Regional Operations Plan

Central RTMC Region | District 2-0, 3-0, 9-0, and 10-0

May 2025

Pennsylvania
Department of Transportation

TSMO

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Executive Summary

This Regional Operations Plan (ROP) has been developed to cover the Pennsylvania Department of Transportation (PennDOT) Central Region. This region is comprised of PennDOT Engineering Districts 2, 3, 9, and part of 10. This region is centered around the Regional Traffic Management Center (RTMC) located in Clearfield, PA at the PennDOT District 2-0 office.

The previous ROP process for this region was completed in 2018 with an interim update done in 2021. Since adoption, 63% of projects listed on the ROP saw progress with 16% being completed. More information and project status updates as well as a new before and after analysis can be found in Chapter 7 of this document.

This ROP has been compiled based on guidance from the *TSMO Guidebook, Part I: Planning*, a PennDOT document which describes how to implement the statewide approach to Transportation Systems Management and Operations (TSMO). TSMO is a set of integrated strategies used to increase the reliability and mobility of existing roadway infrastructure without adding capacity. The ROP will complement the TSMO Program Plan by identifying the regional approach to traffic operations and sets the stage for regional implementation of TSMO strategies.

This document will help to enable the Central Region of Pennsylvania to:

- Meet federal requirements related to Intelligent Transportation System (ITS) planning (23 CFR 940)
- Incorporate statewide TSMO goals for operations planning at the regional level
- Utilize objectives-driven, performance-based planning processes for operations and congestion management planning
- Integrate/mainstream ITS and operations planning into the overall transportation planning process, per Federal Highway Administration (FHWA) guidance
- Identify and prioritize TSMO capital projects as part of the Transportation Improvement Program (TIP)
- Manage funds for the TSMO operations and maintenance (O&M) in future years

It is anticipated that this ROP will be updated every four or five years with an interim update every two years. Similar to the Long Range Transportation Plan (LRTP), the ROP should, at a minimum, identify which projects could be undertaken within the first four years, aligning these projects for potential inclusion in the Transportation Improvement Program (TIP).

The planning process was led by a Steering Committee which included PennDOT Bureau of Operations (BOO), PennDOT Districts 2-0, 3-0, 9-0, and 10-0. This Steering Committee met two times through the process and helped review and refine the message and material to be presented to stakeholders. The Stakeholder Groups included each of the region's Metropolitan Planning Organizations (MPO) and Rural Planning Organizations (RPO), as well as PennDOT District Planning & Programming, District Safety, and District Traffic, and the Pennsylvania Turnpike Commission (PTC). Stakeholder Groups met two times in each District for a total of six meetings. Stakeholder meetings were used to present information on the ROP process and to receive valuable input from the assembled stakeholders on each phase of the plan's development.

A summary of the LRTP for each of the planning partners is provided in this document, as well as a discussion of the regional demographics and key transportation elements. Significant transportation corridors are identified, including the region's interstates, as well as most US Routes, and a few of the most important Pennsylvania state routes.

A summary of existing conditions is provided within this document, including the current ITS elements, existing congestion and safety issues, and notable recently completed projects. Looking towards the future, a discussion of planned infrastructure and land use changes is included, as well as a list of major roadway projects under consideration.

The PennDOT One Map website (gis.penndot.gov/OneMap) was heavily utilized in the development of this plan. The availability of extensive data on the region's operations was tremendously helpful in pinpointing existing congestion and safety issues, as well as identifying gaps in current ITS device coverage. These various hotspots were presented to the Steering Committee and Stakeholder Groups throughout the ROP process and refined based on input received at meetings.

Through data analysis and stakeholder input, a list of the region's transportation needs and operation issues was developed. These needs and issues include the following:

- Traveler Information
- Incident and Emergency Management
- Transportation System Safety
- Traffic Signal Improvements
- Communications Network
- Enhanced Asset Management
- Automated Systems Management

Projects were then developed for identified hotspots based on these issues and needs. Of particular focus in this ROP are Integrated Corridor Management (ICM) projects which seek to improve incident management and maximize use of available capacity on important parallel corridors. There are also a number of safety-related TSMO projects, including Dynamic Curve Warning systems, Queue Warning systems, and Variable Speed Displays.

The ROP Projects were then divided into High Priority and Normal Priority categories. High Priority projects were identified by stakeholder input as the most operationally impactful projects. The following tables show the complete list of recommended projects for the Central RTMC Region.

HIGH PRIORITY PROJECT LIST

Project Number	Project Name	Priority Area	Planned Improvement
CN.01	I-80 Fiber Optic Backbone	Communications Network	Fiber Deployment
FA.01	US 22/322 ITS Gaps	Freeway & Arterial Operations	CCTV, CMS, RWIS, & VSL
FA.02	District 3 I-80 Corridor ITS Gaps	Freeway & Arterial Operations	CCTV, CMS, RWIS, & VSL
FA.03	Future I-99 Corridor ITS Gaps	Freeway & Arterial Operations	CCTV, CMS, RWIS, & VSL
FA.04	I-180 Corridor ITS Gaps	Freeway & Arterial Operations	CCTV, CMS, RWIS, & VSL
FA.05	I-99 ITS Gaps	Freeway & Arterial Operations	CCTV, CMS, & RWIS
FA.06	RTMC Upgrades	Freeway & Arterial Operations	Videowall Upgrade
FA.07	Upgrade I-80 VSL	Freeway & Arterial Operations	VSL
FA.08	I-99 VSL	Freeway & Arterial Operations	VSL
TI.01	Arterial ITS in Elk and Clearfield Counties	Traveler Information	CCTV & CMS
TI.02	I-80 ITS Gaps District 10	Traveler Information	CCTV & CMS
TI.03	US 220 Global Detour Route ITS	Traveler Information	CCTV & CMS
TI.04	US 22 Cresson to Hollidaysburg ITS	Traveler Information	CCTV & CMS
TI.05	I-70 ITS Gaps	Traveler Information	CCTV & CMS
TI.06	US 322, Philipsburg to I-99 ITS	Traveler Information	CMS & Portable CMS
WO.01	US 22 Truck Chain-up Location ITS Support	Weather Operations	CMS & RWIS

Normal Priority Project List

Project Number	Project Name	Priority Area	Planned Improvement
AD.01	Antiquated CMS Structures	Antiquated Devices	CMS Structures
FA.09	ITS on US 219 in Elk County	Freeway & Arterial Operations	CCTV, CMS, & RWIS
FA.10	Winter Operations ITS	Freeway & Arterial Operations	CCTV, CMS, & RWIS
FA.11	Emporium CCTV & RWIS	Freeway & Arterial Operations	CCTV & RWIS
FA.12	PA 970 Traffic Signals Upgrade	Freeway & Arterial Operations	Traffic Signals Improvements
FA.13	Loganton RWIS	Freeway & Arterial Operations	RWIS
FA.14	US 22/322 ICM	Freeway & Arterial Operations	Traffic Signals Improvements
FA.15	Jacks Mountain ITS	Freeway & Arterial Operations	CCTV & RWIS
FA.16	US 322 Orange Detour ICM	Freeway & Arterial Operations	Traffic Signals Improvements, CCTV, & CMS
FA.17	Clarion/Venango County Detour ITS	Freeway & Arterial Operations	CCTV, CMS, & RWIS
FA.18	US 11 Detour ICM	Freeway & Arterial Operations	Traffic Signals Improvements
FA.19	CSVT Traffic Signal Timing Study	Freeway & Arterial Operations	Traffic Signals Improvements
FA.20	Danville Traffic Signal Upgrade	Freeway & Arterial Operations	Traffic Signals Improvements
FA.21	Sayre/Athens & Towanda Signal Upgrades	Freeway & Arterial Operations	Traffic Signals Improvements, CCTV, & CMS
FA.22	US 220 ICM	Freeway & Arterial Operations	Traffic Signals Improvements, CCTV, & CMS
FA.23	Roaring Spring Congestion Management	Freeway & Arterial Operations	Traffic Signals Improvements
FA.24	Ebensburg ICM	Freeway & Arterial Operations	Traffic Signals Improvements, CCTV, & Queue Warning
FA.25	US 219 ITS	Freeway & Arterial Operations	CCTV, CMS, RWIS, & Dynamic Curve Warning
FA.26	PA 56 Truck Warning	Freeway & Arterial Operations	Truck Warning System

Project Number	Project Name	Priority Area	Planned Improvement
FA.27	PA 56 Traffic Signal Improvement	Freeway & Arterial Operations	Traffic Signals Improvements & CCTV
FA.28	PA 601 Traffic Signal Upgrades	Freeway & Arterial Operations	Traffic Signals Improvements & CCTV
FA.29	PA 26 ITS	Freeway & Arterial Operations	CCTV, CMS, & RWIS
FA.30	South Atherton Traffic Signal Upgrade	Freeway & Arterial Operations	Traffic Signals Improvements
FA.31	Dubois Traffic Signals	Freeway & Arterial Operations	Traffic Signals Improvements
FA.32	Shiloh Road Corridor Study	Freeway & Arterial Operations	Traffic Signals Improvements
FA.33	Smart Truck Parking	Freeway & Arterial Operations	Smart Parking System
FA.34	North Atherton Signal Timing	Freeway & Arterial Operations	Traffic Signals Improvements
FA.35	US 322 & College Ave Exit ITS	Freeway & Arterial Operations	Traffic Signals Improvements & CCTV
FA.36	Centre Hall Traffic Signal	Freeway & Arterial Operations	Traffic Signals Improvements
FA.37	Philipsburg Traffic Signal Upgrades	Freeway & Arterial Operations	Traffic Signals Improvements
FA.38	PA 550 Traffic Signals Upgrades	Freeway & Arterial Operations	Traffic Signals Improvements
FA.39	SR 2014 Traffic Signal Connection	Freeway & Arterial Operations	Traffic Signals Improvements
FA.40	17th Street Traffic Signal Upgrades	Freeway & Arterial Operations	Traffic Signals Improvements
FA.41	Punxsutawney Traffic Signals	Freeway & Arterial Operations	Traffic Signals Improvements
FA.42	PA 150 Corridor Study	Freeway & Arterial Operations	Corridor Study
TI.07	US 322 Brown Detour ICM	Traveler Information	CCTV & CMS
TI.08	Dubois CCTV	Traveler Information	CCTV
TI.09	US 322 Green Detour ICM	Traveler Information	CCTV & CMS
TI.10	CCTV at PA 66 & PA 948	Traveler Information	CCTV
TI.11	US 6 CCTV & CMS	Traveler Information	CCTV & CMS

Project Number	Project Name	Priority Area	Planned Improvement
TI.12	Low AADT Incident/Event Management	Traveler Information	CCTV & CMS
TI.13	Natalie Mountain Portable CMS	Traveler Information	Portable CMS
TI.14	CSVT ITS	Traveler Information	CCTV & CMS
TI.15	Lewisburg CCTV	Traveler Information	CCTV
TI.16	US 15 Automated Slow Vehicle Warning	Traveler Information	CMS
TI.17	PA 56 ITS	Traveler Information	CCTV & CMS
TI.18	US 219 Buildout ITS	Traveler Information	CCTV
TI.19	US 22 ITS	Traveler Information	CCTV & CMS
TI.20	US 522 ITS	Traveler Information	CCTV & CMS
TI.21	US 322 Boalsburg ITS	Traveler Information	CCTV & CMS
TI.22	PA 350 Freight Management	Traveler Information	CCTV & CMS
TI.23	US 30 Portable CCTV Upgrades	Traveler Information	CCTV
TI.24	Elk Viewing CCTV	Traveler Information	CCTV
TI.25	I-80 Exit 111 CCTV	Traveler Information	CCTV
TIM.01	CAD ATMS Integration	Traffic Incident Management	ATMS Integration
WO.02	RWIS Gaps	Weather Operations	RWIS
WO.03	Winter Operations Messaging	Weather Operations	PA 511 & ATMS Automated Messaging
WO.04	PA 869 Winter Weather Management	Weather Operations	Portable CCTV & Portable CMS

Acronyms and Abbreviations

Abbreviation/Acronym	Term
511PA	511 Pennsylvania Traveler Information System
AADT	Average Annual Daily Traffic
ADA	Americans with Disabilities Act
AFLADS	Automated Fixed Location Anti-Icing System
ATA	Area Transit Authority of Central Pennsylvania
BOO	Bureau of Operations
CATA	Centre Area Transportation Authority
CCTV	Closed-Circuit Television
CDART	Crash Data Analysis and Retrieval Tool
CMS	Changeable Message Sign
DVMT	Daily Vehicle Miles Traveled
FHWA	Federal Highway Administration
HAR	Highway Advisory Radio
HD	High-Definition
ITS	Intelligent Transportation System
LRTP	Long Range Transportation Plan
M&O	Maintenance and Operations
MJAAA	Mifflin-Juniata Area Agency on Aging
MPO	Metropolitan Planning Organization
NWS	National Weather Service
P3	Public-Private Partnership
PDA	Probe Data Analytics Suite (part of RITIS)
PennDOT	Pennsylvania Department of Transportation
PSP	Pennsylvania State Police
RITIS	Regional Integrated Transportation Information System
ROP	Regional Operations Plan
RPO	Rural Planning Organization
RTMC	Regional Traffic Management Center
RWIS	Roadway Weather Information System
SEDA-COG	SEDA-Council of Governments
TIM	Traffic Incident Management
TIP	Transportation Improvement Program
TSAMS	Traffic Signal Asset Management System
TSMO	Transportation Systems Management and Operations
WATS	Williamsport Area Transportation Study

Chapter 1. Overview of the Region

This ROP has been compiled based on guidance from the *TSMO Guidebook, Part I: Planning*, a PennDOT document which describes how to implement the statewide approach to Transportation Systems Management and Operations (TSMO). TSMO is a set of integrated strategies used to increase the reliability and mobility of existing roadway infrastructure without adding capacity. The ROP will complement the TSMO Program Plan by identifying the regional approach to traffic operations and sets the stage for regional implementation of TSMO strategies.

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Synopsis of the Region

For Transportation Systems Management and Operations (TSMO) planning, Pennsylvania is broken into four regions whose borders coincide with Pennsylvania Department of Transportation's (PennDOT) Regional Traffic Management Center (RTMC) operational areas. These regions can be seen in **Figure 1** below. The Central Region comprises PennDOT Engineering Districts 2, 3, 9, and now part of 10 including 26 counties. The Region spans from the Maryland state line in the south to the New York state line in the north and from Somerset, PA in the west to Berwick, PA in the east. The RTMC for the Central Region is located in the District 2-0 Office in Clearfield, PA.

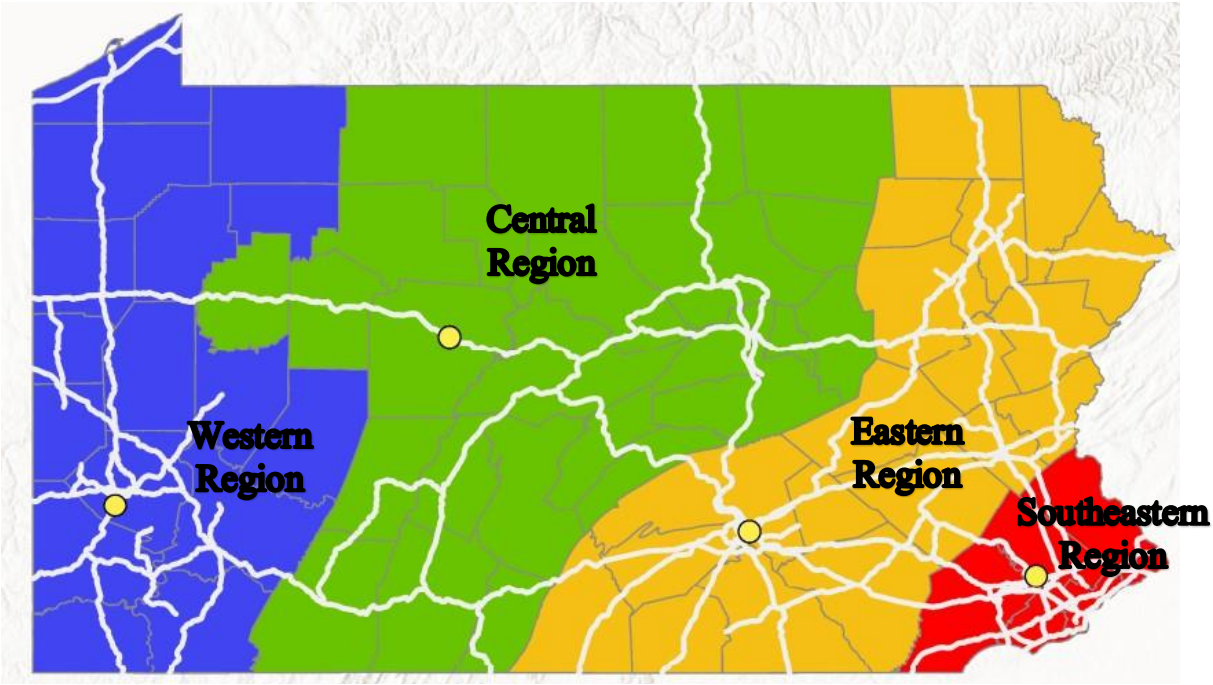


FIGURE 1: TSMO REGIONS WITHIN PENNSYLVANIA

The region experiences great diversity in topography and weather which creates challenges for the transportation system. In particular, whiteouts, flash floods, and ice storms are recurring challenges in the region due to the northeastern location and confluence of mountains, rivers, and creeks. The region links the major metropolitan areas of the state as well as providing a connection between the Northeast and the Midwest. The Central Region is predominantly rural in nature, with urbanized population centers in State College, Williamsport, Altoona, and Johnstown. It has a variety of freight-dependent industries, as well as agriculture, and regional attractions with infrequent travelers such as universities and hospitals.

State College is home to the Pennsylvania State University (PSU) Main Campus that includes over 40,000 students during the school year and football games can draw tens of thousands of additional visitors to the area during fall weekends. The influx of students and visitors for special events creates unique challenges for transportation management.

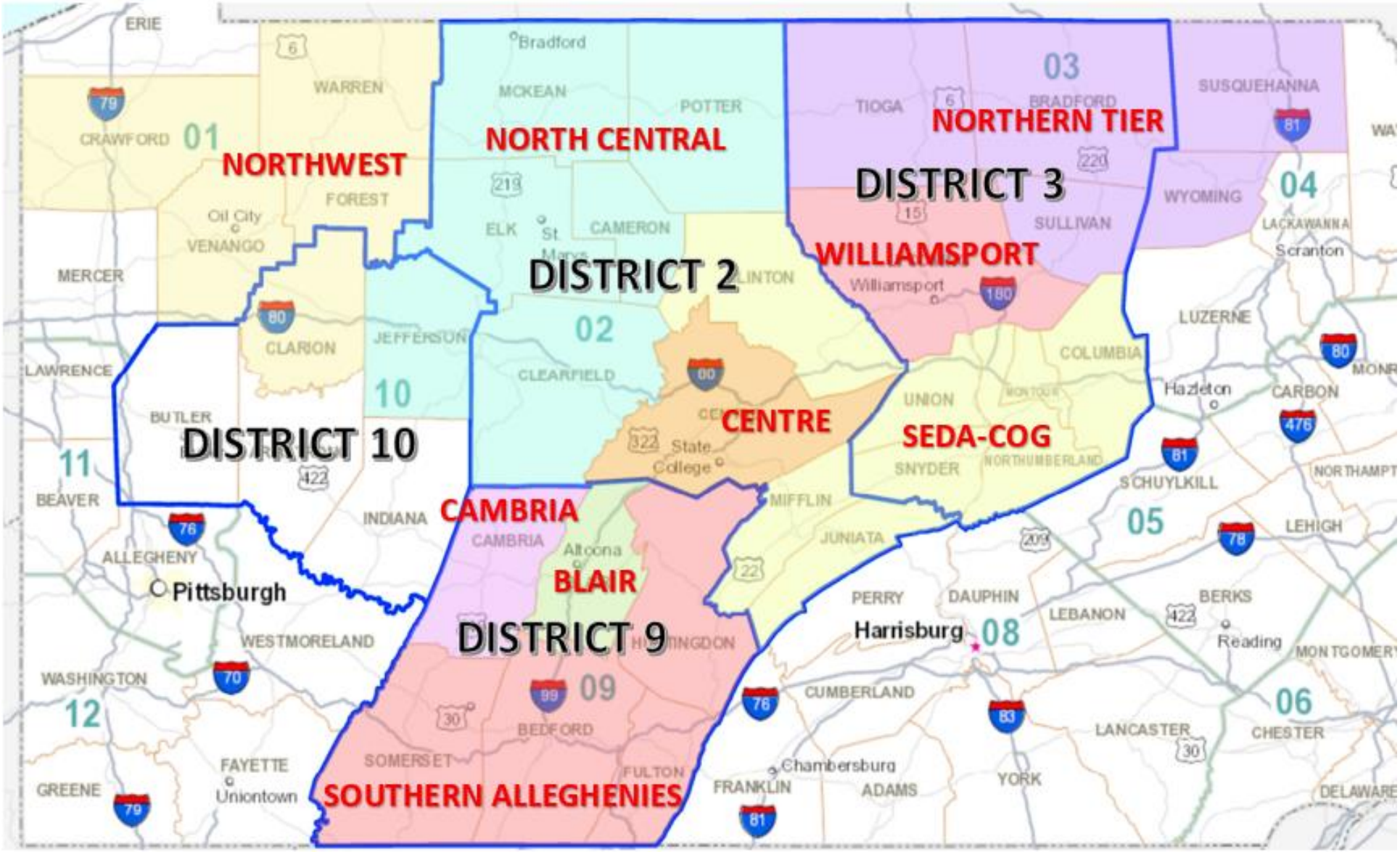
Williamsport is the largest city in District 3-0, located in Lycoming County. Altoona and Johnstown represent the two largest population centers in District 9 and are located in Blair and Cambria Counties, respectively.

The planning partners within the Central Region include:

- Centre County Metropolitan Planning Organization (Centre County MPO)
- North Central Rural Planning Organization (North Central RPO)
- SEDA-Council of Governments (SEDA-COG MPO)
- Northern Tier Regional Planning and Development Corporation (Northern Tier RPO)
- Williamsport Area Transportation Study (WATS MPO)
- Southern Alleghenies Planning & Development Commission RPO (Southern Alleghenies RPO)
- Cambria County Metropolitan Planning Organization (Johnstown MPO)
- Metropolitan Planning Organization for Blair County (Altoona MPO)
- Northwest PA Regional Planning & Development Commission (Northwest RPO)

Figure 2 shows a map of the various planning partner areas within the region.

FIGURE 2: CENTRAL REGION PLANNING PARTNERS



Key Regional Stakeholders

TABLE 1: KEY REGIONAL STAKEHOLDERS

Organization Name	Organization Contact	Geographical Coverage	Roles/Responsibilities
Blair MPO	Wes Burket wburket@blairplanning.org	Blair County	Transportation planning and development
Centre County MPO	Jim Saylor (jsaylor@crcog.net) Anne Messner (amessner@crcog.net)	Centre County	Transportation planning and development
FHWA PA Division	Dan Walston Chirstopher.walston@dot.gov	Pennsylvania	Oversight of transportation engineering within the state
Cambria MPO	Jacob Zerby (jzerby@co.cambria.pa.us)	Cambria County	Transportation planning and development
North Central RPO	Amy Kessler amy@ncentral.com	Cameron, Clearfield, Elk, Jefferson, McKean, and Potter Counties	Transportation planning and development
Northern Tier RPO	Brian Baker baker@northerntier.org	Bradford, Sullivan, Susquehanna, Tioga, and Wyoming Counties	Transportation planning and development
PennDOT Bureau of Operations	Steve Gault (sgault@pa.gov) Frank Cavataio (fcavataio@pa.gov) Pierce Sube (piercsube@pa.gov) Dave Gaffney (davgaffney@pa.gov Jared Strouphauer (jastroupha@pa.gov)	Statewide	Managing statewide transportation management and operations
PennDOT District 2-0/ Central RTMC	Jim Roman jaroman@pa.gov	9 counties in central Pennsylvania	RTMC Manager/ROP Regional champion
PennDOT District 3-0	Joe Lyons (joselyons@pa.gov)	9 counties in north central Pennsylvania	District Traffic Engineer/ROP District champion
PennDOT District 9-0	Ernie Cascino (ecascino@pa.gov)	6 counties in south central Pennsylvania	District Traffic Engineer/ROP District champion
PennDOT District 10-0	Kirk Schrecengost (kirkschrec@pa.gov)	2 counties in central Pennsylvania	District Traffic Engineer/ROP District champion
SEDA-COG MPO	Steve Herman (sherman@seda-cog.org) Kristin McLaughlin (kmclaughlin@seda-cog.org)	8 Central Pennsylvania counties covering parts of Districts 2 and 3	Transportation planning and development
Southern Alleghenies RPO	Matthew Bjorkman (mbjorkman@sapdc.org)	Bedford, Fulton, Huntingdon, and Somerset Counties	Transportation planning and development
WATS MPO	Austin Daily (adaily@lyco.org)	Lycoming County	Transportation planning and development

Outreach for the ROP process consisted of both a steering committee and a stakeholder committee which met throughout the development of this document. The steering committee consisted of representatives from PennDOT Central Office, PennDOT Districts 2, 3, 9, and 10. This group met for a kickoff meeting to review and refine the message and material to be presented to the stakeholders and for a final meeting to refine final list of projects. **Table 2** shows the list of steering committee activities.

TABLE 2: SUMMARY OF STEERING ACTIVITIES

Steering Round	Summary of Activities	Location	Date
Kickoff	• Overview of material to be presented at stakeholder meetings • Discussion of needs identified in previous ROPs • Discussion of PennDOT One Map	Virtual	June 5, 2024
Final	• Refined final list of projects • Discussed future ROP coordination and maintenance of document • Discussed lessons learned	Virtual	May 15, 2025

Stakeholder meetings were held in each of the three PennDOT Districts within the region. Each meeting was comprised of a presentation of information by the project team, followed by breakout sessions to receive input from the assembled stakeholders on each phase of the ROP development. **Table 3** shows the list of stakeholder activities.

TABLE 3: SUMMARY OF STAKEHOLDER ACTIVITIES

Stakeholder Round	Summary of Activities	Location	Date
1	• Overview of TSMO, the previous ROP, the process for the current ROP, and an update on the TSMO Funding Initiative • Introduction to data sources • Breakout sessions discussing initial maps of congestion data including congestion data, crash data, and ITS locations.	PennDOT District 2-0	August 26, 2024
		PennDOT District 9-0	August 26, 2024
		PennDOT District 3-0	August 27, 2024
2	• Discussion of tools and strategies from the TSMO Guidebook • Breakout sessions discussing regional issues and needs and potential TSMO strategies that were developed based on stakeholder input • Discussion of potential ROP projects • Discussion of prioritization and ranking of projects	PennDOT District 2-0	October 29, 2024
		PennDOT District 9-0	October 29, 2024
		PennDOT District 3-0	October 30, 2024

Region's ITS and Operations Vision and Planning Process

The Long-Range Transportation Plan (LRTP) is a planning document used by planning organizations to document the current and future transportation demand and identifies long-term improvements and projects to meet those needs. Common identified needs throughout the region include improving the safety of all travelers, promoting connectivity through all facets of transportation, and effectively preserving and operating the existing roadway network. The following sections provide an overview of the most recent LRTP for each of the Central RTMC Region's planning partners.

Blair County MPO

The Blair County MPO adopted their latest LRTP in 2021. One of the top strategies/priorities for Blair County is improving Public Health and Safety through improving mobility options for people who walk, jog, and bicycle.

The plan also identifies transportation as one of the region's top strategies/priorities that has the biggest impact on the vitality and prospects of the Southern Alleghenies Region -- impacting the region's ability or inability to compete for younger households and build financially sustainable communities. The plan notes that for decades, the expansion of transportation networks was an important focus, driven by a need to reduce isolation, boost economic opportunities, and improve safety. Today, preserving and maintaining this system is a priority and a challenge.

Cambria County MPO

The Cambria County LRTP 2025-2050 was adopted in 2024. Improving TSMO is a way to increase the travel time reliability and capacity of the county's roadways by using a wide range of strategies to help manage traffic and reduce congestion. The MPO is committed to identifying operations activities and projects necessary to meet the mission, vision, and goals of the program.

Ongoing planning for TSMO will help ensure that the MPO is optimizing its transportation network, reducing congestion, delays, and opportunity costs.

Improving transportation operations is also important for freight movement, providing convenient, reliable, and predictable travel times for shippers and carriers.

