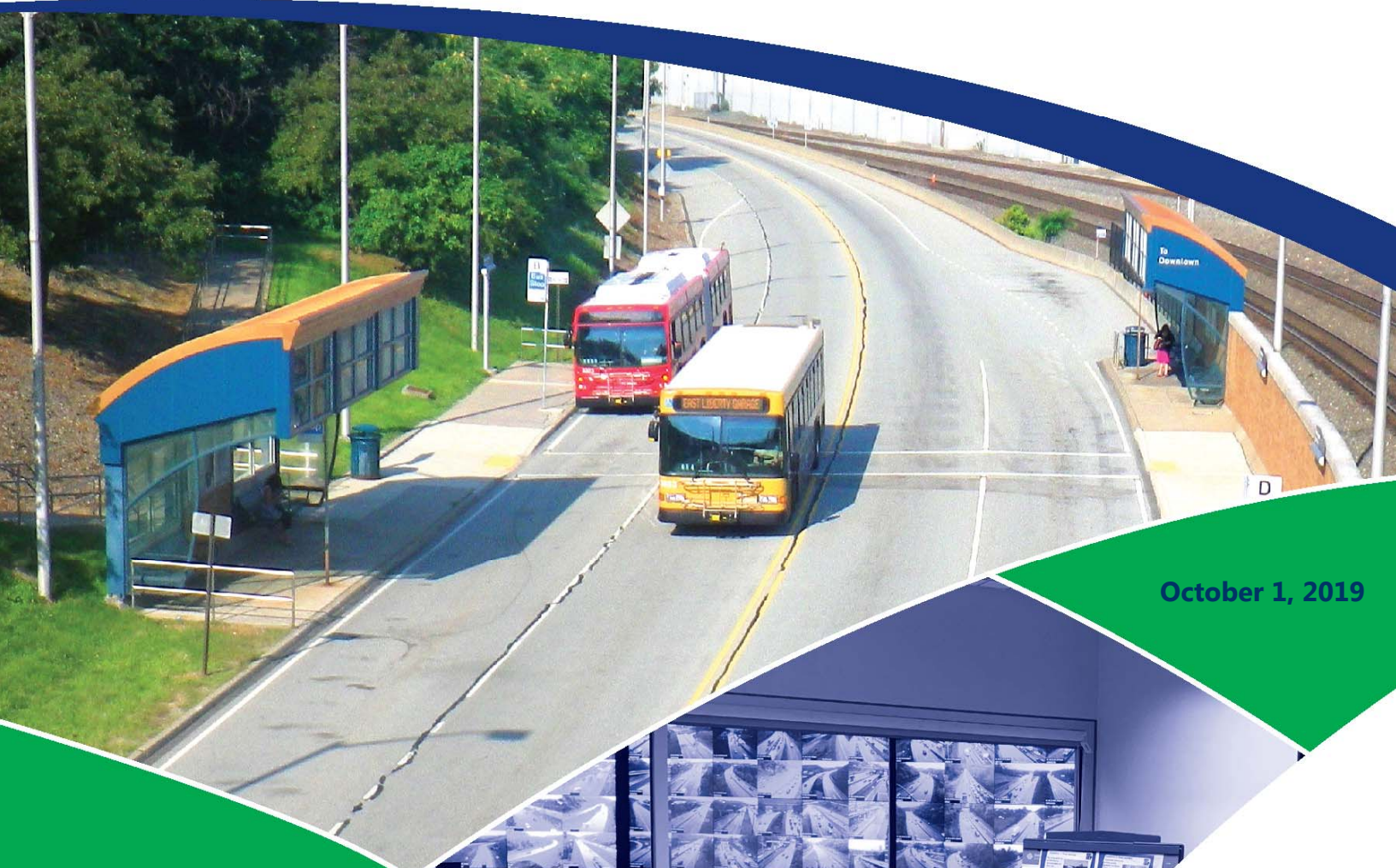


Regional Operations Plan

Western RTMC Region | Districts 1-0, 10-0, 11-0, and 12-0



October 1, 2019



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Confidential – Traffic Engineering and Safety Study

The data and information contained herein are part of a traffic engineering and safety study. This safety study is only provided to those official agencies or persons who have responsibility in the highway transportation system and may only be used by such agencies or persons for traffic safety related planning or research. The document and information are confidential pursuant to 75 Pa. C.S. §3754 and 23 U.S.C. §409 and may not be published, reproduced, released or discussed without the written permission of the Pennsylvania Department of Transportation.

Executive Summary

This Regional Operations Plan (ROP) has been developed to cover the Pennsylvania Department of Transportation (PennDOT) Western Region. This region is comprised of PennDOT Engineering Districts 1, 10, 11, and 12. This region is centered around the Regional Traffic Management Center (RTMC) located in Bridgeville, PA at the PennDOT District 11-0 office.

The previous ROP process for this region was divided into separate documents for the southwestern and northwestern regions. These documents were completed in 2007. Subsequent to this PennDOT-led effort, The Southwestern Pennsylvania Commission (SPC) has been updating a ROP for the southwestern region every four years, including their most recent update, completed in June 2019. The results of this SPC ROP update have been incorporated into this document.

This ROP has been compiled based on guidance from the *TSMO Guidebook, Part I: Planning*, a PennDOT document developed in 2018 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. This is accomplished primarily in 3 ways: Incorporating state-of-the-art intelligent systems, improving management of incidents and events, and encouraging modal shift.

The ROP will complement the statewide 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 Western 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 4 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 Maintenance and Operations (BOMO), PennDOT Districts 1-0, 10-0, 11-0, and 12-0. This Steering Committee communicated throughout the process and helped review and refine the message and material to be presented to stakeholders. The Stakeholder Groups included PennDOT District Safety Engineers, PennDOT County Maintenance Departments, the Pennsylvania Turnpike Commission (PTC), county planning departments, transit agencies, and bicycle advocates. Stakeholder Groups met three times in each District for a total of 12 meetings, with the meetings in Districts 10-0, 11-0, and 12-0 occurring as part of the SPC

process. 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 Long Range Transportation Plan (LRTP) for reach 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 were organized into seven priority areas:

- Traffic Signals
- Traffic Incident Management
- Traveler Information
- Operational Teamwork/Institutional Coordination
- Multimodal Connectivity
- Freeway and Arterial Operations
- Freight 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 signal improvement projects and other ITS-related projects. A number of multimodal projects have also been identified, including improvements to transit operations and bicycle infrastructure that are anticipated to improve overall operations through encouraging mode change and an equitable transportation system for all users.

Projects were prioritized based on stakeholder input and discussion into "High Priority" and "Normal Priority" groups. The ROP Projects were then divided into short-term and long-term categories. Short-term projects were identified as those which could be implemented in less than four years. Long-term projects are those that would take four or more years. The following tables show the complete list of recommended projects for the SPC Region.

HIGH PRIORITY PROJECTS

Project #	Project	Priority Area	Stakeholders*	Planned Improvements
TS.01	Greensburg Operations Improvements	Traffic Signals	PennDOT 12-0	Traffic Signal Improvements, Queue Detection
TIM.01	Armstrong County Bridge De-Icing	Traffic Incident Management	PennDOT 10-0	Bridge De-Icing, RWIS, CCTV
TIM.02	PA-28 Freeway Service Patrol	Traffic Incident Management	PennDOT 11-0	Freeway Service Patrols
TIM.03	PA-28 TIM Team	Traffic Incident Management	SPC , PennDOT 11-0, Local Municipalities, Emergency Personnel	TIM Team
TIM.04	I-80 TIM Team	Traffic Incident Management	PennDOT WRTMC , PennDOT 1-0, PennDOT 10-0; Local Municipalities; Emergency Personnel	TIM Team
TI.01	Hogback Hill RWIS	Traveler Information	PennDOT 10-0	RWIS
TI.02	US 22 Corridor ITS/Signal Improvements	Traveler Information	PennDOT 10-0	CCTV, DMS, Traffic Signal Improvements
TI.03	US 422 Corridor ITS	Traveler Information	PennDOT 10-0	CCTV, Arterial DMS
TI.04	District 12-0 RWIS Expansion	Traveler Information	PennDOT 12-0	RWIS
TI.05	I-79 Corridor ITS	Traveler Information	PennDOT 1-0 , PennDOT 10-0	CCTV, DMS
TI.06	Western RTMC Expansion	Traveler Information	PennDOT 11-0	Traffic Management Center
TI.07	I-90 Corridor ITS	Traveler Information	PennDOT 1-0	CCTV, DMS, Variable Speed Limits, Coordination
TI.08	I-80 Corridor ITS	Traveler Information	PennDOT 1-0 , PennDOT 10-0	CCTV, DMS, Variable Speed Limits, Coordination
TI.09	I-80 Fiber Deployment	Traveler Information	PennDOT 1-0 , PennDOT 10-0	Fiber Deployment
MC.01	South Hills Village Smart Parking	Multimodal Connectivity	Port Authority of Allegheny County , PennDOT 11-0	Smart Parking System
MC.02	W. Carson St. Multimodal Improvements	Multimodal Connectivity	PennDOT 11-0 , Port Authority of Allegheny County	Transit Improvements and bike connection between South Side and West End.
MC.03	Penn Ave. Transit Improvements	Multimodal Connectivity	City of Pittsburgh DOMI , Port Authority of Allegheny County	Transit Improvements, 40 th St. to Fifth Ave.
MC.04	Centre Ave. Transit Improvements	Multimodal Connectivity	City of Pittsburgh DOMI , Port Authority of Allegheny County	Transit Improvements, Washington Pl. to East Liberty Garage

Regional Operations Plan (ROP)

Western RTMC Region

Project #	Project	Priority Area	Stakeholders*	Planned Improvements
MC.05	Peninsula Dr. + W. 8 th St. Corridor Improvements	Multimodal Connectivity	PennDOT 1-0 , City of Erie, Millcreek Township	Ped/Bike Infrastructure, Traffic Signal Improvements
FA.01	Bates St. Interchange Improvements	Freeway and Arterial Operations	PennDOT 11-0	Interchange Improvements
FA.02	I-79 Integrated Corridor Management	Freeway and Arterial Operations	PennDOT 12-0	Traffic Signal Improvements

* Primary stakeholder in **bold**

OTHER RECOMMENDED PRIORITY PROJECTS

Project #	Project	Priority Area	Stakeholders*	Planned Improvements
TS.02	PA-8 Traffic Signal Improvements	Traffic Signals	PennDOT 10-0	Traffic Signal Improvements
TS.03	US 19 and Interchange Rd. Signal Improvements	Traffic Signals	PennDOT 1-0	Traffic Signal Improvements
TS.04	26 th St. Signal Improvements	Traffic Signals	PennDOT 1-0	Traffic Signal Improvements
TS.05	PA-18 Signal Improvements	Traffic Signals	PennDOT 1-0	Traffic Signal Improvements
TS.06	US 322 Signal Improvements	Traffic Signals	PennDOT 1-0	Traffic Signal Improvements
TS.07	East End Signal Improvements	Traffic Signals	PennDOT 11-0	Traffic Signal Improvements
TS.08	PA-51 DOT Signal Pilot	Traffic Signals	PennDOT 11-0	Traffic Signal Improvements
TS.09	Grove City Signal Improvements	Traffic Signals	PennDOT 1-0	Traffic Signal Improvements
TIM.05	I-79 Curve Warning	Traffic Incident Management	PennDOT 10-0	Dynamic Curve Warning
TIM.06	US 30 Curve Warning	Traffic Incident Management	PennDOT 12-0	Dynamic Curve Warning
TIM.07	Erie TIM Team	Traffic Incident Management	PennDOT 1-0, Ohio DOT, New York State DOT, Local Municipalities, Emergency Personnel	TIM Team
TIM.08	I-80 Crossovers	Traffic Incident Management	PennDOT 10-0	Crossovers
TI.10	PA-28 ITS	Traveler Information	PennDOT 10-0	CCTV, DMS
TI.11	US 22 Bridge De-Icing	Traveler Information	PennDOT 10-0	Bridge De-Icing, RWIS, CCTV

Regional Operations Plan (ROP)

Western RTMC Region

Project #	Project	Priority Area	Stakeholders*	Planned Improvements
TI.12	I-376 Corridor ITS	Traveler Information	PennDOT 11-0	CCTV, DMS, RWIS
TI.13	PA-8 Arterial ITS	Traveler Information	PennDOT 11-0	CCTV, DMS
TI.14	US 22 (Monroeville) Arterial ITS	Traveler Information	PennDOT 11-0	CCTV, DMS
TI.15	I-70/US 40 Detour ITS	Traveler Information	PennDOT 12-0	CCTV, DMS
TI.16	US 322 ITS	Traveler Information	PennDOT 10-0	CCTV, DMS
TI.17	US 6 Detour Improvements	Traveler Information	PennDOT 1-0	CCTV, DMS, Coordination
TI.18	DI RWIS Expansion	Traveler Information	PennDOT 1-0	RWIS
TI.19	Franklin Operations Improvements	Traveler Information	PennDOT 1-0	CCTV, DMS, Traffic Signal Improvements
TI.20	Bayfront Pkwy. Arterial DMS	Traveler Information	PennDOT 1-0	DMS
TI.21	US 6 Winter Operations ITS	Traveler Information	PennDOT 1-0	DMS, RWIS
TI.22	West Middlesex Interchange ITS	Traveler Information	PennDOT 1-0	CCTV, DMS
TI.23	Brookville Arterial DMS	Traveler Information	PennDOT 10-0	DMS
TI.24	Butler County Fiber Ring Deployment	Traveler Information	PennDOT 10-0, Cranberry Township	Fiber Deployment
OT.01	Key Bank Pavilion Event Management & Signal Improvements	Operational Teamwork/ Institutional Coordination	PennDOT 12-0, PennDOT 11-0	Traffic Signal Improvements
MC.06	Carnegie Smart Parking	Multimodal Connectivity	Port Authority of Allegheny County, PennDOT 11-0	Smart Parking System, Pedestrian Improvements
MC.07	Wilkinsburg Smart Parking	Multimodal Connectivity	Port Authority of Allegheny County, PennDOT 11-0	Smart Parking System
MC.08	Liberty Ave. Transit Improvements	Multimodal Connectivity	PennDOT 11-0, Port Authority of Allegheny County	Transit Improvements, Downtown to Aspen St.
MC.09	Kennywood Blvd./Browns Hill Rd. Transit Improvements	Multimodal Connectivity	PennDOT 11-0, City of Pittsburgh DOMI, Port Authority of Allegheny County	Transit Improvements, Browns Hill Rd./Hazelwood Ave. to Kennywood Blvd./Library St.
MC.10	E. Carson St. Transit Improvements	Multimodal Connectivity	PennDOT 11-0, Port Authority of Allegheny County	Transit Improvements, 10 th St. to 26 th St.
MC.11	Second Ave. Transit Improvements	Multimodal Connectivity	PennDOT 11-0, Port Authority of Allegheny County	Transit Improvements, Hot Metal St. to Hazelwood Ave.

Regional Operations Plan (ROP) Western RTMC Region

Project #	Project	Priority Area	Stakeholders*	Planned Improvements
MC.12	Healthy Ride E-Bike Deployment	Multimodal Connectivity	Pittsburgh Bike Share	E-assist bike sharing deployment
MC.13	"The Chute" to Eliza Furnace Trail Bike Connection	Multimodal Connectivity	City of Pittsburgh DOMI	Improve bike connection
MC.14	Brady St. to Heritage Trail Bike Connection	Multimodal Connectivity	City of Pittsburgh DOMI	Improve bike connection
MC.15	Butler St. Bike Connection	Multimodal Connectivity	City of Pittsburgh DOMI	Improve bike connection from Lawrenceville to Highland Park
MC.16	Penn Ave. Bike Connection	Multimodal Connectivity	City of Pittsburgh DOMI	Improve bike connection from Lawrenceville to East Liberty
MC.17	East Allegheny Ped/Bike Improvements	Multimodal Connectivity	City of Pittsburgh DOMI , PennDOT 11-0	Improve bike/ped connections in the North Side Pittsburgh area near I-279 and I-579
FA.03	Campbells Run Queue Warning	Freeway and Arterial Operations	PennDOT 11-0	Queue Warning System
FA.04	Parkway North ICM	Freeway and Arterial Operations	PennDOT 11-0	Smart Parking System, Traffic Signal Improvements, Transit Signal Priority
FA.05	Veterans Bridge Junction Control	Freeway and Arterial Operations	PennDOT 11-0	Junction Control System
FA.06	Mercer County Smart Corridor Initiatives	Freeway and Arterial Operations	PennDOT 1-0	Smart Corridor Initiatives

* Primary stakeholder in **bold**

In addition to the projects outlined above, a number of studies and initiatives were also developed as part of the ROP process. While specific projects could be determined for many of the issues and needs, others need further study to best to determine the correct mitigation to improve operations. Recommended studies can be found in the following tables.

HIGH-PRIORITY STUDIES AND INITIATIVES

Study	Priority Area	Stakeholders*	Notes
Downtown Pittsburgh Bridge Operations Study	Freeway and Arterial Operations	SPC , PennDOT 11-0, Port Authority of Allegheny County	Study to improve operations in the vicinity of the Downtown river crossings.
Parkway West ICM Study	Freeway and Arterial Operations	PennDOT 11-0	Study conversion of shoulders for flex lane or transit lane use. Identify other ICM needs.

* Primary stakeholder in **bold**

OTHER RECOMMENDED STUDIES AND INITIATIVES

Study	Priority Area	Stakeholders*	Notes
Regional ITS Strategic Plan	Traveler Information	SPC , PennDOT	In addition to ITS device projects identified in this plan, conduct a regionwide study to determine any other remaining ITS coverage gaps and prioritize for future projects.
District 12-0 Communications Gap Study	Traveler Information	PennDOT 12-0	Identify communications needs throughout District (fiber, etc.)
Indiana University of Pennsylvania (IUP) Special Events Traffic Management Study	Operational Teamwork/ Institutional Coordination	IUP , PennDOT 10-0	Improve ingress/egress to events at Kovalchick Convention and Athletic Complex.
Operations Center/Traffic Management Center Coordination	Operational Teamwork/ Institutional Coordination	SPC , PennDOT, PA Turnpike Commission, Port Authority of Allegheny County, Cranberry Township	Improve coordination between Western RTMC and PA Turnpike Traffic Operations Center, particularly for the I-76/I-376 loop, including incident management, construction detours, communications (fiber), device sharing, traveler information, and weather operations. Port Authority operations center and Cranberry Township TMC should also be included.
Person Trips Prioritization Study	Operational Teamwork/ Institutional Coordination	SPC	Determine feasibility of Roadway Tiering based on total person trips (including transit passengers, cyclists, etc.) instead of AADT.

Regional Operations Plan (ROP)

Western RTMC Region

Study	Priority Area	Stakeholders*	Notes
Key Bank Pavilion Event Management Study	Operational Teamwork/ Institutional Coordination	Key Bank Pavilion , PennDOT 12-0	Improve ingress/egress to events at Key Bank Pavilion.
Downtown Erie Event Management Study/Planning	Operational Teamwork/ Institutional Coordination	Erie MPO , City of Erie, EMTA	Improve traffic management for special events, increase Park-n-Ride utilization to reduce congestion in Downtown area.
Data/Video Sharing Initiative	Operational Teamwork/ Institutional Coordination	PennDOT Western RTMC , County Offices	Share access to CCTV feeds to County offices to improve coordination and incident response.
Birmingham Bridge Complete Street Study	Multimodal Connectivity	PennDOT 11-0	Improve safety of existing bike lanes. Consider protected bike lane infrastructure and possible vehicular lane reduction.
Existing Bike Trail Maintenance Initiative	Multimodal Connectivity	SPC	Initiative to ensure continued maintenance of bike trails throughout region.
Regional Park-n-Ride Expansion Study	Multimodal Connectivity	SPC	Study possibilities for expanding existing sites or providing additional sites (coordinate with upcoming Regional Transit Coordination Study).
Park-n-Bike Campaign/Expansion	Multimodal Connectivity	SPC	Initiative to encourage commuters to transfer to bicycles at established trailheads.
Potential Transit Lane Study	Multimodal Connectivity	SPC , PennDOT District 11-0, City of Pittsburgh DOMI, Port Authority of Allegheny County	Study feasibility of other transit lane candidates not included in this report.
Wabash Tunnel Multimodal Use Study	Multimodal Connectivity	SPC , PennDOT District 11-0, City of Pittsburgh DOMI, Port Authority of Allegheny County	Study of alternate uses for tunnel, including possibility of conversion for bike usage.
West End/South Hills Potential Trail Network Study	Multimodal Connectivity	SPC	Study to determine potential trail network utilizing underused or unused right-of-way.
PA-28 Active Traffic Management Study	Freeway and Arterial Operations	PennDOT 11-0	Study flex lanes and other Active Traffic Management strategies.

Regional Operations Plan (ROP)

Western RTMC Region

Study	Priority Area	Stakeholders*	Notes
Parkway North HOV Conversion Study	Freeway and Arterial Operations	PennDOT 11-0 , Port Authority of Allegheny County	Consider converting existing HOV lanes in the median of the Parkway North (I-279) to a Port Authority Busway or other use.
US 40 Road Safety Audit	Freeway and Arterial Operations	SPC	Road Safety Audit on US 40, east of Uniontown to Somerset County line.
Route 8 Corridor Operations Planning Study	Freeway and Arterial Operations	SPC	Study to improve operations along Route 8 between Wildwood and Bakerstown.
Western RTMC Region Truck Parking Study	Freight Management	SPC , PennDOT Central Office	Determine needs and locations for possible expansion of truck parking. Study possibility of installing Truck Parking Management System. Consider potential public-private partnership opportunities with private truck stop facilities. Coordinate with planned PennDOT Truck Parking Study.
Western RTMC Region Winter Truck Restriction Impact Study	Freight Management	SPC , PennDOT Central Office	Study impact of winter truck restrictions on parallel corridors and determine best practices for future winter operations.

* Primary stakeholder in **bold**

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
BOMO	Bureau of Maintenance and Operations
CCTV	Closed-Circuit Television
CDART	Crash Data Analysis and Retrieval Tool
DMS	Dynamic Message Sign
DVMT	Daily Vehicle Miles Traveled
FHWA	Federal Highway Administration
HD	High-Definition
ITS	Intelligent Transportation System
LRTP	Long Range Transportation Plan
MCRPC	Mercer County Regional Planning Commission
MPO	Metropolitan Planning Organization
NWS	National Weather Service
NHS	National Highway System
O&M	Operations and Maintenance
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
RWIS	Roadway Weather Information System
SPC	Southwestern Pennsylvania Commission
TIM	Traffic Incident Management
TIP	Transportation Improvement Program
TSAMS	Traffic Signal Asset Management System
TSMO	Transportation Systems Management and Operations
WRTMC	Western Regional Traffic Management Center

Chapter 1. Overview of the Region

This ROP has been compiled based on guidance from the *TSMO Guidebook, Part I: Planning*, a PennDOT document developed in 2018 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 additional lane miles. 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 Western 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. 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 TIP.

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 Western Region comprises PennDOT Engineering Districts 1-0, 10-0, 11-0 and 12-0, including 18 counties. The RTMC for the Western Region is located in the District 11-0 Office in Bridgeville, PA.

