125.3 million	$99.9 million
Operating Expenses	$19.8 million	$19.6 million
Roadway Maintenance Expenses	$21.0 million	$21.0 million
Net Revenue Potential	$84.5 million	$59.3 million
Total Net revenues (2025 to 2054)	$5.8 billion	$2.7 billion
Indicative Net Bond Proceeds	$1.0 billion	$624.0 million

Federal Implications

2 FEDERAL PROGRAMS TO SUPPORT TOLLING

- *Interstate System Reconstruction and Rehabilitation Pilot Program*
- *Section 129 Toll Agreements - Bridge Reconstruction Program*

FACTS ABOUT IMPACTS

no IMPACTS TO CURRENT FEDERAL FUNDING AMOUNTS IF I-80 IS TOLLED

EXCESS **REVENUES** CAN BE USED ON OTHER PARTS OF THE FEDERAL AID SYSTEM IN WYOMING

MUST ADHERE TO **FEDERAL PROCUREMENT** REQUIREMENTS FOR ALL FEDERAL AID HIGHWAYS, REGARDLESS IF TOLLS ARE THE FUNDING MECHANISM

Tolling on interstates is restricted by FHWA, but several federal programs allow tolling, two of which could fit the I-80 Master Plan Projects. The Section 129 Tolling Agreement program could be used to fund capital improvements, operations, and maintenance, while the Interstate System Reconstruction and Rehabilitation Pilot Program is focused on non-capacity expanding projects. Both would enable tolling to fund major I-80 roadway improvements and neither would impact the current flows of federal funding to WYDOT. However, without state legislation to allow tolling, WYDOT cannot consider these programs as possible options.

Legislative Review

Tolling Legislation Possibilities

Current Wyoming laws do not allow WYDOT to toll, issue debt for transportation projects, or use design-build project delivery. Tolling legislation can be deployed in several ways ranging from statewide authority for WYDOT to use tolling where it is deemed appropriate, to facility specific legislation that restricts tolling to certain facilities (like I-80) for certain circumstances. Tolling is generally unpopular, but in an environment where funding needs are unmet, it is one of the cleanest funding mechanisms available to link the users benefiting from the infrastructure with the costs to provide it.

Design-Build Legislation

Design-build is a project delivery approach where the design and construction contracts are combined, and much of the schedule and cost overage risks are transferred to the construction contractor. This contracting approach is used throughout the U.S. for financed or large complex projects, but has not been needed in Wyoming to date due to the relatively small scale of highway improvements typically undertaken by WYDOT. Current Wyoming legislation could be amended to include highways. Adopting design-build legislation would require many Wyoming contractors to adjust their business models, and WYDOT would need to develop new procedures for project management. However, use of design-build delivery could provide value in fostering design innovation, efficiency, and cost savings.

Autonomous Vehicle Legislation

Autonomous vehicles are being driven by private industry and are quickly moving into the market. According to the National Council on State Legislatures. Twenty-one states have passed legislation related to autonomous vehicles.

Much of this legislation involves requirements on the performance expectations and testing needed for an autonomous vehicle manufacturer to operate vehicles on public roads in the respective State.

The legislative and policy landscape for autonomous vehicles is changing rapidly. In September of 2017, the National Highway Traffic Safety Administration (NHTSA) issued their second version of guidelines related to highly autonomous vehicles. In this guidance document NHTSA suggests Best Practices for States Regulatory Actions, as well as a division of responsibilities between the federal and state governments. Additionally, the guidelines set forth 12 safety priority elements and a voluntary self-assessment for manufacturers.

Autonomous Vehicle Legislation (con'td)

Following the issuance of the NHTSA guidelines, the U.S. House of Representatives passed the SELF DRIVE Act. The Senate bill has yet to undergo full vote in the Senate, but is expected to garner bi-partisan support. The SELF DRIVE Act would significantly change the legislative environment for states regarding highly autonomous vehicles.

The Wyoming legislature should consider establishing testing and performance requirements for highly autonomous vehicles in Wyoming. There are several topic areas that WYDOT and the Wyoming legislature consider, including:

- Providing a technology "neutral" environment.
- Provide licensing and registration procedures for Highly Automated Vehicles.
- Review traffic laws and regulations that may serve as a barrier to HAVs.
- Establish Administrative Oversight.
- Notification and Permission for Testing Process.
- Liability and Insurance Requirements for HAVs.
- Changes to Registration and Titling.