Centre County MPO

The Centre County LRTP 2050 was adopted in 2020. The primary goals and objectives of the Centre County LRTP 2050 included:

- Improve Safety and Security – Reduce crashes. Reduce conflicts between motorized and non-motorized transportation modes. Improve safety of intersections and roadway alignments

- Preserve the Existing Transportation Network – Conduct preventative maintenance that prolongs the useful life of transportation assets. Rehabilitate and modernize public transportation facilities and fleets. Improve transit ride quality.
- Optimize System Management & Operation – Reduce congestion, improve Levels of Service, and reduce travel times. Increase public transportation service frequency and capacity, Improve system functionality (e.g., signal upgrades, ITS applications, access management) through smart infrastructure and/or technology.
- Improve Integration and Connectivity of the Transportation System – Eliminate/overcome barriers (e.g., closures, detours, and delays, weight restrictions) in key corridors to maintain system reliability. Establish/maintain intermodal connections. Introduce new connections between existing network patterns (e.g., street connectivity, linking bicycle/pedestrian routes, connections between transit routes and providers)
- Improve Accessibility and Mobility Options for People and Freight – Improve public transportation services (e.g., routes, ride-share opportunities, vanpools, park-and-ride lots, customer information and services). Improve pedestrian and bicycle facilities, Improve access to airports, freight distribution facilities, and major industrial districts.

North Central RPO

The North Central PA Commission adopted its current LRTP in June 2022 with a planning horizon year of 2050. The LRTP guides a cohesive investment toward shared goals over the planning horizon. Each goal is made more specific by objectives that begin to define how each goal will be achieved. Some examples of these goals include:

- Reducing rates of transportation-related fatalities and injuries by 5% by 2025
- Improve the accessibility and connectivity of the region's bicycle and pedestrian network and associated facilities.
- Improve first- and last-mile access for both passenger and freight transportation.
- Pursue initiatives, programs, and projects that improve the efficiency of freight transportation within the region.
- Leverage technology and other tactics to improve regional traffic operations.
- Encourage alternatives to single-occupant vehicle trips.
- Identify key transportation assets that are critical to the system, particularly those with potential natural and man-made vulnerabilities.

Northern Tier RPO

The Northern Tier Regional Planning & Development Commission (NTRPDC) LRTP was adopted in 2020. NTRPDC's transportation goal as outlined in the LRTP is to manage the transportation system in support of communities, economies, and environmental priorities for the present and the future.

The plan was developed focusing on the following goals:

- Reduce risk/ improve safety; assess crash data annually.
- Manage repair and maintenance to prevent more costly rehabilitation or construction work.
- Reduce congestion and increase efficiency through operational improvements; consider highway capacity improvements as a last alternative.
- Expand infrastructure for carpooling and vanpooling, i.e., park-n-ride lots.
- Improve connectivity between existing bicycle and pedestrian facilities.
- Support the provision of public transportation services.
- Strengthen municipal governance and cooperation with regard to local transportation infrastructure.
- Encourage the formation of formal and informal transportation partnerships to finance highway improvements in support of commercial and industrial development.

Northwest RPO

The Northwest PA Commission 2025 LRTP was adopted in 2024. The plan was developed focusing on the following goals:

- Assist municipalities and counties in maintaining local infrastructure.
- Support infrastructure projects that create or enhance connections to the region's major travel destinations, including its state parks and national forests.
- Support improvements to fixed-route and human-service transportation.
- Improve public transit connectivity and equity.
- Pursue policies to improve bicycle and pedestrian accessibility and walkability in downtown areas.
- Address truck parking along Interstate routes.
- Implement technology to optimize travel time and safety.
- Support Traffic Incident Management (TIM) and the improvement of first-responder response times.
- Identify pre-established detours in case of incidents on the Interstate.

SEDA-COG MPO

The SEDA-COG Metropolitan Planning Organization's LRTP was adopted in 2021, focusing on the eight-county SEDA-COG region. Outlined in the LRTP are the following goals for the region:

- Support the economic vitality of the region, especially by enabling global competitiveness, productivity, and efficiency.
- Increase the safety of the transportation system for motorized and non-motorized users.
- Increase the security of the transportation system for motorized and non-motorized users.
- Increase the accessibility and mobility of people and for freight.
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
- Promote efficient transportation system management and operations.
- Emphasize the preservation of the existing system.
- Improve the resiliency and reliability of the transportation system and reduce or mitigate storm water impacts of surface transportation.

Southern Alleghenies RPO

The Southern Alleghenies Rural Planning Organization LRTP was adopted in 2022. The vision for the LRTP is to provide a safe, efficient, and sustainable muti-modal transportation system that fosters economic and community development and meets the needs of the region through innovation. To achieve this vision the following goals were outlined:

- Develop a reliable and resilient transportation network, which links the region with the nation's markets and provides regional access for industrial, commercial, educational, and recreational growth areas to support tourism and the economic vitality of the region.
- Increase the safety of the transportation system for all modes and all users to exceed approved safety performance targets.
- Improve quality of life through enhanced and equitable community access to public transportation, including passenger rail, regional transit, and medical assistance transportation.
- Maximize the benefits of transportation investments in the region with a focus on federal, state, and local collaboration as well as sound highway and bridge asset management practices designed to exceed identified performance measures.
- Inform and educate the public, stakeholders, and elected officials on key regional transportation initiatives.

WATS MPO

The WATS Long Range Transportation Plan was adopted in 2023. While adhering to Federal planning factors and Statewide long range transportation planning goals the following priorities were identified on the local planning level:

- Implement projects identified within the county and multi-municipal comprehensive plans.
- Implement projects identified by the CSVT Impact Special Study
- Implement projects identified in the Central Region ROP
- Implement other projects identified through local planning process.

Summary of Planning Horizon Times

Each planning organization works on its own schedule for releasing their LRTPs, with each group releasing an updated document approximately every five years. **Table 4** shows the current LRTP planning years and the anticipated year for their next update.

TABLE 4: LRTP PLANNING YEARS

Organization Name	Current LRTP Planning Years	Anticipated Year for Next Update
Blair County MPO	2021-2045	2025
Centre County MPO	2020-2050	2025
Cambria County MPO	2025-2050	2028
North Central RPO	2022-2050	2027
Northern Tier RPO	2020-2045	2025
Northwest RPO	2025-2050	2029
SEDA-COG MPO	2021-2045	2026
Southern Alleghenies RPO	2022-2042	2027
WATS MPO	2023-2045	2028

Chapter 2. Existing Regional Demographics and Transportation Elements

Existing Key Transportation Elements

Roadway Network

The roadway network in the Central RTMC Region includes interstates, freeways, arterials, collectors, local, municipal, and other agency roads. The Region has approximately 12,500 PennDOT-owned roadway miles, which carry nearly 33,000,000 daily vehicle miles traveled (DVMT). The lineal miles to DMVT ratio of 2,641 DMVT/lineal miles is lower than the statewide average ratio of 5,386 DVMT/lineal miles, which reflects the rural nature of the region.

As reported in PennDOT's 2023 Highway Statistics, the Central RTMC Region contains 33,403 linear miles of roadway, signifying 27.4% of the Commonwealth's total linear mileage.

TABLE 5: CENTRAL RTMC REGION LINEAR MILES

District	Linear Miles	DVMT	DVMT/Lineal Miles Ratio
District 2-0 Total	3,477.94	9,815,779	2,822
District 3-0 Total	4,235.16	11,138,963	2,630
District 9-0 Total	3,750.73	9,516,656	2,537
District 10-0 Total*	1,024.00	2,507,623	2,449
Central RTMC Region Total	12,487.83	32,979,021	2,641
Statewide Total	39,714.66	213,903,336	5,386

*The Central Region only includes Clarion & Jefferson Counties in District 10.

Transit Service

The region is served by multiple transit systems offering fixed route service and demand responsive service. The following agencies provide fixed route and demand responsive transit service in the region:

- Altoona Metro Transit (AMTRAN)
- Area Transportation Authority of North Central Pennsylvania (ATA)
- Cambria County Transit Authority (CamTRAN)
- Centre Area Transportation Authority (CATA)
- Centre County Office of Transportation Services
- Fullington Trailways
- Huntingdon, Bedford, Fulton Area Agency on Aging
- Lower Anthracite Transportation System
- Mifflin-Juniata Area Agency on Aging (MJAAA)

- Rabbittransit
- River Valley Transit
- Somerset County Transportation System
- STEP, Inc.

Airports

There are 27 public airports operating in the region:

- Albert Airport in Clearfield County
- Altoona Blair County Airport (limited passenger service)
- Bedford County Airport
- Bellefonte Airport in Centre County
- Bloomsburg Municipal Airport
- Bradford Regional Airport in McKean County (limited passenger service)
- Cambria County Airport (limited passenger service)
- Centre Airpark in Centre County
- Clearfield Lawrence Airport in Clearfield County
- Danville Airport
- DuBois Regional Airport in Jefferson County (limited passenger service)
- Ebensburg Airport in Cambria County
- Jersey Shore Airport
- Mid-State Airport in Centre County
- Mifflin County Airport in Mifflin County
- Mifflintown Airport in Juniata County
- Northumberland County Airport
- Penn's Cave Airport in Centre County
- Penn Valley Airport
- Ridge Soaring Gliderport in Centre County
- Somerset County Airport
- St. Mary's Municipal Airport in Elk County
- State College Regional Airport
- Sunbury Airport

- Sunbury Seaplane Airport
- William T. Piper Memorial Airport in Clinton County
- Williamsport Regional Airport (regular passenger service)

Tourist and Travel Destinations

The Central RTMC region is also home to tourist and travel destinations including:

TABLE 6: CENTRAL RTMC REGIONAL ATTRACTIONS

Destination Type	Name
Amusement Parks	Clyde Peeling's Reptiland DelGrosso's Amusement Park Knoebels Amusement Resort Lakemont Park Treasure Castle Playland
Caves and Mines	Coudersport Ice Mine Lincoln Caverns & Whisper Rocks Penn's Cave & Wildlife Park Woodward Cave
Sporting Events/Facilities	1st Summit Arena BB&T Ballpark Beard Field – Nittany Lion Softball Park Beaver Stadium Bryce Jordan Center Galactic Ice Rink Heindl Memorial Field Little League World Series Medlar Field at Lubrano Park North Central Recreation Center Ice Skating Rink Pegula Ice Arena Penn State Recreation Hall Peoples Natural Gas Field Point Stadium Port Royal Speedway Selinsgrove Speedway Showers Field Veterans Memorial Field
Universities and Colleges	Bloomsburg University Bucknell University Juniata College Lock Haven University Lycoming College Mansfield University Mt Aloysius College Pennsylvania College of Technology PSU-University Park (main campus) PSU-Altoona PSU-Dubois St Francis University

Destination Type	Name
	Susquehanna University University of Pittsburgh-Bradford University of Pittsburgh-Johnstown
Entertainment and Special Events	Bedford County Fair Bedford Fall Foliage Festival Benezette Elk Viewing Bloomsburg Fair Cambria County Fair Centre County Grange and Encampment Fair Central Pennsylvania Festival of the Arts Downtown DuBois Farmers Market Downtown State College Farmers Market Discovery Space Elk Expo Elysburg Haunted House People's Choice Festival of Pennsylvania Punxsutawney Phil Ridgway Chainsaw Carving Rendezvous Thunder in the Valley Zippo/Case Museum
Parks and Recreation	Austin Dam Bald Eagle State Park Black Moshannon State Park Blue Knob All Seasons Resort Bodine Park Canoe Creek State Park Centralia Cherry Springs State Park Clearfield County Fair & Park Cowans Gap State Park Curwensville Lake Elk Country Visitors Center Evansville Motocross Park Fisherman's Paradise Flight 93 Memorial Greater Renovo Area Heritage Park Greenwood Furnace State Park Hiawatha Paddlewheeler Hidden Valley Resort Hyner Run State Park Kettle Creek State Park Kiess Memorial Park Kinzua Dam Kinzua State Park and Skywalk Little Pine State Park Lyman Run State Park Millbrook Marsh Nature Center Montour Preserve Morrison Cove Memorial Park

Destination Type	Name
Parks and Recreation	Ole Bull State Park Prince Gallitzin State Park Raymond B. Winter State Park Raystown Lake Ricketts Glen State Park Seven Springs Mountain Resort Shaver's Creek Environmental Center Shawnee State Park Shikellamy State Park Susquehanna State Park Treasure Lake Trough Creek State Park Sinnemahoning State Park Whipple Dam State Park Worlds End State Park
Others	Allegheny Portage Railroad National Historic Site Altoona Railroaders Memorial Museum Blair County Convention Center Eisenhower Auditorium Endless Mountains War Memorial Museum Frank J. Pasquerilla Conference Center Freas Farm Winery Horseshoe Curve National Historical Landmark Jaffa Shrine Center Johnstown Convention and Visitors Bureau Johnstown War Memorial Logan Town Center Logan Valley Mall Lycoming County Historical Society & Taber Museum Mishler Theatre Mount Nittany Vineyard & Winery Penn State Palmer Museum of Art The Pioneer Tunnel Pennsylvania Lumber Museum World of Little League Museum

Major Employers

Penn State University is the overwhelmingly largest employer in Centre County and one of the largest in the whole region. The other top employers are medical centers with multiple locations throughout the region. These top employers can be found in **Table 7**.

TABLE 7: MAJOR EMPLOYERS IN REGION

Employer	Location	Number of Employees
Conemaugh Health System	Johnstown and other locations in west central PA	5,000
Geisinger Health System	Danville (headquarters), plus other locations throughout central and northeastern PA	26,000
Penn Highlands Health Network	DuBois, Clearfield, and St Marys	6,200
Penn State University	University Park	20,000
Susquehanna UPMC	6 locations, including Williamsport, Muncy, and Lock Haven	5,100

In addition to the top employers listed above, the following comprise some of the other important employers in the region:

- Other medical centers
- Other educational institutions
- Walmart
- Sheetz
- Wise Foods
- Local, State, and Federal Government
- Various agriculture, manufacturing, lumber, and shale gas businesses

Demographics

The following tables display the demographic comparisons of Central RTMC Region in comparison to Pennsylvania and the United States.

TABLE 8: DISTRICT POPULATIONS

District	Population	Percent of Regional Total
District 2-0	438,201	30.5%
District 3-0	477,967	33.3%
District 9-0	436,648	30.4%
District 10-0*	81,733	5.7%
Total Population in the Region	**1,434,549**	

*(SOURCE: US CENSUS BUREAU, 2020) (*DISTRICT 10-0 INCLUDES CLARION AND JEFFERSON COUNTIES)*

TABLE 9: COMPARISON OF KEY DEMOGRAPHICS

Demographic Factor	District 2-0	District 3-0	District 9-0	District 10-0*	Pennsylvania	United States
Total Population	438,201	477,967	436,648	81,733	13,002,700	331,449,281
% Minority Population	6.9%	7.9%	7.4%	4.3%	25%	38.4%
Median Age (In Years)	44.4	44.0	45.6	42.7	41.1	39.2
Mean Family Size	2.84	2.90	2.92	2.96	2.47	3.26
Mean Income	$61,938	$67,980	$61,340	$59,730	$79,703	$45,105
Commuting Pattern	**District 2-0**	**District 3-0**	**District 9-0**	**District 10-0***	**Pennsylvania**	**United States**
Total Workers 16 & Over	195,099	215,665	192,298	16,967	6,289,250	179,973,247
% Commuters Driving Alone	77.4%	77.1%	79.2%	76.9%	68.5%	69.2%
% Commuters Carpooling	9.5%	7.6%	8.6%	8.1%	8.2%	9.0%
% Commuters Using Public Transportation	0.7%	0.3%	0.5%	0.2%	3.8%	3.5%
Mean Travel Time to Work (Minutes)	22.9	23.4	26.6	25.2	26.5	26.8

*(SOURCE: US CENSUS BUREAU, 2020) (*DISTRICT 10-0 INCLUDES CLARION AND JEFFERSON COUNTIES)*

TSMO Roadway Tiering System

As with any planning effort, it is important to define the scope of the roadway network. With input from statewide and District-level PennDOT representatives, as well as from planning partners, a roadway tiering system was developed to facilitate TSMO planning efforts, shown in the following table.

TABLE 10: ROADWAY TIERING SYSTEM

Road Type	Tier	Criteria
Limited Access (NHS)	1A	AADT > 75,000
	1B	AADT between 50,000 and 75,000
	1C	AADT < 50,000
Non-Limited Access (NHS)	2A	AADT > 25,000
	2B	AADT between 10,000 and 25,000
	2C	AADT < 10,000
Non-NHS	3A	AADT > 10,000
	3B	AADT between 2,000 and 10,000
	3C	AADT < 2,000

The intent of the tiering system is to organize the roadway network into groups with similar characteristics and operational needs. This helps to consistently define expectation for management and operations across the state. While the National Highway System (NHS) roadway types are higher-order roadways with generally higher traffic volumes, the tiering classifications are not intended to dictate specific solutions or levels of funding.

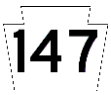
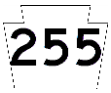
Corridors and Areas of Transportation Significance

As noted earlier, the region has a predominately rural character. Major highway corridors serve to connect urbanized areas and industries within the region to population centers and markets in much wider areas. The following corridors were identified as serving these purposes for the Central RTMC Region.

TABLE 11: CORRIDORS AND AREAS OF TRANSPORTATION SIGNIFICANCE

Class	Route	County	Annual Average Daily Traffic	TSMO Tier	511 Network	Notes and Considerations
Interstates	PENNA TURNPIKE	Bedford Fulton Huntingdon Somerset	29-33K 20-21K 20-21K 29-32K	1C	Yes	• East-west toll facility connecting Philadelphia and Ohio • Significant commerce activity
	INTERSTATE 70	Bedford Fulton	6-7K 8-9K	1C	Yes	• Generally east-west interstate which runs from Baltimore to Utah • Overlaps with I-76 (Pennsylvania Turnpike) from Breezewood to New Stanton • Significant commerce activity
	INTERSTATE 80	Centre Clarion Clearfield Clinton Columbia Jefferson Montour Northumberland Union	19-25K 20-25K 19-25K 18-25K 14-30K 20-24K 14-28K 26-28K 18-27K	1C	Yes	• East-west interstate connecting Northeast (NYC) and Midwest • High percentage of interstate and inter-regional travelers • Significant commerce activity
	INTERSTATE 99	Bedford Blair Centre	10-15K 10-36K 14-40K	1C	Yes	• North-south interstate which currently runs from Bedford to I-80 • Provides access from I-76 (Pennsylvania Turnpike) to Altoona and State College
	INTERSTATE 180	Lycoming Northumberland	13-43K 14-20K	1C	Yes	• Connects I-80 with Lycoming County and Williamsport • Provides connection from I-80 to US 15 and US 220

Class	Route	County	Annual Average Daily Traffic	TSMO Tier	511 Network	Notes and Considerations
U.S. Routes	6	Bradford McKean Potter Tioga	2-18k 1-7k 1-9k 2-12k	2B 2C 2C 2B	No	• East-west scenic byway that runs through the northern tier the length of the state
	11	Columbia Juniata Montour Northumberland Snyder Union	8-21K 14K 11-13K 11-13K 10K-19K 10K	2B 2B 2B 2B 2B 2B	Partial	• North-south highway which runs from Louisiana to Quebec, Canada • Connects many population centers through central Pennsylvania
	15	Juniata Lycoming Snyder Tioga Union	14K 10-28K 17k 8-10k 11-27K	2B 1C,2B 2B 1C 1C,2A	Yes	• Facility type varies • Connects south central PA with New York state • Seasonal RV and camper traffic • Part of Strategic Highway Network (STRAHNET) which allows for emergency mobilization and peacetime movement of military personnel, equipment, and commodities
	22	Blair Cambria Huntingdon Juniata Mifflin	4-20K 11-28K 4-13K 15-21K 5-24K	1C,2B,2C 1C,2B 2B,2C 1C 1C,2C	Partial	• East-west highway which runs from New Jersey to Ohio • One of the original US highways • Mix of limited access and arterial highway • Primary route between Pittsburgh and major population centers in central Pennsylvania
	30	Bedford Fulton Somerset	2K-16K 2K-6K 4K-7K	2C,3A,3B 2C 2C	No	• US route that spans the country from New Jersey to Oregon • Locally, it generally parallels the Pennsylvania Turnpike through most of the region
	219	Cambria Clearfield Elk McKean Somerset	2-20K 1-16K 2-9K 2-15K 2-14K	1C,2C 2B,2C 2C 1C,2B,2C 1C,2C	Partial	• Spur of US 19 which runs north-south from Virginia to New York state • Varies from 4-lane limited access to 2-lane highway • New section of limited access will be completed in 2018 between Somerset and Meyersdale

Class	Route	County	Annual Average Daily Traffic	TSMO Tier	511 Network	Notes and Considerations
		Bedford Bradford Clinton Lycoming Sullivan	1-14K 2-11K 6-20K 2-20K 2-3K	1C,2C 1C,2C,3A,3B 1C,2C 1C,2A,3B 3B	Partial	• Facility varies from limited access to two-lane • Connects to Lock Haven and State College to the west from Williamsport • Connects to New York state from Williamsport to the northeast and through the Northern Tier region
		Centre Clarion Clearfield Jefferson Juniata Mifflin	8-24K 2-8K 2-16K 2-9K 15-21K 18-26K	1C,2B,2C 2C 2B,2C,3B,3C 2C 1C 1C	Partial	• East-west highway running from Cleveland to New Jersey • Regionally, it connects Harrisburg to State College and Clearfield
U.S. Routes		Centre	5-23K	2A.2B,2C	No	• Business loop of US 322 which connects to I-99 • Major route through State College • Known as Atherton Street and Boal Avenue
PA State Routes		Bedford Centre Huntingdon	1-5k 2-21K 1-11k	3B 2B,2C 3A	No	• Portion of this state highway which runs through the State College area • Provides connections between US 322, Atherton St, and PA-150
		Bedford Cambria Somerset	2-8K 4-23K 2-20K	2C,3B 1C,2B,2C 2B,2C	No	• Generally east-west highway between New Kensington and Bedford • Main connection to Johnstown
		Northumberland	1-18K	1C,2B,2C,3B, 3C	Yes	• Connects US 11 near Northumberland to I-80 and I-180 • Used as a connection from I-80 west to I-81/ I-78
		Clearfield Elk	3-15K 3-16K	3A,3B 3A,3B	No	• Major route through DuBois • Connects DuBois to St Marys and points north

I-80 extends through the Region approximately 150 miles in the east-west direction. I-80 carries the most traffic of any roadway in the Central RTMC Region with an Average Daily Traffic (ADT) of approximately 25,000 vehicles. Connecting the Pennsylvania Turnpike (Interstate 70-76) in Bedford with I-80 (northeast of Bellefonte), I-99 is another growing Interstate corridor. Also known as the Appalachian Thruway and the Bud Shuster Highway, it is the first Interstate highway to have its designation written into law. A high-speed interchange is planned to complete the connections between I-99 and I-80.

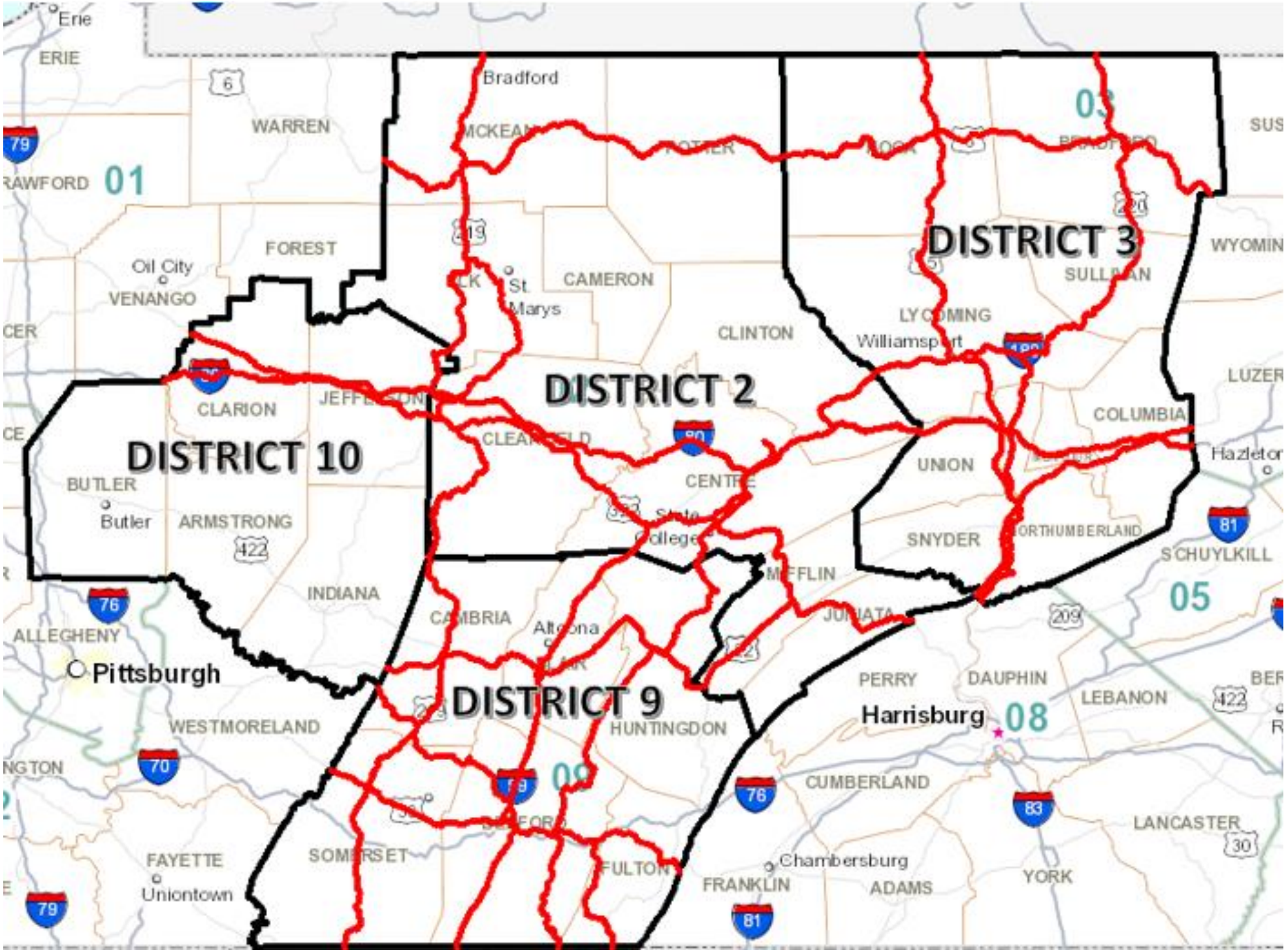
US 22 and US 322 provide the main east/west non-interstate highways through the region. The routes overlap between Harrisburg and Lewistown. To the west, US 322 runs through State College and Clearfield while US 22 runs by Altoona on the way towards Pittsburgh. US routes 11, 15, 219, and 220 all travel generally north/south from Maryland north to New York state. US 30 runs east-west through the region, generally paralleling the Pennsylvania Turnpike.

Some of the major state routes in the region include PA-26, PA-56, PA-147, and PA-255. PA-26 runs through State College, connecting it to US 322 and other state routes. PA-56 provides a connection between I-99 and Johnstown. PA-147 runs along the Susquehanna River connecting Harrisburg and I-80. PA-255 is the major route through DuBois, running north to St Marys.

I-99 runs north to south connecting the PA Turnpike in the south to I-80 in the north. Future expansion for I-99 is planned to extend along US 220 and US 15 to the New York state border. This expansion of I-99 will connect urban centers in Altoona, State College, and Williamsport.

A map of the Corridors of Significance is included as **Figure 3**.

FIGURE 3: CENTRAL REGION CORRIDORS OF SIGNIFICANCE



Regional TSMO Elements

The Central Region has a growing assortment of ITS devices and other TSMO elements throughout the Districts, including CCTV, CMS, roadway weather information systems (RWIS), and Variable Speed Limits (VSL). The hub for the operation of these devices is the Central Regional Traffic Management Center (RTMC), located in the PennDOT District 2-0 office in Clearfield. The RTMC is a central location for the collection, processing, and dissemination of information use for management activities throughout the Central Region. The RTMC opened in August 2016.

From the RTMC, PennDOT personnel have access to a variety of ITS devices such as CMS, CCTV, and RWIS. These devices are largely located on the region's interstates (I-80 and I-99) as well as major arterials such as US 22, US 322, and US 219. At this time, the non-interstate device locations are, for the most part, located in the vicinity of the more populous areas such as Altoona and State College with sporadic coverage in more remote areas such as the southern portion of District 9 and the northern portions of Districts 2 and 3.

A summary of the ITS elements in the region can be found in **Table 12** and a map showing CCTV, CMS, RWIS, HAR, and radar detectors has been included as **Figure 4**.