The previous ROP process for this region was divided into separate documents for the Districts in the Northwest and Southwestern Region. These documents were completed by PennDOT as follows:

- Northwest Region - District 1-0 and 10-0 (Clarion) – July 2007
- Southwestern Region - District 10-0 (Armstrong, Butler, and Indiana), 11-0 and 12-0 – June 2007

Following the completion of these ROPs by PennDOT in 2007, the Southwestern Pennsylvania Commission (SPC) has continued the maintenance of the Southwestern Region ROP every four years, with their most recent update completed in July 2019 (https://www.spcregion.org/trans_ops_rop.asp) and incorporated into this document.

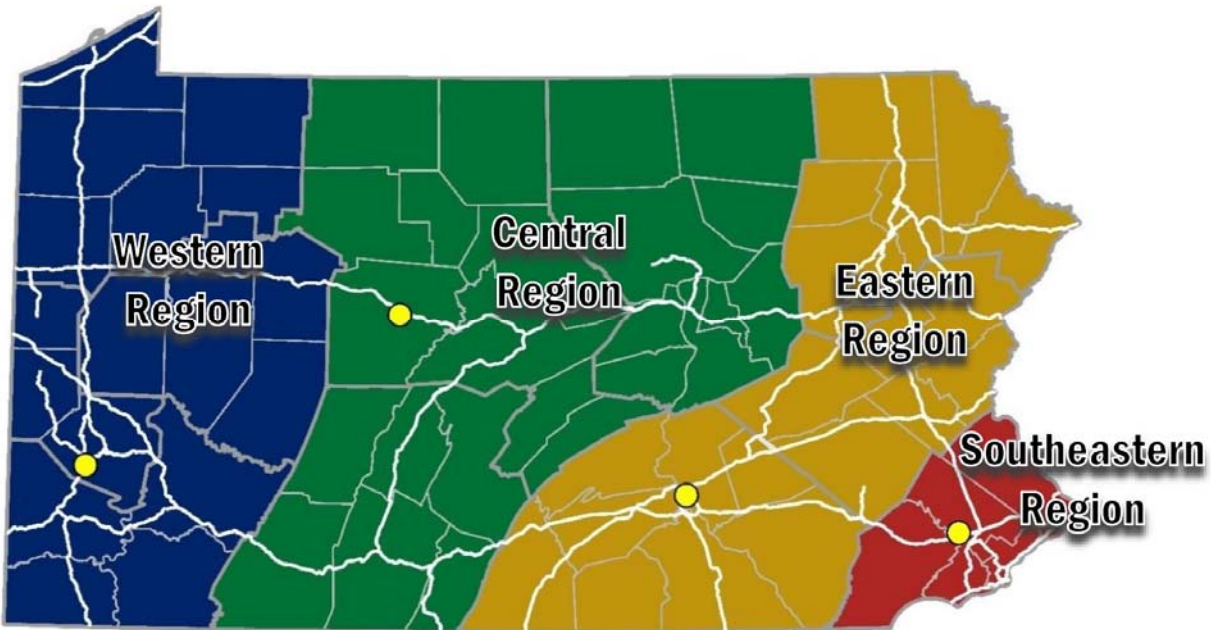


FIGURE 1: TSMO REGIONS WITHIN PENNSYLVANIA

The southwestern portion of Pennsylvania includes 10 counties and a population of 2.6 million people across 7,112 square miles. This region includes PennDOT Engineering Districts 11 and 12, as well as 3 counties from District 10. The region includes the following counties: Armstrong, Butler, and Indiana within PennDOT District 10; Allegheny, Beaver, and Lawrence within PennDOT District 11; and Fayette, Greene, Washington, and Westmoreland within PennDOT District 12. The transportation network within the Southwestern Pennsylvania Region consists of 25,000 linear miles, over 6,600 bridges, and 6 tunnels. The Regional Traffic Management Center (RTMC) for the Western Region is located in the District 11-0 office in Bridgeville, PA.

The Southwestern Region's terrain is defined mostly by the Allegheny Plateaus. The Allegheny Plateaus produce deep valleys and steep hillsides in the region. The steep slopes and rolling topography cause most of the population to be concentrated throughout the river valley communities. Nearly 78% of the region's population lives in the 15% of the land area that is classified as urban.

The City of Pittsburgh, located in the Southwestern Region, is home to many tourist attractions, conventions, and events which draw thousands of visitors to the area. The influx of tourists and visitors creates additional challenges for traffic management.

The remainder of the Western RTMC Region includes an 8-county area located in the northwestern corner of Pennsylvania. The region's location just off the shores of Lake Erie makes it an area with one of the harshest environments in the state. The region is situated within the winter snowbelt, and annually receives upwards of 100 inches of snowfall, along with 40-48 inches of rain. PennDOT typically spends anywhere from 100 to 150 days a year deicing the region's roadways. Geologically, the region is located within the broader Appalachian Plateau region, with deposits of glacial till that can run more than 200 feet deep.

The City of Erie is located in northwestern Pennsylvania, bordering Lake Erie. Erie is within two hour's drive from major markets in Pittsburgh, Buffalo, and Cleveland along the Interstates. Erie has been gaining

visibility in recent years as a regional tourist destination by leveraging its natural resources to provide recreational opportunities for visitors and residents alike.

The planning partners within the Western Region include:

- Erie County Metropolitan Planning Organization (Erie County MPO)
- Mercer County Metropolitan Planning Organization (Mercer County MPO)
- North Central Rural Planning Organization (North Central RPO)
- Northwest Rural Planning Organization (Northwest RPO)
- Southwestern PA Commission (SPC)

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

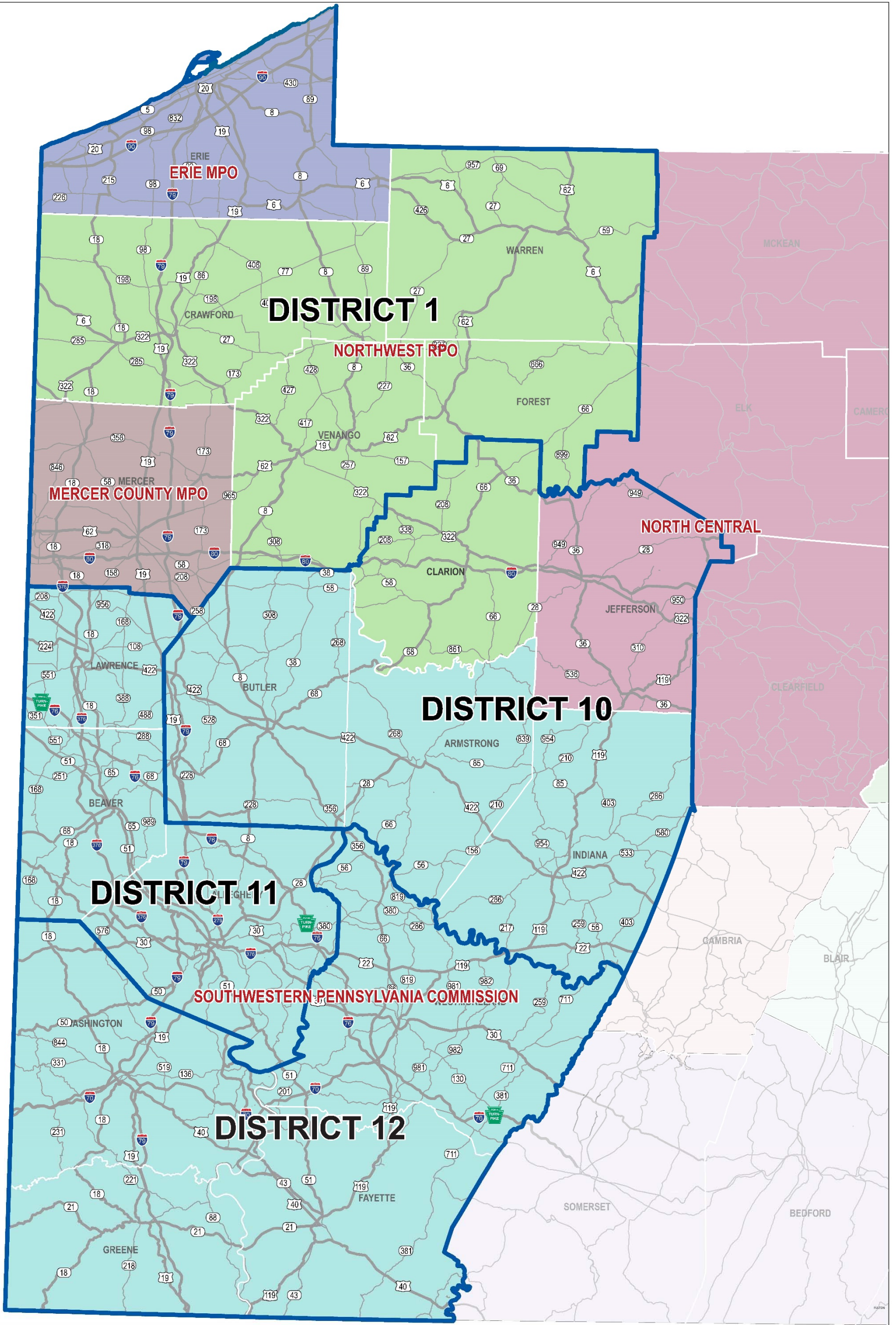


FIGURE 2: WESTERN RTMC REGION PLANNING PARTNERS

Key Regional Stakeholders

As part of an extensive outreach process for this ROP update, the project management team developed a ROP steering committee and ROP stakeholders group. The ROP stakeholders group consisted of key organizations that participate in transportation operations planning and implementation within the region. The following provides a listing of the 2019 ROP stakeholders invited to participate:

- FHWA
- PennDOT Central Office
- PennDOT Districts, 1-0, 10-0, 11-0, and 12-0
- The 18 counties within the region
- City of Pittsburgh
- City of Erie
- Beaver County Transit Authority
- Butler Transit Authority
- Crawford Area Transportation Authority
- Erie Metropolitan Transit Authority
- Fayette Area Coordinated Transportation
- Freedom Transit
- Indiana County Transit Authority
- Mid Mon Valley Transit Authority
- New Castle Transit Authority
- Port Authority of Allegheny County (PAAC)
- Town and County Transit
- Westmoreland County Transit Authority
- Pennsylvania Turnpike Commission
- Airport Corridor Transportation Association (ACTA)
- Oakland Transportation Management Association (OTMA)
- Pittsburgh Downtown Partnership (PDP)
- BikePGH
- Bike Share Pittsburgh
- Allegheny County Airport Authority
- Pennsylvania Emergency Management Agency (PEMA), Western Area
- Port of Pittsburgh Commission
- Pittsburgh Parking Authority
- University of Pittsburgh
- Carnegie-Mellon University
- Cranberry Township

The ROP steering committee was established by inviting specific stakeholder group members with extensive knowledge of the region's operations and those that could assist with data gathering. A list of the 2019 ROP steering committee members that were invited to participate is provided in **Table 1**.

TABLE 1: ROP STEERING COMMITTEE

Organization Name	Organization Contact	Roles/Responsibilities	Geographical Coverage
FHWA – PA Division	Dan Walston christopher.walston@dot.gov	Transportation Operations Program Manager	Statewide
Erie County MPO	Emily Aloiz ealoiz@eriecountypa.gov	Transportation planning and development	Erie County
Mercer County MPO	Matt Stewart mstewart@mcrpc.com	Transportation planning and development	Mercer County
North Central RPO	Amy Kessler amy@ncentral.com	Transportation planning and development	Jefferson County
Northwest RPO	Travis Siegel traviss@northwestpa.org	Transportation planning and development	Clarion, Crawford, Forest, Venango, and Warren Counties
Southwestern PA Commission (SPC)	Andy Waple awaple@spcregion.org	Transportation Director	SPC Region
	Dominic D’Andrea ddandrea@spcregion.org	Manager, Operations and Safety	
	Josh Spano jspano@spcregion.org	Transportation Planner	
	Evan Schoss eschoss@spcregion.org	Transportation Planner	
PennDOT Bureau of Maintenance and Operations	Frank Cavataio fcavataio@pa.gov	Managing statewide transportation management and operations	Statewide
	Pierce Sube piercsube@pa.gov		
PennDOT District 1-0	Brian Smith briansmit@pa.gov	District Traffic Engineer	Crawford, Erie, Forest, Mercer, Venango, and Warren Counties
	Greg Maser grmaser@pa.gov	District ITS/Safety Engineer	
	Ed Orzehowski eorzehowsk@pa.gov	Assistant District Traffic Engineer	
	Courtney Lyle clyle@pa.gov	District Planner	
PennDOT District 10-0	Dave Tomaswick dtomaswick@pa.gov	District Traffic Engineer	Armstrong, Butler, Clarion, Indiana, and Jefferson Counties
	Ernest Cascino ecascino@pa.gov	Assistant District Traffic Engineer	
	Adam Marshall admarshall@pa.gov	Assistant District Traffic Engineer	
PennDOT District 11-0	Todd Kravits tkravits@pa.gov	District Traffic Engineer	Allegheny, Beaver, and Lawrence Counties
	Frank Cippel fcippel@pa.gov	Assistant District Traffic Engineer	

Regional Operations Plan (ROP) Western RTMC Region

Organization Name	Organization Contact	Roles/Responsibilities	Geographical Coverage
PennDOT District 11-0	Kathryn Power kpower@pa.gov	WRTMC Manager	Allegheny, Beaver, and Lawrence Counties
	Doug Barch dobarch@pa.gov	Assistant WRTMC Manager	
PennDOT District 12-0	Bryan Walker brywalker@pa.gov	District Traffic Engineer	Greene, Fayette, Washington, and Westmoreland Counties
	Eric Bell erbell@pa.gov	Assistant District Traffic Engineer	
	Emily Zarichnak emzarichna@pa.gov	District ITS Engineer	
Port Authority of Allegheny County	Amy Silbermann asilbermann@portauthority.org	Director of Planning	Allegheny County
	Chuck Rompala crompala@portauthority.org	Manager, Road Operations	
Allegheny County Economic Development	Ann Ogoreuc ann.ogoreuc@alleghenycounty.us	Assistant Director, Mobility and Transportation Initiatives	Allegheny County
City of Pittsburgh	Amanda Purcell amanda.broadwater@pittsburghpa.gov	City Traffic Engineer	Pittsburgh

Due to the recent completion of the SPC ROP update, steering and stakeholder efforts completed within that effort have been rolled into the overall Western RTMC ROP update. SPC held four steering committee meetings and three rounds of stakeholder meetings. To complement this effort, three stakeholder meetings were held for the northwest region. Two steering meetings were also held, with the first used to organize the northwest region stakeholder process and the second one bringing together the full steering committee, including SPC steering committee members, to finalize this Western RTMC document. A summary of steering committee and stakeholder group activities is provided in **Table 2** and **Table 3**, respectively. The "Process" column notes whether the meeting was part of the SPC-led ROP effort or the PennDOT-led Western Region (WRTMC) ROP effort. Meeting minutes can be found in **Appendix A**.

TABLE 2: SUMMARY OF STEERING ACTIVITIES

Steering Round	Process	Summary of Activities	Location	Date
1	SPC	<ul style="list-style-type: none"> Discussion of needs identified in previous ROPs Overview of material to be presented at stakeholder meetings Discussion of PennDOT One Map tool 	SPC Conference Center	January 16, 2019
2	SPC	<ul style="list-style-type: none"> Discussion of stakeholder meeting feedback 	SPC Conference Center	February 26, 2019

Steering Round	Process	Summary of Activities	Location	Date
2	WRTMC	<ul style="list-style-type: none"> Discussion of operational needs and issue Overview of material to be presented at stakeholder meetings 	via Skype	April 30, 2019
3	SPC	<ul style="list-style-type: none"> Discussion of draft ROP projects Overview of material to be presented at stakeholder meetings 	SPC Conference Center	May 8, 2019
4	SPC	<ul style="list-style-type: none"> Presentation of final ROP document Final review of ROP projects 	SPC Conference Center	June 26, 2019
	WRTMC		SPC Conference Center	September 23, 2019

Stakeholder meetings were held in each of the four 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. Once again, the “Process” column specifies whether a meeting was part of the SPC or WRTMC ROP effort.

TABLE 3: SUMMARY OF STAKEHOLDER ACTIVITIES

Stakeholder Round	Process	Summary of Activities	Location	Date
1	SPC	<ul style="list-style-type: none"> Overview of TSMO, the previous ROP, and process for the current ROP Introduction to PennDOT One Map Breakout sessions discussing initial maps of One Map data including bottlenecks, crash clusters, and notable special events 	SPC Conference Center	January 30, 2019
	WRTMC		PennDOT District 1-0	March 13, 2019
2	SPC	<ul style="list-style-type: none"> Discussion of tools and strategies from the TSMO Guidebook Breakout sessions discussing regional issues and needs and tools and strategies that can be applied 	PennDOT District 10-0	March 14, 2019
			PennDOT District 11-0	March 14, 2019
	PennDOT District 12-0		March 15, 2019	
	WRTMC		PennDOT District 1-0	May 29, 2019
3	SPC	<ul style="list-style-type: none"> Overview of types of proposed projects Breakout sessions discussing and reviewing draft ROP projects 	PennDOT District 10-0	May 30, 2019
			PennDOT District 11-0	May 30, 2019
			PennDOT District 12-0	May 31, 2019
	WRTMC		PennDOT District 1-0	August 26, 2019

Region's ITS and Operations Vision and Planning Process

The following sections provide an overview of the most recent LRTP for each of the Western RTMC Region's planning partners. For planning partner's that adopted the previous ROP for their particular PennDOT District, any completed ROP projects are noted within the planning partner boundaries.

Erie County MPO

The Erie County MPO adopted their 2042 LRTP on March 15, 2017. The plan was developed with the following transportation goals in mind:

- Economic Vitality – improves access to targeted investment areas and planned development to support job growth, freight access, and employee retention. It aims to improve access to the interstate, support revitalization efforts, improve access to tourist attractions, and enhance recreational opportunities for residents and visitors.
- Safety & Security – reduces the number of motorized and non-motorized crashes, reduces hazard potential in school zones, at highway-rail crossings, and other sensitive locations, improves safety, reliability, and accessibility along emergency detour routes and improves emergency response time.
- Multimodal Accessibility and Mobility – improves walking and bicycling accessibility and improves public transportation and ride-share accessibility.
- Freight Accessibility and Mobility - improves passenger and freight services for air, rail, waterborne transportation.
- Sustainability - reduces impacts to environmental, natural, and cultural resources, improves quality of life and accessibility to jobs and resources for underserved populations.
- Project Feasibility - supports locally derived land use and transportation planning projects, improves the linkage between municipal plans, planning studies, and project development, and ensures that right-of-way, utility, and railroad coordination are conducted early in the planning process.
- Congestion and Maintenance - ensures efficient system management and operations that emphasize preservation of the existing transportation system.

To improve incident management and operations, the MPO adopted the Regional Operations Plan (ROP) which covered PennDOT District 1-0. This included the completion of the I-90 Traffic Surveillance project that deployed Closed Circuit Television at key locations identified in the City,

The existing 2007 ROP also recommended congestion management projects that have been completed for the City of Erie along the Bayfront Connector, Peach Street, 38th Street, and the coordination of traffic signals on alternate detour routes for I-90, along 26th Street. Currently a Traffic Signal project along Rt.5 and traffic signal pre-emption in Erie County are in progress.

The current LRTP included congestion management improvements through the following signal projects:

- Union City Signals Project (Union City) to improve operations
- US 20 at SR 98 Fairview Signal Retiming

- I-90/US 19/Peach Street Signal Upgrades

Mercer County MPO

The Mercer County LRTP was adopted in 2016. The primary goals and objectives of the Mercer County LRTP included:

- Enhance Economic Vitality - Improve access to local, regional, and national markets, provide transportation mobility choices for regional travel, ensure travel time reliability • Increase and support tourism and encourage vibrant towns.
- Improve Quality of Life- improve safety and security for motorized and non-motorized modes, improve transportation mobility choices, provide access to natural resources, promote environmental stewardship, provide and enhance recreational opportunities.
- Pursue System Preservation and Enhancements - pursue proper stormwater management and interagency communication, enhance pavement quality, prioritize bridge maintenance, and emphasize project delivery and intergovernmental cooperation.

To improve roadway system management and operations, the MPO has projects prioritized in their LRTP for traffic signal improvements at the following locations:

- SR 0173 and SR 0058 in Grove City
- Mercer Ave (SR 418) at Roemer Blvd (SR 3006) and Sharon New Castle Rd (SR 518)
- SR 18 at SR 4005 Signal Upgrades and Intersection Improvements
- SR 845 at SR 1004 Intersection Reconfiguration and Signal Improvements
- Walnut St (SR 518) at Mercer Ave (SR 3025) Signal Upgrades
- City of Sharon retiming Sharon signals / Green-light-Go

Signal improvement projects identified in the existing 2007 Northwest ROP and supported by the MPO that have been completed includes the Mercer County Traffic Signal Project (Mercer Borough) and the I-80 Traffic Surveillance Project at the I-79 & I-80 Interchange (Ohio Border). The long-term ITS projects prioritized from the 2007 ROP that are in progress include, the Rt. 58 Signal project in Grove City, and the Hermitage and Sharon Traffic Signal Projects along State Street and Route 18.

North Central RPO

The North Central PA Commission adopted its current LRTP in July 2017 with a planning horizon year of 2045. This plan includes Jefferson County in the Northwest region. Under the goal of "promoting efficient system management and operation" the North Central LRTP set the objective to leverage innovations in technology and procurement for improved traffic management, congestion reduction, and safety enhancements. To do this, the North Central LRTP proposes:

- Update the region's roadway functional classification network and National Highway System routes.
- Evaluate potential for alternative intersection improvements during design phases.

- Promote public-private partnerships to distribute traveler information.
- Remain abreast of developments regarding connected and autonomous vehicles and other developing technologies affecting transportation.
- Improve signal timing by adding protective left-turn phases, improving clearance intervals, and coordinating signals.
- Develop a clearly-defined process for the bonding of local roads.
- Access management standards for major collector and arterial streets should be implemented to preserve the capability of a roadway to enhance traffic flows, minimize vehicle conflicts, and improve pedestrian safety.
- Encourage multi-municipal collaboration and resource sharing.
- Support the development and execution of Maintenance and Operations agreements between municipalities and PennDOT for traffic signals.
- Upgrade existing traffic signals with audible pedestrian signals and countdown pedestrian signals and Americans with Disabilities Act (ADA) features where feasible.
- Develop a signal retiming and optimization program to improve arterial corridor operations.

The existing 2007 Northwest ROP identified the need for I-80 Traffic Surveillance in Jefferson County (I-80 at Exit 78) which has not been completed. It also identified a need for improvements to the Punxsutawney Traffic Signal System signals which were completed.

Northwest RPO

The Northwest PA Commission 2040 LRTP was adopted in 2015. The plan was developed focusing on the following goals:

- Modernize traffic signals.
- Address bottlenecks.
- Improve traffic incident management.
- Deploy greater use of ITS: DMS, 511PA, etc.
- Traffic signals are needed along Bauer Road near Clarion.
- Municipalities cannot afford traffic signal maintenance.
- Address distracted driving.
- Advance warning of lane assignment.
- An inventory of both traffic signal operation needs and ITS-related needs.
- Properly maintaining and improving traffic signal systems

The existing 2007 Northwest ROP identified several projects for the region and some have been completed, including a TMC in Oil City, PA, the I-80 & I-79 DMS Replacement project, Oil City Signals, Franklin Signals and Clarion Signals.