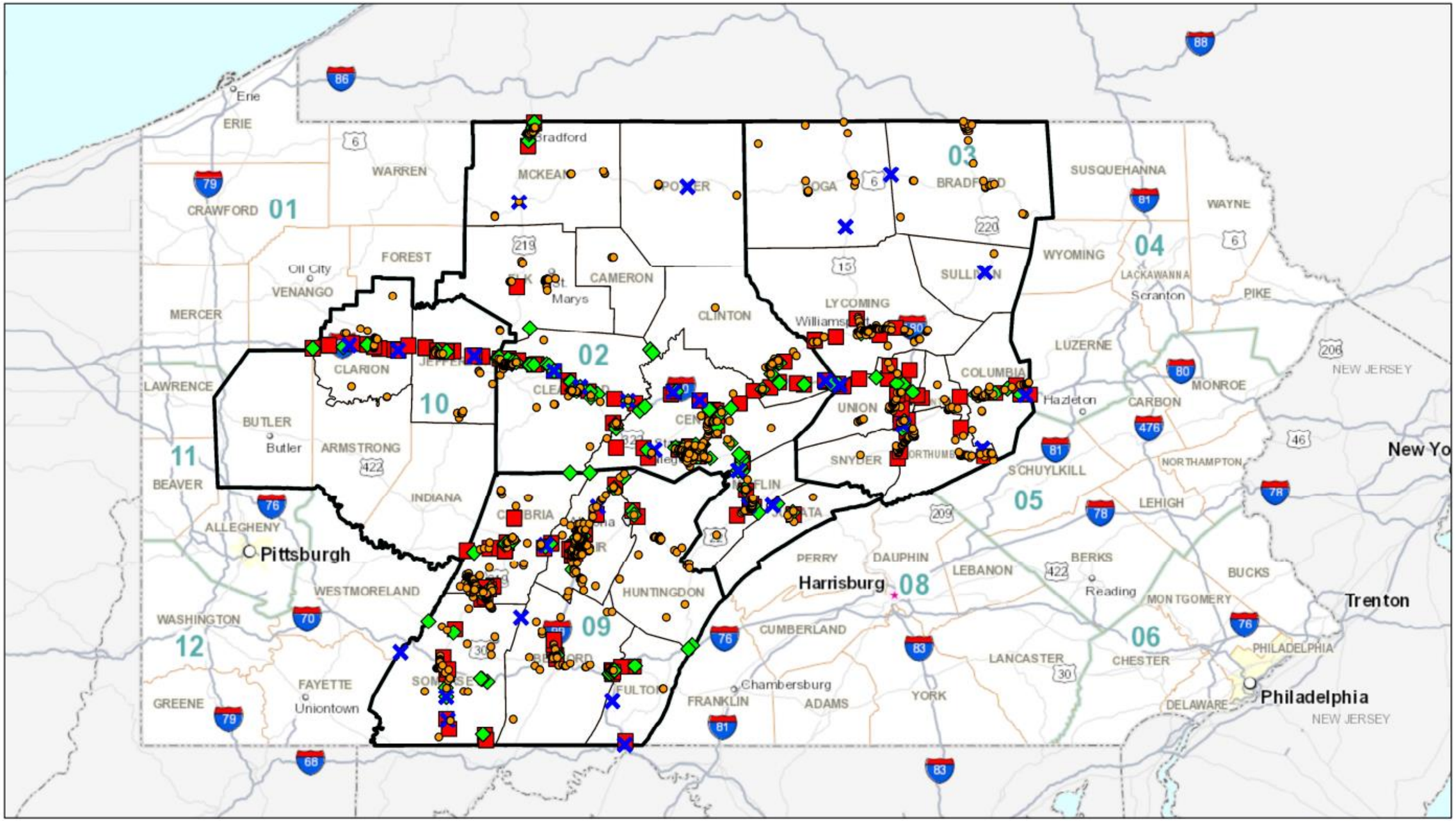
TABLE 12: CENTRAL REGION ITS ELEMENTS

ITS Device	Number of Devices
CCTV	141
CMS	182
RWIS	36
HAR Transmitters	36
HAR Beacons	126
Radar Detectors	33
Traffic Signals	1,144
Connected Traffic Signals	210
Traffic Signal Systems	126
Flashing Warning Devices	45
Communications Hubs	7
High Cross Winds Warning	1
Queue Detection	2
Truck Warning	3
Low Visibility Warning	0
Speed Detection and Feedback	2
Portable CCTV	19
VSL	42

(SOURCE: PENNDOT ITS MASTER DEVICE LIST, AND PENNDOT TSAMS)

pennsylvania

Figure 4: Central Region ITS Devices



January 9, 2025

Legend

- Traffic Signals
- RWIS Stations and Weather
- Traffic Cameras
- Dynamic Message Signs

1:1,914,179

0 15 30 60 mi

0 25 50 100 km

PennDOT

Chapter 3. Existing and Future Operations

TSMO Mapping

This section provides information documenting and summarizing the region's existing and future operations performance. Much of this data has been pulled from PennDOT One Map, a web-based interactive GIS mapping application. Through this new website, PennDOT has aggregated traffic operations metrics, crash clusters, and many other data from a variety of sources. This powerful tool provides PennDOT and their planning partners with the ability to identify and investigate problem areas in a continuing process, planning for new and changing needs as they develop.

Existing Corridor Performance

Mobility

The Central Region is largely rural so does not see widespread recurring congestion. However, there are corridors that incur noticeable vehicular delay in urbanized areas such as State College, as well as areas where regional corridors transition between limited access and signalized arterial roadways. Some of the most significant recurring congestion occurs on the following roadways:

- Atherton Street (SR 3014) in State College and surrounding townships
- I-80 Exit 161 at PA-26
- PA-255 in DuBois
- Plank Road (SR 1001) in Altoona, Logan Township, and Allegheny Township
- US 11 corridor near Shamokin Dam
- US 15 in Lewisburg
- US 322 in Philipsburg and Potters Mill

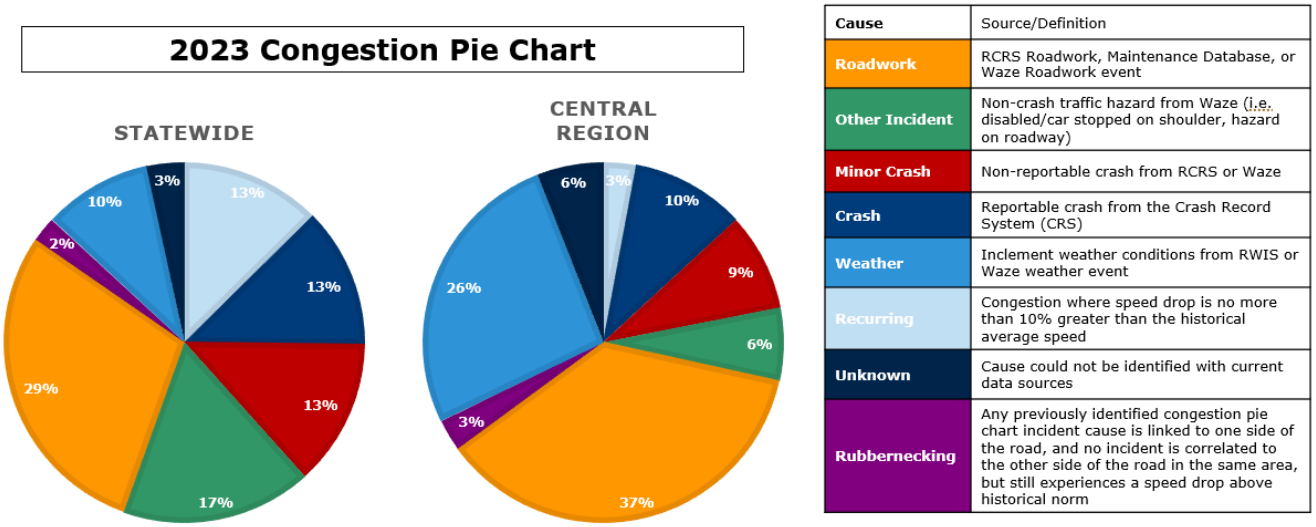
Other measures used for determining congestion are Travel Time Index, Buffer Index, and Planning Time Index. These measures are derived from the RITIS PDA Suite based on INRIX probe speed data. The definitions of these measures are below:

- Travel Time Index: — Travel time represented as a percentage of the ideal travel time (Travel Time / Free-flow Travel Time).
- Buffer Index — The Buffer Time's percentage value of the Average Travel Time ((95% Travel Time - Average Travel Time) / Average Travel Time).
- Planning Time Index: Free Flow Speed — The total travel time that should be planned when an adequate buffer time is included (95% Travel Time / Free-flow Travel Time).

To augment the congestion measures, The Congestion Pie Chart was used to categorize the identified congestion. The Congestion Pie Chart tool was developed starting in 2018 and is limited to the Core Roadway Network. Using INRIX flow incident data which is determined by a traffic speed drop below 65% of free-flow speed for at least 2 minutes are correlated with additional Department data sources such as RCRS, Maintenance Database, CRS, and RWIS to assign a cause to those flow incidents.

Using the Congestion Pie Chart Tool for the Central Region we can see that half of the congestion events in the region are caused by unplanned events (Traffic Incidents or Inclement Weather).

FIGURE 5: CENTRAL REGION CONGESTION PIE CHART



Cause	Source/Definition
Roadwork	RCRS Roadwork, Maintenance Database, or Waze Roadwork event
Other Incident	Non-crash traffic hazard from Waze (i.e. disabled/car stopped on shoulder, hazard on roadway)
Minor Crash	Non-reportable crash from RCRS or Waze
Crash	Reportable crash from the Crash Record System (CRS)
Weather	Inclement weather conditions from RWIS or Waze weather event
Recurring	Congestion where speed drop is no more than 10% greater than the historical average speed
Unknown	Cause could not be identified with current data sources
Rubbernecking	Any previously identified congestion pie chart incident cause is linked to one side of the road, and no incident is correlated to the other side of the road in the same area, but still experiences a speed drop above historical norm

Analysis done by the TSMO Operations and Performance Section provide measures of congestion and use various data sources to categorize congestion events. Measures of traffic congestion are calculated from third party probe data, which aggregates speed and travel time data from a sampling of vehicles throughout the roadway network. Unreliable or operationally deficient segments are determined when traveling a segment during a 15-minute period it will take 50% longer than expected on at least 20% of the trips. In other words when one in five trips takes 50% longer than expected.

The maps provided below show locations of the identified Operationally Deficient Segments:

- Central Susquehanna Valley (see **Figure 6**)
- Breezewood (see **Figure 7**)
- Interstate 80 Clearfield & Jefferson Counties (see **Figure 8**)
- Clinton & Lycoming Counties (see **Figure 9**)

FIGURE 6: CENTRAL SUSQUEHANNA VALLEY

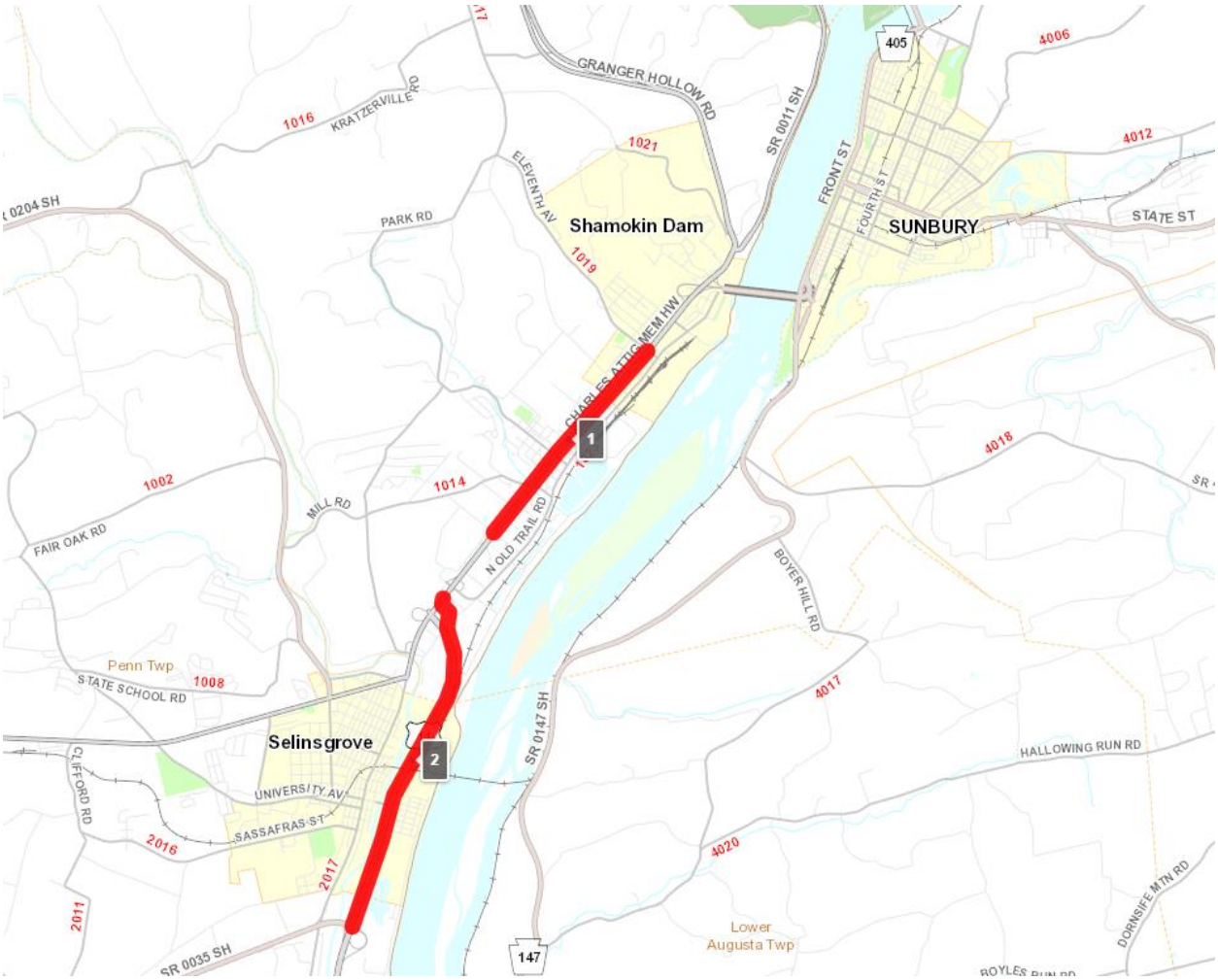


FIGURE 7: BREEZEWOOD

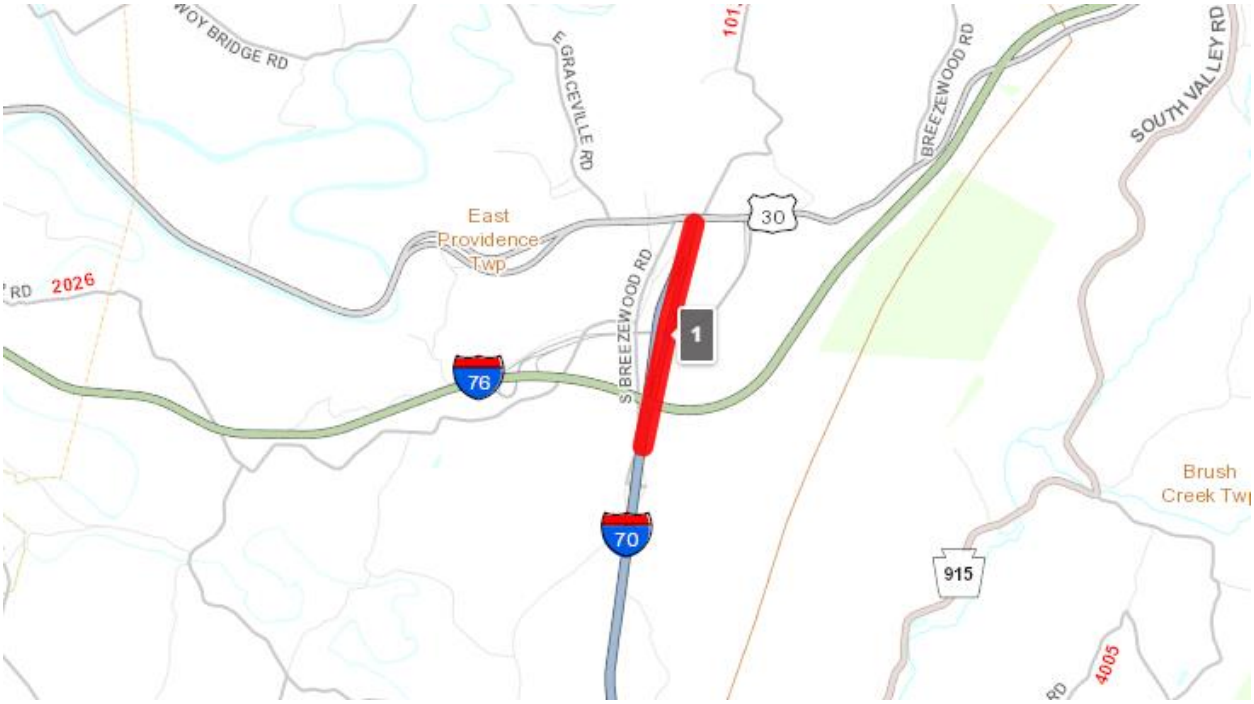


FIGURE 8: INTERSTATE 80 CLEARFIELD & JEFFERSON COUNTIES

FIGURE 9: CLINTON & LYCOMING COUNTIES

Traveler Information and Situational Awareness

Much of the congestion in the Central Region occurs due to weather, incidents, and special events. In these cases, getting information to the operators in the RTMC and to the travelers on the roadways is vital to minimize impacts. The region has made great advancements in deploying ITS devices to assist in acquiring and disseminating important information during these events.

Closures on the region's interstates, particularly on I-80, due to weather and incidents have a profound effect on the parallel corridors. These nearby routes struggle to handle the high volumes rerouted from the interstates, often causing severe congestion until operations on the interstate are restored.

Special events problems are most noticeable around State College due to the urbanized area surrounding the PSU campus and the many special events that occur there. Penn State football games at Beaver Stadium provide the most intense traffic impacts on the region but the campus plays host to a frequent assortment of sporting events, concerts, and other events. Student move-in and move-out days (occurring in the fall and spring, respectively) also create significant traffic impacts.

Other notable special events in the Central Region from a traffic perspective include:

- Little League World Series, Williamsport
- County fairs, particularly in Clearfield and Bloomsburg
- DelGrosso's Park, amusement park outside of Altoona

Safety

Crashes are one of the primary concerns in the region and one of the most frequent causes of congestion as 20% of regional congestion can be traced to crashes. Weather-related crashes are a concern throughout the region but are noticed particularly along I-80 due to the high volumes and particularly the high volumes of truck traffic. Weather contributes to about 26% of the region's congestion.

An analysis was done to determine locations where heavy congestion crashes occurred that were not verified in RCRS. This provides locations where the CCTV network has gaps and where incident clearance times can be improved.

The following maps show the locations of unverified heavy congestion causing crashes on the core network:

FIGURE 10: DISTRICT 2-0 UNVERIFIED CRASH LOCATIONS

FIGURE 11: DISTRICT 3-0 UNVERIFIED CRASH LOCATIONS

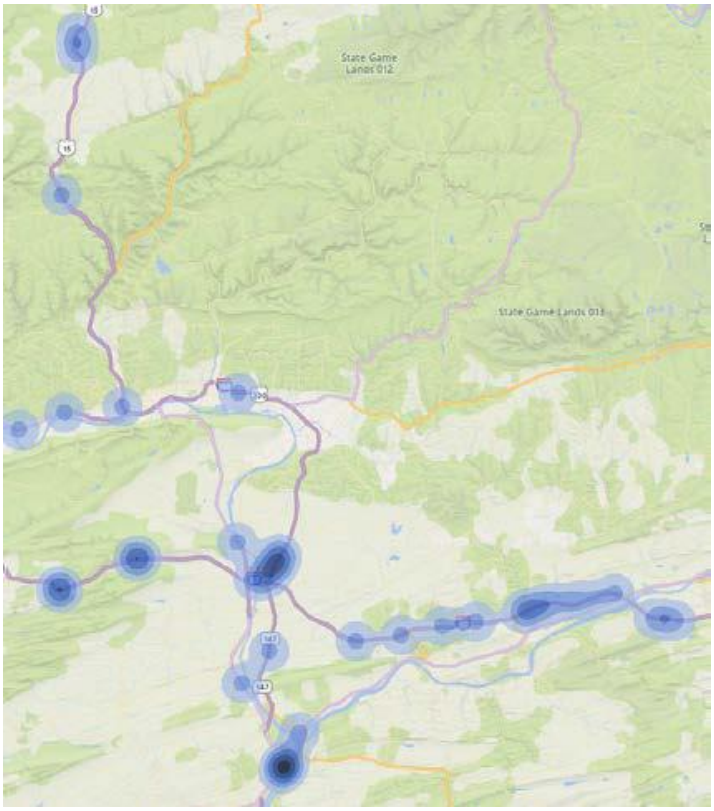


FIGURE 52: DISTRICT 9-0 UNVERIFIED CRASH LOCATIONS

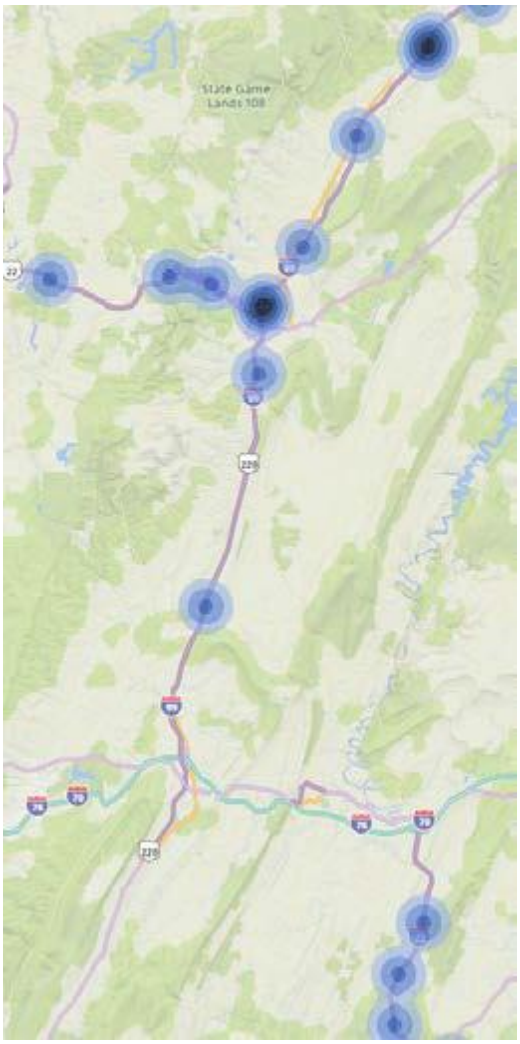
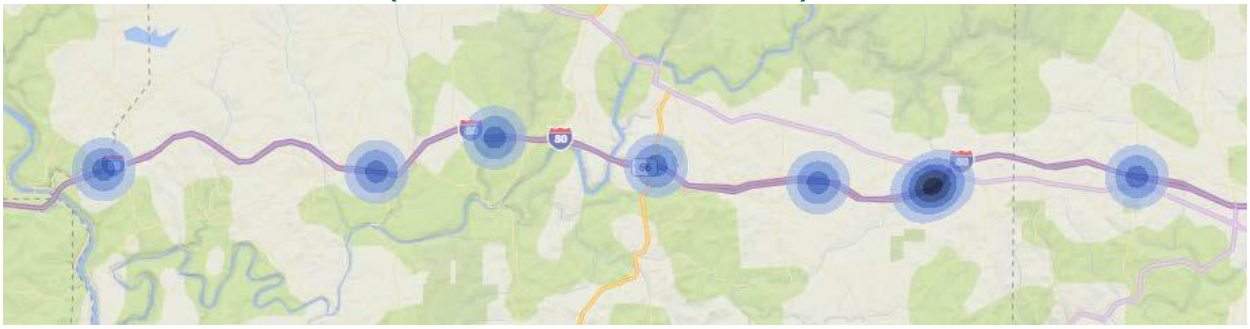


FIGURE 63: DISTRICT 10-0 (CLARION & JEFFERSON COUNTIES) UNVERIFIED CRASH LOCATIONS



Organization Issues

Maintenance of existing ITS elements is vital to the success of the RTMC and the ITS system throughout the region. This includes performing routine inspections, fixing problems in a timely manner when they do arise, and also ensuring that devices are replaced as they approach the end of their lifecycles. An inventory management system is important to track maintenance and device lifecycle. Training in the operation of ITS equipment is also important. RTMC personnel receive training to operate and gather data from the various ITS devices at their disposal and maintenance personnel should also be familiar with the devices so that they can monitor and diagnose problems in the field.

Recently Completed Projects

Performance measures can be used to document and monitor the impact of recently completed pilots, projects, and strategies within the region. By quantifying the impact of different projects, ROP preparers can gain insight into which strategies are successful and begin to quantify the benefits derived from different types of projects and strategies. This information is useful for planning which types of projects, studies, and initiatives to consider in the future. Chapter 7 of this document examines the recently completed ROP projects, a before and after analysis on completed projects, and the progress being made on projects in development.

Planned Infrastructure Changes

State College Area Connector (SCAC) Project

With the completed construction of the Potter Mills Gap Transportation Project, the next phase of completing four lanes of US 322 from Harrisburg to State college is planned to move forward. The State College Area Connector Project has moved into the design phase and plans to connect the four-lane section of US 322 built by the Potter Mills Gap Transportation Project to the four-lane section of US 322 in State College. The existing conditions created a bottleneck, particularly during PSU events, which should be relieved once this project is completed. The project should also relieve congestion on local roads as travelers try to bypass congestion on US 322.

Bellefonte Interchange Projects

The Bellefonte Interchange Project is a 3-phase project to build local access, a high-speed interchange connection between I-99 and I-80, and to make improvements on Jacksonville Road. The first phase, a standard diamond interchange between SR 26 and I-80, was completed December 2022. The second and third phases, Jacksonville Road Betterment & I-80 High Speed Interchange, are currently in construction. The overall project will allow for safer travel between I-99, I-80, PA 26, and other local roads. The projects will enhance safety, ease congestion, during high traffic times, and help to move goods and services more efficiently. The completed project will also connect two critical highway and freight interstates.

Central Susquehanna Valley Transportation (CSVT) Project

This major project is currently underway along the US 11/15 corridor near Shamokin Dam. Currently the roadway transfers from limited access to a local commercial corridor. In addition to US 11/15, other major routes that intersect in this region include PA 61, US 522, and PA-147. The Central Susquehanna Valley

Transportation Project (CSVT) seeks to address the recurring congestion due to the current layout by building a new limited access roadway which would bypass commercial corridor within Shamokin Dam and Monroe Township. The CSVT bridge was completed in 2022 and carries PA-147 over the West Branch of the Susquehanna River into Northumberland County. These new routes will provide important congestion relief at the convergence of some of the busiest routes in the Central Region. For this project, currently 8 new DMS sites and 6 new CCTV sites are planned. An Automated Wind Advisory device was installed for the CSVT bridge to provide wind advisory messages. Traffic signals along the commercial corridor are also planned to be replaced and tied into the Unified Command and Control.

Future Land Use Changes

Overall, there is a trend in economic development from traditional, large scale manufacturing industries to smaller, technology-driven manufacturing and service industries. To best take advantage of this trend, transportation infrastructure and services should be improved in the region's downtown and urban cores, connecting workers to available jobs and lowering shipping costs for freight haulers.

Natural Gas Drilling

Since the development of the last ROP, a sustained oversupply of natural gas has led to a significant decrease in commodity prices for gas and oil, and drilling efforts in the Marcellus region have therefore dropped off. This has reduced some of the highway traffic, particularly heavy vehicle traffic, that had previously been a concern. Moving forward, natural gas well drilling activity should be monitored. Depending on market prices for gas and oil, as well as changes in federal policy, another boom could happen which would again impact the transportation network in the region.

Warehouses and Freight

Pennsylvania is located in an important strategic position in the nation with several interstate roadways traversing the state that serve national and international trade routes. A large proportion of the nation's population can be reached within a single day by trucking freight operators. Therefore, many warehouse and manufacturing operations have been developing throughout the state, but particularly near major interchanges. It should be anticipated that this trend will continue and impact the Central Region given its position within the state and the way that I-80 and other important corridors bisect the area.

Anticipated Development

Centre County has a variety of development occurring. There has been a boom in mixed use construction in downtown State College replacing surface lots and other parcels with mid-rise residential/retail buildings. Elsewhere in the county, industrial park development is occurring near the I-99/PA-150 interchange. Additional development is planned near the Nittany mall as a casino is planned to open in 2026 and is expected to increase traffic in the area.

Infrastructure-Related Development

Some major land use changes are contingent on proposed roadway developments, such as the northward expansion of I-99. The various proposed I-99 projects would result in growth areas for business and industry, as well as residential land uses.

Chapter 4. Transportation Needs and Operational Issues

In addition to the needs which remain from the previous ROP process, a number of other issues and needs were identified during the current stakeholder process. These issues and needs fall under the following additional categories:

- Traveler Information
- Incident and Emergency Management
- Transportation System Safety
- Traffic Signal Improvements
- Communications Network
- Enhanced Asset Management
- Automated Systems Management

The tables in the following sections outline the specific transportation needs and operational issues identified throughout the Region.

Traveler Information

Traveler information is vital to improving the efficiency of the transportation system. When drivers are notified of real-time operating conditions, they can make informed decisions which better distribute traffic across the roadway system, maximizing efficiency. Timely information can also keep queues from continuing to build when closures occur due to crashes or weather conditions, increasing safety for all road users.

Likely the most important traveler information need for the region was completed with the opening of the RTMC. This is now the focal point of traffic operations and traveler information dissemination to the public. Through the RTMC, travelers can be informed of roadway conditions, incidents and crashes, construction and maintenance activities, and weather conditions. RTMC operators utilize CMS to disseminate this traveler information. In addition, the information is also distributed via the 511 Pennsylvania Traveler Information System (511PA) website and app.

In the years since the last ROPs were developed, the distribution of traveler information from third party developers has greatly increased. Now many drivers use apps such as Waze as part of their daily commuting habits. Despite this change, ITS devices still provide an easy and widely used source of traveler information. Many of these third-party navigation services utilize the data feed from 511PA, so the RTMC continues to play a primary role in validating traveler information by maintaining situational awareness even when travelers obtain the information through other sources.

ITS Device Gaps

Though the region has been successful in deploying ITS devices, there are still important gaps that should be filled to improve traveler information. Filling ITS device gaps has been identified as a key component of the Traveler Information needs for this ROP. These gaps sometimes aligned with particular problem areas identified in the review of congestion and safety data, but other gaps were identified based on location of other devices and need to fill in missing links in the ITS system, as coordinated through the stakeholder process. High-definition (HD) CCTV cameras are recommended, as are full-color CMS.

Upgrade/Replace Existing Devices

While filling gaps in ITS coverage is important, the state of existing ITS infrastructure should not be ignored either. Existing devices nearing the end of their useful life have been identified and should be considered for upgrade or replacement. During the ROP process it was determined that several CMS sign structures in the region were made of aluminum which is outdated and need to be replaced. Those signs are listed below:

TABLE 13: EXISTING DEVICE NEEDS

PennDOT District	Planning Organization	Location	TSAMS Device ID
2	Centre	I-99 SB	DMS-02-003
2	Centre	I-99 NB	DMS-02-005
2	Centre	I-99 NB	DMS-02-007
2	SEDA-COG	SR 322 EB	DMS-02-013
2	SEDA-COG	SR 22 WB	DMS-02-014
9	Blair	SR 3013 NB	DMS 09-001
9	Blair	SR 22 WB	DMS 09-002
9	Blair	SR 764 SB	DMS 09-003
9	Blair	SR 22 WB	DMS 09-004
9	Blair	SR 22 EB	DMS 09-005
9	Blair	I-99 NB	DMS 09-006
9	Blair	SR 8004 WB	DMS 09-007
9	Blair	I-99 SB	DMS 09-008
9	Blair	I-99 SB	DMS 09-010
9	Blair	I-99 NB	DMS 09-011
9	Blair	SR 22 WB	DMS 09-013
9	Southern Alleghenies	SR 70 WB	DMS 09-009
9	Cambria	SR 22 EB	DMS 09-014

PennDOT District	Planning Organization	Location	TSAMS Device ID
9	Cambria	SR 22 WB	DMS 09-016
9	Southern Alleghenies	SR 30 EB	DMS 09-015
9	Cambria	SR 22 EB	DMS 09-017
9	Southern Alleghenies	SR 453 SB	DMS 09-018
9	Southern Alleghenies	SR 22 WB	DMS 09-012

Incident and Emergency Management

Incident and Emergency Management refers to the ability to detect, verify, and respond to incidents within the regional transportation system. The central objective of the effort is to improve the time required to respond to incidents and weather events, and to manage the processes safely, securely, and efficiently. Improved management of incidents can significantly reduce congestion and enhance safety and mobility.

Integrated Corridor Management

Unlike most limited access highways, I-80 was not built to mirror the alignment of any particular highway. However, there are still a variety of state routes which parallel the interstate through the region. Because of this, there are multiple opportunities to provide Integrated Corridor Management (ICM). ICM is a strategy to improve the movement of people and goods through institutional collaboration and integration of existing infrastructure along major corridors, often utilizing other TSMO strategies in order to maximize underutilized capacity on parallel roadways in order to reduce overall corridor congestion.

The following TSMO strategies can be integrated in order to achieve successful ICM across the I-80 corridor, as well as other important corridors in the region:

- Traffic Incident Detection – Early and accurate detection of incidents is needed to allow authorities to respond to the scene quickly and with appropriate personnel and equipment. Detection also allows for the parallel corridor to be quickly put into place, minimizing backlog on the mainline. Detection can be provided in a variety of ways:
    - CCTV monitoring
    - Crowd-sourced data such as Waze
    - Coordination with Pennsylvania State Police (PSP) and other emergency personnel
    - Probe speed data monitoring (such as INRIX)
    - Detector data showing major slowdown
- Dynamic rerouting – Present drivers with alternate routes (on parallel corridors) when I-80 is severely congested due to incidents, special events, or other abnormal traffic conditions. Alternate

route information can be displayed on CMS upstream of off-ramps to the parallel corridors. This information can also be provided via 511PA. Incident data available in 511PA also helps third-party navigation apps to recommend rerouting.

- Traffic Signal Enhancements – integrate signal systems across adjacent jurisdictions and connect to the RTMC so that timings can be adjusted remotely to handle the increase in volume and maximize throughput along the route.

The RTMC is a key component of any ICM strategy in order to ensure success. Efficient notification of the incident would be routed through the RTMC who would then adjust CMS messaging to inform drivers of a parallel route, and signal timings would be adapted to ensure the parallel route operates as effectively as possible. **Table 14** summarizes corridors which were identified as candidates for ICM.

TABLE 14: REGIONAL ICM CORRIDOR NEEDS

PennDOT District	Planning Organization	Location	Parallel Corridor
2	SEDA-COG	US 22/322	PA 35 PA 333 Local routes
2	North Central	I-80 Green Detour	US 322 PA 53
2, 10	North Central	I-80 Brown Detour	US 322 PA 28
3	SEDA-COG	I-80	US 11 PA 42
9	Blair	I-99	US 220 BUS 220 ALT 220
9	Cambria	US 22	US 219 US 422 SR 1036
10	Northwest	I-80 Orange Detour	US 322 PA949

TIM Teams

Traffic Incident Management (TIM) is a multi-agency, coordinated effort to minimize the impact of traffic incidents. TIM requires planning and coordination between multiple entities, including local transportation departments, law enforcement, fire departments, emergency medical services, towing and recovery companies, and hazardous materials clean-up contractors. Each agency has its own diverse priorities and cultures which need to be addressed through a unified set of TIM strategies including better interagency coordination and training. A successful TIM team can lead to reduced incident response cost, decreased travel delay, and improved safety through faster, better organized incident clearance.

Special Event Use of Portable CMS

Portable CMS, normally transported via a trailer hitch, are a very handy tool for ITS operations due to the inherit flexibility which they provide. They are often used to improve safety in work zones but can also be utilized during special events which draw large crowds and create congestion. They can also be deployed to rural areas to assist with operations during weather events. The Central Region has the capability to program these devices from the RTMC.

Transportation System Safety

With an estimated 35% of congestion in the Central Region occurring due to traffic incidents, safety is of course an important issue. While the previous section discussed ways to minimize impacts due to incidents, this regional need relates to minimizing the occurrence of incidents before they happen.

Innovative ITS devices continue to be introduced and improved upon which seek to assist drivers in warning of potential dangers and in reducing dangerous conditions in the first place. This section discusses a few of these TSMO strategies which are recommended to improve safety at particularly dangerous sections of the region's highways.

Variable Speed Displays

Variable speed displays, also known as variable speed limits, are posted by variable speed limit signs. These speed limits can be changed remotely by the RTMC or can automatically change in response to congestion, incidents, work zones, or road weather conditions. Identified in the previous ROP, the Central Region deployed a pilot program on I-80 that saw substantial returns on investment. Due to the success of that pilot, Variable Speed Displays were identified as a priority strategy.

TABLE 15: VARIABLE SPEED DISPLAY NEEDS

PennDOT District	Planning Organization	Corridor
2	Centre, SEDA-COG	US 22/322
2, 9	Centre, Blair, Southern Alleghenies	I-99
3	SEDA-COG	I-80
3	WATS, Northern Tier	Future I-99
3	WATS	I-180

Queue Detection

Queue warning systems alert drivers to downstream slow-moving traffic, especially in cases where the congestion would be unexpected. Queue warnings are typically delivered to motorists through CMS, though some advanced ITS applications involve in-vehicle queue warnings. Queue warning systems can be used in conjunction with portable CMS ahead of work zones with lane closures in effect or other temporary conditions which will cause atypical congestion. Queue warning systems can also be effectively paired with variable speed limits to improve their effectiveness.

TABLE 16: QUEUE DETECTION NEEDS

PennDOT District	Planning Organization	Corridor
3	WATS	I-180 WB, approaching SB US 15 off-ramp
9	Cambria	US 22 Eastbound, near US 219

Dynamic Curve Warning

Dynamic curve warning systems provide feedback to vehicles entering a horizontal curve when they approach at an unsafe speed. Vehicle speeds are detected upstream of the curve by radar or other ITS devices and trigger a controller which activates electronic sign elements and/or CMS signs to warn the speeding driver to slow down prior to the curve.

In most cases, Dynamic Curve Warning should be installed only after other more low-cost improvements have been installed and not achieved the desired outcome. Low-cost improvements would include signage, delineation treatments, high friction surface treatments, and other similar solutions.

TABLE 17: DYNAMIC CURVE WARNING NEEDS

PennDOT District	Planning Organization	Corridor
9	Cambria	US 219 between PA 56 & PA 869

Slow Vehicle Warning

Slow vehicle warning systems have begun to be used, often for large construction vehicles entering the roadway from a work zone access point. Sensors can be used to detect the slow moving vehicle, triggering a message to be displayed upstream warning drivers. This could be used in the region at permanent locations as well where speed discrepancies (often due to vertical curves) create rear end crashes.

TABLE 18: SLOW VEHICLE WARNING NEEDS

PennDOT District	Planning Organization	Corridor
3	WATS	US 15

Automated Truck Enforcement

Automated truck enforcement systems can be used to detect certain types of unauthorized vehicles and assess violations, saving manpower that would normally be used for enforcement. Within the region, this could be used to reduce heavy vehicle usage of routes which they are banned from. The vehicle would be identified to be above a specified height, length, or weight and a camera system would record images to be used in an automated violation which would be sent to the driver. It should be noted that the state legislation would be required in order to allow for this type of automated enforcement.

Traffic Signal Enhancements

Traffic signals can improve the safety and efficiency of roadway networks for motorists, as well as for cyclists and pedestrians. However, poor signal timing and/or poor coordination between signalized intersections can negatively impact traffic flow and the effectiveness of the signals. There are a variety of traffic signal enhancements that can allow agencies to get the most effective operations from their existing traffic signals without roadway widening or other costly improvements.

- Optimization and coordination of signal timing.
- Integration signals into the statewide Unified Command and Control (UCC) system to provide remote operational capabilities.
- Adaptive traffic signal control to smoothly adjust timings to account for actual traffic volumes where volumes are less predictable.
- Traffic responsive operations for corridors where traffic volumes fall into typical patterns, but the volumes vary daily.
- Emergency vehicle preemption to halt general traffic movements so that emergency vehicles may pass through.
- Removal of unwarranted traffic signals.
- Monitoring traffic signals using automated traffic signal performance measures developed from high resolution data logs.

The benefits of these enhancements include:

- Decreased congestion and delay, improving travel time and travel time reliability.
- Smoother traffic flow and reduced congestion between traffic signal systems in adjacent jurisdictions.
- Improved safety without major modifications.

Some of the Central Region's corridors which would benefit from these enhancements are shown in **Table 19**.

Table 19: Traffic Signal Enhancement Needs

PennDOT District	Planning Organization	Corridor
2	Centre	South Atherton Street
2	Centre	Shiloh Road PA 26 PA 150
2	Centre	North Atherton Street
2	Centre	College Avenue
2	Centre	PA 45 PA 144
2	Centre	US 322 US 350
2	Centre	PA 550
2	North Central	PA 970
2	North Central	US 219 PA 255
2	SEDA-COG	PA 35
3	Northern Tier	US 6 PA 199
3	SEDA-COG	US 11 PA 42
3	SEDA-COG	US 11 PA 54
3	SEDA-COG	US 15
3	WATS	SR 2014
9	Blair	US 220
9	Blair	PA 36
9	Blair	17th Street
9	Cambria	PA 56
9	Cambria	US 22
9	Southern Alleghenies	PA 601
10	North Central	PA 36
10	Northwest	US 322

Communications Network

Fiber Backbone

In order to best operate many of the ITS device and traffic signal upgrades mentioned above, a robust communications network is required. The installation of a fiber backbone will provide PennDOT with the means for facilitating a high-bandwidth connection to ITS field devices, other agencies and equipment through a state-owned and maintained network. A properly designed fiber optic communications network is highly reliable and will supply the bandwidth necessary to transmit current and future data and video to/from the RTMC.

By utilizing the region's interstates as a pathway to establish the backbone installation, all conduit, cabling, and communications equipment will be installed within the limited access right-of-way which will help mitigate any possible damage to cable or equipment infrastructure due to uncoordinated digging activities near PennDOT underground infrastructure (exacerbated by the fact that PennDOT is not a listed utility as part of Pennsylvania's One-Call system). In addition, the installation of primary backbone facilities along the interstate roadway network provides logical connections for expansion to major arterial facilities via interchanges.

Once deployed, the fiber optic backbone network does not require any additional leasing cost to maintain. The high bandwidth that is provided by a properly designed fiber optic backbone network also makes this alternative more scalable as additional data and video needs are realized in upcoming years. It should be noted that the up-front installation cost for a fiber backbone network is substantial when compared to leasing costs on a device-by-device basis, but the installation of fiber will begin to realize cost savings once fully deployed.

To connect the existing fiber network back to the RTMC, the following gaps were identified:

- I-99, Exit 71 to I-80
- I-80, Existing Fiber (MM 159.1) to Exit 161
- I-80, Existing Fiber (MM 154) to District 2-0 Office

To complete the fiber backbone on I-80 in the region, the additional gaps were identified:

- I-80, Exit 97 to District 2-0 Office
- I-80, MM 165 to Exit 212 (I-180)
- I-180, from I-80 to Montoursville (I-180 Exit 21)

To complete the fiber backbone on I-99, an additional gap from Exit 52 to the Pennsylvania Turnpike (I-76) was also identified.

In total, approximately 49 miles of fiber are needed to connect the existing backbone to the RTMC and an additional 97 miles of fiber are needed to provide a complete backbone on I-80/I-180. An additional 52 miles of fiber are needed to complete the I-99 backbone.

Enhanced Asset Management

With a growing network of ITS devices throughout the Central RTMC Region, it becomes increasingly difficult to manage and maintain them. It is recommended that an Enhanced Asset Management program be deployed so that PennDOT and the planning partners are able to monitor the age and status of the various ITS devices in the region. Therefore, the devices can be best maintained and remain in operation. Also, PennDOT and the planning partners can be aware of which devices are reaching the end of their life cycles and in need of replacement. This allows for planners to determine approximate timing of future expenditures related to replacement of existing ITS devices.

Automated Systems Management

Another aspect to consider with a growing network of ITS devices is the capabilities of RTMC staff to manage and utilize them. Potential solutions exist which can automate some of the operation of devices. These systems, sometimes referred to as advanced roadside information management systems, can pull data from cameras and sensors and run algorithms to determine any issues occurring in real-time. These systems can then automate the operation of variable speed displays and other devices, as well as sending appropriate messaging out to CMS signs.

This sort of technology is relatively new and would specifically be new to the Central RTMC Region. Therefore, no large-scale deployment is recommended at this time. However, a pilot should be considered to test the potential and capabilities of such a system.

Chapter 5. Strategies and Projects

Based on the Transportation Issues and Operational Needs identified in the previous chapter, a set of projects were developed for inclusion in this Regional Operations Plan. The following list shows the variety of TSMO strategies identified for inclusion in these projects:

- CCTV
- CMS
- Integrated Corridor Management
- Queue Warning
- RWIS
- Traffic Signal Enhancements
- Variable Speed Displays

In total, 73 projects were identified which span the entire Central RTMC Region and each of the 9 planning partner regions.

TABLE 20: HIGH PRIORITY PROJECT LIST

Project Number	Project Name	Priority Area	Planned Improvement
CN.01	I-80 Fiber Optic Backbone	Communications Network	Fiber Deployment
FA.01	US 22/322 ITS Gaps	Freeway & Arterial Operations	CCTV, CMS, RWIS, & VSL
FA.02	District 3 I-80 Corridor ITS Gaps	Freeway & Arterial Operations	CCTV, CMS, RWIS, & VSL
FA.03	Future I-99 Corridor ITS Gaps	Freeway & Arterial Operations	CCTV, CMS, RWIS, & VSL
FA.04	I-180 Corridor ITS Gaps	Freeway & Arterial Operations	CCTV, CMS, RWIS, & VSL
FA.05	I-99 ITS Gaps	Freeway & Arterial Operations	CCTV, CMS, & RWIS
FA.06	RTMC Upgrades	Freeway & Arterial Operations	Videowall Upgrade
FA.07	Upgrade I-80 VSL	Freeway & Arterial Operations	VSL
FA.08	I-99 VSL	Freeway & Arterial Operations	VSL
TI.01	Arterial ITS in Elk and Clearfield Counties	Traveler Information	CCTV & CMS
TI.02	I-80 ITS Gaps District 10	Traveler Information	CCTV & CMS
TI.03	US 220 Global Detour Route ITS	Traveler Information	CCTV & CMS
TI.04	US 22 Cresson to Hollidaysburg ITS	Traveler Information	CCTV & CMS
TI.05	I-70 ITS Gaps	Traveler Information	CCTV & CMS

Project Number	Project Name	Priority Area	Planned Improvement
TI.06	US 322, Philipsburg to I-99 ITS	Traveler Information	CMS & Portable CMS
WO.01	US 22 Truck Chain-up Location ITS Support	Weather Operations	CMS & RWIS

TABLE 21: NORMAL PRIORITY PROJECT LIST

Project Number	Project Name	Location	Planned Improvement
AD.01	Antiquated CMS Structures	Antiquated Devices	CMS Structures
FA.09	ITS on US 219 in Elk County	Freeway & Arterial Operations	CCTV, CMS, & RWIS
FA.10	Winter Operations ITS	Freeway & Arterial Operations	CCTV, CMS, & RWIS
FA.11	Emporium CCTV & RWIS	Freeway & Arterial Operations	CCTV & RWIS
FA.12	PA 970 Traffic Signals Upgrade	Freeway & Arterial Operations	Traffic Signals Improvements
FA.13	Loganton RWIS	Freeway & Arterial Operations	RWIS
FA.14	US 22/322 ICM	Freeway & Arterial Operations	Traffic Signals Improvements
FA.15	Jacks Mountain ITS	Freeway & Arterial Operations	CCTV & RWIS
FA.16	US 322 Orange Detour ICM	Freeway & Arterial Operations	Traffic Signals Improvements, CCTV, & CMS
FA.17	Clarion/Venango County Detour ITS	Freeway & Arterial Operations	CCTV, CMS, & RWIS
FA.18	US 11 Detour ICM	Freeway & Arterial Operations	Traffic Signals Improvements
FA.19	CSVT Traffic Signal Timing Study	Freeway & Arterial Operations	Traffic Signals Improvements
FA.20	Danville Traffic Signal Upgrade	Freeway & Arterial Operations	Traffic Signals Improvements
FA.21	Sayre/Athens & Towanda Signal Upgrades	Freeway & Arterial Operations	Traffic Signals Improvements, CCTV, & CMS
FA.22	US 220 ICM	Freeway & Arterial Operations	Traffic Signals Improvements, CCTV, & CMS
FA.23	Roaring Spring Congestion Management	Freeway & Arterial Operations	Traffic Signals Improvements
FA.24	Ebensburg ICM	Freeway & Arterial Operations	Traffic Signals Improvements, CCTV, & Queue Warning
FA.25	US 219 ITS	Freeway & Arterial Operations	CCTV, CMS, RWIS, & Dynamic Curve Warning

Project Number	Project Name	Location	Planned Improvement
FA.26	PA 56 Truck Warning	Freeway & Arterial Operations	Truck Warning System
FA.27	PA 56 Traffic Signal Improvement	Freeway & Arterial Operations	Traffic Signals Improvements & CCTV
FA.28	PA 601 Traffic Signal Upgrades	Freeway & Arterial Operations	Traffic Signals Improvements & CCTV
FA.29	PA 26 ITS	Freeway & Arterial Operations	CCTV, CMS, & RWIS
FA.30	South Atherton Traffic Signal Upgrade	Freeway & Arterial Operations	Traffic Signals Improvements
FA.31	Dubois Traffic Signals	Freeway & Arterial Operations	Traffic Signals Improvements
FA.32	Shiloh Road Corridor Study	Freeway & Arterial Operations	Traffic Signals Improvements
FA.33	Smart Truck Parking	Freeway & Arterial Operations	Smart Parking System
FA.34	North Atherton Signal Timing	Freeway & Arterial Operations	Traffic Signals Improvements
FA.35	US 322 & College Ave Exit ITS	Freeway & Arterial Operations	Traffic Signals Improvements & CCTV
FA.36	Centre Hall Traffic Signal	Freeway & Arterial Operations	Traffic Signals Improvements
FA.37	Philipsburg Traffic Signal Upgrades	Freeway & Arterial Operations	Traffic Signals Improvements
FA.38	PA 550 Traffic Signals Upgrades	Freeway & Arterial Operations	Traffic Signals Improvements
FA.39	SR 2014 Traffic Signal Connection	Freeway & Arterial Operations	Traffic Signals Improvements
FA.40	17th Street Traffic Signal Upgrades	Freeway & Arterial Operations	Traffic Signals Improvements
FA.41	Punxsutawney Traffic Signals	Freeway & Arterial Operations	Traffic Signals Improvements
FA.42	PA 150 Corridor Study	Freeway & Arterial Operations	Corridor Study
TI.07	US 322 Brown Detour ICM	Traveler Information	CCTV & CMS
TI.08	Dubois CCTV	Traveler Information	CCTV
TI.09	US 322 Green Detour ICM	Traveler Information	CCTV & CMS
TI.10	CCTV at PA 66 & PA 948	Traveler Information	CCTV
TI.11	US 6 CCTV & CMS	Traveler Information	CCTV & CMS
TI.12	Low AADT Incident/Event Management	Traveler Information	CCTV & CMS
TI.13	Natalie Mountain Portable CMS	Traveler Information	Portable CMS
TI.14	CSVT ITS	Traveler Information	CCTV & CMS
TI.15	Lewisburg CCTV	Traveler Information	CCTV
TI.16	US 15 Automated Slow Vehicle Warning	Traveler Information	CMS
TI.17	PA 56 ITS	Traveler Information	CCTV & CMS

Project Number	Project Name	Location	Planned Improvement
TI.18	US 219 Buildout ITS	Traveler Information	CCTV
TI.19	US 22 ITS	Traveler Information	CCTV & CMS
TI.20	US 522 ITS	Traveler Information	CCTV & CMS
TI.21	US 322 Boalsburg ITS	Traveler Information	CCTV & CMS
TI.22	PA 350 Freight Management	Traveler Information	CCTV & CMS
TI.23	US 30 Portable CCTV Upgrades	Traveler Information	CCTV
TI.24	Elk Viewing CCTV	Traveler Information	CCTV
TI.25	I-80 Exit 111 CCTV	Traveler Information	CCTV
TIM.01	CAD ATMS Integration	Traffic Incident Management	ATMS Integration
WO.02	RWIS Gaps	Weather Operations	RWIS
WO.03	Winter Operations Messaging	Weather Operations	PA 511 & ATMS Automated Messaging
WO.04	PA 869 Winter Weather Management	Weather Operations	Portable CCTV & Portable CMS

Project Descriptions

Project descriptions have been developed for each of the projects listed above as part of this plan and are included in **Appendix B.** The information found in the descriptions includes:

- Project Description and Scope
- Stakeholders
- Estimated Schedule
- Estimated Costs
- Project Type
- Level of Effort
- Technology Components
- Prerequisites and Dependencies
- Performance Measures
- Benefits
- Other Considerations and Issues

Maps showing project locations within each planning partner region are included as **Appendix A**.

Other Projects Identified

During the stakeholder review process, several projects were identified that do not fit into traditional TSMO strategies. It was determined that these projects still warranted being listed in the ROP but would be forwarded to the relevant areas within PennDOT. These identified projects are listed below:

TABLE 22: OTHER PROJECTS LIST

Location Description	PennDOT Division	Project / Issue Description
PA 150 @ I-99	Bureau Planning & Research	Replace Antiquated counter stations
PA 150 @ I-80	Bureau Planning & Research	Replace Antiquated counter stations
US 220 from Port Matilda to Unionville	County Maintenance	Flooding closures awareness
Atherton St. State College	County Maintenance	Signal priority for plow trucks
Millheim	Highway Safety	Truck routing issues. Add signage, prohibit twin trailers
Bald Eagle State Park	Highway Safety	Regional events awareness and signing

Chapter 6. ROP Coordination and Maintenance

The complete ROP process should be undertaken once every four years, with an interim update two years after each full ROP is completed. Therefore, the ROP would be refreshed every other year, aligning with the TIP update schedule. The ROP schedule should however align so that it is published in the years prior to TIP updates, so that the ROP can be incorporated into the development of the TIP.

Aligning the ROP with the region's LRTPs was also discussed. Unfortunately, with nine different planning partners involved, there is no way to align the ROP with them, since their LRTP update schedules differ (as seen in **Table 4**).

Also, in order to maximize the success of the ROP, further funding sources for TSMO projects should be pursued. Ideally, a dedicated line item for TSMO funding would be added to the LRTP and TIP processes.

TSMO should also be included within the project scoping checklist. This way, ROP projects can be incorporated into larger construction projects occurring in the areas recommended within this plan. To help ensure continuity of the recommendations included in this report, it is hoped that each of the region's planning partners will formally adopt this ROP and the recommendations included herein.

Connected and autonomous vehicles were generally not accounted for within this report. Despite its ongoing presence in the news and the very real advancements occurring, too much remains unknown with the future of these technologies. As this plan is revisited for future updates, the issue of regional planning for connected and autonomous vehicles should be examined again. Any guidance provided by PennDOT Central Office and other stakeholders should also be incorporated into the document.

Chapter 7. Status of Existing ROP Projects

In the initial 2018 Central RTMC ROP, 42 projects were identified, ranging from intelligent transportation systems (ITS) and traffic signal improvements to incident management and preventive safety technologies. Integrated Corridor Management (ICM) was also a key component of the ROP. The Interim ROP update published in 2021 added 15 additional projects. With the addition of the two District 10 counties in this update, 11 projects relevant to those counties were included in the list of existing ROP projects. Those projects come from the 2019 Western RTMC ROP and the 2023 Interim ROP Update. This section will provide status updates for these previously documented projects. Project status updates fall into the following categories shown in **Table 23**. Project Details for these projects can be found in **Appendix C**. Details for completed projects were not included since they no longer need to be listed as potential future projects.

TABLE 23: PROJECT STATUS DEFINITIONS

Project Status	Definition
Documented	Project has been included in the ROP.
Programmed	Project has been included in a planning document, such as a Transportation Improvement Program (TIP), Twelve Year Program (TYP), or Long-Range Transportation Plan (LRTP) and/or another a funding source has been secured. Specific funding sources are noted were applicable.
Partial Progress	Progress has been made on some component of the project. The "Notes" column provides more detail. For example, a project that might have included both traffic signal improvements and ITS devices could have seen the signal work progressed but not the ITS devices, or vice versa.
In Design	Project is currently in design.
In Construction	Project is currently in construction.
Complete	Project has been completed.

TABLE 24: COMPLETE PROJECTS

ROP Project ID	Project Title	Project Status	Funding Source	Notes
IU-04	I-80 VSL Pilot	Complete		Portable VLS placed on I-80 from MM 111-120, funded through BOMO 2021/22 Winter.
LT-03	I-80 ICM (Exit 97 to 101)	Complete	TFI	Integrated Corridor Management along I-80 between Exits 97 and 101 and along the parallel corridors of US 219 and PA-255 through DuBois. This project would include upgrading signal controllers at approximately 11 intersections in order to allow for command/control functionality. It also includes installation of 3 full-color Type A DMS sign and 2 HD CCTV cameras.SR 255/N47 ECMS 114189, ITS work included installation of 3 Type A CMS, 2 CCTVs and Verizon circuit upgrades for signal/ITS integrations. Traffic Signals complete
LT-05	I-99/US 322 ICM (Atherton Street)	Complete	TFI	Upgrade signal controllers at 29 intersections in order to allow for command/control functionality and performance measures. Install 1 full-color standard DMS, 1 full-color Type A DMS, and 2 HD CCTV cameras to aid in Integrated Corridor Management between I-99, US 322, and Atherton Street. SR 3014/153 ECMS 101960, ITS work included installation of double-sided CMS on Skytop, Type A CMS-SR322 WB (Boalsburg) and 2 CCTVs (1) on SR322 EB- Boalsburg sign structure and (1) on SR3014-CMS #49 at Myers Dairy. Also includes various circuit upgrades. (T1 to Fiber) Signal integration completed under various contracts. Traffic Signals partially complete. In Design to complete remaining traffics signals under State College Borough GLG project.
LT-08	PA-56 Traffic Signal Improvements	Complete	CMAQ	
LT-09	US 220-Business Traffic Signal Improvements	Complete		
ST-11	Existing DMS Retrofit - Centre County	Complete		DMS #3 AMSIG retrofit completed under ECMS 114493. DMS #4 Color sign replacement under ECMS 114493.
ST-13	I-80 Slow Vehicle Warning	Complete		Queue/Slow/Stopped safety messaging added to I-80 corridor throughout district 2 using INRIX data. Automatic messaging through ATMS software.