Southwestern Pennsylvania Commission (SPC)

SPC adopted their latest Long Range Transportation Plan (LRTP), [SmartMoves for a Changing Region](#), in June 2019. The plan was developed with the following regional vision: A world-class, safe and well maintained, integrated transportation system that provides mobility for all, enables resilient communities, and supports a globally competitive economy. To achieve the vision, the following investments, relative to the ROP, were identified:

- Investment for Maintaining Infrastructure Condition
- Investment for System Safety, Efficiency and Reliability
- Multimodal Investment for Community and Economic Development

The last (2015) SPC ROP was incorporated into the LRTP process. By linking the ROP and LRTP, operational projects are institutionalized into the overall planning cycle. The operations objectives developed in the ROPs tie to the regional policy goals and strategies set in the regional LRTP. Four operations objectives were established to achieve the goal of efficient transportation system operations and management – mitigate recurring congestion, maintain mobility during planned events, minimize impact of unplanned events, and provide an efficient multimodal transportation system. Some of the projects aimed at following these objectives included:

- Oakland and Downtown Bikesharing
- Evacuation Plans and Procedures Developed
- Low Cost Road Surface Monitoring
- Adaptive Traffic Signalization Strategies
- Real Time Transit Rider Information

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
Erie County MPO	2017-2042	2021
Mercer County MPO	2016-2042	2020
North Central RPO	2017-2045	2020
Northwest RPO	2015-2040	2019
SPC	2015-2035	2019

Chapter 2. Existing Regional Demographics and Transportation Elements

Existing Key Transportation Elements

Roadway Network

The roadway network in the Western RTMC Region includes Interstates, freeways, arterials, collectors, local, municipal, and other agency roads. As reported in PennDOT's 2017 Highway Statistics, the Western RTMC Region contains 38,273 linear miles of roadway, encompassing 31.8% of the Commonwealth's total linear mileage.

TABLE 5: WESTERN RTMC REGION LINEAR MILES

County	PennDOT Linear Miles	Other Agencies Linear Miles*	Local County/ Municipal Linear Miles	Total Linear Miles	Total DVMT
Erie	781	33	1788	2,602	4,713,378
Crawford	910	57	1498	2,467	1,843,426
Forest	201	125	162	488	142,276
Mercer	740	36	1262	2,038	2,831,363
Venango	529	24	826	1,379	1,276,080
Warren	529	149	612	1,290	747,343
District 1-0	3,690	424	6,148	10,264	11,553,866
Armstrong	655	14	1,151	1,820	1,496,917
Butler	654	84	1,631	2,368	5,266,143
Clarion	467	33	944	1,446	1,365,217
Indiana	797	38	1,271	2,106	2,040,941
Jefferson	555	5	837	1,397	1,283,272
District 10-0	3,128	174	5,834	9,137	11,452,490
Allegheny	1,178	42	4,569	5,789	22,876,659
Beaver	603	63	1,022	1,689	3,285,562
Lawrence	384	24	792	1,200	1,884,377
District 11-0	2,165	130	6,376	8,671	28,046,598
Fayette	759	92	1,298	2,147	2,769,970
Greene	567	6	931	1,504	1,419,181
Washington	1,089	41	1,748	2,877	6,082,949
Westmoreland	1,182	88	2,402	3,672	8,946,293
District 12-0	3,596	227	6,379	10,201	19,218,393
Western RTMC Region Total	12,579	955	24,737	38,273	70,271,347

*Other agencies include Turnpike toll roads and other state and federal agencies, such as state universities, national parks, etc.

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:

Fixed Route Bus	Shared-Ride/Demand Response
Area Transportation Authority (ATA) Beaver County Transit Authority Butler Transit Authority Crawford Area Transportation Authority (CATA) Erie Metropolitan Transit Authority (EMTA) Fayette Area Coordinated Transportation Heritage Community Transportation Indiana County Transit Authority Mercer County Community Transit Center Mid Mon Valley Transit Authority New Castle Area Transportation Authority Port Authority of Allegheny County (bus, incline, and light rail) Shenango Valley Shuttle Service Town and Country Transit (Armstrong County) Transit Authority of Warren County (TAWC) Washington County Transportation Authority Westmoreland County Transit Authority	ACCESS Transportation Airport Corridor Transportation Association Allied Coordinated Transportation Services Beaver County Transit Authority Butler County Community Action Fayette Area Coordinated Transportation Greene County Transportation Department Mid-County Transit Venango County Public Transportation – GoBus Washington County Transportation Authority Westmoreland County Transit Authority

The Mountain Line Transit Authority, although based outside of the SPC region, provides service from Morgantown, West Virginia, to Waynesburg, Washington, Pittsburgh’s Greyhound Station, and Pittsburgh International Airport. In addition to these transit agencies, a variety of private intercity bus companies also provide service through the region, including:

- CoachUSA: commuter service from Cranberry Township and Warrendale to Downtown Pittsburgh.
- Fullington Trailways: intercity service from Harrisburg, State College, and DuBois to Downtown Pittsburgh and Pittsburgh International Airport (1 round trip per day).
- Greyhound Lines: operates a bus station in Downtown Pittsburgh with a number of intercity route options.
- Megabus: intercity service from Harrisburg, Philadelphia, and State College, as well as Morgantown, West Virginia, New York City, and Washington, DC.

The Western region has over 100 Park and Ride lots with capacities ranging from 10 spaces to 2,200 spaces. These locations provide connections to public transit as well as meeting places for carpools and vanpools. Many of the locations fill up by 8:00 am on weekdays. Three of the locations (General Robinson Street, First Avenue, and South Hills Village) are garages. Structured parking is also planned for expansions of the Ross and Carnegie facilities. All existing and proposed structured parking is part of the PAAC system.

In addition to the transit service listed above, there are three Amtrak trains that operate within the region. The *Pennsylvanian* line connects Pittsburgh to Harrisburg, Philadelphia, and New York, while also stopping at Greensburg and Latrobe. The *Capitol Limited* line connects Pittsburgh to Washington, D.C. to the southeast and Cleveland and Chicago to the west. *Capitol Limited* also services Connellsville, a city in Fayette County. Union Station is an Amtrak railroad station and mixed-use commercial building in downtown Erie.

It is served by the *Lake Shore Limited* route, which provides daily passenger service between Chicago and New York City or Boston; Erie is the train's only stop in Pennsylvania.

Active Transportation Network

Through long range planning and public engagement, the Western Region has seen a strong desire for safe and reliable multimodal transportation and development of sustainable active communities. Based on identification of this important theme, SPC has developed their first [Active Transportation Plan](#) in 2018 and developed the [Active Transportation Resource Center](#) webpage.

The City of Pittsburgh has a growing network of protected bike lanes, as well as standard bike lanes and other infrastructure. There are also a number of trails, mostly along the rivers that run through the city. Of particular note is the 150-mile Great Allegheny Passage which connects with the 184.5-mile C&O Canal Towpath at Cumberland, Maryland to provide a 334.5-mile trail between Pittsburgh and Washington, DC, free from traffic and motorized vehicles. This is part of US Bike Route 50, along with the Montour Trail and the Panhandle Trail.

As Erie County is rich with local recreational destinations, it is important for tourism and quality of life to provide facilities for residents and visitors to reach these conveniently. The trail system connects Presque Isle in Erie County with Ohio and New York. This multimodal system is important for recreation, tourism, and providing mode choice for travel.

The statewide BicyclePA network includes five routes through the Western RTMC Region:

- [PA Bike Route A](#): north-south route generally paralleling the I-79/US 19 corridors from Erie south to West Virginia.
- [PA Bike Route S](#): east-west route across southern Pennsylvania which connects Washington and Connellsville within the Western Region.
- [PA Bike Route V](#): east-west route across central Pennsylvania, generally paralleling I-80, connecting New Castle and Brookville within the Western Region.
- [PA Bike Route Y](#): east-west route across northern Pennsylvania, mostly following US 6 through Meadville, Corry, and other points to the east.
- [PA Bike Route Z](#): route along Lake Erie, mostly on PA-5 through Erie County.

In addition, the City of Pittsburgh also has a bike share system called Healthy Ride. Healthy Ride has over 100 stations with 700 bikes in a growing network throughout the city. Current plans are to continue expansion with the hopes of serving 170,000 people and increasing the service area to 16 square miles.

Airports

There are 31 public airports operating in the region. Pittsburgh International Airport is one of the major airports in the region and state. Others include:

- Arnold Palmer Regional Airport
- Allegheny County Airport
- Bandel Airport
- Beaver County Airport
- Brokenstraw Airport
- Butler County Airport

- Butler Farm Show Airport
- Clarion County Airport
- Corry-Lawrence Airport
- DuBois Regional Airport
- Erie International Tom Ridge Field Airport
- Inter-County Airport
- Finleyville Airport
- Greene County Airport
- Greensburg-Jeanette Regional Airport
- Grove City Airport
- Joseph A. Hardy Connellsville Airport
- McVile Airport
- Mt. Pleasant-Scottdale Airport
- New Castle Municipal Airport
- Pittsburgh International Airport
- Pittsburgh-Monroeville Airport
- Pittsburgh Northeast Airport
- Port Meadville Airport
- Punxsutawney Municipal Airport
- Rostraver Airport
- Thermal G Ranch Airport
- Titusville Airport
- Washington County Airport
- Venango Regional Airport
- Zelienople Municipal Airport

Ports

The region includes two major ports – Port of Pittsburgh and the Port of Erie. The Port of Pittsburgh encompasses three major waterways- Allegheny, Monongahela, and Ohio Rivers – and is the second largest inland port in the US. The Port of Erie, located on Lake Erie, is serviced by Norfolk Southern, the Allegheny Eastern Railroad, and CSX. It has the largest crane (300-ton capacity) as well as one of only two 1,000-foot dry docks on the Great Lakes.

Tourist and Travel Destinations

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

TABLE 6: WESTERN RTMC REGIONAL ATTRACTIONS

Destination Type	Name
Amusement Parks	Conneaut Lake Park
	Go Ape Treetop Adventure
	Idlewild Park (Ligonier)
	Kennywood Park
	Sandcastle Waterpark
	Splash Lagoon Indoor Water Park Resort
	Waldameer Park & Water World
Caves and Mines	Laurel Caverns
	Tour-Ed Mine and Museum

Destination Type	Name
<p align="center">Sporting Events/Facilities</p>	<p>A.J. Palumbo Center Erie Insurance Arena Heinz Field Highmark Stadium Lake Erie Speedway Lernerville Speedway Mercer Raceway Park Oakmont Country Club Petersen Events Center Pittsburgh’s Pennsylvania Motor Speedway PNC Park PONY League World Series PPG Paints Arena Tri-City Speedway UPMC Events Center UPMC Park Wild Things Park</p>
<p align="center">Universities and Colleges</p>	<p>Allegheny College Carlow University Carnegie Mellon University Chatham University Clarion University of Pennsylvania Duquesne University Edinboro University of PA Indiana University of PA Gannon University Geneva College Grove City College La Roche College Mercyhurst College Point Park University Penn State University – Beaver Penn State University – Behrend Penn State University – Fayette Penn State University – Greater Allegheny Penn State University – New Kensington Robert Morris University Seton Hill University Slippery Rock University of Pennsylvania St. Vincent College Theil College University of Pittsburgh University of Pittsburgh – Greensburg Washington & Jefferson College Waynesburg University Westminster College</p>
<p align="center">Entertainment and Special Events</p>	<p>The Dam Tri-Family Festival Bedford County Fair</p>

Destination Type	Name
<p align="center">Entertainment and Special Events</p>	<p>Big Butler Fair Butler Farm Show Fayette County Fair First Night Pittsburgh Holiday Event Fort Armstrong Folk Festival Greater Pittsburgh Renaissance Festival Greene County Fair Hidden Valley Resort Indiana County Fair Key Bank Pavilion Lawrence County Fair Meadows Racetrack & Casino OpenStreetsPGH Peoples Gas Holiday Market Pittsburgh Earth Day Festival Pittsburgh Great Race Pittsburgh Marathon Pittsburgh Vintage Grand Prix Rivers Casino Seven Springs Mountain Resort Stage AE The ScareHouse Three Rivers Arts Festival Three Rivers Regatta Washington County Agricultural Fair Westmoreland County Fair</p>
<p align="center">Parks and Recreation</p>	<p>Beaver County Conservation District Environmental Center Boyce Park Bradys Run Park Brush Creek Park Challenger Raceway Crosby Beach Opens Drake Well Museum and Park Erie Zoo & Botanical Garden ERIEBANK Sports Park Forbes State Forest Frick Park Hartwood Acres Highland Park Hillman State Park Hopewell Township Community Park I.S. & Gertrude Sahli Nature Park Keystone State Park</p>

Destination Type	Name
Parks and Recreation	Laurel Mountain State Park Laurel Ridge State Park Laurel Summit State Park Linn Run State Park McConnell's Mill State Park Monaca Riverfront Park Moraine State Park North Park Ohiopyle State Park Old Economy Park Pittsburgh Zoo & PPG Aquarium Point State Park Raccoon Creek State Park Ryerson Station State Park Schenley Park Settler's Cabin Park South Park Twin Lakes Park Yellow Creek State Park
Others	Air Heritage Museum Andrew Carnegie Free Library & Music Hall Andy Warhol Museum August Wilson Center for African American Culture Arrowhead Wine Cellars The Baldwin-Reynolds House Museum Battle Museums of Rural Life Battle of Lake Erie Maritime Museum Beaver Area Historical Museum Beaver County Industrial Museum Bookamer Family Farm Burns Family Alpacas Caldwell One Room Schoolhouse Cambridge Springs Bridge Canal Museum Carnegie Museum of Art Carnegie Museum of Natural History Cashier's House Children's Museum of Pittsburgh Clemente Museum Conneaut Cellars Winery Conneaut Lake Area Historical Society Corry Area Historical Society Inc., and Museum Courtyard Winery Crawford Center and Pumping Jack Museum

Destination Type	Name
Others	Dr. Knisely Covered Bridge
	Erie Art Museum
	Fallingwater
	Fort Ligonier
	Frick Art & Historical Center
	The Hoyt Institute of Fine Arts
	John A. Hermann Memorial Art Museum
	Kentuck Knob
	Living Treasures Animal Park
	Meadowcroft Rockshelter and Historic Village
	Merrick Art Gallery
	Monroeville Convention Center
	National Aviary
	Nemacolin Woodlands Resort
	Pennsylvania Trolley Museum
	Phipps Conservatory and Botanical Gardens
	Pittsburgh Center for the Arts
	Pittsburgh Zoo & PPG Aquarium
	Senator John Heinz History Center
	Society for Contemporary Craft
Soldiers & Sailors Memorial Hall & Museum	
Sweetwater Center for the Arts	
University Museum at Indiana University of Pennsylvania	
Wash Community Arts and Cultural Center	
Woodville Plantation	

Major Employers

Figure 3 displays the number of employees in various industries, based on the 2012-2016 American Community Survey. Educational services, health care, and social assistance are the top industries in the region by a large margin. This group is led by a number of top universities as well as strong healthcare systems like the University of Pittsburgh Medical Center (UPMC) and the Allegheny Health Network (AHN).

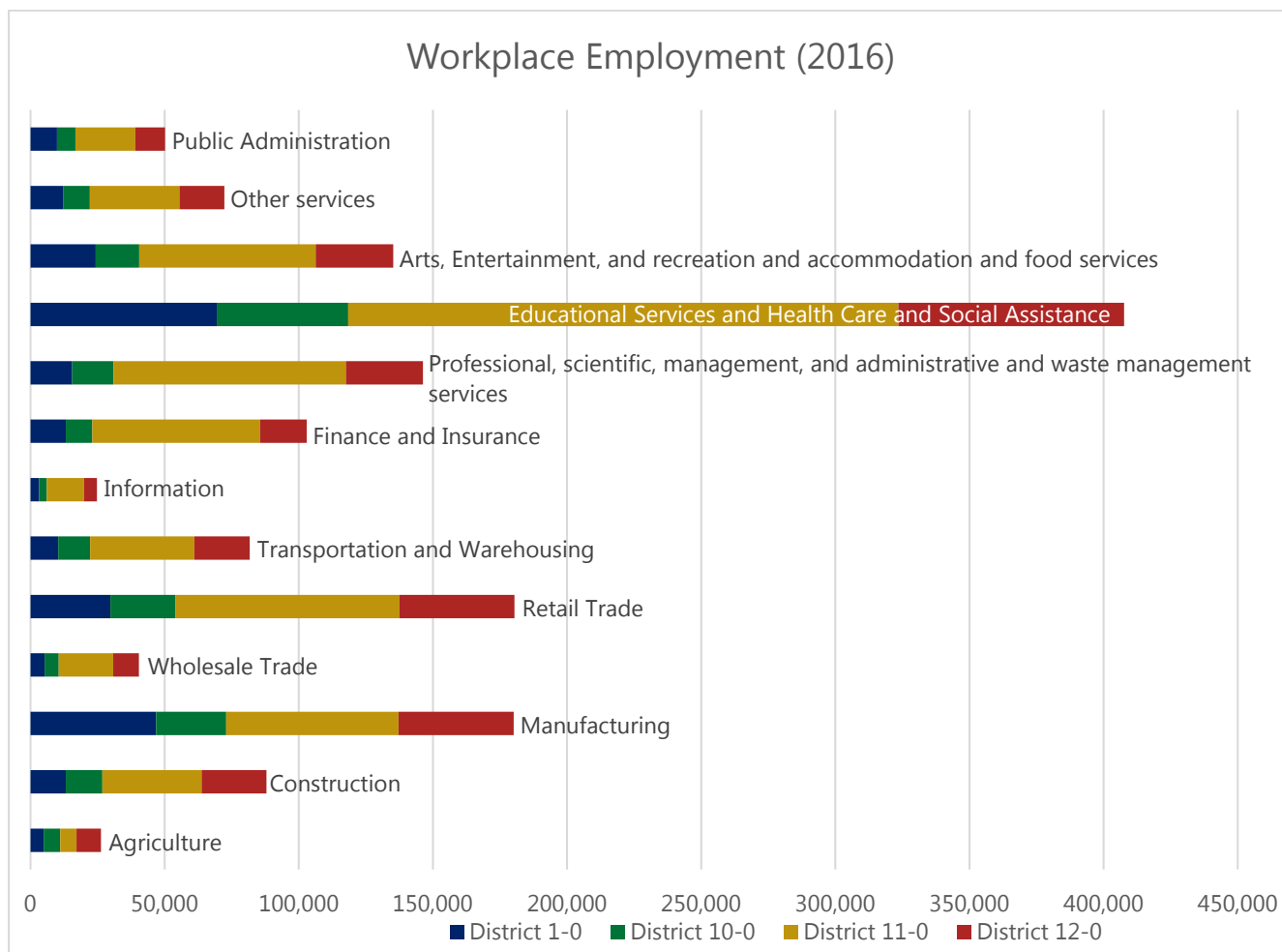


FIGURE 3: MAJOR INDUSTRIES IN THE REGION

Demographics

The following tables, also based on the American Community Survey, show the demographics and commuting patterns of the region. Data is based on workers' place of residence, not employment.

TABLE 7: COUNTY AND DISTRICT POPULATIONS

District	Population	Percent of Regional Total
Crawford	86,847	2.70%
Erie	277,794	8.62%
Forest	7,388	0.23%
Mercer	113,623	3.53%
Venango	52,880	1.64%
Warren	40,345	1.25%
District 1-0	578,877	17.97%
Armstrong	66,737	2.07%
Butler	185,984	5.77%
Clarion	38,747	1.20%
Jefferson	44,258	1.37%
Indiana	86,551	2.69%
District 10-0	422,277	13.11%
Allegheny	1,229,605	38.16%
Beaver	168,161	5.22%
Lawrence	88,231	2.74%
District 11-0	1,485,997	46.12%
Fayette	133,160	4.13%
Greene	37,338	1.16%
Washington	207,661	6.44%
Westmoreland	356,835	11.07%
District 12-0	734,994	22.81%
Total Population in the Region	3,222,145	

(SOURCE: US CENSUS BUREAU, 2013-2017 AMERICAN COMMUNITY SURVEY 5-YEAR POPULATION ESTIMATES)

TABLE 8: COMPARISON OF KEY DEMOGRAPHICS

Demographic Factor	District 1-0	District 10-0	District 11-0	District 12-0	Pennsylvania	United States
Total Population	578,877	422,277	1,485,997	734,994	12,783,977	318,558,162
% Minority Population	9.44%	3.65%	17.74%	5.86%	18.7%	26.7%
Median Age (In Years)	43.0	42.8	43.6	44.4	40.6	37.7
Mean Family Size	2.87	2.91	2.91	2.89	3.10	3.24
Per Capita Income	\$45,438	\$49,917	\$52,501	\$52,154	\$30,137	\$29,829
Commuting Pattern	District 1-0	District 10-0	District 11-0	District 12-0	Pennsylvania	United States
Total Workers 16 & Over	252,492	194,137	729,458	334,100	5,922,289	145,861,221
% Commuters Driving Alone	79.45%	83.17%	73.76%	84.05%	76.5%	76.4%
% Commuters Carpooling	10.39%	7.95%	8.50%	8%	8.5%	9.3%
% Commuters Using Public Transportation	1.04%	0.66%	7.93%	1.08%	5.6%	5.1%
Mean Travel Time to Work (Minutes)	22	25	25	26.58	26.5	26.1

(SOURCE: US CENSUS BUREAU, 2013-2017 AMERICAN COMMUNITY SURVEY 5-YEAR ESTIMATES)

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 9: 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







The major highway corridors identified in **Table 10** connect the core population centers of the region with each other as well as providing links to key areas outside of the area. Average Daily Traffic was retrieved from PennDOT One Map RMS data. Roads identified as part of the 511PA Core Network are ones which PennDOT has identified as having reliable speed data, road condition reporting, and traffic cameras.