ROP Project ID	Project Title	Project Status	Funding Source	Notes
ST-17	Existing Bridge De-Icing Retrofit	Complete		ECMS 116332 Added High friction surface treatment on bridges at Milesburg and Anderson creek (I-80 Eastbound and Westbound); ECMS 88579, Removed disks from roadway/bridges and disabled both sprayer systems.
ST-18	I-99 RWIS	Complete		CCTV Duplicate, To be installed under ECMS 119970; RWIS in place, commissioned through BOMO Statewide.
ST-21	Existing DMS Retrofit - District 9	Complete	TFI (MPMS 112704)/ Antiquated Devices (MPMS 114493)	
ST-22	Existing DMS Retrofit - McKean County	Complete	Antiquated Devices Funding	DMS #22 and #23 AMSIG retrofits completed under ECMS 106373.

TABLE 25: PROJECTS IN CONSTRUCTION

ROP Project ID	Project Title	Project Status	Funding Source	Notes
IU-11	Middleburg Signal Improvements	In Construction	GLG	Project being completed with GLG project.
LT-16	Sayre Traffic Signal Improvements	In Construction	TFI	Project is in construction to replace detection and controllers. Will also be tied into MaxView. Project to be completed by Fall of 2025.
ST-03	Breezewood ICM	In Construction		
ST-15	US 322 Slow Vehicle Warning	In Construction		US 322 EB Type A CMS for Downgrade Messaging prior to Seven Mountains, US 322 WB Type A CMS for slow vehicle warning bottom of Seven Mountains; Work being completed under ECMS 119970 (In Construction).
ST-16	I-99 CCTV Gaps	In Construction		12 new CCTV on I-99 from MM 59 to MM 84.5; Work Being completed under ECMS 119970 (In Construction).
ST-19	US 15 to I-180 Dynamic Curve Warning	In Construction		Project has a NTP to proceed of 11/2024 with a completion date of 9/2025.
ST-20	Central Region CCTV Gaps	In Construction		I-80 MM 105.7, Installed MIC CCTV on DMS #28 ECMS 114493; I-80 near MM 116, Installed CCTV on 50' Pole ECMS 88579 (In Construction).

Table 26: Projects In Design

ROP Project ID	Project Title	Project Status	Funding Source	Notes
LT-04	I-180 Interchange Improvements	In Design		District has executed a work order to start design for adding queue preemption to Maynard and Market interchanges. Anticipated to be let by early 2026
ST-01	CSVT ICM + TIM Team	In Design	TYP	Project is in design. Anticipated to be let in 2027. Project does not include development of a TIM team
ST-04	I-80 ICM (Exit 147 to 158)	In Design		(3) Type A CMS; (1) @ SR150/220 EB, (1) @ SR150/220 WB, Milesburg and (1) @ SR4005, Snowshoe), Permanent Install VSL I-80 Exit 147 to Exit 158. No Signal Upgrade, No CCTV Camera. In design under ECMS: 88577. Traffic signal upgraded. Need communication for Unified Command & Control JJT

Table 27: Programmed Projects

ROP Project ID	Project Title	Project Status	Funding Source	Notes
LT-07	I-80 ICM (Exit 173 to 185)	Programmed		Work in design under 80/I03 project; (3) Type A CMS, (1) CCTV, Remove HAR transmitter, possible permanent VSL, T1 to fiber ethernet upgrades. 4 of 5 traffic signals complete.
ST-06	I-80 CCTV Gaps	Programmed		New CCTV @ 185MM I-80 Duplicate Device Shown on LT-07 (I-80 ICM, Exit 173-185), In Design 80/I03. (ECMS 114493. Installed MIC CCTV on DMS #44 (I-80 Westbound MM 184.5)

TABLE 28: PARTIAL PROGRESS PROJECTS

ROP Project ID	Project Title	Project Status	Funding Source	Notes
IU-01	PA-150 ICM	Partial Progress		Installation of CCTV on I-99 exit 78 median under ECMS 119970 (in construction). Traffic Signals partially complete. Capable of Unified Command/Control.
IU-02	College Twp. Signal Improvements	Partial Progress		Possible CCTV at US 322/PA-26 Interchange. **Partially complete. All traffic signals equipped for Unified Command & Control. 4 of 11 are fully completed.**
IU-05	North Central ITS	Partial Progress		Portable CCTV Boone Mountain (Completed under ECMS 106373); Portable CMS SR255/153 (Completed under ECMS 101960); Upgrade existing RWIS (Completed under ECMS 114493).
IU-06	PA-879 Signal Improvements	Partial Progress		TI to fiber ethernet upgrade completed for CCTV 35 (SR 879). **Traffic Signals Complete**
IU-07	PA 655 Signal Improvements	Partial Progress		TI to fiber ethernet upgrade completed under ECMS 119436. **Not complete**
IU-08	US 220 Corridor ITS	Partial Progress		Installed (2) CCTV; (1) NB and (1) SB on SR 220, Castanea Exit, under SR120/325 ECMS 117465 (Completed); Type A not complete. **In Design on SR 80 Sect 103 project?**
IU-10	CSVT Signal Improvements	Partial Progress	GLG, TIP	Signals on the US 15 corridor in Kelly Township have been upgraded with GLG project which tied into MaxView. US 11 corridor in Northumberland will be evaluated after the completion of the CSVT southern section and will include Shamokin Dam/Monroe Township signals. 2028 Anticipated date
IU-12	Montoursville Signal Improvements	Partial Progress	ARLE	SR 2014 and Walnut Ave. is being replaced with ARLE project. To be constructed in 2025. The department is encouraging the Municipality to apply for grants to replace the signal at SR 2014 and Willow.
IU-13	Third Street Signal Improvements	Partial Progress	GLG	In coordination with the GLG project to replace the signal at 3rd and Northway, the township is also retiming the signals from Country Club road to Northway. Project has been advertised. CCTV at Faxon St. is documented.

ROP Project ID	Project Title	Project Status	Funding Source	Notes
LT-01	I-80 ICM (Exit 232 to 241)	Partial Progress	ARLE	3 Signals being replaced on East St in Bloomsburg as part of the SR 11-114 Project which started in April of this year. These will be tied into the MaxView. An ARLE has been granted to Bloomsburg to replace controller cabinets at the rest of the signals in Bloomsburg and tie them into MaxView. The design kickoff meeting for that will happen in mid June. Also looking at adding a CCTV and a CMS in the WB direction at exit 232 (Buckhorn interchange).
LT-02	I-80/I-99 Fiber Backbone	Partial Progress	MPMS 112320 MPMS 3142 MPMS 74910/109243 MPMS 112324 MOMS 112323 (included in 2021 SEDA-COG LRTP) MPMS 112374/112376 MPMS 112380	I-80, Exit 97 to District 2-0 Office: In Construction under 80/B42 ECMS 88579.; I-80, MM161 to MM165: Completed under 80/A18 ECMS 51466.; I-80 MM 158 to MM 161: In Construction under 80/B18 ECMS 3142.; I-99 MM 84.5 to Exit 161 interchange: In Construction under ECMS 3142.
LT-06	I-80 ICM (Exit 111 to 123)	Partial Progress		Numerous circuit upgrades for T1 to fiber ethernet, Type A CMS on SR 153 added under 80/B42 ECMS 88579 (in construction), SR153-N46 ECMS 93330 Type A CMS on SR 879 in design.
LT-11	PA-54 Traffic Signal Improvements	Partial Progress		Signal system retimed. Congestion still an issue. No ITS devices planned at this time. Consider extending signal improvement scope to include US 11 intersections with State Hospital Dr and with Woodbine Ln. Consider extending scope to include considering removal of existing signal at intersection of US-11 intersection with Mill St., conversion of Mill St. to Right-in/Right-out. Consider addition of CCTV cameras for US-11/PA 54 intersection and PA 54/SR 4001 intersection at south end of Danville River Bridge.
LT-12	Central Region DMS Gaps	Partial Progress	TSMO Funding Initiative I-70 MPMS 112704	TFI funded Altoona MPO and Southern Alleghenies RPO devices. I-70 CMS in construction Some boards will be added to Atherton project. PA 64 near I-80 (Lamar) under 80/I03 (in design); I-99 exit 62S (not complete); I-99 exit 68N (Skytop CMS installed under 3014/153 ECMS 101960); I-99 exit 76N (Shiloh RD not complete); I-99 exit 78N (Bellefonte not complete).

ROP Project ID	Project Title	Project Status	Funding Source	Notes
LT-15	PA-150 Traffic Signal Improvements	Partial Progress		T1 to fiber ethernet upgrades (CCTV 50, Hogan Blvd.) **1 of 5 traffic signals completed**
LT-17	PA-144 Truck Enforcement	Partial Progress		Placed portable CCTV under ECMS 119436 (SR144 Seg 0140, Installed Permanent CCTV at SR45/144 Intersection (CCTV 64) ECMS 114493, Placed portable CMS (SP-5) on SR144 NB under ECMS 106373.
ST-02	I-80/I-99 CCTV Replacements	Partial Progress		District 9 portion completed.
ST-07	I-80 TIM Team	Partial Progress		Stage 1 complete - meeting with PSP and emergency responders (Clearfield County)
ST-09	Philipsburg Traffic Signal Improvements	Partial Progress		ITS integrations included Type A DMS #53 (SR 322 Eastbound Segment 0770 Offset 1161), 2 new CCTVs (SR 322-53 intersection and SR 322-Centre Street intersection) Also includes Verizon circuit upgrade for signal/ITS integration. SR322-267 ECMS 93329. **3 of 5 traffic signals complete**
ST-10	I-80 Existing HAR Replacements	Partial Progress		Received upgraded parts from PTC. Working with Central Office/511 on future information dissemination
ST-14	I-99 TIM Team	Partial Progress		Currently coordinated through incident management plans. Coordination through Construction Projects, County Maintenance forces, and First Responders.
ST-25	Special Event Use of Portable CMS	Partial Progress		11 Portable CMS units for Maintenance forces under ECMS 101960; 8 Portable CMS/CCTV units available under ECMS 88579 once project is completed (In Construction).
IU.01	I-80 DMS Retrofit/ Replace	Partial Progress		Work is being performed through the ITS Maintenance Contract 2023 - D2 project ECMS 119436

TABLE 29: DOCUMENTED PROJECTS

ROP Project ID	Project Title	Project Status	Funding Source	Notes
IU-03	Dubois fiber Deployment	Documented		
IU-09	US 15 Corridor ITS	Documented		
IU-14	I-70 Curve Warning	Documented		
IU-15	I-70 ITS Gaps	Documented		
LT-10	Central Region Dynamic Curve Warning	Documented		
LT-13	PA-36 Traffic Signal Improvements	Documented		
LT-14	US 6 Corridor ITS	Documented		
ST-05	US 22 Queue Detection	Documented		Existing Queue preemption was removed. Traffic signal equipment at US 22 and Mini Mall Rd was replaced. New stop bar radar detection and advanced radar detection were installed. New signal timing was also implemented, and signal is operating efficiently. Monitor crash data to determine continued project need.
ST-08	US 219/Elton Road Queue Preemption	Documented		Other issues along Elton Rd - recent study completed. Refer to study and ensure TSMO-related recommendations are accounted for in ROP project

ROP Project ID	Project Title	Project Status	Funding Source	Notes
ST-12	US 322, Philipsburg to I-99 ITS	Documented		
ST-23	US 22/322 RWIS	Documented		
ST-24	PA-350 RWIS	Documented		
TI.08	I-80 Corridor ITS	Documented		
TI.09	I-80 Fiber Deployment	Documented		
TI.16	US 322 ITS	Documented		
TI.23	Brookville Arterial DMS	Documented		
TIM.04	I-80 TIM Team	Documented		
TIM.08	I-80 Crossovers	Documented		
IU.12	I-80 Fiber Optic Backbone	Documented		
IU.16	I-80 Slow Vehicle Warning	Documented		
IU.18	I-80 & Applicable State Routes Detour Sign Update	Documented		
IU.39	I-80 Corridor CCTV	Documented		

Completed Projects Before & After Analysis

Since the adoption of the ROP in 2018, several projects have been completed. To ensure we are effectively utilizing funds we have started to perform a before and after analysis on completed projects. Performance measures identified for each project are listed in the project detail section and will serve as the benchmark for determining if goals were achieved for each completed project. Available tools for the analysis include CDART (Crash Data Analysis and Retrieval Tool), TOA (Traffic Operation Analytics) Platform, and RITIS Probe Data Analytics Suite.

**This analysis can't be done for all completed projects at this time as depending on when projects are completed enough data may not yet be available to complete an accurate analysis.*

LT-09: US 220 Business/Plank Road Traffic Signal Improvements

The data analysis demonstrates a significant improvement in travel times following the completion of signal upgrades on US 220 Business/Plank Road from Pinecroft (I-99, Exit 39) to US 22 near Hollidaysburg in November 2021. This enhancement in traffic flow efficiency can be attributed to the optimized signal coordination and modernized traffic control systems implemented during the upgrade. The reduction in travel times suggests that the upgraded signals have effectively alleviated congestion, leading to smoother and more predictable travel along this corridor. Consequently, these improvements not only enhance the driving experience for commuters but also contribute to reduced fuel consumption and lower emissions, reflecting broader environmental and economic benefits.

FIGURE 14: LT-09: TRAVEL TIME COMPARISON NORTHBOUND:

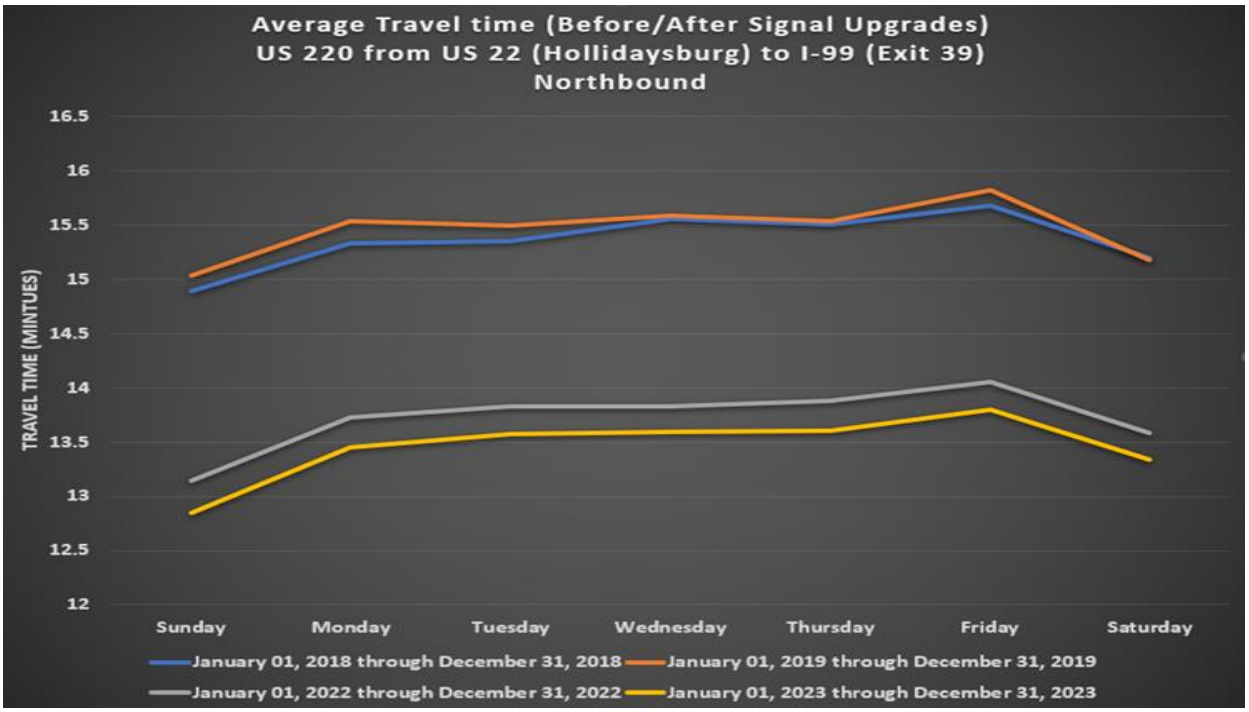
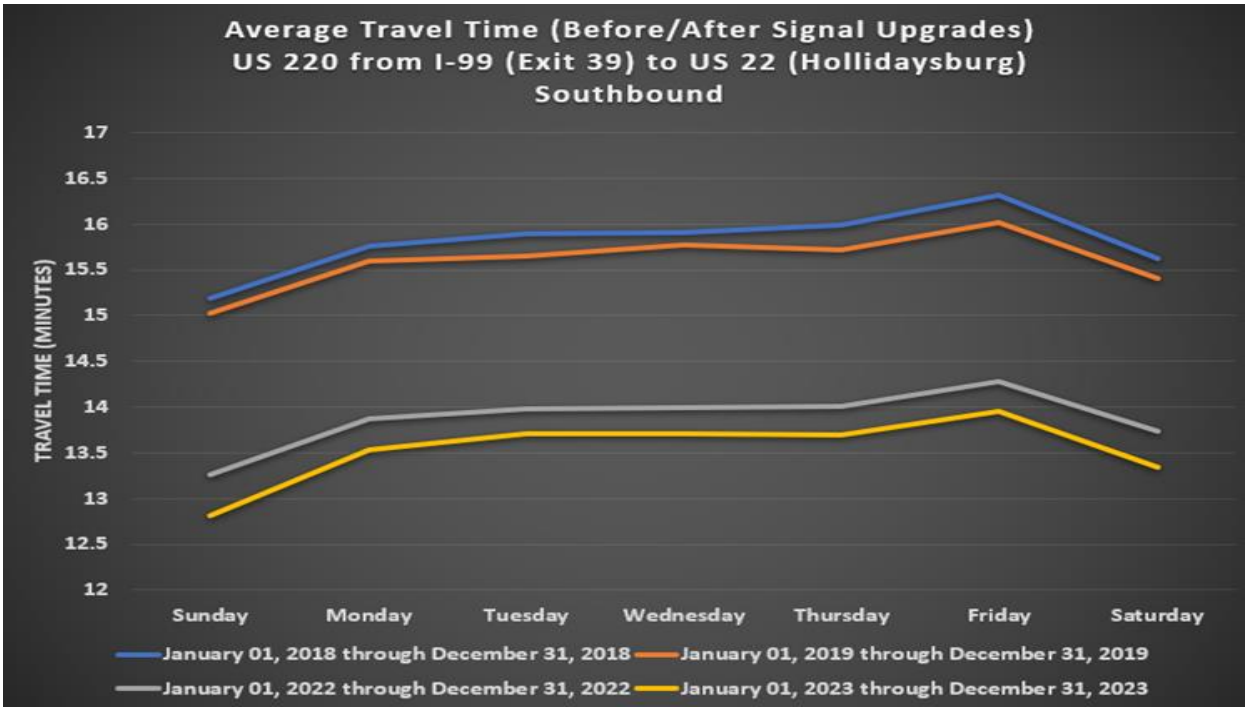


FIGURE 15: LT-09: TRAVEL TIME COMPARISON SOUTHBOUND:



IU-04: I-80 VSL Pilot

The data analysis reveals a substantial improvement in road safety along the I-80 corridor following the installation of Variable Speed Limit (VSL) devices in October 2023. Excluding the anomalous traffic patterns of 2020 and 2021, which were directly impacted by the COVID-19 pandemic, there is an average 55% reduction in crash rates. This significant decrease underscores the efficacy of VSL devices in enhancing traffic safety by adjusting speed limits in real-time based on prevailing road conditions.

Even when accounting for the years affected by reduced traffic volume during the pandemic, the data still indicates a noteworthy 45% average decrease in crash rates post-installation. The accompanying graphs in **Figure 18** visually depicts this decline in total crashes, reinforcing the positive impact of VSL devices on overall traffic safety.

FIGURE 16: IU-04: TOTAL CRASHES

I-80 VSL Corridor: October to December Crash Comparison (Excluding COVID)		
YEAR	*TOTAL CRASHES*	*Decrease in Crash Rates Compared to 2023*
2016	15	53%
2017	12	42%
2018	17	83%
2019	13	46%
2022	15	53%
2023	7	
	Average Decrease	**55%**

I-80 VSL Corridor: October to December Crash Comparison (Including COVID)		
YEAR	*TOTAL CRASHES*	*Decrease in Crash Rates Compared to 2023*
2016	15	53%
2017	12	42%
2018	17	83%
2019	13	46%
2020	15	53%
2021	6	-17%
2022	15	53%
2023	7	
	Average Decrease	**45%**

**Data based on the months of October to December from each year*

FIGURE 17: IU-04: CRASHES BY INJURY TYPE

Injury Type	2016	2017	2018	2019	2020	2021	2022	2023
FATALITIES	0	0	0	0	1	0	0	0
SUSPECTED SERIOUS	0	0	2	0	0	0	0	0
SUSPECTED MINOR	3	2	2	4	5	1	1	2
POSSIBLE INJURY	2	0	1	0	1	0	0	2
UNK SEVERITY	0	1	1	1	0	0	3	1
UNK IF INJURED	0	0	0	1	0	0	0	0
PROPERTY DAMAGE ONLY	10	9	11	7	8	5	11	2
TOTAL CRASHES	*15*	*12*	*17*	*13*	*15*	*6*	*15*	*7*

FIGURE 18: IU-04: TOTAL CRASH TRENDS

This data analysis comparing speed and travel time metrics from 2018/2019 to 2023/2024 reveals a noteworthy trend. Post-VSL installation, there has been a slight overall increase in average speeds, which has correspondingly led to a reduction in travel times. This correlation suggests that the VSL system has effectively optimized traffic flow. The increase in average speeds indicates that the VSL devices have contributed to more consistent and adaptive speed management, accommodating varying traffic conditions more efficiently. Consequently, the reduction in travel times demonstrates that vehicles can traverse the corridor more swiftly and predictably, likely due to the smoother and more regulated traffic patterns facilitated by the VSL system.

FIGURE 19: IU-04: SPEED DATA: OCTOBER TO MAY

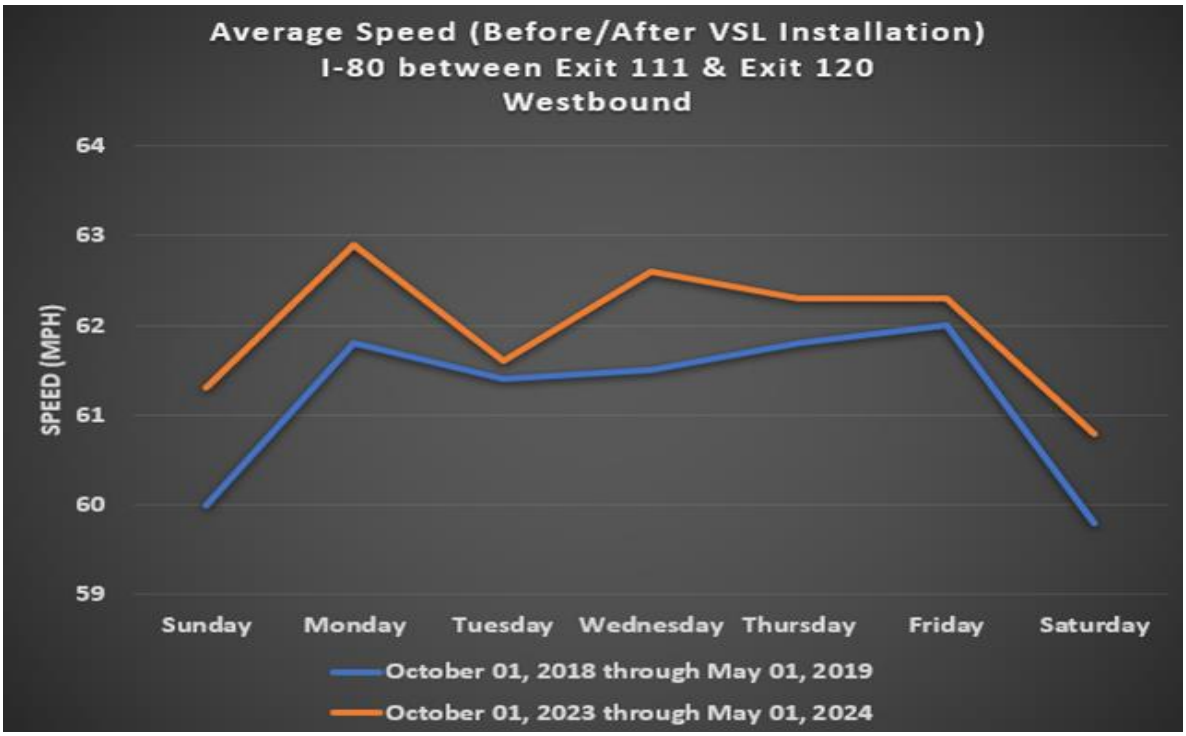
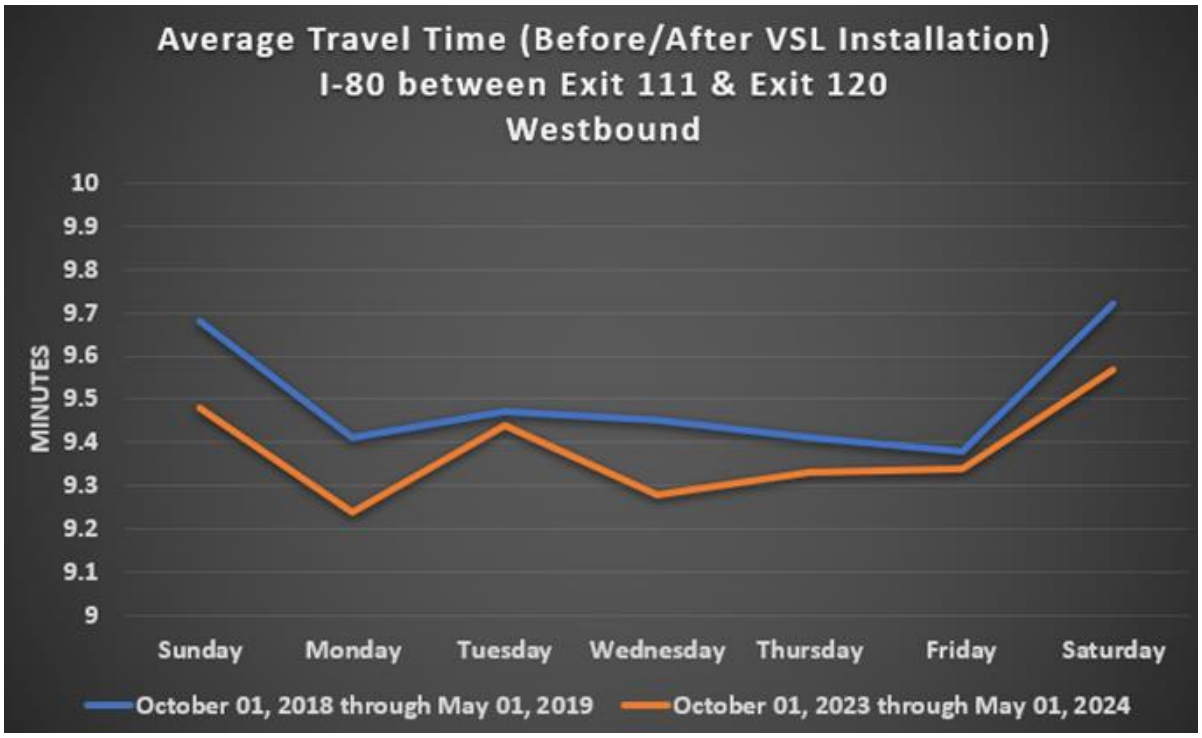


FIGURE 20: IU-04: TRAVEL TIME DATA: OCTOBER TO MAY



Appendix A. Planning Partner Project Maps

FA-22. US 220 ICM. Add pre-entry Type A CMS and CCTV along US 220 for I-99 Detour management. Upgrade Signals along US 220 and connect to UCC.

FA-08. Install VSL signs on I-99 corridor

FA-05. I-99 ITS Gaps. Add CMS, CCTV, VSL, and RWIS along I-99 Corridor.

FA-40. Connect 17th Street Signals to UCC

TI-04. US 22 Cresson to Hollidaysburg. Add CCTV & Type A and Portable CMS. Truck Chain up location.

FA-23. Roaring Spring Congestion Management. Signal Upgrades.