TABLE 10: CORRIDORS AND AREAS OF TRANSPORTATION SIGNIFICANCE

Class	Route	County	Average Daily Traffic	TSMO Tier	511 Network	Notes and Considerations
Interstates		Allegheny Beaver Butler Lawrence Westmoreland	25K – 48K 25K 25K 25K 35K – 48K	1C 1C 1C 1C 1C	Yes	<ul style="list-style-type: none"> East-west toll facility connecting New Jersey and Ohio Significant regional commerce activity
		Washington Westmoreland	24K – 56K 32K – 48K	1B,1C 1C	Yes	<ul style="list-style-type: none"> East-west Interstate connecting Baltimore and Utah Co-designated as I-76 from New Stanton to Breezewood Significant regional commerce activity
		Allegheny Butler Crawford Erie Greene Lawrence Mercer Washington	46K – 110K 27K – 64K 22K – 27K 10K – 38K 24K – 35K 24K 27K – 29K 30K-72K	1A,1B,1C 1B,1C 1C 1C 1C 1C 1C 1B,1C	Yes	<ul style="list-style-type: none"> North-south Interstate connecting West Virginia and Erie, PA Significant regional commerce activity
		Clarion Jefferson Mercer Venango	37K – 43K 45K – 50K 33K – 42K 39K – 48K	1C 1C 1C 1C	Yes	<ul style="list-style-type: none"> East-west Interstate connecting Northeast (NYC) and Midwest High percentage of Interstate and inter-regional travelers Significant commerce activity
		Erie	13K – 42K	1C	Yes	<ul style="list-style-type: none"> East-west Interstate connecting through Ohio, New York, and beyond










Regional Operations Plan (ROP)







Western RTMC Region

Class	Route	County	Average Daily Traffic	TSMO Tier	511 Network	Notes and Considerations
Interstates		Allegheny	28K – 79K	1A,1B,1C	Yes	<ul style="list-style-type: none"> North-south auxiliary route connecting I-376 and I-79 Primarily serves as a main access route between Pittsburgh and its northern suburbs Reversible HOV lane from Perrysville Ave. Interchange to Bedford Ave. and Stadium Dr.
		Allegheny Beaver Lawrence Mercer	23K – 103K 15K – 37K 12K – 18K 16K – 23K	1A,1B,1C 1C 1C 1C	Yes	<ul style="list-style-type: none"> Auxiliary route connecting I-80 and I-76 Serves Pittsburgh and the surrounding areas Main access road to Pittsburgh International Airport Tolled route from US 422 to PA 51
		Allegheny	45K	1C	Yes	<ul style="list-style-type: none"> North-south auxiliary Interstate within Pittsburgh Route connects Liberty Bridge and Boulevard of the Allies to I-279
U.S. Routes		Crawford Erie Warren	1K – 26K 3K – 11K 2K – 16K	2A,2B,3A, 3B 2C,3B 1C,2B,2C	No	<ul style="list-style-type: none"> East-west route spanning from Ohio to New York across northern PA Mostly rural, two-lane highway except for some freeway bypasses around larger towns Coincides with most of BicyclePA Route Y
		Allegheny Butler Crawford Erie Mercer Greene Lawrence Washington	7K – 39K 5K – 37K 3K – 5K 4K – 28K 2K – 14K 500 – 23K 2K – 4K 900 – 33K	1C, 2A, 2B,3A,3B 2A,2B,3A, 3B 3B 2A,2B,3A, 3B 3B 2B,3B,3C 3B 2A,2B,2C, 3B,3C	Partial	<ul style="list-style-type: none"> North-south US highway running from Florida to Erie, PA
		Erie	3K – 34K	2A,2B,3A, 3B	No	<ul style="list-style-type: none"> East-west highway from Pacific Northwest to New England Runs along Lake Erie through Erie County in PA

Regional Operations Plan (ROP)

Western RTMC Region

Class	Route	County	Average Daily Traffic	TSMO Tier	511 Network	Notes and Considerations
U.S. Routes		Allegheny Indiana Washington Westmoreland	14K – 55K 11K – 22K 21K – 22K 19K – 31K	1C,2A,2B 2B 1C 2A,2B	Partial	<ul style="list-style-type: none"> West-east US highway running from Cincinnati, OH to Newark, NJ One of the original US highways Mix of limited access and arterial highway Primary route between Pittsburgh and major population centers in central Pennsylvania
		Allegheny Beaver Westmoreland	4K – 32K 4K – 8K 4K – 48K	2A,2B,3B 3B 1C,2A,2B, 2C	No	<ul style="list-style-type: none"> East-west US highway running from Astoria, OR to Atlantic City, NJ
		Fayette Washington	3K – 32K 1K – 15K	1C,2B,2C 1C,2B,2C, 3B,3C	No	<ul style="list-style-type: none"> East-west US highway running from Silver Summit, UT to Atlantic City, NJ
		Forest Mercer Venango Warren	1K – 3K 1K – 15K 1K – 20K 2K – 18K	2C 2B,2C,3B 2B,2C,3B, 3C 2B,2C	No	<ul style="list-style-type: none"> Runs from El Paso, TX to Niagara Falls, NY Locally, connects the areas of Sharon, Mercer, Franklin, and Oil City
		Fayette Indiana Jefferson Westmoreland	2K – 32K 5K – 22K 5K – 13K 4K – 28K	1C,2A,2B, 2C 1C,2B,2C 2B,2C 1C,2B,3B	Partial	<ul style="list-style-type: none"> North-south auxiliary route of US 19 Route runs from Kentucky to Sandy Township, PA
		Clarion Crawford Jefferson Mercer Venango	2K – 12K 2K – 17K 2K – 10K 3K – 8K 3K – 19K	2B,2C,3B 2C 3A,3B,3C 2C 2C	No	<ul style="list-style-type: none"> East-west highway running from Cleveland to New Jersey Regionally, it connects the towns of Meadville, Franklin, Clarion, and Brookville
		Armstrong Butler Indiana Lawrence	8K – 22K 11K – 25K 6K – 14K 5K – 14K	1C,2B,2C 1C,2B 1C,2B,2C 1C,2B,2C	No	<ul style="list-style-type: none"> Spur route of US 22 running from Cleveland, OH to Ebensburg, PA
PA State Routes		Allegheny Butler Crawford Erie Venango	13K – 44K 4K – 24K 3K – 12K 2K – 13K 2K – 13K	2A,2B 2B,2C 3B 2C,3A,3B, 3C 1C,2B,2C, 3B	No	<ul style="list-style-type: none"> State highway running from Pittsburgh to Erie Also named the William Flinn Highway
		Allegheny Armstrong Butler	18K – 78K 3K – 17K 17K – 21K	1A,1B,1C 1C,2C 1C	Partial	<ul style="list-style-type: none"> State highway running from Pittsburgh to Brockway, PA

Class	Route	County	Average Daily Traffic	TSMO Tier	511 Network	Notes and Considerations
PA State Routes		Allegheny Fayette Washington	7K – 8K 12K – 21K 6K – 15K	1C 1C 1C	Partial	<ul style="list-style-type: none"> Tolled freeway linking I-68 in West Virginia to PA-51 in Jefferson Hills, PA Route is planned to link to I-376 near Monroeville, PA
		Allegheny Beaver Fayette Westmoreland	3K – 39K 6K – 26K 10K – 15K 14K – 22K	1C,2A,2B, 2C 1C,2A,2B, 2C 2B 2B	No	<ul style="list-style-type: none"> State highway that runs from Uniontown to the Ohio state line
		Allegheny	800 – 26K	2A,2B,3A, 3B,3C	Yes	<ul style="list-style-type: none"> State highway located in the western suburbs of Pittsburgh Connects US Route 19 and PA 51 to I-376, US 22 and US 30
		Allegheny Beaver Lawrence	17K – 33K 4K – 24K 4K – 12K	1C,2A,2B 2B,3B 3A,3B	No	<ul style="list-style-type: none"> State highway connecting downtown Pittsburgh to the northwestern portion of the Pittsburgh metropolitan area
		Armstrong Westmoreland	2K – 14K 8K – 21K	3A,3B 1C,2B,2C, 3A,3B	Partial	<ul style="list-style-type: none"> North-south state highway connecting US Route 119 near New Stanton to US 6 in Kane Tolled route from US 119 to US 22
		Butler	600 – 51K	2A, 2B, 3B, 3C	No	<ul style="list-style-type: none"> State highway located in Butler County Connects between Cranberry Township and Buffalo Township Route is currently being widened to include Safety improvements, turning lanes and culvert replacement in Adams Township

I-79 runs the length of the region, from West Virginia to Erie, providing the north-south backbone and carrying the most traffic of any roadway in the region with an annual average daily traffic (AADT) of 110,000 in Allegheny County. I-80 provides a major east-west route through the northern part of the region and is notable for its particularly heavy truck traffic. I-376 is another major corridor in the region, connecting I-76 to I-80 and traveling through the City of Pittsburgh. The Interstate also serves as the main access to the Pittsburgh International Airport.

US 22 is a main east/west non-Interstate highway through the region. US 22 runs from Cincinnati to Newark, NJ and provides connections from the eastern and western areas of the region to Pittsburgh, running as part of I-376 through the city.

Some of the major state routes include PA-28, PA-43, PA-60, PA-66, and PA-576. Also known as the Mon-Fayette Expressway, PA-43 is a tolled freeway that connects from I-68 near Morgantown, West Virginia to

PA-51 in Jefferson Hills, PA. An extension is planned which will eventually continue the roadway north, connecting with I-376 near Monroeville, PA.

Figure 4 displays a map of the significant corridors in the region.

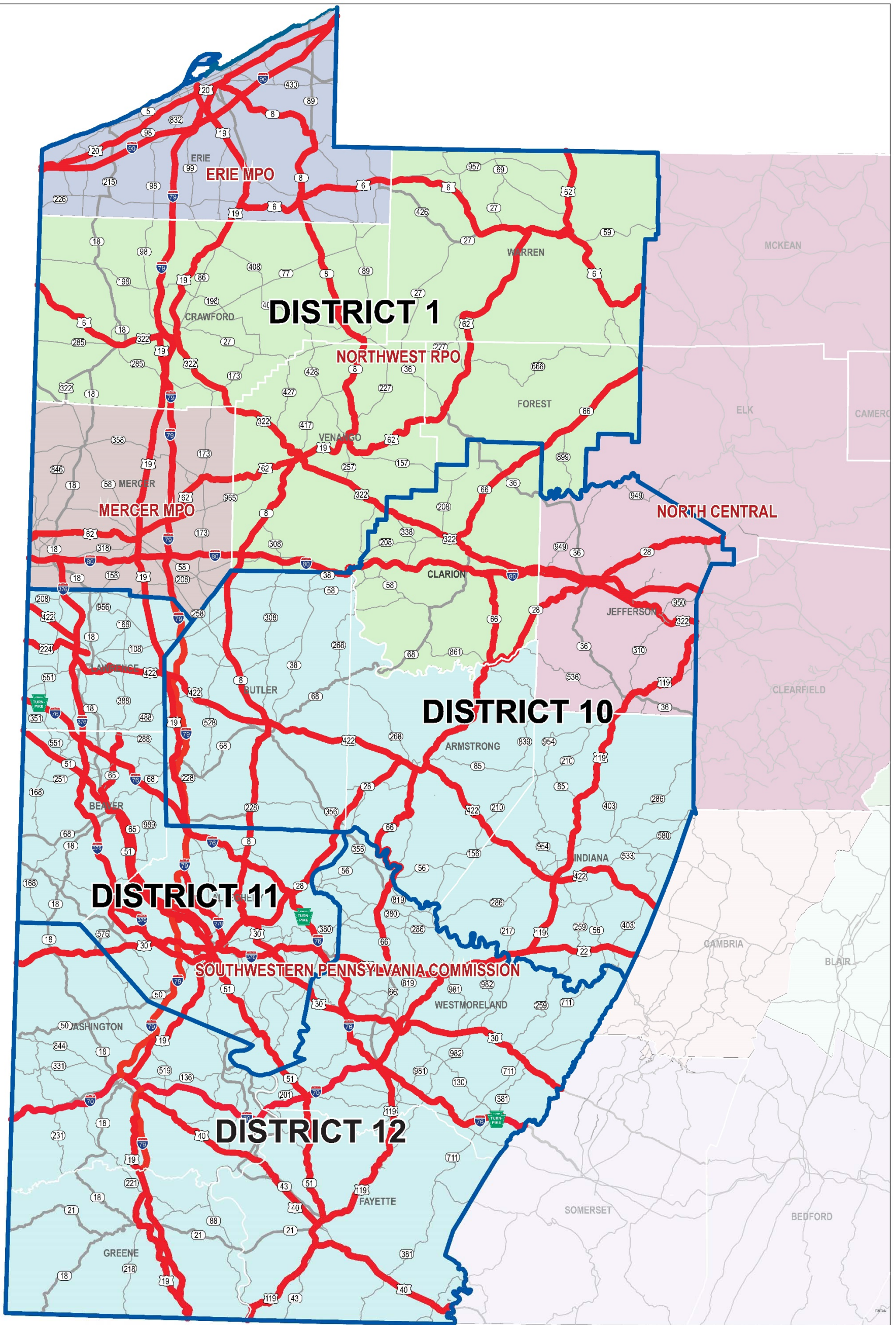


FIGURE 4: WESTERN REGION CORRIDORS OF SIGNIFICANCE

Regional TSMO Elements

The Western Region has a growing number of ITS devices throughout the districts including Closed-Circuit Television (CCTV) cameras, dynamic message signs (DMS), and road weather information systems (RWIS). The Western Regional Traffic Management Center (WRTMC), located at the PennDOT District 11-0 offices in Bridgeville, PA, operates these devices. The WRTMC oversees the operations of the freeway and major arterial system through ITS devices, freeway service patrols, communication with emergency responder agencies, and close coordination with the other PennDOT Districts.

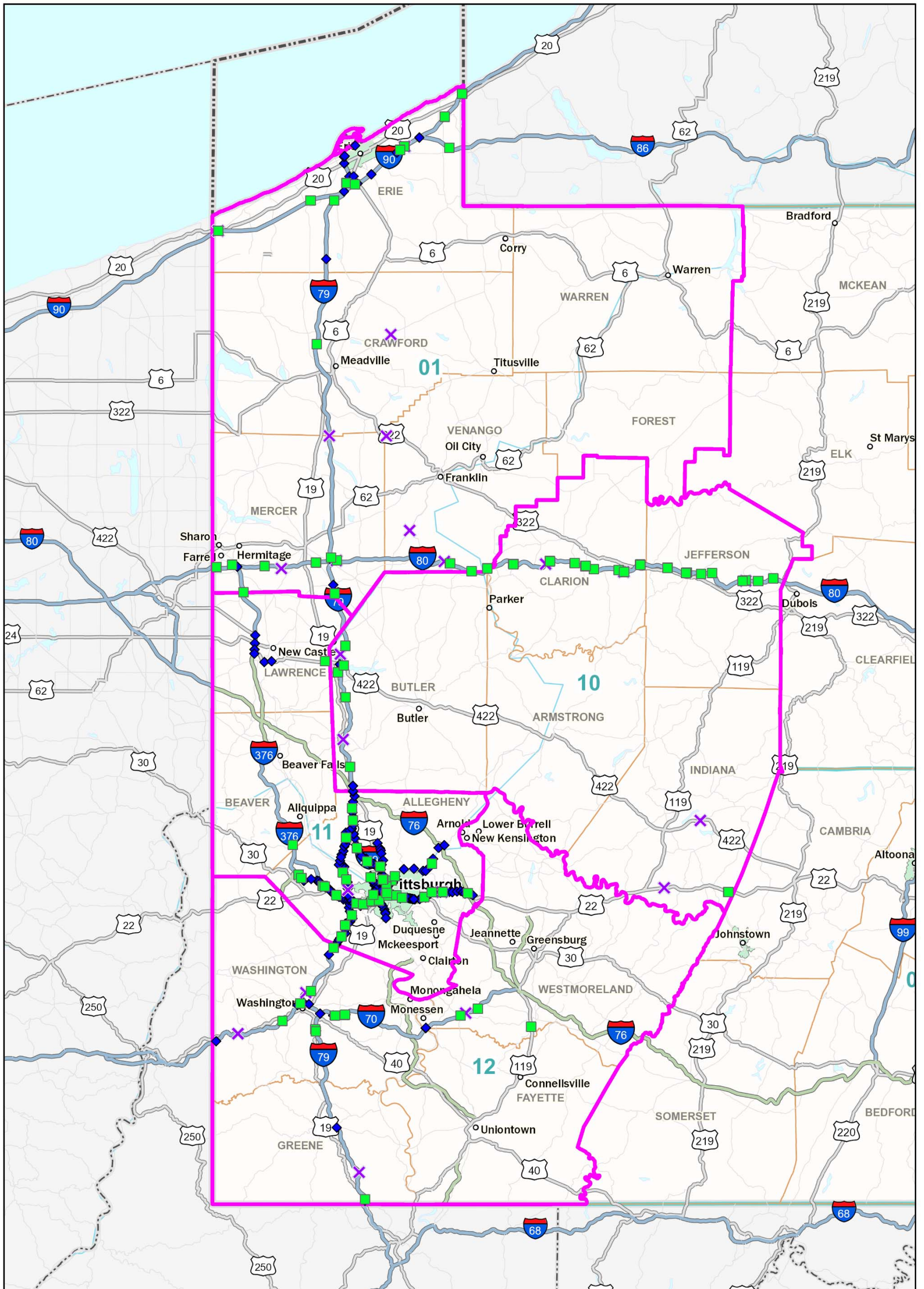
A summary of the PennDOT ITS devices in the region can be found in **Table 11** and a map showing the ITS devices is included as **Figure 5**.

TABLE 11: WESTERN REGION ITS ELEMENTS

ITS Devices	District 1	District 10	District 11	District 12	Total
Bridge De-Icing	2	0	4	1	5
CCTV	17	5	247	21	273
DMS	22	30	48	12	90
RWIS	9	7	2	4	13
Traffic Signals	586	280	1675	522	2477

(SOURCE: PENNDOT WRTMC)

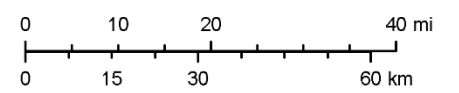
Western RTMC ITS Devices



August 14, 2019

1:1,205,086

- Dynamic Message Signs
- ✕ RWIS Stations
- ◆ CCTV Cameras
- TSMO Western Region



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FIGURE 5: WESTERN RTMC REGION ITS DEVICES

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 culled from PennDOT One Map, a web-based interactive GIS mapping application (gis.penndot.gov/OneMap). 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 Western region is a diverse mix of urban, suburban, and rural areas, each with their own unique transportation issues. The heavily urban areas in and around Pittsburgh incur the heaviest recurring congestion, though other notable recurring congestion occurs in areas throughout the rest of the region, particularly at connections between signalized arterials and limited access roadways. Some of the most significant recurring congestion can be found on the following roadways:

- I-79/I-76 Turnpike Interchange, US 19, & PA-228 in Cranberry Township
- US 119 & US 30 corridors in Greensburg
- Parkway East (I-376) from Wilkinsburg to Downtown Pittsburgh
- Parkway West (I-376) from Robinson Town Centre to Downtown Pittsburgh
- US 19, West Liberty Ave; & PA-51 corridors in the South Hills

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. Two distinct measures of congestion are Bottleneck Rankings and TomTom Travel Time Ratios, which have been aggregated in One Map. Bottleneck Rankings are derived from the RITIS PDA Suite based on INRIX probe speed data, with a bottleneck occurring whenever the speed is less than 60% of the estimated free flow speed. These bottlenecks are ranked by delay, which is weighted by volume, queue length, magnitude of speed drop, and duration. This is a valuable piece of data but the following limitations should be kept in mind when analyzing bottleneck data:

- Free flow speeds are determined by INRIX, which in some cases might be based on limited data sets
- Low volume periods may use historical average speeds when there aren't enough probe vehicles
- Non-NHS roadways do not have volume data in RITIS, so delay cannot be calculated

To augment the bottleneck data, travel time ratio data was also considered, derived from anonymized data pulled from TomTom's navigation devices, in-dash systems, and apps. The travel time ratio compares actual travel times to free-flow travel times. This data is presented as four different tiers of severity within One Map.

The maps provided on the subsequent pages show both the Top 50 Western RTMC Region Bottlenecks and the TomTom Travel Time Ratio displayed in some of the region's most congested areas. Note that the maps do not represent the actual distance covered by the bottlenecks, only the length of the segment of road where the bottleneck occurred.

- Cranberry Township (**Figure 6**)
- Greensburg (**Figure 7**)
- Parkway East (**Figure 8**)
- Parkway West (**Figure 9**)
- South Hills (**Figure 10**)

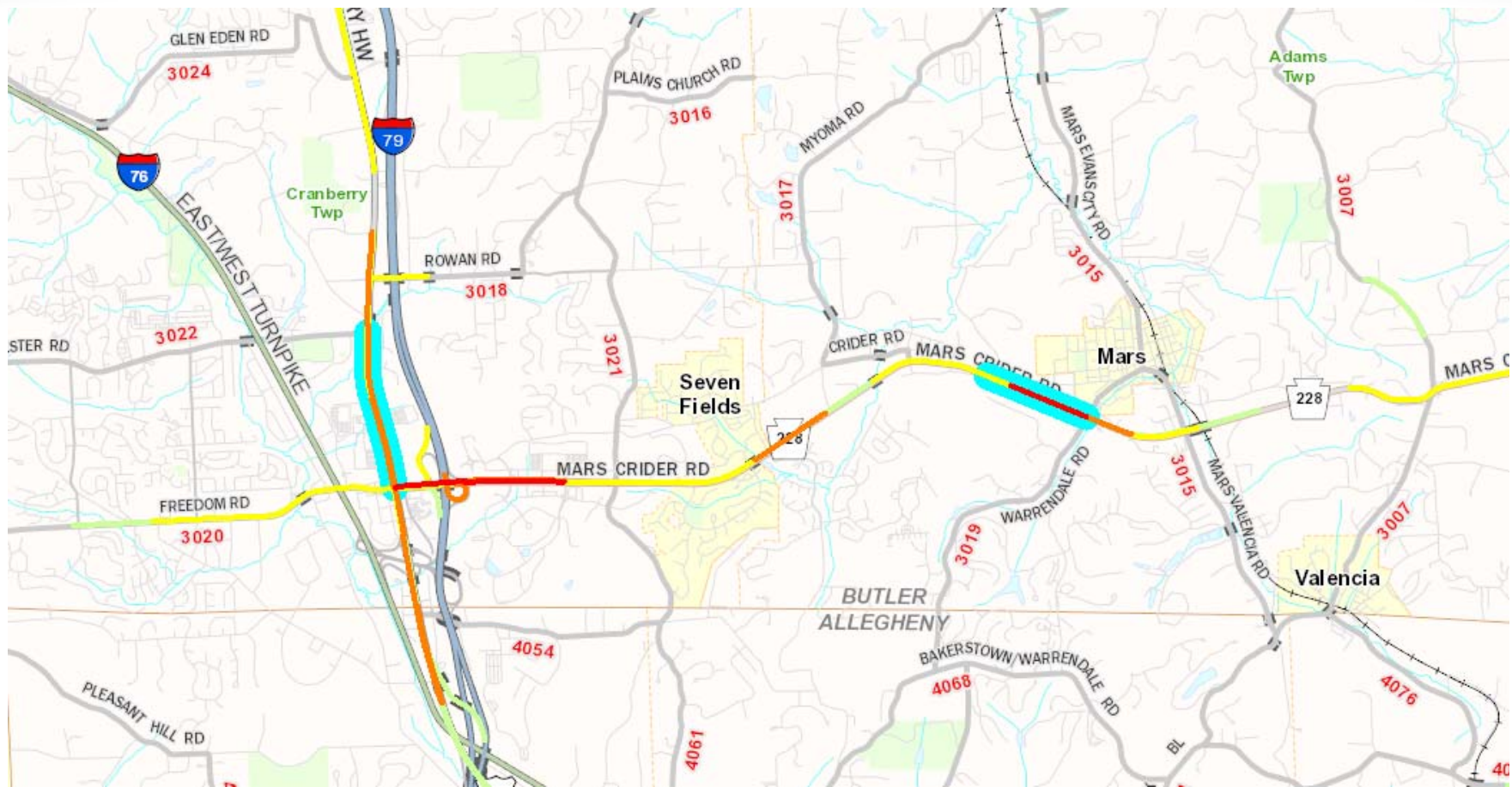
One of the most effective ways to increase the capacity of these congested roadways is by shifting single-occupant vehicle trips to more efficient modes. The existing multimodal accommodations on these routes vary. Cranberry Township has a growing density of development but lacks in transit and other multimodal infrastructure that could help reduce its significant congestion. While a large number of jobs can be found in the immediate area of Cranberry, a number of residents also commute to Pittsburgh, but the only transit option for this commute is the CoachUSA commuter service. Also, jobs in Cranberry Township are inaccessible to many Butler County residents due to a lack of Butler Transit Authority routes connecting Cranberry to the City of Butler and other residents of the county. Cranberry has emphasized an inclusion of sidewalks and increased walkability within the township and should continue this effort, as well as continuing to develop safe, dedicated bike infrastructure.