September 18, 2024

1:81,151

Traffic Signals

RWIS Stations and Weather

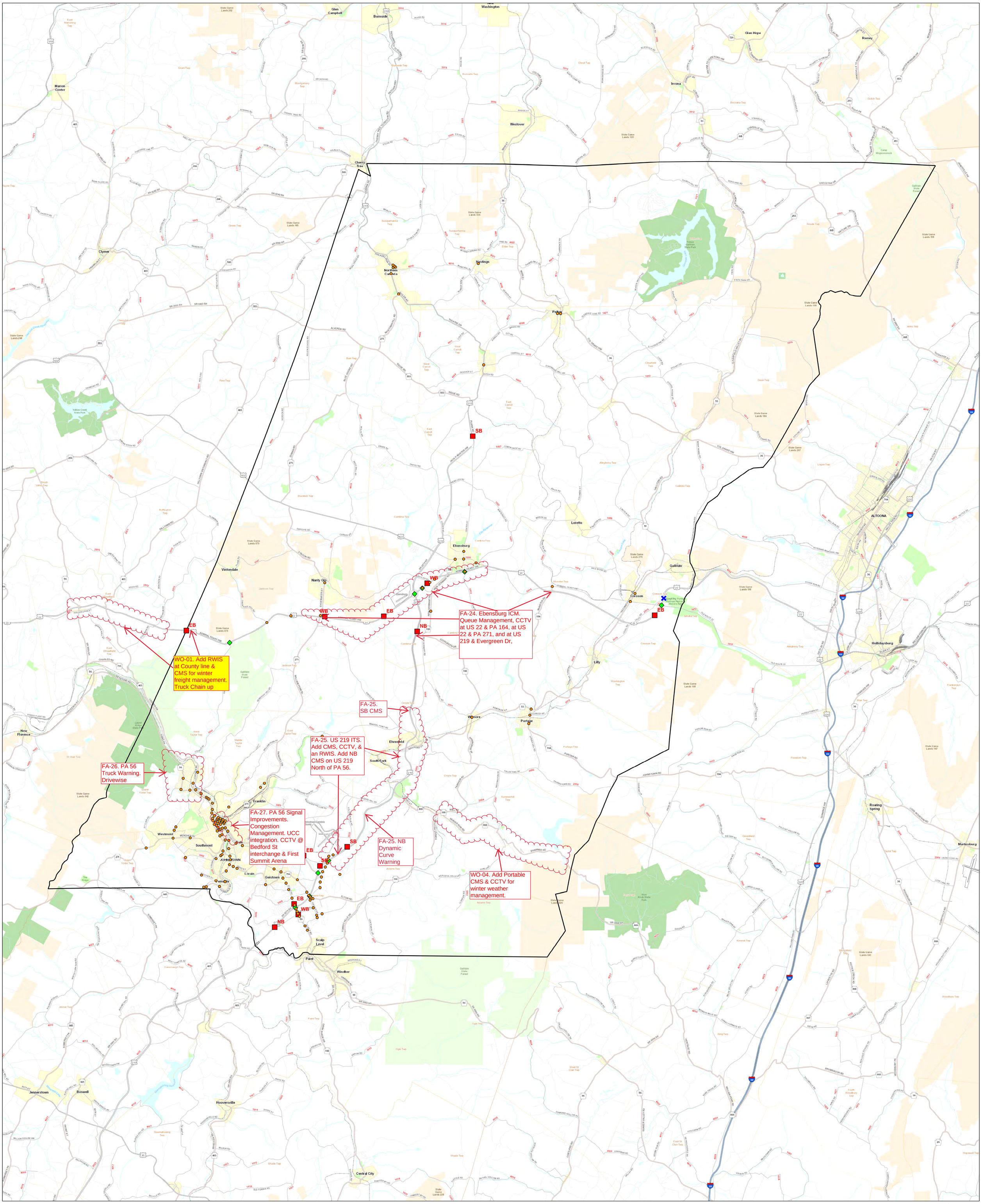
Traffic Cameras

Dynamic Message Signs

piercsube@pa.gov
PennDOT

pennsylvania
DEPARTMENT OF TRANSPORTATION

Cambria MPO



September 18, 2024

1:103,422

Traffic Signals | RWIS Stations and Weather | Traffic Cameras | Dynamic Message Signs

0 0.75 1.5 3 mi
0 1.25 2.5 5 km

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PennDOT

pennsylvania
DEPARTMENT OF TRANSPORTATION

Centre County MPO

WO-03. Regional Winter Operations Messaging. Connect Truck Chain up Restrictions to PA511. Automated winter messaging through ATMS.

FA-33. Truck Parking Issues at Snow Shoe Rest Area - Smart Parking

FA-37. Philipsburg US 322 & PA 350 Traffic Signal upgrades. Freight and safety issues.

FA-42. PA 150 from I-99 to Bellefonte. corridor study.

FA-38. PA 550 Safety and Traffic Signal Upgrades in Bellefonte.

FA-32. Shiloh Rd from PA 150 to I-99. Corridor Study.

FA-36. Connect traffic signal at PA 45 & PA 144.

FA-35. US 322 @ College Ave install CCTV. Connect signals

TI-06. US 322 from I-99 to Philipsburg. Update ST-12, Add Type-A and Portable CMS.

TI-22. PA 350 Freight Issues. ICM with US 322. Add CCTV & CMS

FA-34. N Atherton St. Develop Incident Management & Special Event Timing Plans.

FA-30. S. Atherton St. @ Branch Rd. Signal Upgrade (In Design Now)

TI-21. US 322 @ Boalsburg. Work with SCAC to include ITS (CMS & CCTV)

September 18, 2024

Traffic Signals | RWIS Stations and Weatrun | Traffic Cameras | Dynamic Message Signs

1:144,633

0 1.25 2.5 5 mi
0 2 4 8 km

perculm@pa.gov
PennDOT

FA-33. Region wide Truck Parking Study. Look at implementing Smart Parking at Rest Stops along I-80.

FA-06. RTMC Upgrades. Video Wall upgrade. New chairs for operators.

FA-07. Region wide convert portable VSL on I-80 to permanent.

FA-10. Portable CMS & RWIS for weather events.

FA-10. Install CMS

TI-11. US 6 CCTV & CMS

TI-10. CCTV at PA 66 & PA 948.

FA-11. CCTV & RWIS near Emporium.

FA-10. Install CMS & CCTV

FA-09. Add CCTV on existing CMS. Update CMS to color. Install RWIS.

TI-24. Elk viewing CCTV

FA-16. Orange Detour ICM. Install CCTV & CMS around US 322 & PA 949 Intersection.

TI-02. Pre-entry CMS on PA 36

TI-02. I-80 ITS Gaps. Install CMS & CCTV at each exit.

TI-08. Install CCTV at US 219 & PA 28. CCTV at PA 255 & Industrial Pk.

TI-02. Pre-entry SB CMS.

TI-01. Install SB CMS & CCTV.

Install NB CMS & CCTV

Install NB CMS

TI-07. SB CMS & CCTV

FA-31. Upgrade Signals

FA-12. Signal Upgrades. Connect Signals on PA 970.

TI-07. US 322 Brown Detour ICM.

TI-07. CMS

TI-07. NB CMS & CCTV

TI-09. US 322 Green Detour ICM. Install CCTV at important intersections.

TI-09. WB CMS.

TI-09. EB CMS @ Bigler.

TI-09. SB CMS close to stockpile.

TI-09. CMS @ US 322 & PA 53.

FA-41. Connect Signals to UCC

September 18, 2024

Traffic Signals | RWIS Stations and Weather | Traffic Cameras | Dynamic Message Signs

1:245,062

0 2 4 8 mi

0 3.25 6.5 13 km

piercsube@pa.gov
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pennsylvania
DEPARTMENT OF TRANSPORTATION

Northern Tier RPO

FA-03. I-99/US 15 Incident Detour Management. Add Type A CMS EB on PA 49. Upgrade Signals on PA 49 and PA 287. Coordinate with NYDOT.

FA-03. Future I-99 Corridor ITS Gaps. Add CCTV at PA 287, US 6, & Blossburg Exits.

FA-03. Add CCTV and CMS both directions Tie in RWIS data.

FA-21. Sayre/ Athens & Towanda Signal upgrades.

September 18, 2024

Traffic Signals | RWIS Stations and Weather | Traffic Cameras | Dynamic Message Signs

1:173,353

0 1.5 3 6 mi

0 2.25 4.5 9 km

pierscube@pa.gov
PennDOT

pennsylvania
DEPARTMENT OF TRANSPORTATION

Northwest RPO

WO-02. Install RWIS

FA-17. Clarion/ Venango County Detour. Install CCTV & CMS at intersections along detour routes. Install RWIS.

FA-16. Orange Detour ICM. Upgrade Signals & Install CCTV along US 322.

TI-02. Pre-entry SB CMS.

CN-01. I-80 Corridor Fiber Backbone.

TI-02. I-80 ITS Gaps. Install CMS & CCTV at each exit. Fill gaps in VSL coverage. Convert portable VSL to Permanent.

WO-02. RWIS Gaps. Install RWIS near Sligo, New Bethlehem, East Brady, & Farmington Twp.

September 18, 2024

Traffic Signals | RWIS Stations and Weather | Traffic Cameras | Dynamic Message Signs

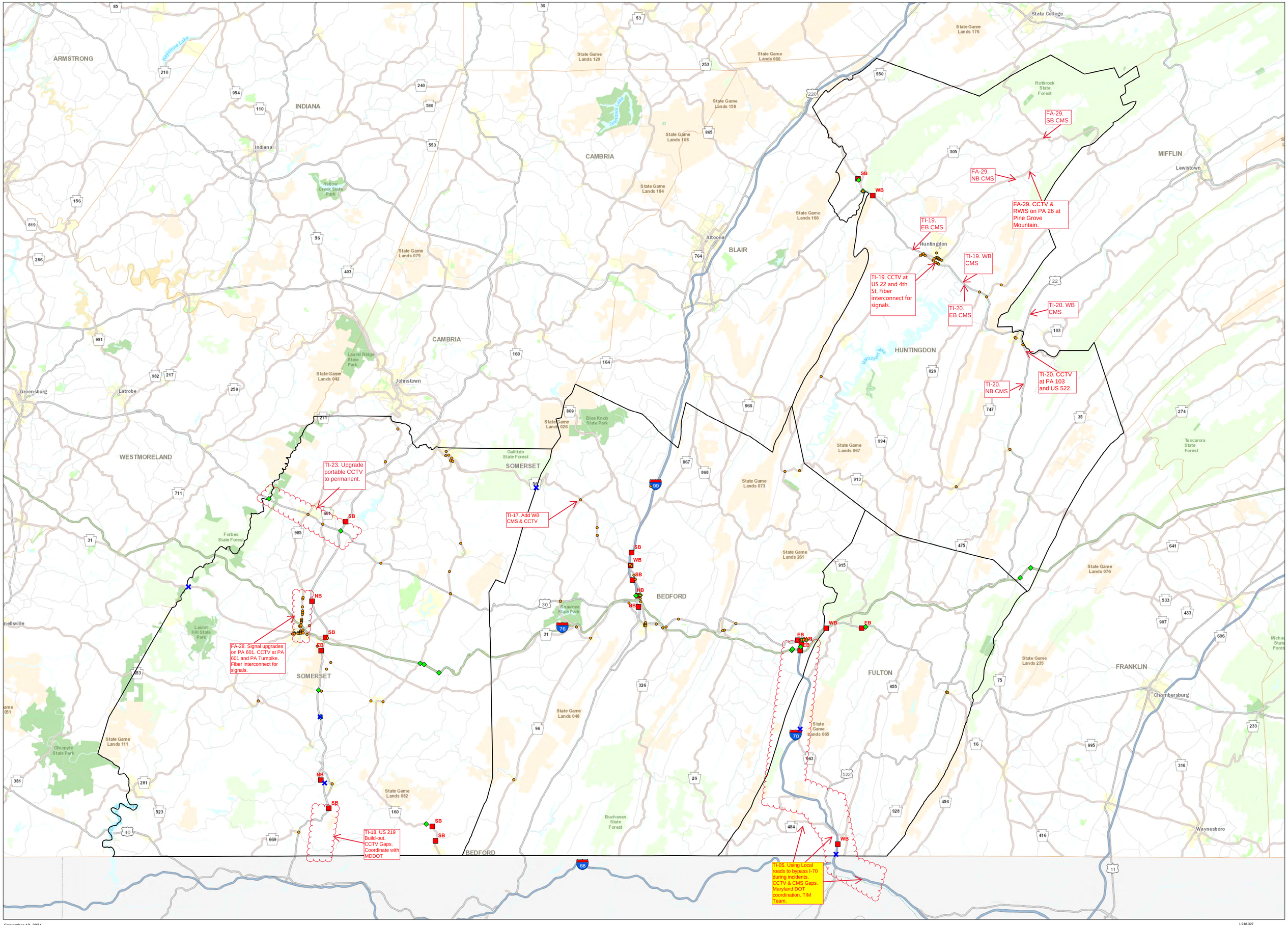
1:80,813

0 0.5 1 2 mi
0 1 2 4 km

piercsube@pa.gov
PennDOT

pennsylvania
DEPARTMENT OF TRANSPORTATION

Southern Alleghenies RPO



September 18, 2024

Traffic Signals | RWIS Stations and Weather | Traffic Cameras | Dynamic Message Signs

1:218,327
0 1.75 3.5 7 mi
0 3 6 12 km

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pennsylvania
DEPARTMENT OF TRANSPORTATION

SEDA-COG MPO (D2)

TI-12. PA 120 & PA 144. Install CCTV and Portable CMS.

FA-33. Truck smart parking at rest areas

FA-13. RWIS I-80 at exit 185 Loganton

FA-01. US 22/322 ITS Gaps. Add CCTV, CMS, RWIS, & VSL.

FA-14. US 22/322 ICM. Connect signals on parallel routes.

FA-15. Jacks Mountain ITS. Add CCTV & RWIS at US 22 & SR 4007 intersection.

September 18, 2024

Traffic Signals

RWIS Stations and Weather

Traffic Cameras

Dynamic Message Signs

1:196,145

0 1.5 3 6 mi
0 2.5 5 10 km

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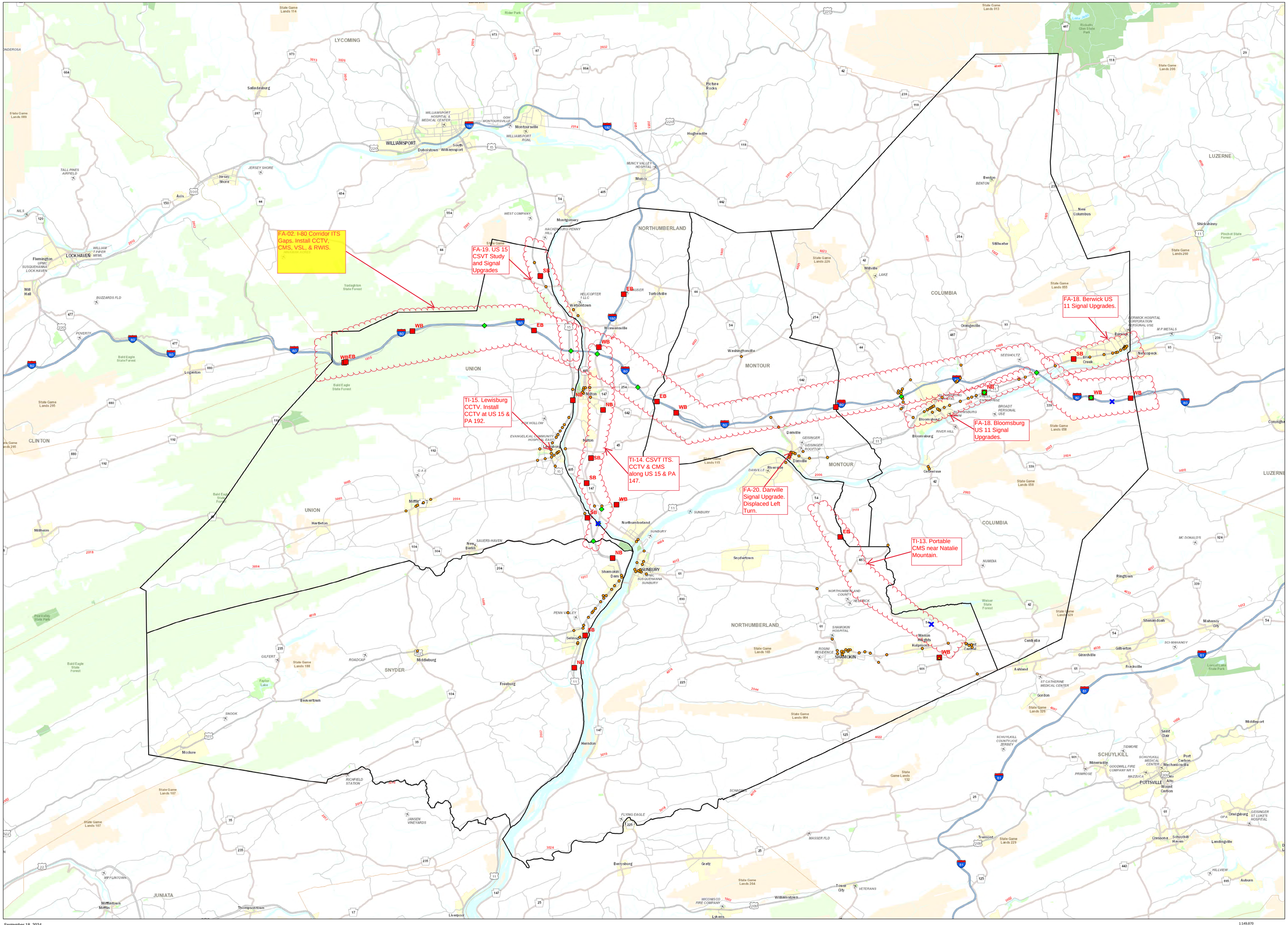
pennsylvania
DEPARTMENT OF TRANSPORTATION

SEDA-COG MPO (D3)



September 18, 2024

Traffic Signals | RWIS Stations and Weatron | Traffic Cameras | Dynamic Message Signs

1:149,870
0 1.25 2.5 5 mi
0 2 4 8 km

FA-03. Future I-99 Corridor ITS Gaps. Install CMS, CCTV, RWIS, & VSL along US-15 to prepare for future Interstate Corridor.

FA-39. SR 2014 Signal connects I-180 detour

FA-04. Add NB Portable or Type A CMS

TI-03. Add CCTV to signal at US 220 and PA 287 for incidents. (Pull RWIS data to see if issue here)

FA-04. I-180 Corridor ITS Gaps. Install CCTV, CMS, VSL, & Automated Queue Warning.

TI-16. US 15 Auto Slow Moving Vehicle Warning. Install Type A CMS.

FA-04. Add NB Type A CMS

TI-03. US 220 Global Detour Route ITS. Install CCTV, CMS, Pre-entry Type A CMS.

September 18, 2024

Traffic Signals | RWIS Stations and Weather | Traffic Cameras | Dynamic Message Signs

1:131,064
0 1 2 4 mi
0 1.75 3.5 7 km

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Appendix B. Project Details

Projects in this section use the following project ID nomenclature:

TABLE 30: APPENDIX B PROJECT ID ABBREVIATIONS

Project ID Abbreviation	Definition
AD	Antiquated Device
CN	Communications Network
FA	Freeway & Arterial Operations
TI	Traveler Information
TIM	Traffic Incident Management
WO	Weather Operations

AD-01: Antiquated CMS Structures

FOCUS AREA: Antiquated Devices

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Replace antiquated CMS signs and prohibited aluminum structures.

STAKEHOLDERS: **PennDOT 2-0, PennDOT 3-0, PennDOT 9-0**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $2M-$10M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Required Maintenance

BENEFITS: Ensure continued operation of existing devices.

OTHER CONSIDERATIONS AND ISSUES: N/A

CN-01: I-80 Fiber Optic Backbone

FOCUS AREA: Communications Network

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install fiber optic cable backbone along I-80 to build out existing communications network.

STAKEHOLDERS: **PennDOT 2-0, PennDOT 3-0, PennDOT 10-0**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 25 years	**ESTIMATED COSTS:** $10M+

LEVEL OF EFFORT: Complex

TECHNOLOGY COMPONENTS *(if applicable)*: Communications System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES:

BENEFITS: Increased connectivity between the TMC and devices in the field.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-01: US 22/322 ITS Gaps

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install CCTV, CMS, RWIS, and VSL along US 22/322 through Centre, Mifflin, and Juniata Counties.

STAKEHOLDERS: **PennDOT 2-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $2M-$10M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems, RWIS Systems, VSL Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion. Improved winter maintenance response.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-02: District 3 I-80 Corridor ITS Gaps

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install CCTV, CMS, RWIS, and VSL to fill in gaps on I-80 in District 3.

STAKEHOLDERS: **PennDOT 3-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $2M-$10M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems, RWIS Systems, VSL Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion. Improved winter maintenance response.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-03: Future I-99 Corridor ITS Gaps

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install CCTV, CMS, RWIS, & VSL to fill gaps along US 15 to prepare for future interstate corridor.

- CCTV, NB CMS, SB CMS @ PA 414 exit
- CCTV @ PA 287
- CCTV @ US 6
- CCTV @ Blossburg exit
- EB Type A CMS on PA 49
- EB Type A CMS on PA 287

STAKEHOLDERS: **PennDOT 3-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $2M-$10M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems, RWIS Systems, VSL Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion. Improved winter maintenance response.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-04: I-180 Corridor ITS Gaps

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install CCTV, CMS, RWIS & VSL to fill gaps along I-180. Deploy Automated Queue Warning and Automated Weather Warning. Upgrade existing CMS to full size.

- NB Type A @ PA 44 exit
- NB Type A @ PA 54 exit
- NB Portable CMS or Type A CMS on SR 2014 before SR 2036

STAKEHOLDERS: **PennDOT 3-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $2M-$10M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems, RWIS Systems, VSL Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion. Improved winter maintenance response.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-05: I-99 ITS Gaps

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install CCTV, CMS, and RWIS to fill gaps along I-99 corridor.

STAKEHOLDERS: **PennDOT 9-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems, RWIS Systems, VSL Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion. Improved winter maintenance response.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-06: RTMC Upgrades

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Upgrade RTMC Videowall and procure new replacement chairs for TMC operators. Improvements to the Situation Room are needed.

STAKEHOLDERS: **PennDOT 2-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Videowall System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Required Videowall Maintenance; Improved Operator Satisfaction and Retention

BENEFITS: Ensure continuous operation of videowall. Provide more comfortable and ergonomic work environment for TMC operators.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-07: Upgrade I-80 VSL

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Upgrade deployed portable VSL signs on I-80 to permanent structures to assist operations during incident and weather events.

STAKEHOLDERS: **PennDOT 2-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $2M-$10M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: VSL Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Reduced Crashes

BENEFITS: Improved traffic flow and reduced congestion. Reduction in congestion and weather related incidents.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-08: I-99 VSL

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install VSL signs on I-99 corridor to assist operations during incident and weather events.

STAKEHOLDERS: **PennDOT 2-0, PennDOT 9-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $2M-$10M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: VSL Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Reduced Crashes

BENEFITS: Improved traffic flow and reduced congestion. Reduction in congestion and weather related incidents.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-09: ITS on US 219 in Elk County

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV on existing CMS structure, CMS-02-034. Upgrade existing CMS to color and Install RWIS on US 219 near Ridgway.

STAKEHOLDERS: **PennDOT 2-0**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System, CMS Systems, RWIS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion. Improved winter maintenance response.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-10: ITS for Winter Operations

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV and NB CMS on PA 255 South of St Marys. Install WB CMS on US 6 East of Coudersport. Deploy Portable CMS for winter operations on PA 46 & PA 346 and install an RWIS East of Bradford.

STAKEHOLDERS: **PennDOT 2-0**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System, CMS Systems, RWIS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion. Improved winter maintenance response.

OTHER CONSIDERATIONS AND ISSUES: Without approval for unlimited data plans for CCTVs, communications to remote locations may become expensive as fiber optics or specified circuit would need to be built out.

FA-11: Emporium CCTV & RWIS

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV and RWIS on PA 120 near Emporium.

STAKEHOLDERS: **PennDOT 2-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System, RWIS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Improved winter maintenance response.

OTHER CONSIDERATIONS AND ISSUES: Without approval for unlimited data plans for CCTVs, communications to remote locations may become expensive as fiber optics or specified circuit would need to be built out.

FA-12: PA 970 Traffic Signals Upgrade

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade and connect two traffic signals on PA 970 in Clearfield County.

STAKEHOLDERS: **PennDOT 2-0, Bradford Township**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-13: Loganton RWIS

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install RWIS on I-80 near exit 185, Loganton.

STAKEHOLDERS: **PennDOT 2-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: RWIS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Improved winter maintenance response.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-14: US 22/322 ICM

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Connect traffic signals on US 22/322 parallel routes to assist in detour operations when incidents occur on US 22/322.

STAKEHOLDERS: **PennDOT 2-0, Local Municipalities**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signals Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-15: Jacks Mountain ITS

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV & RWIS at US 22 and SR 4007 intersection.

STAKEHOLDERS: **PennDOT 2-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, RWIS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Improved winter maintenance response.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-16: US 322 Orange Detour ICM

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade traffic signals and install CCTV along US 322 in Clarion County to assist operations along the Orange Detour for I-80. Install CCTV & CMS at US 322 & PA 949 intersection.

STAKEHOLDERS: **PennDOT 2-0, PennDOT 10-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems, Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-17: Clarion & Venango County Detour ITS

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV and CMS at intersections along I-80 detour routes, PA 38 and US 322, in Clarion and Venango Counties. Install an RWIS. Coordinate with District 1 for Venango County locations.

STAKEHOLDERS: **PennDOT 2-0, PennDOT 10-0, PennDOT 1-0**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems, RWIS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion. Improved winter maintenance response.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-18: US 11 Detour ICM

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade 14 traffic signals on US 11 and 4 traffic signals on PA 42 in Bloomsburg and 14 traffic signals on US 11 in Berwick to improve detour operations for I-80.

STAKEHOLDERS: **PennDOT 3-0, Local Municipalities**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-19: CSVT Traffic Signal Timing Study

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Perform a traffic signal timing study to determine signal retiming and coordination on US 15 near I-80.

STAKEHOLDERS: **PennDOT 3-0, Local Municipalities**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-20: Danville Traffic Signal Upgrade

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade traffic signals on US 11 and PA 54 in Danville. Install displaced left turn at US 11 and PA 54 intersection.

STAKEHOLDERS: **PennDOT 3-0, Danville Borough**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-21: Sayre, Athens, & Towanda Signal Upgrades

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade traffic signals in Sayre, Athens, and Towanda. Install CCTV and CMS at important intersections.

STAKEHOLDERS: **PennDOT 3-0, Local Municipalities**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems, Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Improved traffic flow and reduced congestion. Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-22: US 220 ICM

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Add pre-entry Type A CMS and CCTV along US 220 for I-99 detour operations. Upgrade traffic signals and connect to UCC along US 220.

STAKEHOLDERS: **PennDOT 9-0, Local Municipalities**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems, Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Improved traffic flow and reduced congestion. Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-23: Roaring Spring Congestion Management

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade traffic signals in Roaring Springs.

STAKEHOLDERS: **PennDOT 9-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-24: Ebensburg ICM

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV, upgrade traffic signals, and deploy Automated Queue Warning system on US 22.

- CCTV @ US 22 & PA 164
- CCTV @ US 22 & PA 271
- CCTV @ US 219 & Evergreen Drive

STAKEHOLDERS: **PennDOT 9-0, Local Municipalities**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time; Reduced Rear-End Crashes

BENEFITS: Improved traffic flow and reduced congestion. Fill gaps in camera coverage to improve incident response and congestion monitoring.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-25: US 219 ITS

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV, CMS, RWIS, & Dynamic Curve Warning on US 219 in Cambria County.

STAKEHOLDERS: **PennDOT 9-0**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems, Traffic Signal Systems, Dynamic Curve Warning

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time; Reduced Crashes

BENEFITS: Improved traffic flow and reduced congestion. Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-26: PA 56 Truck Warning

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Deploy truck warning system on PA 56 north of Johnstown. Potential for inclusion in Drivewyze.

STAKEHOLDERS: **PennDOT 9-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: Truck Warning Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Reduction of freight congestion on local roads.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-27: PA 56 Traffic Signal Improvement

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Deploy congestion management strategies. Upgrade traffic signals on PA 56 and connect to UCC. Install CCTVs on PA 56 at Bedford Street Interchange and at First Summit Arena.

STAKEHOLDERS: **PennDOT 9-0**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Improved traffic flow and reduced congestion. Fill gaps in camera coverage to improve incident response and congestion monitoring.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-28: PA 601 Traffic Signal Upgrades

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade traffic signals on PA 601. Install fiber optic interconnect for traffic signals. Install CCTV at PA Turnpike entrance.

STAKEHOLDERS: **PennDOT 9-0**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Improved traffic flow and reduced congestion. Fill gaps in camera coverage to improve incident response and congestion monitoring.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-29: PA 26 ITS

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV and RWIS on PA 26 at Pine Grove Mountain. Install CMS on PA 26 north and south of Pine Grove Mountain.

STAKEHOLDERS: **PennDOT 9-0**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems, RWIS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion. Improved winter maintenance response.

OTHER CONSIDERATIONS AND ISSUES: Without approval for unlimited data plans for CCTVs, communications to remote locations may become expensive as fiber optics or specified circuit would need to be built out.

FA-30: South Atherton Traffic Signal Upgrades

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade traffic signal at South Atherton Road and Branch Road intersection.

STAKEHOLDERS: **PennDOT 2-0, State College Borough**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-31: Dubois Traffic Signals Upgrade

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade traffic signals in Dubois on US 219. Also, include upgrades to the US 322 and SR 119 intersection.

STAKEHOLDERS: **PennDOT 2-0, Dubois City**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-32: Shiloh Road Corridor Study

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Complete corridor study on Shiloh Road between I-99 and PA 150. Should also consider impact of PA 150 and PA 26 in the study.

STAKEHOLDERS: **PennDOT 2-0, College Township**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-33: Smart Truck Parking

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install Smart Parking systems at 10 rest areas along I-80 in the Central Region.

STAKEHOLDERS: **PennDOT 2-0, PennDOT 3-0, PennDOT 10-0**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Smart Parking Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES:

BENEFITS: Reduction of overnight parking along ramps.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-34: North Atherton Signal Timing

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Create incident management and special event signal timing plan for North Atherton Street and Park Avenue.

STAKEHOLDERS: **PennDOT 2-0, State College Borough, Penn State University**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion during incidents and special events.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-35: US 322 ITS at College Ave Exit

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV on US 322 at the College Avenue Exit. Connect traffic signals on College Avenue and create special event signal timing plan.

STAKEHOLDERS: **PennDOT 2-0, College Township**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Improved traffic flow and reduced congestion. Fill gaps in camera coverage to improve incident response and congestion monitoring.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-36: Centre Hall Traffic Signal

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Connect traffic signal at PA 45 and PA 144 intersection in Centre Hall.

STAKEHOLDERS: **PennDOT 2-0, Potter Township**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-37: Philipsburg Traffic Signal Upgrades

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade traffic signals in Philipsburg on US 322 and PA 350. Consider strategies to address safety and freight.

STAKEHOLDERS: **PennDOT 2-0, Local Municipalities**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-38: PA 550 Traffic Signal Upgrades

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade traffic signals on PA 550 in Bellefonte. Consider strategies to improve safety.

STAKEHOLDERS: **PennDOT 2-0, Local Municipalities**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signals Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-39: SR 2014 Traffic Signal Connection

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Connect traffic signals on SR 2014 to assist operations for I-180 detours.

STAKEHOLDERS: **PennDOT 3-0, Local Municipalities**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signals Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-40: 17th Street Traffic Signal Upgrades

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade traffic signals on 17th Street in Altoona and connect to UCC.

STAKEHOLDERS: **PennDOT 9-0, Altoona City**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signals Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-41: Punxsutawney Traffic Signals

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade traffic signals on PA 36 in Punxsutawney and connect to UCC.

STAKEHOLDERS: **PennDOT 10-0, Punxsutawney Borough**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signals Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion

OTHER CONSIDERATIONS AND ISSUES: N/A

FA-42: PA 150 Corridor Study

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Complete corridor study for traffic signals on PA 150 in Bellefonte.

STAKEHOLDERS: **PennDOT 2-0, Local Municipalities**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signals Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-01: Arterial ITS in Elk and Clearfield Counties

FOCUS AREA: Traveler Information

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install CCTV and CMS on Arterials in Elk and Clearfield Counties to improve traveler information. Support Truck Chain-up locations with messaging and deployment.

- SB CMS and CCTV on US 219 north of PA 153
- NB CMS and CCTV on PA 153 east of PA 255
- NB CMS on PA 255 south of I-80

STAKEHOLDERS: **PennDOT 2-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-02: I-80 ITS Gaps District 10

FOCUS AREA: Traveler Information

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install CCTV and CMS to fill gaps along I-80 in District 10. Install arterial pre-entry CMS at following exits:

- PA36
- US 219
- PA 68
- PA 255

STAKEHOLDERS: **PennDOT 2-0, PennDOT 10-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-03: US 220 Global Detour Route ITS

FOCUS AREA: Traveler Information

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install CCTV, CMS, and pre-entry Type A CMS to improve operations on the US 220 Global Detour Route. Install CCTV at signalized intersection between US 220 and PA 287.

STAKEHOLDERS: **PennDOT 2-0, PennDOT 3-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-04: US 22 Cresson to Hollidaysburg ITS

FOCUS AREA: Traveler Information

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install CCTV, Type A CMS, and Portable CMS. Install a new Truck Chain-up location.

STAKEHOLDERS: **PennDOT 9-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-05: I-70 ITS Gaps

FOCUS AREA: Traveler Information

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install CCTV and CMS on I-70. Create TIM Team to manage incident response on I-70. Coordinate with Maryland DOT to keep freight from using local roads during detour events.

STAKEHOLDERS: **PennDOT 9-0, Maryland DOT**

ESTIMATED SCHEDULE: 1 year Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-06: US 322, Philipsburg to I-99 ITS

FOCUS AREA: Traveler Information

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Update existing ROP project ST-12. Add Type A and Portable CMS

STAKEHOLDERS: **PennDOT 2-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $2M-$10M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Provide traveler information to reduce impact of congestion

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-07: US 322 Brown Detour ICM

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install ITS to assist operations along the I-80 Brown Detour in Jefferson and Clearfield Counties.

- WB CMS & CCTV on US 322 east of PA 153
- WB CMS on US 322 east of US 219
- EB CMS on US 322 west of US 119
- SB CMS & CCTV on PA 28 north of US 322

STAKEHOLDERS: **PennDOT 2-0, PennDOT 10-0**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-08: Dubois CCTV

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install a CCTV at US 219 & PA 28 intersection and a CCTV at PA 255 & Industrial Parkway.

STAKEHOLDERS: **PennDOT 2-0,**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-09: US 322 Green Detour ICM

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Connect traffic signals for UCC capability at the US 322 and SR 2030 intersection. Install ITS to assist operations along the I-80 Green Detour in Clearfield County. Install CCTV at major intersections along the detour route. Install CMS at the following locations:

- WB CMS on US 322 east of PA 879
- EB CMS on US 322 west of SR 2030
- SB CMS on PA 53 north of SR 2030
- WB CMS on US 322 east of PA 53

STAKEHOLDERS: **PennDOT 2-0,**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-10: CCTV at PA 66 & PA 948

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV at PA 66 & PA 948 in Elk County.

STAKEHOLDERS: **PennDOT 2-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring.

OTHER CONSIDERATIONS AND ISSUES: Without approval for unlimited data plans for CCTVs, communications to remote locations may become expensive as fiber optics or specified circuit would need to be built out.

TI-11: US 6 CCTV & CMS

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV and CMS on US 6 at intersections with PA 321 and US 219.

STAKEHOLDERS: **PennDOT 2-0**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: Without approval for unlimited data plans for CCTVs, communications to remote locations may become expensive as fiber optics or specified circuit would need to be built out.

TI-12: Low AADT Incident/Event Management

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Deploy portable CMS and CCTV on low AADT routes to manage incidents or events across the region.

STAKEHOLDERS: **PennDOT 2-0, PennDOT 3-0, PennDOT 9-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: Portable CCTV Systems, Portable CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-13: Natalie Mountain Portable CMS

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Deploy portable CMS near Natalie Mountain on PA 54 in Northumberland County.

STAKEHOLDERS: **PennDOT 3-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: Portable CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Provide traveler information to reduce impact of congestion

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-14: CSVT ITS

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV and CMS along US 15 and PA 147.

STAKEHOLDERS: **PennDOT 3-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-15: Lewisburg CCTV

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV at intersection of US 15 and PA 192 in Lewisburg.

STAKEHOLDERS: **PennDOT 3-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-16: US 15 Automated Slow Vehicle Warning

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Implement an automated slow vehicle warning system. Install a Type A CMS to provide warning messages.

STAKEHOLDERS: **PennDOT 3-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-17: PA 56 ITS

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install WB CMS and CCTV at PA 56 and PA 96 intersection in Bedford County.

STAKEHOLDERS: **PennDOT 9-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-18: US 219 Buildout ITS

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV to fill gaps on the future US 219 buildout north of Maryland Border. Coordinate with Maryland DOT.

STAKEHOLDERS: **PennDOT 9-0**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-19: US 22 ITS

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CMS east and west of Huntingdon on US 22. Install CCTV at intersection of US 22 and 4th Street. Add Fiber interconnect for traffic signals along US 22 in Huntingdon.

STAKEHOLDERS: **PennDOT 9-0, Local Municipalities**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems, Traffic Signals Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-20: US 522 ITS

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install a CCTV at US 522 & PA 103. Install a NB CMS on US 522 south of Mt. Union and a SB CMS on US 22 north of Mt. Union.

STAKEHOLDERS: **PennDOT 9-0**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: Without approval for unlimited data plans for CCTVs, communications to remote locations may become expensive as fiber optics or specified circuit would need to be built out.

TI-21: US 322 Boalsburg ITS

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Work with SCAC (State College Area Connector Project) to install CCTV and CMS on US 322 near Boalsburg.

STAKEHOLDERS: **PennDOT 2-0, SCAC Project Team**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-22: PA 350 Freight Management

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Deploy ICM strategies to address freight issues on PA 350. Install low costs safety measures. Install CCTV and CMS to assist operations. Climbing lane considerations sent to Design Section.

STAKEHOLDERS: **PennDOT 2-0**

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $500k-$2M

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System, CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-23: US 30 Portable CCTV Upgrades

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade deployed portable CCTVs on US 30 to permanent structures.

STAKEHOLDERS: **PennDOT 9-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI-24: Elk Viewing CCTV

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV on PA 555 in Benezette to manage congestion from Elk viewing tourism.

STAKEHOLDERS: **PennDOT 2-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring.

OTHER CONSIDERATIONS AND ISSUES: Without approval for unlimited data plans for CCTVs, communications to remote locations may become expensive as fiber optics or specified circuit would need to be built out.

TI-25: I-80 Exit 111 CCTV

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install new CCTV in the median near the SR-153 overpass, Solar array and microwave connection to CCTV: C_D2_80-111.5_30 (Penfield). Due to lack of available power connections in the area of I-80 Exit 111, Power to the camera will come from an adjacent Solar array.

STAKEHOLDERS: **PennDOT 2-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring.

OTHER CONSIDERATIONS AND ISSUES: Without approval for unlimited data plans for CCTVs, communications to remote locations may become expensive as fiber optics or specified circuit would need to be built out.

TIM-01: CAD ATMS Integration

FOCUS AREA: Traffic Incident Management

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Computer Aided Dispatch (CAD) integration into ATMS to assist with incident response.

STAKEHOLDERS: **PennDOT 2-0, 911 Centers**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*:

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Incident Response Time

BENEFITS: Reduction of congestion impact caused from incidents

OTHER CONSIDERATIONS AND ISSUES: N/A

WO-01: US 22 Truck Chain-up Location ITS Support

FOCUS AREA: Weather Operations

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install RWIS at the county line on US 22 and install a CMS for winter freight messaging for Truck Chain-up location.

STAKEHOLDERS: **PennDOT 9-0, PennDOT 10-0**

ESTIMATED SCHEDULE: 1 year Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: RWIS System, CMS System

PREREQUISITES AND DEPENDENCIES: PSP outreach to ensure they will enforce proposed truck chain-up pilot project.

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Improved winter maintenance response. Decreased winter freight incidents.

OTHER CONSIDERATIONS AND ISSUES: N/A

WO-02: RWIS Gaps

FOCUS AREA: Weather Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install RWIS near Cligo, New Bethlehem, East Brady, and Farmington Township.

STAKEHOLDERS: **PennDOT 10-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: RWIS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduction of winter related incidents

BENEFITS: Improved winter maintenance response. Reduction of winter related incidents

OTHER CONSIDERATIONS AND ISSUES: N/A

WO-03: Winter Operations Messaging

FOCUS AREA: Weather Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Connect Truck Chain-up restrictions to PA 511. Automate messaging through ATMS.

STAKEHOLDERS: **PennDOT 2-0, PennDOT CO**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*:

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduction of winter related incidents

BENEFITS: Reduction of winter related incidents

OTHER CONSIDERATIONS AND ISSUES: N/A

WO-04: PA 869 Winter Weather Management

FOCUS AREA: Weather Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Deploy portable CMS and CCTV for winter weather management on PA 869.

STAKEHOLDERS: **PennDOT 9-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** <$500k

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems, CMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Fill gaps in camera coverage to improve incident response and congestion monitoring. Provide traveler information to reduce impact of congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

Appendix C. Existing ROP Project Details

The project details listed in Appendix C are for projects carried over from the previous ROPs. This includes projects from the Central RTMC ROP adopted in 2018 and the Central RTMC Interim ROP Update adopted in 2021. Additionally, since the addition of two counties in District 10 have been added to the Central Region for this update, project details for projects in those two counties from the Western RTMC ROP adopted in 2019 and the Western RTMC Interim ROP Update adopted in 2023 have been included in this section. Updates made to these projects are marked in red. Projects in this section use the following project ID nomenclature:

TABLE 31: APPENDIX C PROJECT ID ABBREVIATIONS

Project ID Abbreviation	Definition
ST	Short-Term
LT	Long-Term
IU	Interim Update

ST-01: CSVT ICM+TIM Team

PROJECT DESCRIPTION AND SCOPE: Integrated Corridor Management in the Central Susquehanna Valley Transportation corridor, including US 11, US 15, PA-61, and PA-147. This project includes upgrading signal controllers at approximately 9 intersections in order to allow for command/control functionality. It also includes installation of 13 full-color DMS and 9 HD CCTV cameras. This project also includes the development of a TIM Team to optimize incident response.

STAKEHOLDERS: PennDOT 2-0 and 3-0; SEDA-COG MPO; Local Municipalities; Emergency Personnel

ESTIMATED SCHEDULE: 3-6 years (estimate ITS contract for CSVT project will run between 2021-2024) Life Cycle: 10-15 years	**ESTIMATED COSTS:** Capital: $5,200,000 Annual O&M: $62,000

PROJECT TYPE: Planning & Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; DMS System; Traffic Signal Systems; Telecommunications

PREREQUISITES AND DEPENDENCIES: For devices on proposed roadway sections, the completion of the current CSVT construction project.

PERFORMANCE MEASURES: Reduced Bottleneck Delay Surrogate; Improved Travel Time Ratio; Improved Inter-Agency Communications; Improved Incident Response Time

BENEFITS: Immediate improvements to traffic signal timing and progression through work zone as well as long-term improvement to ITS capabilities and incident management.

OTHER CONSIDERATIONS AND ISSUES: N/A

ST-02: I-80/I-99 Existing CCTV Replacements

PROJECT DESCRIPTION AND SCOPE: Replacement of six (6) existing CCTV cameras along I-80 and I-99 with HD cameras. The locations are as follows (listed by District ID): 1, 3, 4, 6, 9, and 10.

STAKEHOLDERS: PennDOT 2-0 and 9-0; Centre County MPO; Altoona MPO

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS:
Capital: $110,000
Annual O&M: $6,000

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduce Required Maintenance Hours

BENEFITS: Vital to ensure that existing devices remain operable at these key locations for acquiring traffic surveillance at the RTMC.

OTHER CONSIDERATIONS AND ISSUES: N/A

ST-03: Breezewood ICM

PROJECT DESCRIPTION AND SCOPE: Improve interagency communication between PennDOT and the Pennsylvania Turnpike Commission (PTC) to improve operations at the junction of I-70, I-76, and US 30. Coordinate with PTC to gain access to existing PTC Pre-Entry DMS on I-70 westbound prior to I-70 Exit 149 (Everett) interchange. Install 1 HD CCTV camera at I-70 Everett interchange.

STAKEHOLDERS: PennDOT 2-0 and 9-0; Southern Alleghenies RPO

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** Capital: $155,000 Annual O&M: $950

PROJECT TYPE: Planning & Deployment **LEVEL OF EFFORT:** Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; Telecommunications

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Incident Response Time; Improved Travel Time Ratio

BENEFITS: Improving incident management and operations in the vicinity of this important connection between two major interstates.

OTHER CONSIDERATIONS AND ISSUES: N/A

ST-04: I-80 ICM (Exit 147 to 158)

PROJECT DESCRIPTION AND SCOPE: Integrated Corridor Management along I-80 between Exits 147 and 158 and along the parallel corridors of PA-144 and PA-150. This project would include upgrading the signal controller at 1 intersection in order to allow for command/control functionality. It also includes installation of 3 full-color Type A DMS signs and 1 HD CCTV camera. Camera can be mounted on existing signal pole.

STAKEHOLDERS: PennDOT 2-0; Centre County MPO

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** Capital: $609,000 Annual O&M: $5,600

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; DMS System; Traffic Signal Systems; Telecommunications

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Improving incident management and operations on parallel corridors, optimizing the available capacity adjacent to I-80.

OTHER CONSIDERATIONS AND ISSUES: N/A

ST-05: US 22 Queue Detection

PROJECT DESCRIPTION AND SCOPE: Install queue warning system on eastbound US 22 near US 219 interchange. Queue detection should be placed west of signalized intersection of US 22 and Mini Mall Road. An existing DMS (Device ID #34) can be utilized to display generated queue warning messages.

STAKEHOLDERS: PennDOT 2-0 and 9-0; Johnstown MPO

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** Capital: $365,000 Annual O&M: $3,250

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: DMS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduction in Rear End Crashes; Reduced Bottleneck Delay Surrogate

BENEFITS: Provide warning to drivers as they approach this congested signal corridor from a free flow, high speed section of highway with limited sight distance due to the US 219 overpass.

OTHER CONSIDERATIONS AND ISSUES: Results from current signal improvement project along this corridor should be monitored. This project should only be implemented if excessive queueing and rear end crashes continue.

ST-06: I-80 CCTV Gaps

PROJECT DESCRIPTION AND SCOPE: Install 2 HD CCTV cameras to fill gaps along I-80 corridor. Cameras would be placed near the following locations: Exit 185 & Exit 224. Install CCTVs at gap locations, focusing on locations with existing CMS structures.

STAKEHOLDERS: PennDOT 2-0 and 3-0; SEDA-COG MPO

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS:
Capital: $245,000
Annual O&M: $2,000

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; Telecommunications

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Incident Response Time; Improved Travel Time Ratio

BENEFITS: Fill important gaps in cameras coverage along the I-80 corridor to improve incident response and congestion monitoring from the RTMC.

OTHER CONSIDERATIONS AND ISSUES: Proposed CCTV camera at Exit 185 is also included in Project LT-07, I-80 ICM (Exit 173 to 185).

ST-07: I-80 TIM Team

PROJECT DESCRIPTION AND SCOPE: Establish TIM Team for I-80 corridor.

STAKEHOLDERS: PennDOT 2-0 and 3-0; Centre County MPO; North Central RPO; SEDA-COG MPO; Local Municipalities; Emergency Personnel

ESTIMATED SCHEDULE: 1 year Life Cycle: N/A	**ESTIMATED COSTS:** Capital: $20,000 Annual O&M: N/A

PROJECT TYPE: Planning

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Inter-Agency Communications; Improved Incident Response Time; Improved Incident Clearance Time; Reduction in Secondary Crashes

BENEFITS: Improved incident management and coordination increasing safety for motorists and emergency responders.

OTHER CONSIDERATIONS AND ISSUES: N/A

ST-08: US 219/Elton Road Queue Preemption

PROJECT DESCRIPTION AND SCOPE: Add queue preemption to US 219 southbound off-ramp at signalized intersection with Elton Road (PA-756). Also, add lane use control to eastbound Elton Road at Theatre Drive so that through lane can become through/right at peak times of day for this right turn movement.

STAKEHOLDERS: PennDOT 2-0 and 9-0; Johnstown MPO

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** Capital: $60,000 Annual O&M: $500

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduction in Rear End Crashes; Improved Travel Time Ratio

BENEFITS: Reduce queuing on southbound US 219 off-ramp and improve traffic flow along the corridor. Minimize risk of ramp queuing onto mainline US 219.

OTHER CONSIDERATIONS AND ISSUES: N/A

ST-10: I-80 Existing HAR Replacements

PROJECT DESCRIPTION AND SCOPE: Replacement of 11 existing Highway Advisory Radio (HAR) transmitters along I-80. The HAR transmitters are as follows (listed by District ID): 101, 106, 111, 120, 133, 147, 161, 173, 178, 185, and 192.

STAKEHOLDERS: PennDOT 2-0; Centre County MPO; North Central RPO; SEDA-COG MPO

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS:
Capital: $1,100,000
Annual O&M: $4,000

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: HAR System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduce Required Maintenance Hours

BENEFITS: Vital to ensure that existing devices remain operable to continue providing traveler information at important locations

OTHER CONSIDERATIONS AND ISSUES: N/A

ST-12: US 322, Philipsburg to I-99 ITS

PROJECT DESCRIPTION AND SCOPE: Install variable speed limit system along approximately 7 miles of US 322, west of I-99. Install 1 HD CCTV camera along this section. Install RWIS near SR 0322 Segment 0100/Offset 450.

STAKEHOLDERS: PennDOT 2-0; Centre County MPO

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS:
Capital: $2,300,000
Annual O&M: $19,500

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Variable Speed Limit System, CCTV System, RWIS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Crash Rates; Improved Incident Response Time; Improved Travel Time Ratio

BENEFITS: Installation of variable speed limit signing will improve safety in this hilly, windy section of US 322 which is prone to winter weather issues. Also improve camera coverage and weather monitoring through this section.

OTHER CONSIDERATIONS AND ISSUES: N/A

ST-13: I-80 Slow Vehicle Warning

PROJECT DESCRIPTION AND SCOPE: Install slow vehicle warning system along I-80 from approximately MM 111 to MM 120 in westbound direction. Provided side-mounted radar detection to determine speeds and a full-color DMS sign to provide upstream notification.

STAKEHOLDERS: PennDOT 2-0; North Central RPO

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS:
Capital: $960,000
Annual O&M: $11,500

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Slow Vehicle Warning System; DMS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Crash Rates; Improved Travel Time Ratio

BENEFITS: Warn drivers of downstream slow-moving vehicles, likely tractor trailers, allowing them to change lanes and safely pass. This should improve traffic flow and increase safety along this stretch of I-80.

OTHER CONSIDERATIONS AND ISSUES: N/A

ST-14: I-99 TIM Team

PROJECT DESCRIPTION AND SCOPE: Establish TIM Team for I-99 corridor.

STAKEHOLDERS: PennDOT 2-0 and 9-0; Centre County MPO; Altoona MPO; Southern Alleghenies RPO; Local Municipalities; Emergency Personnel

ESTIMATED SCHEDULE: 1 year Life Cycle: N/A	**ESTIMATED COSTS:** Capital: $20,000 Annual O&M: N/A

PROJECT TYPE: Planning

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Inter-Agency Communications; Improved Incident Response Time; Improved Incident Clearance Time; Reduction in Secondary Crashes

BENEFITS: Improved incident management and coordination increasing safety for motorists and emergency responders.

OTHER CONSIDERATIONS AND ISSUES: N/A

ST-15: US 322 Slow Vehicle Warning

PROJECT DESCRIPTION AND SCOPE: Install slow vehicle warning system along an approximately 6-mile section of US 322 which runs through the Seven Mountains area. System should be installed in westbound direction. Provided side-mounted radar detection to determine speeds and a full-color DMS sign to provide upstream notification.

STAKEHOLDERS: PennDOT 2-0; SEDA-COG MPO

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** Capital: $430,000 Annual O&M: $5,000

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Slow Vehicle Warning System; DMS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Crash Rates; Improved Traveler Time Ratio

BENEFITS: Warn drivers of downstream slow-moving vehicles, likely tractor trailers, allowing them to change lanes and safely pass. This should improve traffic flow and increase safety along this stretch of US 322.

OTHER CONSIDERATIONS AND ISSUES: LT-10: Central Region Dynamic Curve Warning includes deployments at 2 curves within this project area. Those Curve Warning systems could also be integrated into this project.

ST-16: I-99 CCTV Gaps

PROJECT DESCRIPTION AND SCOPE: Install 14 HD CCTV cameras along I-99 in Centre County, including 10 cameras mounted on existing sign structures, 2 mounted on existing DMS, and 2 mounted on new poles.

STAKEHOLDERS: PennDOT 2-0; Centre County MPO

ESTIMATED SCHEDULE: 4+ years

Life Cycle: 10-15 years

ESTIMATED COSTS:
Capital: $700,000
Annual O&M: $13,000

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; Telecommunications

PREREQUISITES AND DEPENDENCIES: Can be completed in conjunction with the I-99 segments of LT-02: I-80/I-99 Fiber Backbone

PERFORMANCE MEASURES: Improved Incident Response Time

BENEFITS: Fill in gaps in camera coverage along I-99 through Centre County to improve incident response and congestion monitoring from the RTMC.

OTHER CONSIDERATIONS AND ISSUES: N/A

ST-18: I-99 RWIS

PROJECT DESCRIPTION AND SCOPE: Install 1 Road Weather Information System (RWIS) and 1 CCTV camera on I-99 near Skytop.

STAKEHOLDERS: PennDOT 2-0; Centre County MPO

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS:
Capital: $245,000
Annual O&M: $1,900

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; RWIS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Winter Weather Crashes; Improved Incident Response Time; Improved Travel Time Ratio

BENEFITS: Improve monitoring of weather and roadway conditions, particularly during winter weather. Improve plowing and winter maintenance response.

OTHER CONSIDERATIONS AND ISSUES: N/A

ST-19: US 15 to I-180 Dynamic Curve Warning

PROJECT DESCRIPTION AND SCOPE: Install Dynamic Curve Warning system on southbound US 15 ramp to eastbound I-180. Curve warning alerts will be broadcast via 1 full-color Type A DMS located upstream on southbound US 15. Side-mounted radar detection will be utilized to determine speeds.

STAKEHOLDERS: PennDOT 2-0 and 3-0; Williamsport MPO

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS:
Capital: $250,000
Annual O&M: $2,100

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Dynamic Curve Warning System; DMS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Curve Road Crash Rate

BENEFITS: Reduce crashes, particularly at high speeds, in the area of this curve which merges US 15 onto eastbound I-180.

OTHER CONSIDERATIONS AND ISSUES: N/A

ST-20: Central Region CCTV Gaps

PROJECT DESCRIPTION AND SCOPE: Install 4 HD CCTV cameras in Central Region. Locations include:

- US 22, east of Tunnelhill
- US 219 and US 6 intersection
- I-80 near MM 106
- I-80 near MM 116

STAKEHOLDERS: PennDOT 2-0 and 9-0; North Central RPO; Altoona MPO

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** Capital: $462,000 Annual O&M: $4,000

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; Telecommunications

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Incident Response Time; Improved Travel Time Ratio

BENEFITS: Fill in gaps in camera coverage throughout the region in order to improve incident response and congestion monitoring from the RTMC.

OTHER CONSIDERATIONS AND ISSUES: N/A

ST-23: US 22/322 RWIS

PROJECT DESCRIPTION AND SCOPE: Install 1 Road Weather Information System (RWIS) on US 22/322, near Thompsontown.

STAKEHOLDERS: PennDOT 2-0; SEDA-COG MPO

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS:
Capital: $135,000
Annual O&M: $950

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: RWIS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Winter Weather Crashes; Improved Incident Response Time; Improved Travel Time Ratio

BENEFITS: Improve monitoring of weather and roadway conditions, particularly during winter weather. Improve plowing and winter maintenance response.

OTHER CONSIDERATIONS AND ISSUES: N/A

ST-24: PA-350 RWIS

PROJECT DESCRIPTION AND SCOPE: Install 1 Road Weather Information System (RWIS) on PA-350, west of Bald Eagle.

STAKEHOLDERS: PennDOT 2-0; Centre County MPO

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS:
Capital: $135,000
Annual O&M: $950

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: RWIS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Winter Weather Crashes; Improved Incident Response Time; Improved Travel Time Ratio

BENEFITS: Improve monitoring of weather and roadway conditions, particularly during winter weather. Improve plowing and winter maintenance response.

OTHER CONSIDERATIONS AND ISSUES: N/A

ST-25: Special Event Use of Portable DMS

PROJECT DESCRIPTION AND SCOPE: Utilize portable DMS signs for special events throughout the Central RTMC Region. Portable DMS should include cell modems and have capability to be operated remotely by RTMC. Locations include: Penn State University events, Benezette Elk Viewing on PA-555, Bloomsburg Fairgrounds Events, and Altoona Curve games (and other events) at Peoples Natural Gas Field.

STAKEHOLDERS: PennDOT 2-0, 3-0, and 9-0; Centre County MPO; North Central RPO; SEDA-COG MPO; Altoona MPO

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** Capital: $250,000 Annual O&M: $2,000

PROJECT TYPE: Planning & Deployment

LEVEL OF EFFORT: Simple

TECHNOLOGY COMPONENTS *(if applicable)*: DMS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Increased flexibility in providing traveler information based on recurring or non-recurring planned special events.