The City of Greensburg experiences congestion on the US 30 and US 119 corridors in and around the city limits. Multimodal options are limited but some are available. Westmoreland Transit runs a number of routes through the city on both corridors, including local routes and commuter routes to Pittsburgh. There is also an Amtrak station for the *Pennsylvanian* route, which has one stop daily in each direction between Pittsburgh and New York City. Limited bike infrastructure is available in the area, though the Five Star Trail provides dedicated trail right-of-way from Greensburg to the south, generally paralleling US 119.

The other notable areas of recurring congestion in the region are located in and around the City of Pittsburgh. The Parkway East and West carry I-376 through the city and provide connections to Monroeville and the Pennsylvania Turnpike to the east and Pittsburgh International Airport to the west. PAAC provides a number of bus routes to support mobility along both of these routes, with the East and West Busway in particular providing dedicated transit right-of-way to support high ridership, which helps keep congestion on the Parkways from worsening. The East Busway runs from Swissvale to Downtown and the West Busway runs from Carnegie to West Carson Street, north of the West End Bridge. The Eliza Furnace and Great Allegheny Passage trail network runs parallel to the Parkway East from Greensburg to

Downtown providing popular, dedicated right-of-way for active transportation commuters and for recreation.

The other area of congestion noted above in the Pittsburgh area is the South Hills, including US 19, PA-51, and West Liberty Avenue. The main transit asset in the South Hills is PAAC's light rail system which runs service from Library and from South Hills Village, though bus service is provided throughout the rest of the area, including along PA-51. Bicycle infrastructure is generally limited and Mount Washington restricts connections between the area and Downtown Pittsburgh. With a combination of crowded park-n-ride lots and available capacity on the light rail system, improved bike and pedestrian connections to light rail stations could positively impact mode share and reduce congestion on the main thoroughfares.



LEGEND	
—	TOP 50 BOTTLENECKS
—	TRAVEL TIME RATIO > 4
—	TRAVEL TIME RATIO 3-4
—	TRAVEL TIME RATIO 2-3
—	TRAVEL TIME RATIO 1.5-2

FIGURE 6: CRANBERRY TOWNSHIP CONGESTION MAP



FIGURE 7: GREENSBURG CONGESTION MAP

LEGEND	
—	TOP 50 BOTTLENECKS
—	TRAVEL TIME RATIO > 4
—	TRAVEL TIME RATIO 3 - 4
—	TRAVEL TIME RATIO 2 - 3
—	TRAVEL TIME RATIO 1.5 - 2

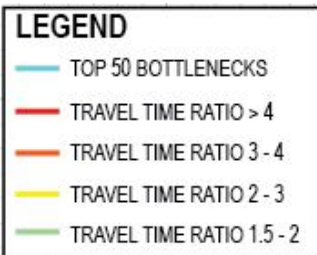
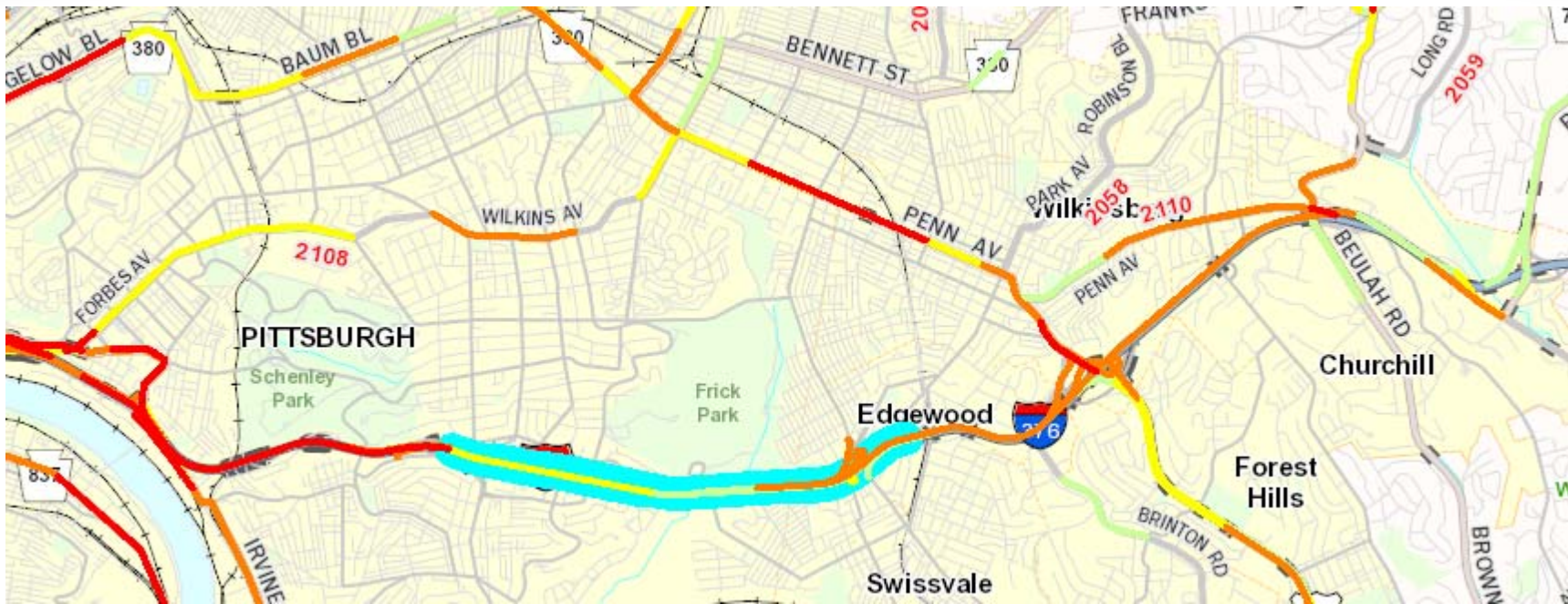


FIGURE 8: PARKWAY EAST CONGESTION MAP

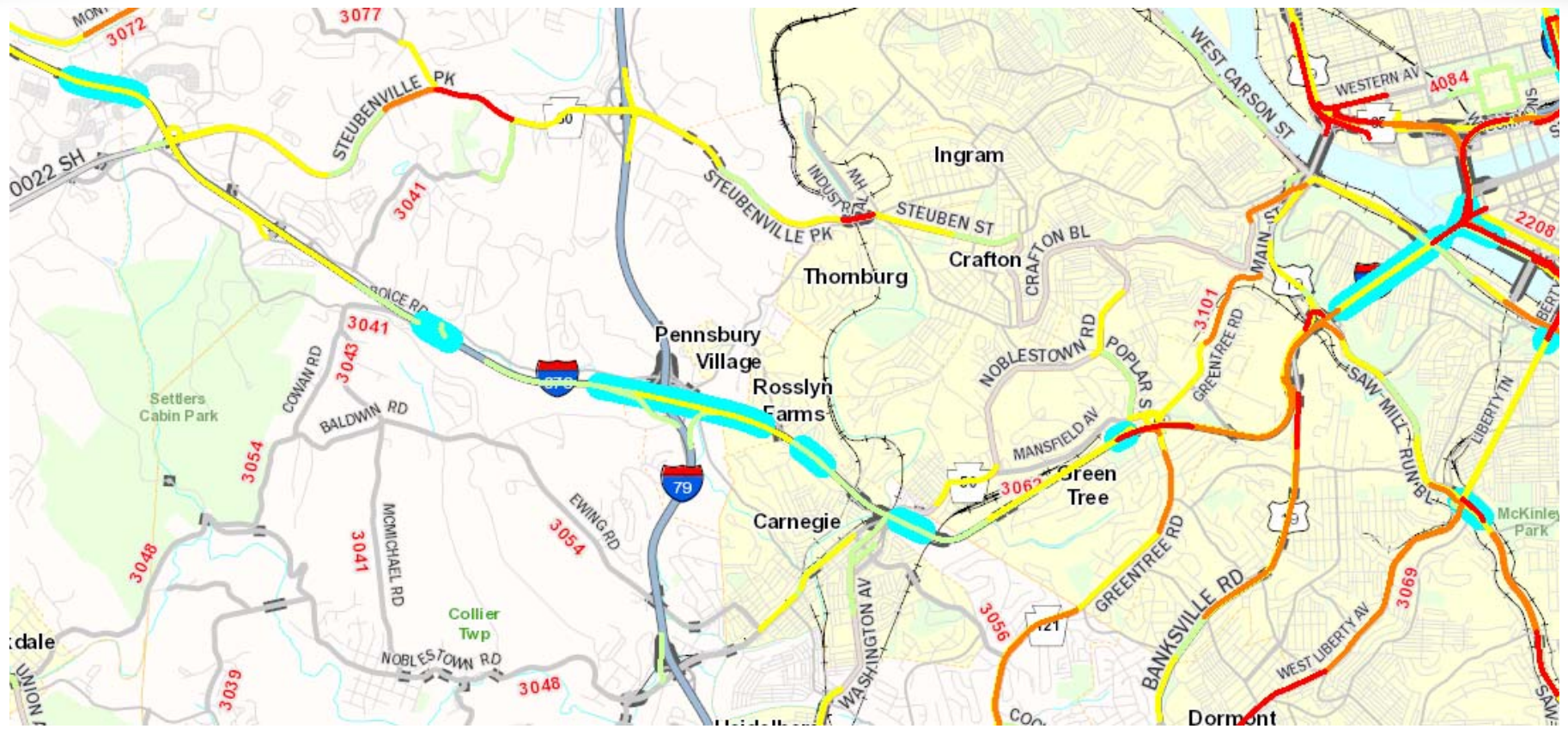


FIGURE 9: PARKWAY WEST CONGESTION MAP

LEGEND	
—	TOP 50 BOTTLENECKS
—	TRAVEL TIME RATIO > 4
—	TRAVEL TIME RATIO 3 - 4
—	TRAVEL TIME RATIO 2 - 3
—	TRAVEL TIME RATIO 1.5 - 2



LEGEND	
—	TOP 50 BOTTLENECKS
—	TRAVEL TIME RATIO > 4
—	TRAVEL TIME RATIO 3 - 4
—	TRAVEL TIME RATIO 2 - 3
—	TRAVEL TIME RATIO 1.5 - 2

FIGURE 10: SOUTH HILLS CONGESTION MAP

Traveler Information and Situational Awareness

While much of the congestion in the urban and suburban areas of the region is recurring in nature, non-recurring congestion due to weather, incidents, and special events also has great impacts on mobility throughout the entirety of the region. In these cases, getting information to the operators in the WRTMC and to the travelers on the roadways is vital to minimize impacts. Allegheny County has a large number of ITS devices that assist in acquiring and disseminating important information during these events. Elsewhere in the region, these deployments are more sporadic, so situational awareness is more limited for the WRTMC and other operators and, as a result, it is more difficult to get information to affected travelers.

Recently, truck restrictions have been proactively placed on Interstates when winter storms are approaching. This is done to avoid trucks becoming stuck on the Interstates and causing dangerous long-term closures and trapped queues. However, many trucks are diverting to arterials and causing operational problems during these events. Crucially, ITS deployments on these arterials are rare, so situational awareness of these events is difficult to achieve, and there are not easy ways to distribute traveler information on these routes. Many other trucks are also parking on shoulders and ramps, reflecting a need for more truck parking and better dissemination of truck parking availability to drivers.

The most notable special event traffic issues occur during events at Pittsburgh's Heinz Field and PNC Park, especially Steelers football games. Operational impacts are also seen during Pirates baseball games, University of Pittsburgh football games, and during concerts. The light rail system provides convenient access to the stadium area and the generally hub and spoke bus network delivers most routes into Downtown, allowing for a reasonable walk to and from the area. Given the stadium area's location along the Allegheny River, bike access is provided by the built-out trail network. The developing network of bike lanes through the city also provide access, particularly along the protected two-way cycle track on Penn Avenue. Bike and ped access to stadium events is also encouraged through the temporary closures of the Roberto Clemente Bridge to vehicular traffic.

Other notable special events in the Western RTMC region from a traffic perspective include:

- Key Bank Pavilion concerts in Burgettstown
- Pittsburgh Steelers camp in Latrobe
- Seasonal traffic for Nemaquin and other ski resorts in Fayette and Westmoreland Counties
- Seasonal traffic for Presque Isle State Park and other recreation and tourism in the Lake Erie area

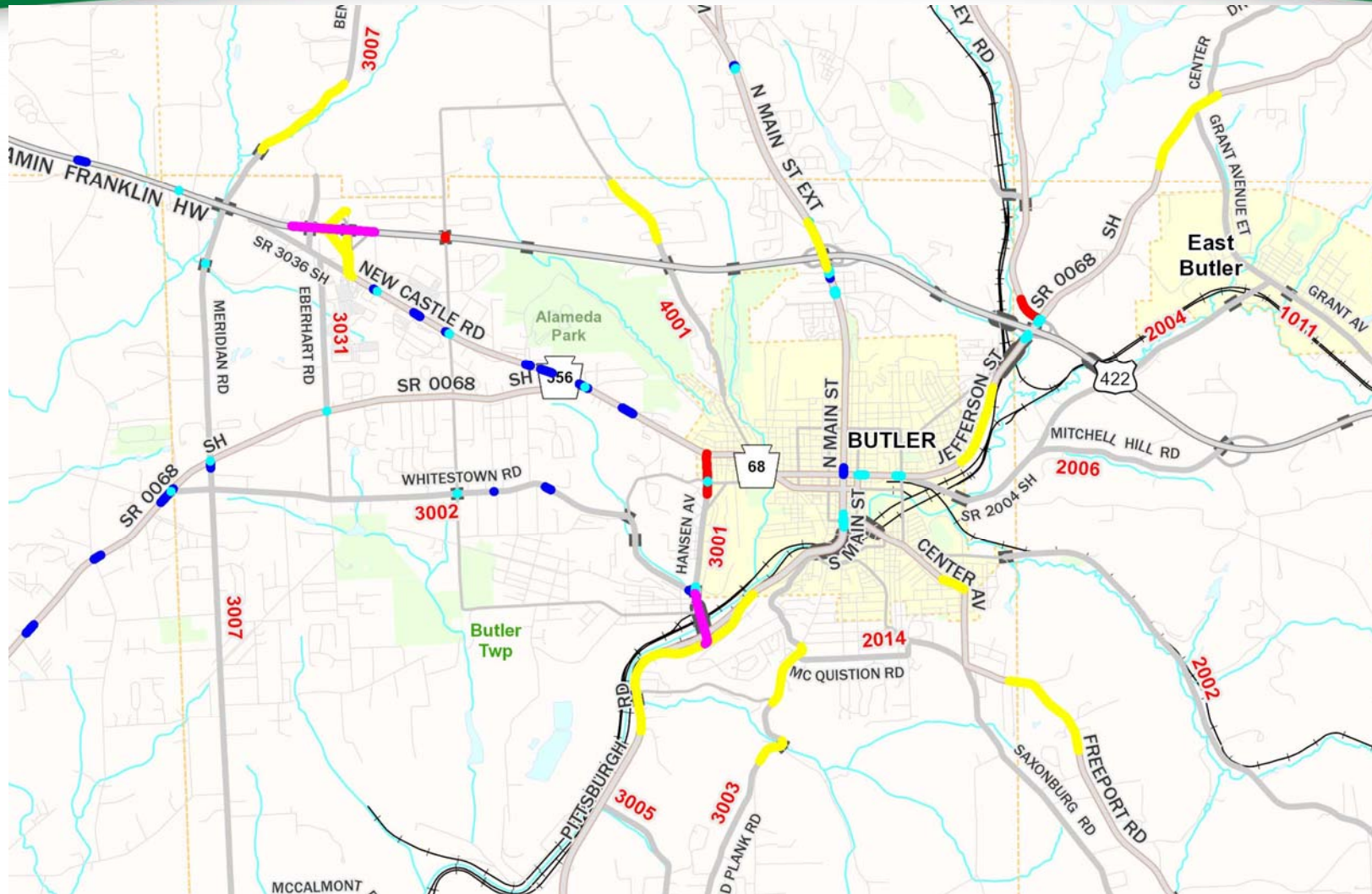
Safety

Safety is a primary concern for PennDOT and operations improvements will not be instituted at the detriment to safety. Crash issues are a concern throughout the region and a frequent cause of congestion. Clusters of curved road crashes are widely spread throughout the region on winding, rural roads as well as on Interstates. Rear-end crashes and intersection crashes are noticeable in urbanized areas and along signalized arterial corridors. A few corridors with higher crash activity are:

- City of Butler, Butler County

- PA-8, PA-68, and SR 3001 (Hansen Ave.)
- City of Washington, Washington County
 - I-70, I-79, and SR 4049 (Main St.)
- Downtown Pittsburgh, Allegheny County
 - I-376, I-279, I-579, and PA-65
 - Ft. Pitt Bridge and Tunnel, Liberty Bridge and Tunnel, Ft. Duquesne Bridge, West End Bridge
- East End Pittsburgh, Allegheny County
 - PA-8, PA-380 (Penn Ave., Fifth Ave., Washington Blvd., Baum Blvd.)
- City of Erie, Erie County
 - US 20 (26th St.), US 19 (Peach St.), and PA-5 (12th St.)

These corridors were identified based on crash data provided through PennDOT One Map. The data is based on source information from CDART, the Crash Data Analysis and Retrieval Tool. This is a web-based query tool that pulls together detailed information on reportable crashes. Reportable crashes are classified as incidents that result in an injury or where at least one of the involved vehicles must be towed from the scene. The latest CDART data is available in One Map; currently 2016 crash report data that is taken from the previous 5-year period.

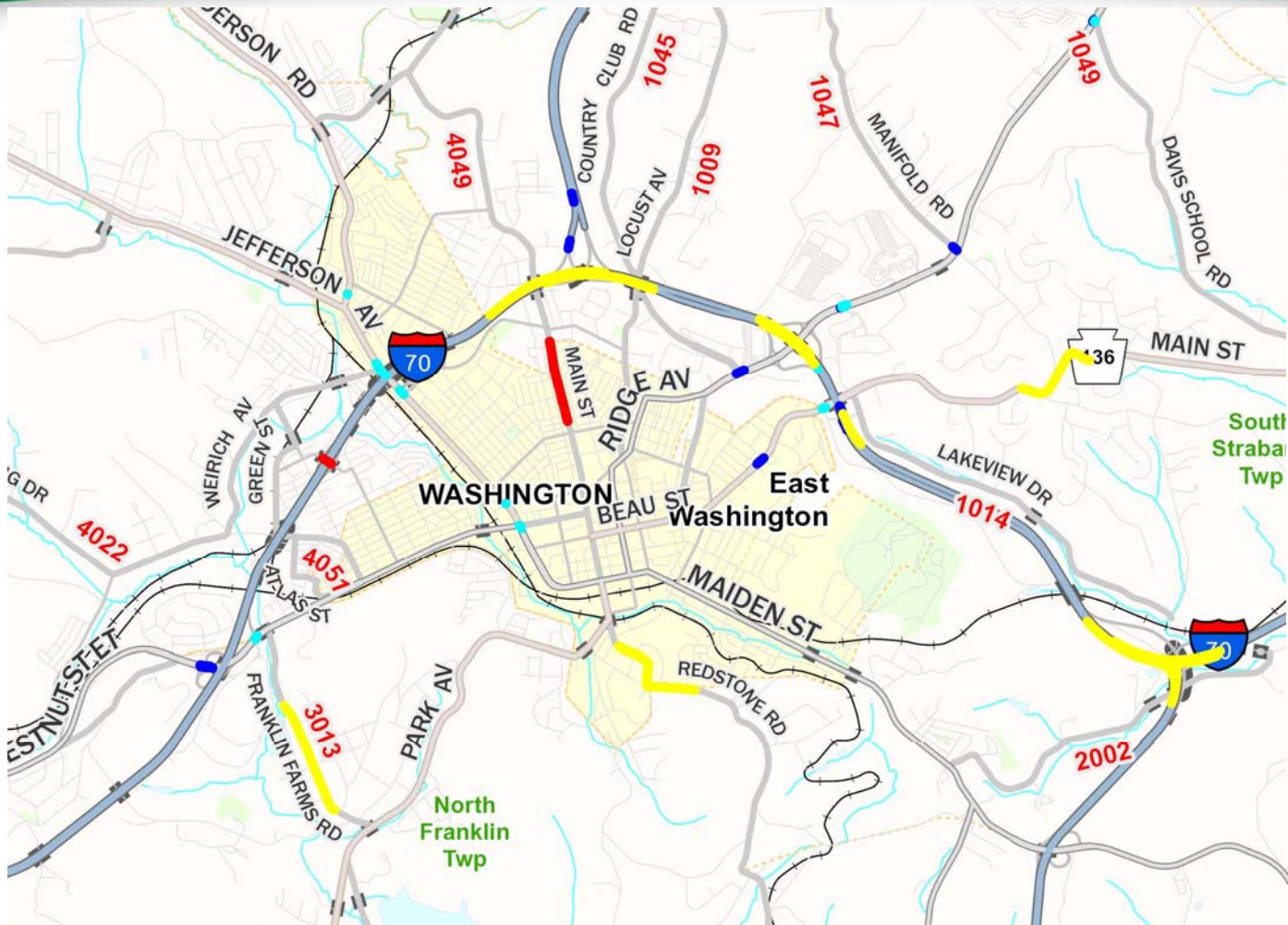


LEGEND

- STATEWIDE REAR-END CRASH CLUSTERS
- STATEWIDE INTERSECTION CRASH CLUSTERS
- STATEWIDE CURVED ROAD CRASH CLUSTERS
- STATEWIDE WINTER RELATED CRASH CLUSTERS
- CRASH RATE PER 100 MILES > 500 AND AADT > 5000

FIGURE 11: BUTLER CRASH CLUSTERS AND HIGH CRASH RATE AREAS

IMPORTANT: This traffic engineering and safety study is confidential pursuant to 75 Pa. C.S. §3754 and 23 U.S.C. §409 and may not be disclosed or used in litigation without written permission from PennDOT.



LEGEND	
	STATEWIDE REAR-END CRASH CLUSTERS
	STATEWIDE INTERSECTION CRASH CLUSTERS
	STATEWIDE CURVED ROAD CRASH CLUSTERS
	STATEWIDE WINTER RELATED CRASH CLUSTERS
	CRASH RATE PER 100 MILES > 500 AND AADT > 5000

FIGURE 12: WASHINGTON CRASH CLUSTERS AND HIGH CRASH RATE AREAS

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Regional Operations Plan (ROP) Western RTMC Region



FIGURE 13: DOWNTOWN PITTSBURGH CRASH CLUSTERS AND HIGH CRASH RATE AREAS

LEGEND	
	STATEWIDE REAR-END CRASH CLUSTERS
	STATEWIDE INTERSECTION CRASH CLUSTERS
	STATEWIDE CURVED ROAD CRASH CLUSTERS
	STATEWIDE WINTER RELATED CRASH CLUSTERS
	CRASH RATE PER 100 MILES > 500 AND AADT > 5000

IMPORTANT: This traffic engineering and safety study is confidential pursuant to 75 Pa. C.S. §3754 and 23 U.S.C. §409 and may not be disclosed or used in litigation without written permission from PennDOT.

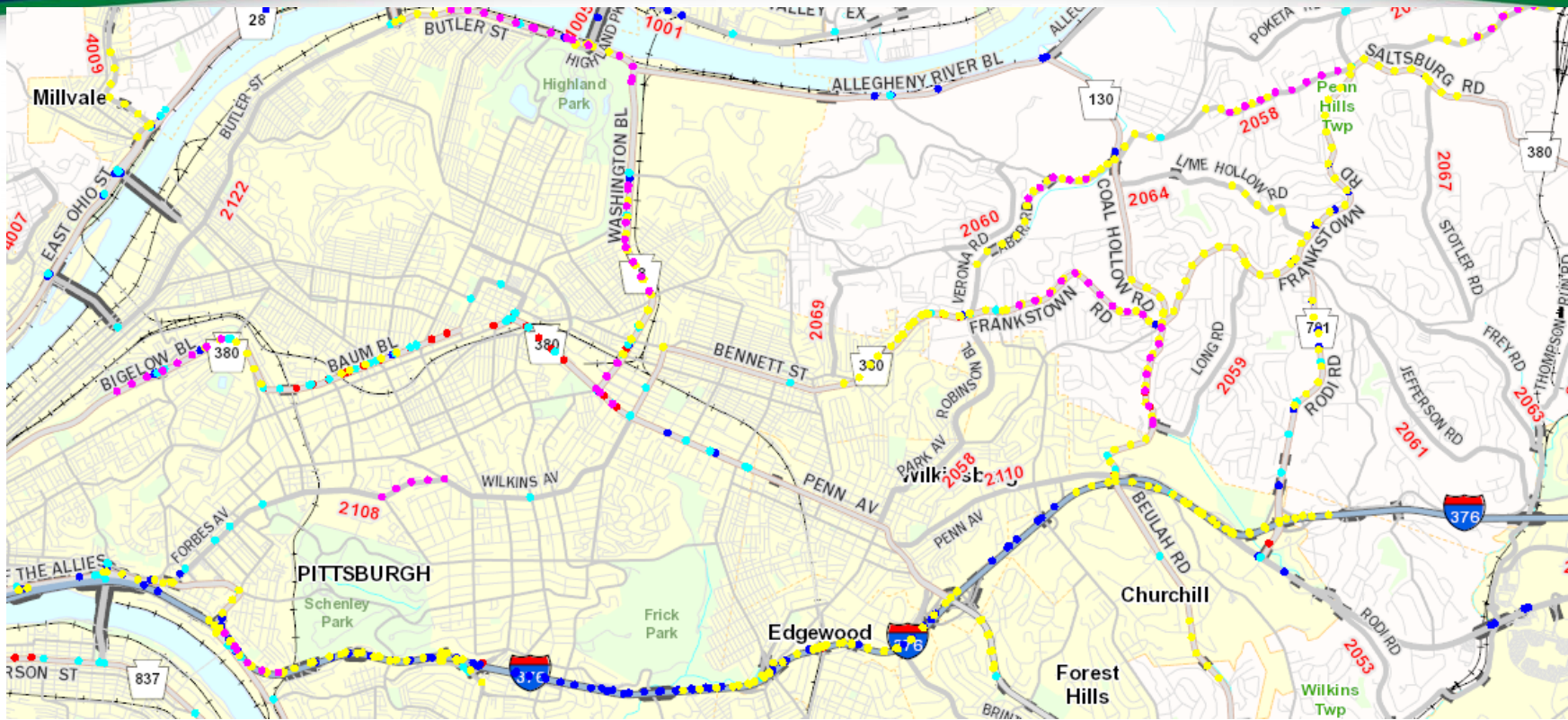
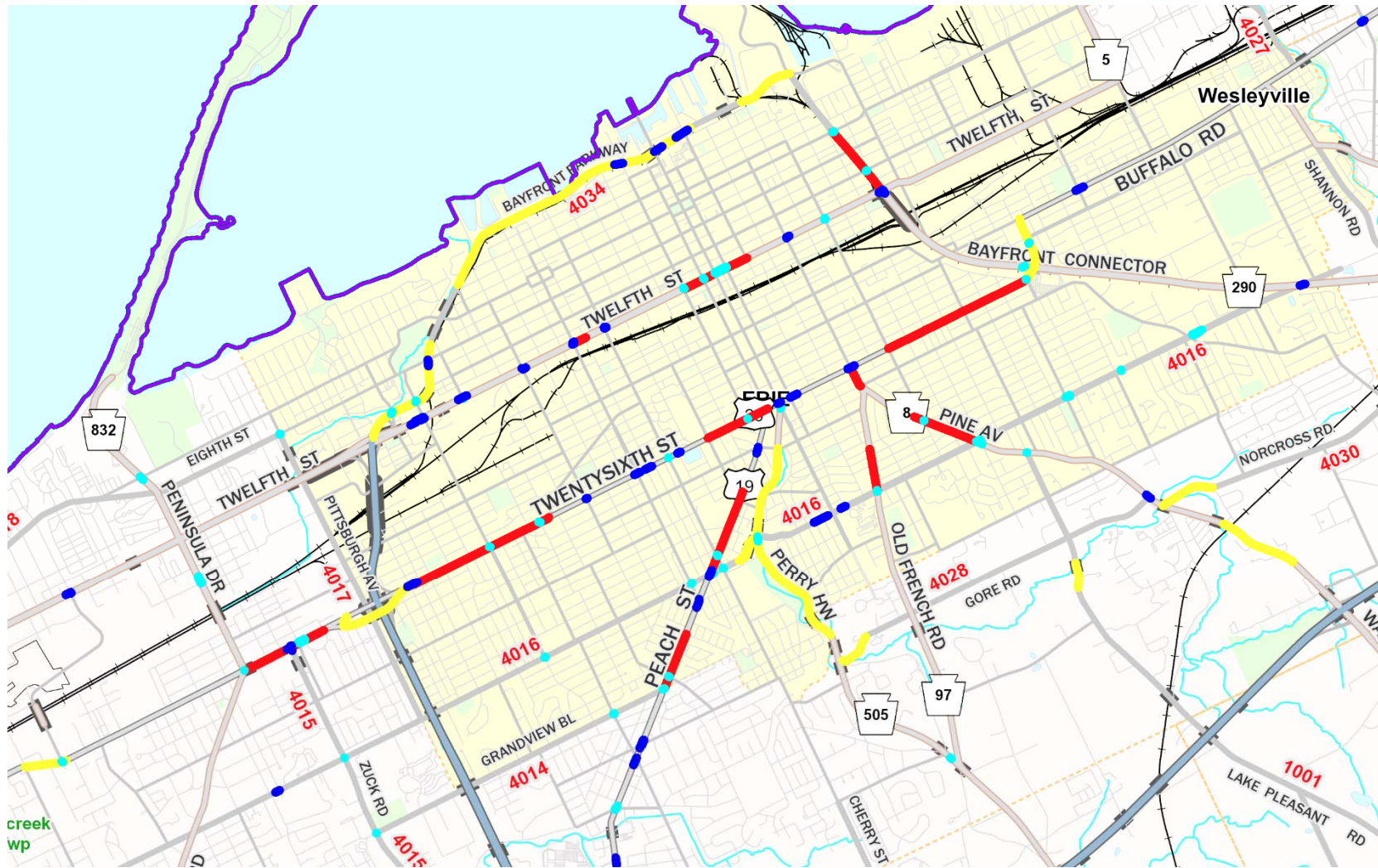


FIGURE 14: EAST END PITTSBURGH CRASH CLUSTERS AND HIGH CRASH RATE AREAS

LEGEND

- STATEWIDE REAR-END CRASH CLUSTERS
- STATEWIDE INTERSECTION CRASH CLUSTERS
- STATEWIDE CURVED ROAD CRASH CLUSTERS
- STATEWIDE WINTER RELATED CRASH CLUSTERS
- CRASH RATE PER 100 MILES > 500 AND AADT > 5000

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LEGEND	
	STATEWIDE REAR-END CRASH CLUSTERS
	STATEWIDE INTERSECTION CRASH CLUSTERS
	STATEWIDE CURVED ROAD CRASH CLUSTERS
	STATEWIDE WINTER RELATED CRASH CLUSTERS
	CRASH RATE PER 100 MILES > 500 AND AADT > 5000

FIGURE 15: ERIE CRASH CLUSTERS AND HIGH CRASH RATE AREAS

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Organizational Issues

Maintenance of existing ITS elements is vital to the success of the WRTMC 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.

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.

Another important organization aspect of operations is adherence to the various federal requirements. The following provides an outline of the various guidance and requirements provided by FHWA.

- SAFETEA-LU: Signed into law in 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy For Users (SAFETEA-LU) provided guaranteed funding for highways, highway safety, and public transportation and was described as the largest surface transportation investment in the nation's history. More detail on the law can be found at <http://fhwa.dot.gov/safetealu>, but the law does provide certain requirements to MPOs, including:
 - Promoting "efficient system management and operation" is identified as one of eight planning factors in the law.
 - Management and operations strategies must be included in planning process to improve the performance of existing transportation facilities.
 - The Real-Time System Management Information Program was established nationally. It requires the capability to monitor, in real-time, the traffic and travel conditions of the major highways throughout the country and to share that data with state and local governments and with the traveling public.
- Map-21: The Moving Ahead for Progress in the 21st Century Act (Map-21) was signed into law in 2012 and provides surface transportation funding programs, including highway, transit, bike, and pedestrian programs. A key part of Map-21 (<https://www.fhwa.dot.gov/map21/>) is the emphasis on performance management and accountability for meeting defined performance goals. As such, performance measures are an important part of the ROP process and should be tied directly to the goals and objectives of the overall document, as well as to the specific projects outlined herein.
- The FAST Act: signed into law in 2015, the Fixing America's Surface Transportation Act (FAST) Act is the first federal law since SAFETEA-LU to provide long-term funding certainty for surface transportation infrastructure planning and investment. The FAST Act authorizes \$305 billion over fiscal years 2016 through 2020. The law continues a focus on safety, streamlining project delivery and, for the first time, provides a dedicated source of federal dollars for freight projects.

Recently Completed Projects

Within the WRTMC region, two major interstate projects have recently been completed, the I-279 Reconstruction project in PennDOT District 11-0 and US 19/I-70 Diverging Diamond Interchange in PennDOT District 12-0. Additionally, multiple Adaptive Traffic Signal systems and ITS equipment

installations have been completed as well. Another notable roadway project that was recently finished was the Interchange Road Improvement Project in Erie County.

Highway Projects

The two-year **I-279 Parkway Reconstruction** project included concrete patching and overlay, preservation of 30 bridges and 49 overhead sign structures, repairs to 29 walls, ramp repairs, lighting improvements, HOV repairs, signage updates, guide rail and drainage improvements, and an anti-icing system installation on the McKnight Road interchange structures. The project also included several safety improvements such as lengthening of Madison Avenue, Veterans Bridge and Perrysville Avenue on-ramps. The project was completed in June 2019.

The **US 19/I-70 Diverging Diamond Interchange** (DDI) was part of PennDOT District 12-0's long-term improvement plan for I-70 in Washington County. The project consisted of the reconstruction of the US 19 (Murtland Avenue) Interchange, and also involved reconstruction and widening of 1.4 miles of I-70 from two lanes to three lanes. This is PennDOT's first-ever DDI and was recognized as one of the top 10 road projects in North America by Road & Bridges magazine in 2017.



FIGURE 16: US 19/I-70 DIVERGING DIAMOND INTERCHANGE, SOUTH STRABANE TOWNSHIP

The **Interchange Road Improvement Project** was recently completed in June 2019. It included widening and improvements along SR 4012 (Interchange Road/Zimmerly Road) in the vicinity of US 19 and I-79 in Erie County. The project also included traffic signal upgrades at seven intersections, sidewalk and ADA improvements, and drainage to alleviate flooding issues.

Adaptive Traffic Signal System Projects

The first adaptive signal system in the Western RTMC Region was completed in 2013 on US 19 from Marshall to McCandless. Since then, a number of other adaptive systems have been installed, including the following more recent projects:

- State Route 8 – Etna to Shaler: This adaptive traffic signal project consisted of 24 signals in four municipalities and was completed in May 2019.
- State Route 30 – Forest Hills: This adaptive traffic signal project consisted of 8 signals in two municipalities and was completed in May 2019.
- State Route 50 – Bridgeville – South Fayette: This adaptive traffic signal project consisted of 12 signals in two municipalities and was completed in May 2019.
- State Route 65 – Sewickley: This adaptive traffic signal project consisted of 3 signals in Sewickley Borough and was completed in June 2018.
- State Route 22/2048 – Churchill to Delmont: These were two adaptive traffic signal projects consisting of 34 signals in three municipalities and two PennDOT Districts (PennDOT D-11-0 and PennDOT D-12-0) and were completed in June 2018.
- State Route 4003, McKnight Road – McCandless – Ross: This adaptive traffic signal project consisted of 17 signals in two municipalities and was completed in September 2018.

ITS Projects

PennDOT District 11-0 has installed new fiber optic cable on I-79 in Lawrence County in preparation for future communications and ITS projects.

PennDOT District 12-0 has installed new fiber optic cable and several additional ITS devices on their various I-70 projects.

Planned Infrastructure Changes

State Route 228 “Balls Bend” – Butler County, PennDOT District 10-0

The proposed project is a widening and safety improvement project on SR 228 (Mars-Crider Road) in Middlesex Township. The project limits (1.6 miles) extend from approximately 0.25 mile east of Three Degree Road (western terminus) to the intersection of State Route 8 (Pittsburgh Road terminus). The project would straighten out a sharp curve near the intersection with Harbison Road, and widen existing SR 228 from two lanes (one lane in each direction) to four lanes (two lanes in each direction).

Freedom Road Crows Run – Beaver County, PennDOT District 11-0

The Freedom Road project includes realignment and roadway construction on Freedom Road between Route 65 in Conway Borough and Park Quarry Road in New Sewickley Township. The project enhances safety and addresses substandard roadway features and also includes bridge and structure replacement, utility and stream relocation, and wetlands mitigations.

Southern Beltway – Pennsylvania Turnpike Commission

The Southern Beltway (US 22 to I-79) project begins at the southern terminus of the Findlay Connector at the US 22 interchange and proceeds 13 miles southeast to an interchange with I-79 and a local connection at Morganza Road near the Allegheny/Washington County line. This new facility will be a cashless toll facility. All connections to and from I-79 will be open in 2022. As part of this project, I-79 Northbound will be widened from two to three lanes between the Southpointe Interchange and Alpine Road.

Mon Valley Expressway (Large to Monroeville) – Pennsylvania Turnpike Commission

This project will extend the current Mon Fayette Expressway system 14 miles north from PA-51 in Jefferson Hills through West Mifflin, Dravosburg, Duquesne, North Versailles, Turtle Creek, and Wilkins before connecting to the Parkway East (I-376) near Thompson Road in Monroeville. This project will complete the 68-mile system, allowing continuous travel from West Virginia north to an interchange with the Parkway East in Monroeville. The project will also encourage redevelopment of abandoned industrial sites, encourage revitalization of neighborhoods, and relieve local traffic congestion on roadways in the southern and eastern portions of Allegheny County.

Highland Park Bridge Interchange – PennDOT District 11-0

The project will address the existing bottleneck and congested traffic flow on PA-28 and other operational and safety issues within the PA-28/Highland Park Bridge and Freeport Road Interchange. It involves the reconstruction of PA-28 to reestablish two travel lanes in each direction through the interchange, construction of improved acceleration and deceleration ramps, bridge preservation work, and other operational and safety improvements. Noise walls are also being evaluated as part of the project. Construction is anticipated for Spring 2020.

Bus Rapid Transit – Port Authority of Allegheny County

The Bus Rapid Transit (BRT) service plan is designed for a “core” route that travels east-west between Downtown Pittsburgh and the Oakland neighborhood with three branches that go to Greenfield, Highland Park and through several Mon Valley communities. The network will include 7.4 miles of dedicated bus lanes serving 44 stations at 72 platforms. Due to the dedicated bus lanes and frequent operations, the BRT system will offer a faster and more cost-effective service for the Port Authority of Allegheny County riders.

Future Land Use Changes

Natural Gas

A large-scale ethane cracker plant is currently under construction in Beaver County, which would convert ethane produced from Marcellus Shale into ethylene for Royal Dutch Shell. This could lead to an uptick in drilling within the region as well as the development of other ancillary business. The Western RTMC region is in a prime location for a pipeline distribution network and other petrochemical, plastics, and other energy infrastructure and manufacturing throughout the quad-state area (Pennsylvania, Ohio, Kentucky, and West Virginia).

Freight

The economic vitality of western Pennsylvania depends on safely and efficiently moving people, goods, and materials into, through, and out of the region. The regional freight transportation network includes the highway and Interstate network, including local bridges and roadways, as well as the region’s airports, rail lines, and waterways. A large portion of the nation’s population can be reached within a single day by trucking freight operators from the region. This important strategic position is enhanced by the number of major Interstates running through the region, including I-70, I-76, I-79, I-80, and I-90, that serve national and international trade routes.

Anticipated Development

Growth areas in the Western RTMC region include the I-79 Corridor (Allegheny County Line to City of Washington) in Washington County and US 19 and PA-228 in Butler County. The Hazelwood Green site is primed for redevelopment and is located in the City of Pittsburgh along the Monongahela River in the neighborhood of Hazelwood. The site has a median target of 2.8 million square feet of mixed-use development that includes 1,050 dwelling units. As mentioned above, development is also anticipated in the vicinity of the ethane cracker plant under construction in Beaver County.

Infrastructure-Related Development

The I-579 Cap Urban Connector Project, located in the City of Pittsburgh, will consist of the construction of a new cap structure spanning over a portion of I-579 (Crosstown Boulevard). The project will significantly improve the safety of pedestrians and bicyclists, as well as provide new and improved links to public transportation at the nearby Steel Plaza subway station. The surface of the cap will provide a new 3-acre public open space that includes recreational and educational areas as well as rain gardens for storm water management. Once completed, the cap will provide a linkage from the old Civic Arena site to the Central Business District and encourage further redevelopment of the old Civic Arena site.

Chapter 4. Transportation Needs and Operational Issues

Through the previous ROP updates, a number of key priority areas have been identified for regional TSMO efforts. The 2007 Northwest ROP identified four needs areas, including Traveler Information, Incident and Emergency Management, Congestion Management, and Communications. The recent 2019 SPC ROP included seven priority areas:

- Traffic Signals
- Traffic Incident Management
- Traveler Information
- Operational Teamwork/Institutional Coordination
- Multimodal Connectivity
- Freeway and Arterial Operations
- Freight Management

The four Northwest needs areas overlap with and can be integrated within the identified SPC needs, so this document will continue with the same seven priorities.

Related to these categories, the tables in the following sections outline the specific transportation needs and operational issues throughout the region.

Traffic Signals

Traffic signals can improve the safety and efficiency of roadway networks for motorists, as well as for transit, 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.

SPC's Regional Traffic Signal Program has been very successful in reducing vehicle delay and congestion, as well as improving travel times along the region's road network. The program provides technical assistance to municipalities as well as potential funding to assist in upgrading signal systems throughout the region. Now entering its fourth cycle of funding, the incredible value of traffic signal improvements can be seen in the 71:1 benefit/cost ratio produced in the first two program cycles.











Retiming Benefits		First Year Operations Benefits	First Year Safety Benefits	Total First Year Benefits
 897,635 vehicles travel these corridors on an average day	First Year Operations Benefit: \$176,453,451 Benefit Cost Ratio: 64:1	 The safety benefits to pedestrians included bringing over 300 intersections up to current standards by increasing the pedestrian intervals and installing 472 countdown pedestrian signals. This can help reduce in-vehicle pedestrian related crashes by 70% and provide a 111:1 benefit to cost for pedestrians. 28 Emergency Vehicle Preemption systems were also installed with this program, which helped reduce emergency response times by 14% to 23%.	Total First Year Benefit (Operations & Safety): \$195,519,248 Benefit Cost Ratio: 71:1	
 7,340,754 reduced vehicle hours of travel				
 10,122,657 gallons reduced fuel consumption				
 523,239 kg reduced total CO pollutant emissions				
 99,455 kg reduced total NO pollutant emissions				
 118,684 kg reduced total VOC pollutant emissions				
 \$140,747 LED upgrade savings (energy & maintenance)				
 259,382,043 reduced number of stops				
 \$2,747,503 total life cycle project cost				

FIGURE 17: SPC REGIONAL TRAFFIC SIGNAL PROGRAM BENEFITS

Another important funding mechanism for traffic signal improvements is PennDOT’s Green Light-Go. This is a municipal signal partnership program that provides state funds for operational improvements and equipment upgrades at signalized intersections along designated critical corridors of state highways.

Traffic signal funding is also provided by the Automated Red Light Enforcement (ARLE) program, established by Pennsylvania state legislature in 2002. Camera technology is used to monitor and automatically enforce red light running at signalized intersections. The net revenue of this program is then utilized for a state-administered competitive grant program focused on safety improvements, particularly at signalized intersections.

Through these funding sources and others, a number of traffic signal improvements can be implemented that provide improvements to traffic flow without roadway widening or other costly improvements.

- Optimization and coordination of signal timing
- Integrating signal systems across adjacent jurisdictions to improve arterial progression
- 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
- Transit Signal Priority (TSP), which provides special treatment to transit vehicles at signalized intersections

Traffic signals in Pennsylvania are currently owned by each individual municipality. This can create issues when operations and maintenance of signals varies along the same corridor that might run through a number of different municipalities. To combat this problem, PennDOT is currently planning to pilot state ownership of a small number of corridors where they could unify signal systems and provide consistent operations and maintenance. The initial project in this effort consists of PennDOT taking ownership of over 150 traffic signals on parallel arterials to I-76 from Montgomery County to Philadelphia.

Some of the corridors identified as needing signal improvements or other initiatives are shown in **Table 12**.

TABLE 12: TRAFFIC SIGNAL IMPROVEMENT NEEDS

PennDOT District	Arterial	Location	Improvements Needed
1	26 th Street	City of Erie	Upgrade signal equipment
1	US 19 and Interchange Rd	Erie County	Command/Control on both corridors, full upgrades on US 19
1	PA-18	Longview Rd. to Lamor Rd.	Upgrade detection, retiming, possible adaptive system
1	PA-58 (Main St.)	Grove City	Timing improvements, detection
1	US 322	Near PA-257	Improve timing and coordination, upgrade signal equipment
10	US 22	East of Blairsville	Dilemma Zone Detection, LED "RED" Signal Ahead signs
10	PA-8	Center Township	Coordination, equipment upgrade
11	PA-8, PA-130, PA-380	East End, Pittsburgh	Command/control integration, performance metrics. Potential DOT ownership pilot for PA-8.
11	PA-51	West End Bridge to Large, PA	Potential DOT ownership pilot
11	McKnight Road	US 19 (McCandless) to I-279	Potential DOT ownership pilot, Transit Signal Priority, Command/control integration
12	PA-18	US 22 WB Ramp, Burgettstown	Controller upgrades, performance metrics
12	US 30	Near Greensburg	Equipment upgrade, performance metrics
12	I-79 Parallel Corridors	North of Washington	Command/control integration, update vehicle detection and signal equipment

Traffic Incident Management

The ability to detect, verify, and respond to incidents throughout the regional transportation system is vital to maintain operations and minimize the impact of incidents. The central objective of traffic incident management is to improve the safety of emergency responders, crash victims, and other motorists. Additionally, good Traffic Incident Management reduces the duration and impacts of traffic incidents. Improved management of incidents can improve safety as well as mobility.