OTHER CONSIDERATIONS AND ISSUES: N/A

LT-01: I-80 ICM (Exit 232 to 241)

PROJECT DESCRIPTION AND SCOPE: Integrated Corridor Management along I-80 between Exits 232 and 241 and along the parallel corridor of US 11 through Bloomsburg. This project would include full replacements of signal equipment at approximately 12 intersections, including upgraded signal controllers to allow for command/control functionality. It also includes installation of 1 full-color standard DMS, 1 full-color Type A DMS, and 2 HD CCTV.

STAKEHOLDERS: PennDOT 2-0 and 3-0; SEDA-COG MPO

ESTIMATED SCHEDULE: 4+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** Capital: $4,180,000 Annual O&M: $10,500

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; DMS System; Traffic Signal Systems; Telecommunications

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Improving incident management and operations on parallel corridors, optimizing the available capacity adjacent to I-80.

OTHER CONSIDERATIONS AND ISSUES: N/A

LT-02: I-80/I-99 Fiber Backbone

PROJECT DESCRIPTION AND SCOPE: Expansion of fiber optic backbone network to fill in existing network gaps along I-80 and I-99 and to expand the network east on I-80 through District 3-0 and south on I-99 through District 9-0 to the Pennsylvania Turnpike. This includes filling the following gaps:

- I-99, Exit 71 to I-80
- I-80, Existing Fiber (MM 159.1) to Exit 161
- I-80, Existing Fiber (MM 153.9) to District 2-0 Office
- I-80, Exit 161 to Clinton County Rest Area (MM 193.9)
- I-80, Exit 97 to District 2-0 Office
- I-99, Existing Fiber to Pennsylvania Turnpike

STAKEHOLDERS: PennDOT 2-0, 3-0, and 9-0; Centre County MPO; North Central RPO; SEDA-COG MPO; Altoona MPO; Southern Alleghenies RPO

ESTIMATED SCHEDULE: 4+ years Life Cycle: 25 years	**ESTIMATED COSTS:** Capital: $22,600,000 Annual O&M: $35,000

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Complex

TECHNOLOGY COMPONENTS *(if applicable)*: Communications Infrastructure

PREREQUISITES AND DEPENDENCIES: The I-99 segments of this project can be completed in conjunction with ST-16: I-99 CCTV Gaps.

PERFORMANCE MEASURES: Number of Miles of Installed Fiber Optic Cable

BENEFITS: A fiber optic backbone along the region's interstates would increase connectivity and greatly increase the ability of the Department to expand their deployment of ITS and other technology.

OTHER CONSIDERATIONS AND ISSUES: This project should be coordinated with PennDOT's statewide fiber deployment and, if possible, with the Pennsylvania Turnpike Commission's fiber deployment as well. Once the backbone is complete, further fiber deployments should be considered along the region's key arterials.

LT-04: I-180/Market Street Interchange Improvements

PROJECT DESCRIPTION AND SCOPE: Install queue warning system on westbound I-180 approaching the Market Street off-ramp, including 1 full-color DMS to provide queue alerts to travelers. Also, add queue preemption to I-180 westbound off-ramp leg of the single-point urban interchange traffic signal. Existing upstream DMS (ID: D3-180W-US15) can be used for queue notification. Timing improvements should also be included to improve excessive queue for northbound left turn from Market Street to I-180 westbound on-ramp.

STAKEHOLDERS: PennDOT 3-0; Williamsport MPO

ESTIMATED SCHEDULE: 4+ years

Life Cycle: 10-15 years

ESTIMATED COSTS:
Capital: $76,000
Annual O&M: $700

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: DMS System; Traffic Signal Systems; Telecommunications

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Reduced Rear End Crashes

BENEFITS: Improve safety on I-180 and the westbound off-ramp to Market Street as well as reducing congestion at the I-180 Ramps/Market Street traffic signal.

OTHER CONSIDERATIONS AND ISSUES: N/A

LT-05: I-99/US 322 ICM (Atherton Street)

PROJECT DESCRIPTION AND SCOPE: Upgrade signal controllers at 29 intersections in order to allow for command/control functionality and performance measures. Install 1 full-color standard DMS, 1 full-color Type A DMS, and 2 HD CCTV cameras to aid in Integrated Corridor Management between I-99, US 322, and Atherton Street.

STAKEHOLDERS: PennDOT 2-0; Centre County MPO

ESTIMATED SCHEDULE: 4+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** Capital: $1,458,000 Annual O&M: $15,000

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Complex

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems; DMS System; CCTV System

PREREQUISITES AND DEPENDENCIES: Location of Type A DMS on westbound US 322 should be coordinate with ongoing Potters Mill Gap construction project.

PERFORMANCE MEASURES: Improved Travel Time Ratio; Reduced Bottleneck Delay Surrogate; Reduced Rear End Crash Rate

BENEFITS: Improving incident management and operations on parallel corridors, optimizing the available capacity between I-99, US 322, and US 322-Business (Atherton Street/Boal Avenue).

OTHER CONSIDERATIONS AND ISSUES: The traffic signals west of College Avenue are equipped with Transit Signal Priority technology for CATA buses which must be maintained.

LT-06: I-80 ICM (Exit 111 to 123)

PROJECT DESCRIPTION AND SCOPE: Integrated Corridor Management along I-80 between Exits 111 and 123 and along the parallel corridor of US 322 as well as connecting routes PA-153, PA 879, and PA-970 near Clearfield. This project would include upgrading signal controllers at approximately 6 intersections in order to allow for command/control functionality. It also includes installation of 2 full-color Type A DMS signs.

STAKEHOLDERS: PennDOT 2-0; North Central RPO

ESTIMATED SCHEDULE: 4+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** Capital: $550,000 Annual O&M: $4,500

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: DMS System; Traffic Signal Systems; Telecommunications

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Improving incident management and operations on parallel corridors, optimizing the available capacity adjacent to I-80.

OTHER CONSIDERATIONS AND ISSUES: N/A

LT-07: I-80 ICM (Exit 173 to 185)

PROJECT DESCRIPTION AND SCOPE: Integrated Corridor Management along I-80 between Exits 173 and 185 and along the parallel corridors of PA-64 and PA-477. This project would include upgrading signal controllers at approximately 5 intersections in order to allow for command/control functionality. It also includes installation of 1 full-color standard DMS sign, 3 full-color Type A DMS signs, and 1 HD CCTV camera.

STAKEHOLDERS: PennDOT 2-0; SEDA-COG MPO

ESTIMATED SCHEDULE: 4+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** Capital: $1,110,000 Annual O&M: $11,000

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; DMS System; Traffic Signal Systems; Telecommunications

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Improving incident management and operations on parallel corridors, optimizing the available capacity adjacent to I-80.

OTHER CONSIDERATIONS AND ISSUES: Proposed CCTV camera at Exit 185 is also included in Project ST-05, I-80 CCTV Gaps

LT-10: Central Region Dynamic Curve Warning

PROJECT DESCRIPTION AND SCOPE: Install Dynamic Curve Warning systems at the following noted curved road problem areas:

- I-80, near MM 180
- US 322, near Laurel Creek Reservoir
- I-99, near Exit 81
- US 22, near Williamsburg
- US 219, near Summerhill
- US 30, near McConnellsburg

System will consist of side-mounted radar speed detection and a full-color DMS (or full-color Type A DMS) for notification.

STAKEHOLDERS: PennDOT 2-0, 3-0, and 9-0; Centre County; SEDA-COG MPO; Altoona MPO; Johnstown MPO; Southern Alleghenies RPO

ESTIMATED SCHEDULE: 4+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** Capital: $1,685,000 Annual O&M: $17,000

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: DMS System; Telecommunications

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Curved Road Crashes

BENEFITS: Regional deployment of curve warning systems to reduce crashes at some of the most dangerous curves on the region's highways.

OTHER CONSIDERATIONS AND ISSUES: ST-12: US 322 Slow Vehicle Warning includes improvements within the same project area as the "US 322, near Laurel Creek Reservoir" site listed here. This Curve Warning deployment could be also be integrated into that project and removed from this regional project.

LT-11: PA-54 Traffic Signal Improvements

PROJECT DESCRIPTION AND SCOPE: This signal improvement project includes upgrades at 9 signalized intersections along US 11 and PA-54 in Danville. This will include full replacements of signal equipment at each intersection, including upgraded signal controllers to allow for command/control functionality. This project also includes 2 HD CCTV cameras, 1 full-color standard DMS, and 1 full-color Type A DMS. Study potential conversion of Mill St. to right-in/right-out at US 11 with removal of the traffic signal or use of blank-out signs. Consider development of local signing district to improve wayfinding to medical, educational, industrial, and commercial destinations in the Danville area.

STAKEHOLDERS: PennDOT 2-0 and 3-0; SEDA-COG MPO

ESTIMATED SCHEDULE: 4+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $$$

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems; DMS System; CCTV System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Reduced Bottleneck Delay Surrogate; Improved Incident Response Time

BENEFITS: Improved traffic flow and reduced congestion along an important arterial running through Danville.

OTHER CONSIDERATIONS AND ISSUES: Green Light-Go application submitted to improve US 11/State Hospital Dr intersection and extend Liberty St to US 11, adding an additional traffic signal. This work is related to Danville Area School District plan to relocate middle school operations.

For potential signal removal at US 11/Mill St., consider operational effects during closures in adjacent Continental Blvd.

LT-12: Central Region DMS Gaps

PROJECT DESCRIPTION AND SCOPE: Install 8 full-color standard DMS signs and 1 full-color Type A DMS throughout Central Region. DMS signs would be placed at the following locations:

- PA-64, near I-80 (Type A DMS location)
- I-80, westbound prior to I-180
- I-99 Exit 52, northbound
- I-99 Exit 52, southbound
- I-99 Exit 62, southbound
- I-99 Exit 68, northbound
- I-99 Exit 76, northbound
- I-99 Exit 78, southbound
- I-70, Maryland State Line

STAKEHOLDERS: PennDOT 2-0, 3-0, and 9-0; Centre County MPO; SEDA-COG MPO; Altoona MPO; Southern Alleghenies RPO

ESTIMATED SCHEDULE: 4+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** Capital: $2,658,000 Annual O&M: $33,000

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: DMS System; Telecommunications

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Traveler Time Ratio

BENEFITS: Fill important gaps in traveler information availability along key interstates and arterials throughout the region.

OTHER CONSIDERATIONS AND ISSUES: N/A

LT-13: PA-36 Traffic Signal Improvements

PROJECT DESCRIPTION AND SCOPE: Upgrade signalized intersections along the PA-164 and PA-36 corridor in Roaring Spring. Improvements include upgrading to radar detection at 4 intersections. The project will also include LED "Red Signal Ahead" signs for northbound PA-36 and westbound PA-164 prior to Roaring Spring.

STAKEHOLDERS: PennDOT 2-0 and 9-0; Altoona MPO

ESTIMATED SCHEDULE: 4+ years

Life Cycle: 10-15 years

ESTIMATED COSTS:
Capital: $185,000
Annual O&M: $1,000

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Reduced Rear End Crashes

BENEFITS: Improved traffic flow and reduced congestion along an important signalized corridor within the region. Improved safety on approaches to this signalized corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

LT-14: US 6 Corridor ITS

PROJECT DESCRIPTION AND SCOPE: Install 12 full-color DMS signs and 3 HD CCTV cameras at the junctions of US 6 with US 220, US 15, and PA-14. Each location will have 1 full-color Type A DMS sign on each approach and 1 HD CCTV camera to view the intersection/interchange.

STAKEHOLDERS: PennDOT 2-0 and 3-0; Northern Tier RPO

ESTIMATED SCHEDULE: 4+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** Capital: $2,449,000 Annual O&M: $24,000

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; DMS System; Telecommunications

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Incident Response Time; Improved Travel Time Ratio

BENEFITS: Fill in gaps in camera coverage and traveler information along US 6 to improve incident response and congestion monitoring from the RTMC for this main east-west route across the northern portion of the region.

OTHER CONSIDERATIONS AND ISSUES: N/A

LT-15: PA-150 Traffic Signal Improvements

PROJECT DESCRIPTION AND SCOPE: Upgrade signal controllers at 5 signalized intersections along PA-150 near Mill Hall in order to allow for command/control functionality and performance measures. These signals are part of the Bald Eagle-Hogan system.

STAKEHOLDERS: PennDOT 2-0; SEDA-COG MPO

ESTIMATED SCHEDULE: 4+ years

Life Cycle: 10-15 years

ESTIMATED COSTS:
Capital: $175,000
Annual O&M: $1,500

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion along an important signalized corridor within the region.

OTHER CONSIDERATIONS AND ISSUES: N/A

LT-16: Sayre Traffic Signal Improvements

PROJECT DESCRIPTION AND SCOPE: Upgrade controllers at 5 signalized intersections along US 220 and Elmira Street near Sayre. Retime and improve coordination along the corridor.

STAKEHOLDERS: PennDOT 2-0 and 3-0; Northern Tier RPO

ESTIMATED SCHEDULE: 4+ years

Life Cycle: 10-15 years

ESTIMATED COSTS:
Capital: $210,000
Annual O&M: $1,300

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion along an important signalized corridor within the region.

OTHER CONSIDERATIONS AND ISSUES: N/A

LT-17: PA-144 Truck Enforcement

PROJECT DESCRIPTION AND SCOPE: Install automated truck enforcement system on PA-144 near Centre Hall. Include Weigh-in-Motion detection to determine oversized vehicles. Consider addition of speed detection as well. Include portable CCTV to monitor as necessary.

STAKEHOLDERS: PennDOT 2-0; Centre County MPO; Pennsylvania State Police (PSP)

ESTIMATED SCHEDULE: 4+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** Capital: $730,000 Annual O&M: $6,000

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Automated Enforcement System;

PREREQUISITES AND DEPENDENCIES: This project will require legislative changes to allow for automated enforcement based on vehicle classification.

PERFORMANCE MEASURES: Reduction in Heavy Vehicle Usage

BENEFITS: Improved enforcement of truck ban on this state highway and improved on the route.

OTHER CONSIDERATIONS AND ISSUES: Coordinate with PSP Weigh Team. Project will require increased enforcement effort from PSP.

IU-01: PA-150 ICM

PROJECT DESCRIPTION AND SCOPE: Upgrade traffic signal controllers as necessary in order to allow for command/control functionality and performance measures at five intersections along the PA-150 corridor in Benner and Spring Townships between I-99 and Bellefonte. Also consider installation of CCTV cameras and Type A DMS, as needed.

STAKEHOLDERS: PennDOT 2-0; Centre County MPO

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $$

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; DMS System; Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Reduced Bottleneck Delay Surrogate; Reduced Rear End Crash Rate

BENEFITS: Improved traffic flow and reduced congestion along an important signalized corridor within the region.

OTHER CONSIDERATIONS AND ISSUES: Considerable development activity, including retail and housing, has occurred along the PA-150 corridor. Multiple traffic impact studies have been completed for commercial and residential developments in the corridor. Traffic volume and congestion levels are expected to increase and impact traffic signal operations.

IU-02: College Twp. Signal Improvements

PROJECT DESCRIPTION AND SCOPE: Upgrade traffic signal controllers as necessary in order to allow for command/control functionality and performance measures along the PA-26 and PA-150 corridors in College Township (11 intersections). Consider installation of ramp preemption at the PA-26 interchange with US 322. Also consider installation of CCTV cameras and Type A DMS, as needed.

STAKEHOLDERS: PennDOT 2-0; Centre County MPO

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $$

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; DMS System; Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Reduced Bottleneck Delay Surrogate; Reduced Rear End Crash Rate

BENEFITS: Improved traffic flow and reduced congestion along an important signalized corridor within the region.

OTHER CONSIDERATIONS AND ISSUES: Considerable development activity has occurred along the PA-26 corridor. Traffic volume and congestion levels are expected to increase and impact traffic signal operations. Large casino development planned for former mall site in 2022.

IU-03: DuBois Fiber Deployment

PROJECT DESCRIPTION AND SCOPE: Installation of fiber optic backbone along the US 219/PA-255 corridors through the DuBois area.

STAKEHOLDERS: PennDOT 2-0; North Central RPO

ESTIMATED SCHEDULE: 4+ years

Life Cycle: 10-15 years

ESTIMATED COSTS: $$$

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Complex

TECHNOLOGY COMPONENTS *(if applicable)*: Communications Infrastructure

PREREQUISITES AND DEPENDENCIES: Project LT-03 is currently under design and will install ITS and signal improvements along these corridors. Project should also be coordinated with LT-02 (I-80/I-99 Fiber Backbone) as this project would install fiber west along I-80 to DuBois.

PERFORMANCE MEASURES: Number of Miles of Installed Fiber Optic Cable

BENEFITS: A fiber optic backbone along this key corridor would increase connectivity and greatly increase the ability of the Department to expand their deployment of ITS, connected vehicles, and other emerging transportation technology.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-05: North Central ITS

PROJECT DESCRIPTION AND SCOPE: Install/upgrade the following ITS devices in the North Central RPO region:

- Install CCTV camera on PA-153 at Boone Mountain
- Install CCTV camera at Lantz Corners (US 219/US 6 intersection)
- Install CCTV cameras and possible DMS at PA-255/PA-153 intersection
- Install DMS on US 322 westbound approaching US 219 (prior to Shaffer Rd)
- Upgrade existing RWIS at I-80 MM 111 to include grit factor measurement capability

STAKEHOLDERS: PennDOT 2-0; North Central RPO

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $$

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; DMS System; RWIS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Incident Response Time; Improved Travel Time Ratio

BENEFITS: Fill in gaps in camera coverage and traveler information to improve incident response and congestion monitoring from the RTMC at key locations in the North Central region.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-07: PA-655 Signal Improvements

PROJECT DESCRIPTION AND SCOPE: In Brown Township, connect four signalized intersections along PA-655 to the command and control network via an existing CCTV camera at the US 322 interchange. Upgrade signal controllers at the westbound US 322 ramps and at SR 1005 (Tea Creek Road) in order to allow for command and control functionality.

STAKEHOLDERS: PennDOT 2-0; SEDA-COG MPO

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS: $$

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion along important signalized corridor in Brown Township.

OTHER CONSIDERATIONS AND ISSUES: Increased development – Geisinger and Kish Bank.

IU-08: US 220 Corridor ITS

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras and Type A DMS along US 220 corridor, north and south of Mill Hall. CCTV cameras should be mounted onto the DMS.

STAKEHOLDERS: PennDOT 2-0; SEDA-COG MPO

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS: $$

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; DMS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Incident Response Time; Improved Travel Time Ratio

BENEFITS: Fill in gaps in camera coverage and traveler information to improve incident response and congestion monitoring from the RTMC at key locations on the US 220 corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-09: US 15 Corridor ITS

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras and Dynamic Message Signs at key locations along the US 15 corridor, between US 6 and Williamsport.

STAKEHOLDERS: PennDOT 3-0; Northern Tier RPO

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS: $$

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; DMS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Incident Response Time; Improved Travel Time Ratio

BENEFITS: Fill in gaps in camera coverage and traveler information to improve incident response and congestion monitoring from the RTMC at key locations on the US 15 corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-10: CSVT Signal Improvements

PROJECT DESCRIPTION AND SCOPE: Evaluate traffic signal operations along two corridors and complete retiming if necessary:

- US 15 – Smoketown Road/Moore Avenue to Ziegler Road (Lewisburg)
- US 11 – Duke Street to King Street (Northumberland)

STAKEHOLDERS: PennDOT 3-0; SEDA-COG MPO

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion along important signalized corridors in the region. Mitigate potential effects of ongoing CSVT construction project.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-11: Middleburg Signal Improvements

PROJECT DESCRIPTION AND SCOPE: At the US 522/PA-104 intersection, upgrade traffic signal controller and detection to connect to Unified Command and Control network and allow for Automated Traffic Signal Performance Measures

STAKEHOLDERS: PennDOT 3-0; SEDA-COG MPO

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS: $

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion through this key intersection in the region.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-12: Montoursville Signal Improvements

PROJECT DESCRIPTION AND SCOPE: Full equipment upgrade at the SR 2014 (Broad Street) intersections with Walnut Avenue and with Willow Street. Add corridor to the Unified Command/Control network.

STAKEHOLDERS: PennDOT 3-0; Williamsport MPO

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS: $$

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion along an important signalized corridor within the region.

OTHER CONSIDERATIONS AND ISSUES: Coordinate with Montour Street Airport connector project (ECMS 110772).

IU-13: Third Street Signal Improvements

PROJECT DESCRIPTION AND SCOPE: Full signal equipment replacement and retiming along SR 2014 (Third St.) in Loyalsock Township. This includes seven intersections spanning from Country Club Road to Northway Road. In addition, also retime signal at Third St. and Shiffler Ave. Consider installation of CCTV cameras at Faxon interchange (I-180 Exit 25) and connection of traffic signals to the Unified Command and Control network via this camera.

STAKEHOLDERS: PennDOT 3-0; Williamsport MPO

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $$

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Incident Response Time; Improved Travel Time Ratio

BENEFITS: Improved traffic flow and reduced congestion along an important signalized corridor within the region. Fill in gap in camera coverage to improve incident response and congestion monitoring from the RTMC at a key location on the I-180 corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-14: I-70 Curve Warning

PROJECT DESCRIPTION AND SCOPE: Install Dynamic Curve Warning systems at the following noted curved road problem areas along I-70:

- Westbound at PA-643 overpass (Exit 156)
- Eastbound before and after PA-915 interchange (Exit 151)

Curve warning alerts will be broadcast via Dynamic Message Signs installed upstream of the curve locations.

STAKEHOLDERS: PennDOT 9-0; Southern Alleghenies RPO

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $
PROJECT TYPE: Deployment	**LEVEL OF EFFORT:** Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Dynamic Curve Warning System; DMS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Curved Road Crashes

BENEFITS: Reduce crashes, particularly at high speeds, in the area of some of the most dangerous curves on the I-70 corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-15: I-70 ITS Gaps

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras and Dynamic Message Signs along the I-70 corridor between the Maryland state line and Breezewood at key locations to be determined.

STAKEHOLDERS: PennDOT 9-0; Southern Alleghenies RPO

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS: $$

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; DMS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Improved Incident Response Time

BENEFITS: Improve incident response, congestion monitoring, and traveler information along I-70 Corridor. Improve monitoring of weather and roadway conditions.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-16: Pleasantville ITS

PROJECT DESCRIPTION AND SCOPE: Install Type A DMS westbound on PA-56 prior to PA-96 (Pleasantville Borough).

STAKEHOLDERS: PennDOT 9-0; Southern Alleghenies RPO

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: DMS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Fill an important gap in traveler information in the region.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI.08: I-80 Corridor ITS

FOCUS AREA: Traveler Information

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras and DMS at strategic locations across the Western Region portion of I-80 and at key interchanges. Install variable speed limit signs. Improve coordination with Ohio DOT.

STAKEHOLDERS: **PennDOT 1-0**; PennDOT 10-0

ESTIMATED SCHEDULE: 3+ years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $$$ ($2M-$10M)

PROJECT TYPE: Deployment **LEVEL OF EFFORT:** Complex

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; DMS System; Variable Speed Limit System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Travel Time Ratio; Improved Incident Response Time

BENEFITS: Improve incident response, congestion monitoring, and traveler information along I-80 Corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI.09: I-80 Fiber Deployment

FOCUS AREA: Traveler Information

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Expansion of fiber optic cable backbone network along I-80 corridor through Western Region. Connect this fiber deployment south along I-79 to existing terminus of I-79 fiber at District 11-0 border.

STAKEHOLDERS: **PennDOT 1-0**, PennDOT 10-0

ESTIMATED SCHEDULE: 3+ years Life Cycle: 25 years	**ESTIMATED COSTS:** $$$$ ($10M+)

PROJECT TYPE: Deployment **LEVEL OF EFFORT:** Complex

TECHNOLOGY COMPONENTS *(if applicable)*: Communications Infrastructure

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Number of Miles of Installed Fiber Optic Cable

BENEFITS: A fiber optic backbone along this key interstate would increase connectivity and greatly increase the ability of PennDOT to expand their deployment of ITS and other technology.

OTHER CONSIDERATIONS AND ISSUES: Coordinate with fiber deployment project in Central RTMC ROP.

TI.16: US 322 ITS

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV camera and Arterial DMS at I-80 interchange and PA-66 intersection.

STAKEHOLDERS: **PennDOT 10-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $$ ($500k-$2M)

PROJECT TYPE: Deployment **LEVEL OF EFFORT:** Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV System; DMS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Travel Time Ratio; Improved Incident Response Time

BENEFITS: Improve incident response, congestion monitoring, and traveler information along US 322 Corridor. Improve detour capabilities along route.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI.23: Brookville Arterial DMS

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install Arterial DMS in the vicinity of Brookville, including on eastbound US 322, as well as northbound and southbound PA-36 prior to I-80.

STAKEHOLDERS: **PennDOT 10-0**

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $$ ($500k-$2M)

PROJECT TYPE: Deployment **LEVEL OF EFFORT:** Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: DMS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Travel Time Ratio;

BENEFITS: Improve traveler information capabilities in the vicinity of Brookville and improve detour operations along I-80 corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

TIM.04: I-80 TIM Team

FOCUS AREA: Traffic Incident Management

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Develop new Traffic Incident Management Team for the I-80 Corridor across the Western Region.

STAKEHOLDERS: **PennDOT WRTMC**, PennDOT 1-0, PennDOT 10-0; Local Municipalities; Emergency Personnel

ESTIMATED SCHEDULE: 1 year Life Cycle: N/A	**ESTIMATED COSTS:** $ (<$500k)

PROJECT TYPE: Planning **LEVEL OF EFFORT:** Simple

TECHNOLOGY COMPONENTS *(if applicable)*: N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Inter-Agency Communications; Improved Incident Response Time; Improved Incident Clearance Time; Reduction in Secondary Crashes

BENEFITS: Improved incident management and coordination, increasing safety for motorists and emergency responders.

OTHER CONSIDERATIONS AND ISSUES: N/A

TIM.08: I-80 Crossovers

FOCUS AREA: Traffic Incident Management

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Construct new crossovers on I-80 east and west of Brookville and near Exits 60 and 64.

STAKEHOLDERS: PennDOT 10-0

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 20-25 years	**ESTIMATED COSTS:** $$ ($500k-$2M)

PROJECT TYPE: Deployment **LEVEL OF EFFORT:** Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Incident Response Time; Improved Incident Clearance Time; Reduction in Secondary Crashes

BENEFITS: Improved incident management removal of trapped queues during incidents, increasing safety for motorists and emergency responders.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-01: I-80 DMS Retrofit/Replace

PROJECT DESCRIPTION AND SCOPE: Retrofit or Replace existing DMS along I-80 in Clarion and Jefferson Counties.

STAKEHOLDERS: PennDOT 10-0, North Central RPO, Northwest RPO

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $$ ($500k-$2M)

PROJECT TYPE: Antiquated Devices

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: DMS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improve Travel Time Ratio

BENEFITS: Improve traveler information along I-80 Corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-12: I-80 Fiber Backbone

PROJECT DESCRIPTION AND SCOPE: Install fiber optic cable backbone along I-80 in Clarion, Jefferson, Mercer, and Venango Counties to connect to existing fiber on I-79.

STAKEHOLDERS: PennDOT 10-0, PennDOT 1-0, Mercer County MPO, North Central RPO, Northwest RPO

ESTIMATED SCHEDULE: 3+ years Life Cycle: 25 years	**ESTIMATED COSTS:** $$$$ ($10M+)
PROJECT TYPE: Communications	**LEVEL OF EFFORT:** Complex

TECHNOLOGY COMPONENTS *(if applicable)*: Communications Infrastructure

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Number of Miles of Installed Fiber Optic Cable

BENEFITS: A fiber optic backbone along the region's interstates and major arterials would increase connectivity and greatly increase the ability of PennDOT to expand their deployment of ITS and other technology.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-16: I-80 Slow Vehicle Warning

PROJECT DESCRIPTION AND SCOPE: Install slow vehicle warning on I-80 in District 10.

STAKEHOLDERS: District 10, North Central RPO

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15	**ESTIMATED COSTS:** $$ ($500k-$2M)

PROJECT TYPE: Freeway Operations

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: Slow Vehicle Warning Signs

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Heavy Truck Crashes

BENEFITS: Improved traffic safety and traffic flow with less incidents at locations of slow climbing vehicles.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-18: I-80 & Applicable State Routes Detour Sign Update

PROJECT DESCRIPTION AND SCOPE: Update detour signs on I-80 and applicable state route detours.

STAKEHOLDERS: PennDOT 1-0, PennDOT 10-0

ESTIMATED SCHEDULE: N/A Life Cycle: N/A	**ESTIMATED COSTS:** <$500k

PROJECT TYPE: Incident Management

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Reduced Incident Clearance Time

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-39: I-80 Corridor CCTV

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras along I-80 corridor in Clarion and Jefferson Counties.

STAKEHOLDERS: PennDOT 10-0, North Central RPO, Northwest RPO

ESTIMATED SCHEDULE: 1-3 years Life Cycle: 10-15 years	**ESTIMATED COSTS:** $$ ($500k-$2M)

PROJECT TYPE: ITS Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable)*: CCTV Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Incident Response Time

BENEFITS: Improve incident response time, and congestion management along I-80 Corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A