TIM Teams

Traffic Incident Management (TIM) is a multi-agency, coordinated effort to minimize the impact of traffic incidents so that traffic flow can be restored as safely and quickly as possible. 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 entity has its own diverse priorities and cultures that need to be addressed through a unified set of TIM strategies to 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.

The SPC region currently has two active TIM teams: a Cranberry team and a Tunnels team. The Cranberry team focuses on I-79, I-76, PA-228, and US 19 in the vicinity of Cranberry Township. The Tunnels team covers the Squirrel Hill, Fort Pitt, and Liberty Tunnels, as well as the key bridges and major roadways in the urban core of Pittsburgh, including I-279, I-376, and I-579. Based on stakeholder discussions, there is a current need to expand the existing Tunnels team to also cover PA-28 in the Pittsburgh area.

Additionally, other TIM Team are needed along the I-80 and I-90 corridors through the region. The I-80 corridor handles high volumes and very high percentages of heavy vehicles. I-90 carries heavy through traffic between the states of Ohio and New York. Safe and efficient clearance of incidents is vital to operations and to Interstate commerce along both of these routes.

Freeway Service Patrols

Freeway Service Patrols (FSP) involve roving tow trucks systematically patrolling freeways and providing free assistance to motorists. FSP can provide basic services such as towing, jump starts, furnishing fuel, and flat tire repair for disabled vehicles. FSP assistance can clear minor incidents from travel lanes to quickly reopen the roadway and minimize congestion and risk of secondary crashes. For major incidents, FSP can deploy temporary traffic control devices to divert traffic around incidents and increase safety at the scene prior to arrival of emergency services.

Currently, freeway service patrols are active during AM and PM peak hours in the Pittsburgh area on I-79, I-279, and I-376. The PTC also has their own FSP program, sponsored by State Farm insurance, covering the Turnpike roadways in the region. Additional need for FSP was identified on PA-28 in Allegheny County.

Safety Systems

While TIM Teams and Freeway Service Patrols are vital aids in improving response to traffic incidents, there are also a number of TSMO solutions that can reduce the occurrence of incidents in the first place. Some examples that could be beneficial in the SPC region include Bridge De-Icing, Dynamic Curve Warning, and Queue Warning systems.

Bridge De-Icing utilizes technology to prevent snow and ice accumulation on bridge decks during winter storms. PennDOT has utilized the Fixed Anti-Icing Spray Technology (FAST) system at various locations in the state. This system consists of a series of spray disks that deliver a freeze point depressant agent, in a pre-prescribed amount, determined by the roadway surface condition. Nearby Road Weather Information System (RWIS) locations are typically utilized to determine the current roadway surface temperature and condition. RTMC personnel are notified when the system is activated. The latest bridge de-icing technology utilizes heating elements incorporated into the deck surface instead of the sprayer system. Electric resistance cables or pipes with heated liquid can be buried within the pavement to warm the bridge and reduce snow and ice accumulation. If possible, this type of technology could be incorporated when a bridge deck is already planned for reconstruction. Three bridges, which have a history of winter-related crashes, were identified as potential candidates for such a system:

- PA-28 over Buffalo Creek, Butler and Armstrong Counties (District 10-0)
- US 422 over Allegheny River, Armstrong County (District 10-0)
- US 22 over Conemaugh River, Indiana County (District 10-0)

Dynamic Curve Warning systems provide feedback to vehicles approaching a horizontal curve at unsafe speeds. Vehicle speeds are detected upstream of the curve by radar or other ITS devices and trigger a controller that activates electronic sign elements and/or DMS 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 have not achieved the desired reduction in crashes. Low-cost improvements would include signage, delineation treatments, high friction surface treatments, and other similar solutions.

Currently a Dynamic Curve Warning system is planned for the S-bends on I-79 near Coraopolis. Another series of deployments are being installed from I-86 westbound to I-90 westbound near Erie. Other Dynamic Curve Warning needs were identified by evaluating curved road crash clusters within PennDOT One Map. These clusters were tiered and the highest ranking curved road crash locations were evaluated to determine if an ITS solution was warranted or if low-cost improvements should be attempted first. The following locations were found to be good candidates for Dynamic Curve Warning:

- I-79, near MM 91, Butler County (District 10-0)
- US 30, east of Latrobe, Westmoreland County (District 12-0)

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 Dynamic Message Signs (DMS), though some advanced ITS applications involve in-vehicle notification. While these systems can reduce crashes caused by congestion, they are also quite effective in reducing secondary crashes from occurring in the backups caused by an initial incident. A few potential areas of need for such a system were identified, including the following:

- I-376 Eastbound, Campbells Run Road to Carnegie, Allegheny County (District 11-0)
- US 30 at US 119 Ramps, Westmoreland County (District 12-0)
- I-80 Corridor (District 1, District 10-0)

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. This leads to a better distribution of traffic across the roadway system and maximizes 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.

The focal point of traffic operations and traveler information dissemination for the Western Region is the Western Regional Traffic Management Center (WRTMC) at the PennDOT District 11-0 offices in Bridgeville. Through the RTMC, travelers can be informed of roadway conditions, incidents and crashes, construction and maintenance activities, and weather conditions. WRTMC operators utilize DMS to disseminate this traveler information. In addition, the information is also distributed via the 511 Pennsylvania Traveler Information System (511PA) website and smart phone application.

In recent years, 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 development, ITS devices still provide an easy and widely used source of traveler information.

ITS Device Gaps

Throughout Pittsburgh and Allegheny County, an extensive array of traveler information devices has already been installed and a network of CCTV cameras provides the RTMC with reliable situational awareness. Deployment of ITS devices in the rest of the Western RTMC region are much less frequent. While Allegheny County is the most populous county in the region, other important population centers exist throughout the rest of the region, and major Interstates run through these areas. Because of this, filling ITS device gaps has been identified as a key component of the Traveler Information needs for this ROP. These gaps are 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 the 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 DMS. **Table 13** shows some of the key ITS gaps identified.

TABLE 13: ITS DEVICE GAPS

PennDOT District	Location	ITS Devices Needed
1	PA-6, Ohio State Line to I-79	Type A DMS, CCTV
1	Bayfront Parkway, City of Erie	Arterial DMS
1	I-79 Corridor (District 1)	CCTV, DMS
1	PA-18/PA-318, West Middlesex Township	Arterial DMS, CCTV
1	I-90 Corridor	CCTV, DMS
1	I-79 at MM 164 Rest Area	RWIS
1	PA-8 near Titusville	RWIS
1	I-80 near Allegheny River	RWIS
1	PA-6, Warren County	Arterial DMS, RWIS
1	US 322/PA-62, Franklin	CCTV, Arterial DMS

PennDOT District	Location	ITS Devices Needed
1	PA-8 @ I-80	CCTV, DMS
1,10	I-80 Corridor	CCTV, DMS, Fiber
10	US 322/PA-36, Brookville	Arterial DMS
10	US 322 @ I-80 and PA-66	CCTV, Arterial DMS
10	Kittanning Bypass (US 422), PA-28 at Hogback Hill	RWIS
10	US 422	CCTV, Arterial DMS
10	US 22, east of Blairsville	CCTV, Arterial DMS
10	PA-28 at PA-356 interchange	CCTV, DMS
11	I-376, Beaver and Lawrence Counties	CCTV, DMS
11	PA-8, Allegheny County	CCTV, Arterial DMS
11	US 22-Business, Monroeville	CCTV, Arterial DMS
12	I-70/US 40, east of Washington	CCTV, DMS
12	US 30, near Somerset County line	RWIS
12	US 40, near scenic overlook east of Uniontown	RWIS

In addition to the identified gaps, other identified traveler information needs include:

- Western RTMC Upgrade: The WRTMC in Bridgeville has now been in operation for over 20 years. With the expanding amount of ITS devices it controls and the increase in new technology available, the WRTMC should be upgraded or replaced to be able to successfully continue to manage traffic in Western Pennsylvania.
- Regional ITS Strategic Planning: while the table above lists some of the most important existing gaps in ITS devices, a robust regionwide gap study would be helpful to determine any remaining gaps and to prioritize a hierarchy for deploying devices in these gaps.
- Fiber Ring Deployment: Existing fiber is located on I-79 in the Cranberry area. A proposed fiber ring could be deployed to tie into this fiber via PA-228, PA-8, and US 422, helping to expand ITS and other technology in this growing area. Fiber deployment should also be expanded along the I-80 corridor, as well as connecting to the existing from I-80 south on I-79 to the existing limits of that corridor’s fiber deployment.

Operational Teamwork/Institutional Coordination

Teamwork and coordination amongst the various transportation agencies and other entities in the region are vital to ensure a well-functioning transportation system. TIM Teams, as mentioned above, are a great example of the type of interdisciplinary collaboration that can develop from these partnerships. Other examples of this type of teamwork and coordination can be found in the Transportation Operations and Safety Forum (TOSF) and the Regional ITS Architecture update processes, led by SPC.

The SPC Regional ITS Architecture was last updated in 2016 and provides a roadmap for transportation systems integration throughout the SPC region. It is developed from a highly cooperative effort between

transportation agencies representing all of the region's transportation modes. The overarching framework developed through this process provides a glimpse at the various ITS-related relationships that span the region and all of the stakeholder agencies. The latest ITS Architecture can be found online here:

<https://local.iteris.com/spc/index.htm>

SPC should continue to maintain these various collaborative relationships and documents as they provide a multitude of positive impacts on transportation operations and safety in the region. The Northwest Region ITS Architecture was last updated in 2004. This document should be updated to reflect the different stakeholders and technology which have emerged since this last update.

Through the stakeholder process, a number of potential study needs and potential initiatives were identified that would improve operational teamwork and institutional coordination in the region.

- IUP – Kovalchick Traffic Management: need to improve ingress/egress to events at Indiana University of Pennsylvania convention and athletic complex
- Key Bank Pavilion Traffic Management: need to improve ingress/egress to events
- Downtown Erie Event Management: need to improve traffic management during special events, particularly encouraging increased use of Park-n-Ride lots to remove congestion from the core of the city.
- Operations Center/Traffic Management Center Coordination: need to improve coordination and collaboration traffic management centers/operations centers, particularly between PennDOT and PA Turnpike, for incident management, construction detours, communications, device sharing, traveler information, and weather operations
- Person Trips Prioritization: determine feasibility of a Roadway Tiering-like system that would evaluate roadways on total person trips (including transit, cycling, etc.) instead of AADT
- Data/Video Sharing: share access to CCTV feeds with County offices, particularly 9-1-1 centers to improve incident response, situational awareness, and coordination

Multimodal Connectivity

The core philosophy of TSMO is to maximize the existing roadway capacity available to improve operations. With that in mind, enhancing non-single occupant vehicle mode choices can provide significant improvements. In addition to improving congestion, multimodal investment can also decrease fuel consumption, minimize the impacts of emissions thereby improving air quality, and provide economic development through an equitable transportation network.

In order for modes of transportation to be successful, connectivity between each mode should be safe, efficient, and convenient. Transportation alternatives include walking, bicycling, rail, bus transit, carpooling, vanpooling, and other options.

In recent years, on-demand transportation options have grown. This new growth in shared mobility includes Pittsburgh's bike share network, Healthy Ride, which has a growing network of bike stations throughout the city. Transportation Network Companies (TNCs) such as Uber and Lyft provide ride-hailing services which can replace personal vehicle trips but can also have detrimental effects on transit ridership and congestion.

Other shared mobility options have become popular in cities throughout the country and could come to the region in the future, including dockless networks of shared bikes and scooters.

A large variety of multimodal needs were identified in the stakeholder process, including:

- Bike trail maintenance
- Filling gaps between existing trails and bike lanes
- Bike Share expansion
- Transit Signal Priority on key bus corridors
- Transit Lanes/Bus Rapid Transit (BRT)
- Smart Parking Systems
- Potential expansion of transit services (light rail, commuter bus and rail)

Bike Network Needs

Despite the challenging terrain in the Pittsburgh area, a growing bike network has been enthusiastically utilized by residents and visitors. Bike trails line much of the land adjacent to rivers and extend out from the city to the rest of the region. An increasing number of bike lanes and protected bike lanes have also been installed in Downtown Pittsburgh, Oakland and other nearby neighborhoods. While this bike network is impressive, critical gaps still exist that would better connect the existing facilities. With a better connected, more complete network, many more people could potentially choose cycling as a transportation option in their daily commutes and recreational trips. Notable bike network gaps identified include:

- Birmingham Bridge (improve safety of existing bike lanes)
- Brady Street (Uptown/Oakland) to the Heritage Trail
- Butler Street, Lawrenceville to Highland Park
- W. Carson Street, Ft. Pitt Bridge to West End Bridge
- "The Chute" (Oakland/Greenfield) to the Eliza Furnace Trail
- Penn Avenue, Lawrenceville to East Liberty
- Surface streets near I-279/I-579 on Pittsburgh's North Side

The City of Pittsburgh is also planning to release a citywide bike plan in early 2020 that will include approximately 120 miles of proposed bike infrastructure, bring 50% of the city within walking distance of a bicycle facility, and propose facilities that would be designed for potential cyclists of all ages and abilities.

Another notable plan, the *Allegheny Riverfront Green Boulevard Strategic Plan*, was released by the Urban Redevelopment Authority in 2013. It lays out a vision of a strong bike (and transit) network that would connect Downtown Pittsburgh to Highland Park via the Strip District and Lawrenceville.

While the density of Pittsburgh provides many opportunities for a strong bike network, cycling infrastructure can provide benefits throughout the region. The Peninsula Drive and West 8th Street corridors in Mill Creek

Township were identified as another bike network need. These roadways provide connections between the City of Erie and the popular Presque Isle State Park.

Generally speaking, future roadway projects in the region should consider and implement where possible Complete Street design standards. This policy and design approach requires streets to be planned, designed, and maintained to enable safe, convenient, and comfortable travel and access for users of all ages and abilities, regardless of mode of transportation. This allows for safe travel by cyclists, as well as those walking, driving automobiles, riding transit, or delivering goods. A well-designed Complete Street network has the capability to improve equity, access to jobs, economic development, and the environment, while also reducing congestion by discouraging less efficient modes of travel.

Another bike-related need is for expansion of Healthy Ride, Pittsburgh's Bike Share program. Due to the challenging terrain, certain neighborhoods have not been included in their existing rollout. A potential use of pedal assist electric bicycles (e-bikes) could allow expansion throughout more of the city, as well as welcoming more users who would be more inclined to try the service. These bikes have an integrated electric motor that provides pedal assist to the cyclist. This change would provide the city with an equitable shared bike network and provide potentially impactful mode change.

E-bikes have proven to be a transformational component for cities addressing safety concerns from traffic violence, with increased use of e-bikes helping to address congestion, air quality, parking, and mode shift challenges. Early indicators from Los Angeles, Sacramento, Chicago, and Minneapolis show that cities and regions will be most successful if they implement public, electric-vehicle charging infrastructure to accommodate e-bikes and integrate that public hardware with existing transit offerings.

Other cycling-related needs discussed by the stakeholder group include:

- Park-n-Bike Campaign/Expansion: While the terrain in much of the Pittsburgh area can be challenging to cyclists, the areas along the rivers provide a generally flat and expansive trail system. Therefore, a number of commuters choose to drive to these trails and bike in to Downtown from there, providing some relief to the congested road network in the City. This "Park-n-Bike" approach to commuting should be formalized and promoted, with possible designated areas in Millvale, Manchester, Greenfield, and Homestead.
- Wabash Tunnel Alternate Uses: The Wabash Tunnel is an underutilized tunnel connecting the South Hills and PA-51 to the Station Square area and the South Side neighborhood of Pittsburgh. Alternate multimodal uses of the tunnel should be studied. Currently, Mount Washington is a natural barrier that restricts any reasonable bike routes connecting the South Hills area to Downtown, so this could provide a possible bike connection between these areas.
- West End/South Hills Potential Trail Network Study: Rights-of-way in the West End and South Hills are narrow and there are often only one or two streets that provide connectivity in the neighborhood, supporting all modes. To improve multimodal access in these neighborhoods, a study should be conducted to assess potential assets such as unused rail rights-of-way, bridges, tunnels, and existing or potential greenways.

Improving walking and cycling connections to T stations, as well as providing safe, secure bike parking facilities at stations, was another need discussed in the stakeholder process. This need will be looked into further as part of PAAC's 2019 First and Last Mile Program Plan. This plan outlines a process for how the

agency pursues and advocates for first and last mile (FLM) improvements. Focused on collaboration, best practices, and data-driven decision making, the First and Last Mile Program Plan includes a solutions toolbox and a thorough evaluation of the fixed-guideway stations in the system. The station evaluation identifies the strengths and weaknesses of multimodal connections to stations in order to prioritize fixed-guideway station areas for FLM improvements.

Transit Needs

PAAC owns and operates a light rail system connecting the South Hills to Downtown and the North Shore, as well as a strong bus network that makes great use of its busway system (East, West, and South) and PennDOT’s HOV Lane (North) to provide quick and dependable service to large swaths of the county on dedicated rights-of-way. In areas of the City of Pittsburgh, particularly Downtown, where the buses must share the road with passenger vehicle traffic, this reliability worsens due to intense congestion.

Due to this, a number of major corridors were identified to enhance the speed and reliability of bus service. This can be achieved through a variety of infrastructure improvements, including, but not limited to: dedicated transit lanes, queue jumps, transit signal priority (TSP), stop bumpouts, and real-time information systems for users (such as real-time parking capacity signage at highway exits for park and ride facilities).

TSP can either extend green time or shorten red time upon receiving a priority request signal from transit vehicles, allowing them to move more efficiently along corridors and provide faster, more reliable service. The first use of TSP in the SPC region is now planned for PA-51.

PAAC compiled an analysis of ridership and speed data that was used to identify other high priority corridors for transit infrastructure improvements, as seen in **Table 14**. Speed data was analyzed for the month of November 2018. Indexed speed was determined by proportionally analyzing each route as compared to the slowest studied corridor.

TABLE 14: TRANSIT LANE CORRIDOR PRIORITIZATION

Corridor	Max Weekday Load (one direction)	PM Peak Outbound Slowest Segment Speed (mph)	Indexed Speed (reversed)	Ridership *Indexed Speed = Score
West Carson Street (SR 837)	6,600	8.20	3.00	19,800
Penn Ave	4,000	6.90	3.57	14,261
Centre Ave	4,400	7.80	3.15	13,877
Liberty Ave	5,200	13.50	1.82	9,476
Kennywood Blvd/8 th Ave (SR 837), Browns Hill Rd	2,300	10.80	2.28	5,239
East Carson Street (SR 837)	3,000	14.60	1.68	5,055
Second Ave (SR 885)	1,800	11.10	2.22	3,989
McKnight Road (SR 4003)	1,200	11.30	2.18	2,612

Commuter rail service and extension of the existing light rail system were identified as needs in the ROP stakeholder process. These possibilities will be looked at in more detail as part of the long range transit planning effort that PAAC proposes to initiate in Fiscal Year 2020. SPC has recently assisted a number of transit agencies with Transit Development Plans, including Mid Mon Valley Transit Authority, Butler Transit, Westmoreland County Transit Authority, and Freedom Transit. These plans discuss other transit-related

needs for the respective agencies, providing recommendations for additional service opportunities and other improvements to efficiency and operations.

Erie Metropolitan Transit Authority is currently undergoing a transit development planning effort to potentially redesign their bus network. They have three possible scenarios which they have made available for public comment. Scenario 1 maximizes access to downtown with a hub-and-spoke network. Scenario 2 is a more grid-based network which improves travel between the east and west side of Erie but would increase the need for transfers to and from Downtown Erie. Scenario 3 provides a hybrid network combining portions of the first two Scenarios.

In addition to the PAAC transit corridor needs outlined above, other transit-related needs identified in the stakeholder process include:

- Potential Transit Lane Study: Dedicated bus lanes have been a very successful aspect of PAAC's service. A study should be completed to identify other potential corridors (in addition to those listed in **Table 14**) where travel lanes could be converted for transit use or, where removing general travel lanes is prohibitive, queue jumps could be added to increase transit reliability and speed.
- Parkway West Transit Lane: In addition to the corridors listed in **Table 14**, potential bus-on-shoulder running should be examined west of Carnegie on the Parkway West. Currently the 28X (Airport Flyer) bus route can utilize the West Busway for much of its route but must run with traffic along a congested portion of the Parkway West between Carnegie and the Airport. This slows bus speeds and reduces reliability for travel to and from the airport. A dedicated bus lane would greatly improve reliability and has the possibility to improve ridership and promote positive mode change, thereby reducing congestion as well.

Freeway and Arterial Operations

Freeways and arterials act as the backbone of the roadway network, transporting the majority of people and goods within and through the region. Reducing congestion and improving traffic flow along these routes is essential to facilitate the region's economic development. A number of TSMO-related strategies are available to improve operations on these important roadways, maximizing throughput and improving the flow of traffic.

Variable Speed Limits

Variable speed limits, also known as variable speed displays, are posted by variable message speed limit signs. These speed limits can be changed remotely by a traffic management center or automatically in response to congestion, incidents, work zones, or road weather conditions. Variable speed displays may be used to slow vehicles before they enter an area of slow-moving traffic to reduce rear-end collisions and maintain traffic flow.

Due to the frequency of inclement weather in the northern areas of the Western RTMC region, the I-80 and I-90 corridors were identified for potential deployments of variable speed limit systems. Such a system would benefit the corridors through helping to slow down traffic during inclement weather as well as reducing rear end crashes if an incident does occur. A number of other corridors are noted in the following section for potential variable speed limit deployment as part of a comprehensive system of congestion mitigation strategies.

Integrated Corridor Management

Integrated Corridor Management (ICM) is a strategy to improve the movement of people and goods through institutional collaboration and integration of existing infrastructure along major corridors. Transportation corridors often contain underutilized capacity such as parallel roadways, unoccupied seats in vehicles, and parallel transit services which could be leveraged to maximize person throughput and reduce congestion.

Currently, an ICM pilot project is underway on the Schuylkill Expressway portion of I-76 that runs from Montgomery County into the City of Philadelphia. This capacity-limited Interstate section is an excellent testbed for a number of ICM strategies. A system of variable speed limit signs and a queue detection and warning system are now under construction. Other expected improvements include dynamic junction control, flex lanes, and ramp metering on I-76. PennDOT is also planning to take ownership of traffic signals along parallel corridors in order to manage signal timings and improve flow when traffic diverts from the Interstate. Meanwhile, other planned pursuits include increasing frequency of transit on parallel Regional Rail routes and making improvements to the Schuylkill River Trail to encourage cycling.

These types of ICM improvements are ideal for the congested corridors in and around the Pittsburgh area, in particular the Parkway East and West (I-376). This portion of Interstate is heavily congested but wide-scale widening is not practical due to the restraints of the Fort Pitt and Squirrel Hill tunnels, in addition to other geometric limitations. Fortunately, a large number of ITS devices are already in use and can be further enhanced. Some of the traffic signal systems on parallel corridors have already been improved and other improvements are planned. Most importantly, PAAC has strong bus service that can utilize the East and West Busways to provide efficient and reliable connections between Downtown Pittsburgh, Oakland, and suburban areas. Along the Parkway East, the Three Rivers Heritage and Eliza Furnace Trails provide a bike network that generally parallels the Interstate from Greenfield into Downtown Pittsburgh.

Specific regional corridors that could benefit from ICM strategies are as follows:

- PA-28, Allegheny County (PennDOT District 11-0)
- Parkway North (I-279)/US 19/McKnight Road (PennDOT District 11-0)
- Parkway West/East (I-376) (PennDOT District 11-0)
- I-79/US 19, north of Washington (PennDOT District 12-0)

Smart Corridor Initiatives

Smart Corridor Initiatives involve dynamic solutions to increase the efficiency of transportation facilities by focusing on trip reliability. Smart Corridor Initiatives may employ combinations of other TSMO strategies. Integrated systems with new technology are used to optimize system performance quickly and without delay that occurs when operators must deploy strategies manually.

A series of corridors near I-80 in Mercer County were identified which could benefit from Smart Corridor Initiatives. Combining adaptively adjusted traffic signal timings with incident detection and arterial DMS would improve operations on parallel corridors when an incident occurs on I-80. These corridors include US 19, US 62, and PA-18.

Freight Management

The economic vitality of Western Pennsylvania depends on the safe and efficient movement of people, goods, and materials, into, through, and out of the region. The major Interstates and other aspects of the roadway network are important components of the regional freight network. The other network components include the airports, rail lines, and waterways. SPC released a Southwestern Pennsylvania Regional Freight Plan in 2016 which included the following strategic freight investigations:

- Define, assess, and develop a more comprehensive understanding of today's multimodal freight transportation systems
- Identify future freight movement needs and opportunities through a horizon year of 2040
- Craft a strategic freight action plan that will assist in efforts to advance the coordinated use of the region's overall transportation resources
- Build upon findings from Pennsylvania's latest statewide LRTP, *PA On Track*, and the corresponding statewide *Comprehensive Freight Movement Plan*
- Consider federal freight planning revisions as defined by the *Fixing America's Surface Transportation Act* (FAST Act)

Estimated freight mode shares for the SPC region are shown in **Figure 18**¹ for both existing 2011 and projected 2040.

¹ Southwestern Pennsylvania Commission. (2016, December 16). *Southwestern Pennsylvania Regional Freight Plan*. Retrieved January 8, 2019, from <https://spcregion.org/pdf/freight16/SWPA%20RgFP%20-%202016%20FINAL%20PLAN.pdf>

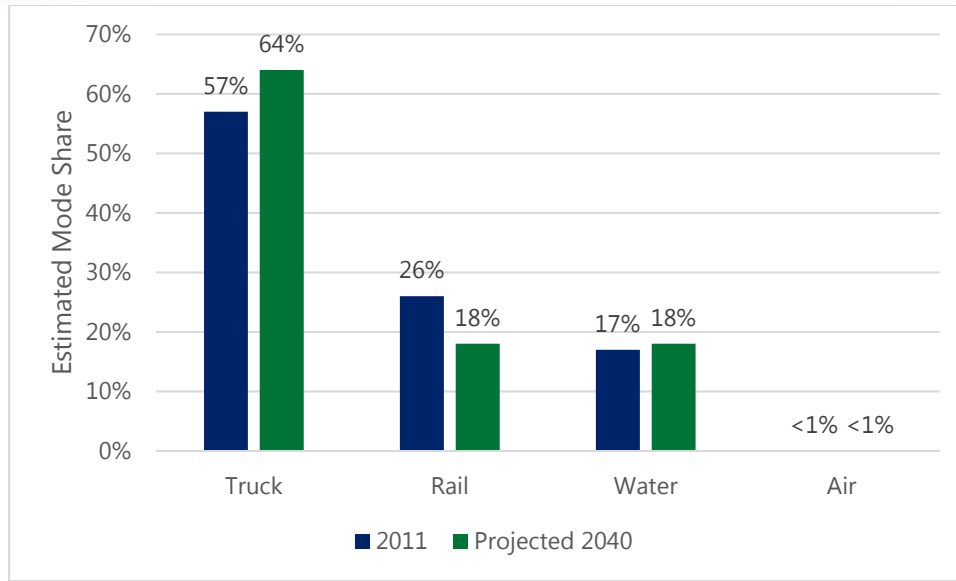


FIGURE 18: SPC REGION ESTIMATED MODE SHARES

This data is not available for the entirety of the Western RTMC Region, but the mode shares and importance of freight operations remains consistent. Particularly with the growth of truck-based freight movement, two areas of concern were identified in terms of operations planning, truck parking and winter truck restrictions.

The increasing truck traffic, combined with more stringent hours of service regulations on drivers, have resulted in a noticeable increase in illegal truck parking. Truck drivers at the end of their allowable daily hours find parking areas full and are forced to park on shoulders of ramps and other dangerous locations overnight. The Pennsylvania Turnpike Commission is currently planning to deploy a truck parking management system, initially in the central and eastern portions of the state, to detect available parking spaces and distribute that information to drivers so they can make smarter, safer parking decisions. A study of truck parking is needed to evaluate needs in the western portion of the state as well, both to analyze use of a similar truck parking system, as well as to evaluate where additional parking capacity is needed and can possibly be provided.







Another recent freight issue is the more proactive truck restrictions that have been instituted on Interstates throughout the state, as previously mentioned in the **Traveler Information and Situational Awareness** section. The impacts these restrictions have on parallel arterials as truck traffic shifts off of the Interstates should be analyzed to determine the best and safest course of action. A regionwide study of this issue would be beneficial so that policy revisions can be instituted for subsequent winter seasons.

Chapter 5. Strategies and Projects

ROP 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. Once the types of congestion were identified and classified for each area, the most appropriate TSMO tools and strategies were determined, thereby developing projects. The TSMO Guidebook includes the following table, which provides a matrix for matching tools and strategies with the varying types of congestion.

TABLE 15: TSMO SOLUTION APPLICABILITY

TSMO Solution	Causes of Congestion					
	Recurring Congestion		Unplanned Events		Planned Events	
	Bottlenecks 	Poor Signal Timing 	Traffic Incidents 	Inclement Weather 	Work Zones 	Special Events 
Bridge De-icing				X		
Closed Circuit TV Cameras (CCTV)	X		X	X	X	X
Dynamic Curve Warning			X	X		
Dynamic Message Signs (DMS)	X		X	X	X	X
Dynamic Rerouting	X		X		X	X
Flex Lanes	X		X		X	X
Freeway Service Patrols			X		X	X
Integrated Corridor Management	X	X	X	X	X	X
Junction Control	X		X		X	X
Managed Lanes	X					
Queue Warning	X		X		X	X
Ramp Metering	X		X			X
Road Weather Info. Systems (RWIS)				X		
Smart Corridor Initiatives	X	X	X	X	X	X
TIM Teams			X			X
Traffic Incident Detection			X			
Traffic Management Center	X	X	X	X	X	X
Traffic Signal Enhancements		X				
Transit Signal Priority		X				
Traveler Information	X		X	X	X	X
Variable Speed Displays	X		X	X	X	

A number of the strategies in the above table were included as part of the projects in this ROP, including:

- Bridge De-Icing
- Closed Circuit TV Cameras (CCTV)
- Dynamic Message Signs (DMS)

- Freeway Service Patrols
- Integrated Corridor Management
- Junction Control
- Queue Warning
- Road Weather Info. Systems (RWIS)
- Smart Corridor Initiatives
- TIM Teams
- Traffic Management Center
- Traffic Signal Enhancements
- Transit Signal Priority
- Traveler Information
- Variable Speed Displays

In addition to the strategies outlined above, other multimodal tools and strategies were also identified and included in ROP projects, including the following:

- Integrating transit information into Integrated Corridor Management projects
- Dedicated transit lanes, queue jumps, curb bumpouts and other physical improvements to prioritize transit movement
- Park-n-Ride planning, coordination, and expansion
- Expansion of bike lanes, trails, and other bike infrastructure
- Support of Bike Share programs
- Truck Parking Management Systems

In total, 66 projects were identified for inclusion in this document, spanning the entire Western RTMC Region. With such a diverse set of needs areas and project types, prioritization by a simple metric would be difficult. Therefore, in addition to the operational and safety data utilized to develop and evaluate projects, stakeholder input was utilized to help determine the highest priority projects. In the final stakeholder meetings, the stakeholder group was given a set number of sticker dots to apply to the projects they deemed to have the highest priority, marking them on a set of maps. This voting process, along with the open discussions during these breakout sessions, were used to classify each project as either high or medium priority. Projects were also classified by short-term or long-term, depending on the types of tools and strategies involved and the varying complexity and relative cost of the project.

Table 16 summarizes the high priority projects while **Table 17** summarizes the other identified projects. Where multiple stakeholders are listed, the bolded name is determined to be the primary stakeholder. For further detail on each project, please refer to **Chapter 6**. Maps of the projects are also provided in **Chapter 6**. For Maps are provided for each planning partner region, with the exception of SPC. Given the size of this planning partner's boundaries, maps are provided for each PennDOT District within it. For PennDOT District 11-0, three maps are included: Beaver/Lawrence Counties, Allegheny County, and a map focused on the City of Pittsburgh.

TABLE 16: HIGH PRIORITY PROJECTS

Project #	Project	Priority Area	Stakeholders*	Planned Improvements
TS.01	Greensburg Operations Improvements	Traffic Signals	PennDOT 12-0	Traffic Signal Improvements, Queue Detection
TIM.01	Armstrong County Bridge De-Icing	Traffic Incident Management	PennDOT 10-0	Bridge De-Icing, RWIS, CCTV
TIM.02	PA-28 Freeway Service Patrol	Traffic Incident Management	PennDOT 11-0	Freeway Service Patrols
TIM.03	PA-28 TIM Team	Traffic Incident Management	SPC , PennDOT 11-0, Local Municipalities, Emergency Personnel	TIM Team
TIM.04	I-80 TIM Team	Traffic Incident Management	PennDOT WRTMC , PennDOT 1-0, PennDOT 10-0; Local Municipalities; Emergency Personnel	TIM Team
TI.01	Hogback Hill RWIS	Traveler Information	PennDOT 10-0	RWIS
TI.02	US 22 Corridor ITS/Signal Improvements	Traveler Information	PennDOT 10-0	CCTV, DMS, Traffic Signal Improvements
TI.03	US 422 Corridor ITS	Traveler Information	PennDOT 10-0	CCTV, Arterial DMS
TI.04	District 12-0 RWIS Expansion	Traveler Information	PennDOT 12-0	RWIS
TI.05	I-79 Corridor ITS	Traveler Information	PennDOT 1-0 , PennDOT 10-0	CCTV, DMS
TI.06	Western RTMC Expansion	Traveler Information	PennDOT 11-0	Traffic Management Center
TI.07	I-90 Corridor ITS	Traveler Information	PennDOT 1-0	CCTV, DMS, Variable Speed Limits, Coordination
TI.08	I-80 Corridor ITS	Traveler Information	PennDOT 1-0 , PennDOT 10-0	CCTV, DMS, Variable Speed Limits, Coordination
TI.09	I-80 Fiber Deployment	Traveler Information	PennDOT 1-0 , PennDOT 10-0	Fiber Deployment
MC.01	South Hills Village Smart Parking	Multimodal Connectivity	Port Authority of Allegheny County , PennDOT 11-0	Smart Parking System
MC.02	W. Carson St. Multimodal Improvements	Multimodal Connectivity	PennDOT 11-0 , Port Authority of Allegheny County	Transit Improvements and bike connection between South Side and West End
MC.03	Penn Ave. Transit Improvements	Multimodal Connectivity	City of Pittsburgh DOMI , Port Authority of Allegheny County	Transit Improvements, 40 th St. to Fifth Ave.
MC.04	Centre Ave. Transit Improvements	Multimodal Connectivity	City of Pittsburgh DOMI , Port Authority of Allegheny County	Transit Improvements, Washington Pl. to East Liberty Garage
MC.05	Peninsula Dr. + W. 8 th St. Corridor Improvements	Multimodal Connectivity	PennDOT 1-0 , City of Erie, Millcreek Township	Ped/Bike Infrastructure, Traffic Signal Improvements

Project #	Project	Priority Area	Stakeholders*	Planned Improvements
FA.01	Bates St. Interchange Improvements	Freeway and Arterial Operations	PennDOT 11-0	Interchange Improvements
FA.02	I-79 Integrated Corridor Management	Freeway and Arterial Operations	PennDOT 12-0	Traffic Signal Improvements

* Primary stakeholder in **bold**

TABLE 17: OTHER RECOMMENDED PROJECTS

Project #	Project	Priority Area	Stakeholders*	Planned Improvements
TS.02	PA-8 Traffic Signal Improvements	Traffic Signals	PennDOT 10-0	Traffic Signal Improvements
TS.03	US 19 and Interchange Rd. Signal Improvements	Traffic Signals	PennDOT 1-0	Traffic Signal Improvements
TS.04	26 th St. Signal Improvements	Traffic Signals	PennDOT 1-0	Traffic Signal Improvements
TS.05	PA-18 Signal Improvements	Traffic Signals	PennDOT 1-0	Traffic Signal Improvements
TS.06	US 322 Signal Improvements	Traffic Signals	PennDOT 1-0	Traffic Signal Improvements
TS.07	East End Signal Improvements	Traffic Signals	PennDOT 11-0	Traffic Signal Improvements
TS.08	PA-51 DOT Signal Pilot	Traffic Signals	PennDOT 11-0	Traffic Signal Improvements
TS.09	Grove City Signal Improvements	Traffic Signals	PennDOT 1-0	Traffic Signal Improvements
TIM.05	I-79 Curve Warning	Traffic Incident Management	PennDOT 10-0	Dynamic Curve Warning
TIM.06	US 30 Curve Warning	Traffic Incident Management	PennDOT 12-0	Dynamic Curve Warning
TIM.07	Erie TIM Team	Traffic Incident Management	PennDOT 1-0, Ohio DOT, New York State DOT, Local Municipalities, Emergency Personnel	TIM Team
TIM.08	I-80 Crossovers	Traffic Incident Management	PennDOT 10-0	Crossovers
TI.10	PA-28 ITS	Traveler Information	PennDOT 10-0	CCTV, DMS
TI.11	US 22 Bridge De-Icing	Traveler Information	PennDOT 10-0	Bridge De-Icing, RWIS, CCTV
TI.12	I-376 Corridor ITS	Traveler Information	PennDOT 11-0	CCTV, DMS, RWIS
TI.13	PA-8 Arterial ITS	Traveler Information	PennDOT 11-0	CCTV, DMS

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Project #	Project	Priority Area	Stakeholders*	Planned Improvements
TI.14	US 22 (Monroeville) Arterial ITS	Traveler Information	PennDOT 11-0	CCTV, DMS
TI.15	I-70/US 40 Detour ITS	Traveler Information	PennDOT 12-0	CCTV, DMS
TI.16	US 322 ITS	Traveler Information	PennDOT 10-0	CCTV, DMS
TI.17	US 6 Detour Improvements	Traveler Information	PennDOT 1-0	CCTV, DMS, Coordination
TI.18	DI RWIS Expansion	Traveler Information	PennDOT 1-0	RWIS
TI.19	Franklin Operations Improvements	Traveler Information	PennDOT 1-0	CCTV, DMS, Traffic Signal Improvements
TI.20	Bayfront Pkwy. Arterial DMS	Traveler Information	PennDOT 1-0	DMS
TI.21	US 6 Winter Operations ITS	Traveler Information	PennDOT 1-0	DMS, RWIS
TI.22	West Middlesex Interchange ITS	Traveler Information	PennDOT 1-0	CCTV, DMS
TI.23	Brookville Arterial DMS	Traveler Information	PennDOT 10-0	DMS
TI.24	Butler County Fiber Ring Deployment	Traveler Information	PennDOT 10-0, Cranberry Township	Fiber Deployment
OT.01	Key Bank Pavilion Event Management & Signal Improvements	Operational Teamwork/ Institutional Coordination	PennDOT 12-0, PennDOT 11-0	Traffic Signal Improvements
MC.06	Carnegie Smart Parking	Multimodal Connectivity	Port Authority of Allegheny County, PennDOT 11-0	Smart Parking System, Pedestrian Improvements
MC.07	Wilkinsburg Smart Parking	Multimodal Connectivity	Port Authority of Allegheny County, PennDOT 11-0	Smart Parking System
MC.08	Liberty Ave. Transit Improvements	Multimodal Connectivity	PennDOT 11-0, Port Authority of Allegheny County	Transit Improvements, Downtown to Aspen St.
MC.09	Kennywood Blvd./Browns Hill Rd. Transit Improvements	Multimodal Connectivity	PennDOT 11-0, City of Pittsburgh DOMI, Port Authority of Allegheny County	Transit Improvements, Browns Hill Rd./Hazelwood Ave. to Kennywood Blvd./Library St.
MC.10	E. Carson St. Transit Improvements	Multimodal Connectivity	PennDOT 11-0, Port Authority of Allegheny County	Transit Improvements, 10 th St. to 26 th St.
MC.11	Second Ave. Transit Improvements	Multimodal Connectivity	PennDOT 11-0, Port Authority of Allegheny County	Transit Improvements, Hot Metal St. to Hazelwood Ave.
MC.12	Healthy Ride E-Bike Deployment	Multimodal Connectivity	Pittsburgh Bike Share	E-assist bike sharing deployment
MC.13	"The Chute" to Eliza Furnace Trail Bike Connection	Multimodal Connectivity	City of Pittsburgh DOMI	Improve bike connection
MC.14	Brady St. to Heritage Trail Bike Connection	Multimodal Connectivity	City of Pittsburgh DOMI	Improve bike connection

Project #	Project	Priority Area	Stakeholders*	Planned Improvements
MC.15	Butler St. Bike Connection	Multimodal Connectivity	City of Pittsburgh DOMI	Improve bike connection from Lawrenceville to Highland Park
MC.16	Penn Ave. Bike Connection	Multimodal Connectivity	City of Pittsburgh DOMI	Improve bike connection from Lawrenceville to East Liberty
MC.17	East Allegheny Ped/Bike Improvements	Multimodal Connectivity	City of Pittsburgh DOMI, PennDOT 11-0	Improve bike/ped connections in the North Side Pittsburgh area near I-279 and I-579
FA.03	Campbells Run Queue Warning	Freeway and Arterial Operations	PennDOT 11-0	Queue Warning System
FA.04	Parkway North ICM	Freeway and Arterial Operations	PennDOT 11-0	Smart Parking System, Traffic Signal Improvements, Transit Signal Priority
FA.05	Veterans Bridge Junction Control	Freeway and Arterial Operations	PennDOT 11-0	Junction Control System
FA.06	Mercer County Smart Corridor Initiatives	Freeway and Arterial Operations	PennDOT 1-0	Smart Corridor Initiatives

* Primary stakeholder in **bold**

Studies/Initiatives

In addition to the projects outlined above, a number of studies and initiatives were also developed as part of the ROP process. While specific projects could be determined for many of the issues and needs, others need further study to best to determine the correct mitigation to improve operations.

Information on the recommended operations-based studies and initiatives can be found in **Table 18** and **Table 19**.

TABLE 18: HIGH-PRIORITY STUDIES AND INITIATIVES

Study	Priority Area	Stakeholders*	Notes
Downtown Pittsburgh Bridge Operations Study	Freeway and Arterial Operations	SPC , PennDOT 11-0, Port Authority of Allegheny County	Study to improve operations in the vicinity of the Downtown river crossings.
Parkway West ICM Study	Freeway and Arterial Operations	PennDOT 11-0	Study conversion of shoulders for flex lane or transit lane use. Identify other ICM needs.

* Primary stakeholder in **bold**

TABLE 19: OTHER RECOMMENDED STUDIES AND INITIATIVES

Study	Priority Area	Stakeholders*	Notes
Regional ITS Strategic Plan	Traveler Information	SPC , PennDOT	In addition to ITS device projects identified in this plan, conduct a regionwide study to determine any other remaining ITS coverage gaps and prioritize for future projects.
District 12-0 Communications Gap Study	Traveler Information	PennDOT 12-0	Identify communications needs throughout District (fiber, etc.)
Indiana University of Pennsylvania (IUP) Special Events Traffic Management Study	Operational Teamwork/ Institutional Coordination	IUP , PennDOT 10-0	Improve ingress/egress to events at Kovalchick Convention and Athletic Complex.
Operations Center/Traffic Management Center Coordination	Operational Teamwork/ Institutional Coordination	SPC , PennDOT, PA Turnpike Commission, Port Authority of Allegheny County, Cranberry Township	Improve coordination between Western RTMC and PA Turnpike Traffic Operations Center, particularly for the I-76/I-376 loop, including incident management, construction detours, communications (fiber), device sharing, traveler information, and weather operations. Port Authority operations center and Cranberry Township TMC should also be included.
Person Trips Prioritization Study	Operational Teamwork/ Institutional Coordination	SPC	Determine feasibility of Roadway Tiering based on total person trips (including transit passengers, cyclists, etc.) instead of AADT.
Key Bank Pavilion Event Management Study	Operational Teamwork/ Institutional Coordination	Key Bank Pavilion , PennDOT 12-0	Improve ingress/egress to events at Key Bank Pavilion.
Downtown Erie Event Management Study/Planning	Operational Teamwork/ Institutional Coordination	Erie MPO , City of Erie, EMTA	Improve traffic management for special events, increase Park-n-Ride utilization to reduce congestion in Downtown area.

Regional Operations Plan (ROP)

Western RTMC Region

Study	Priority Area	Stakeholders*	Notes
Data/Video Sharing Initiative	Operational Teamwork/ Institutional Coordination	PennDOT Western RTMC, County Offices	Share access to CCTV feeds to County offices to improve coordination and incident response.
Birmingham Bridge Complete Street Study	Multimodal Connectivity	PennDOT 11-0	Improve safety of existing bike lanes. Consider protected bike lane infrastructure and possible vehicular lane reduction.
Existing Bike Trail Maintenance Initiative	Multimodal Connectivity	SPC	Initiative to ensure continued maintenance of bike trails throughout region.
Regional Park-n-Ride Expansion Study	Multimodal Connectivity	SPC	Study possibilities for expanding existing sites or providing additional sites (coordinate with upcoming Regional Transit Coordination Study).
Park-n-Bike Campaign/Expansion	Multimodal Connectivity	SPC	Initiative to encourage commuters to transfer to bicycles at established trailheads.
Potential Transit Lane Study	Multimodal Connectivity	SPC , PennDOT District 11-0, City of Pittsburgh DOMI, Port Authority of Allegheny County	Study feasibility of other transit lane candidates not included in this report.
Wabash Tunnel Multimodal Use Study	Multimodal Connectivity	SPC , PennDOT District 11-0, City of Pittsburgh DOMI, Port Authority of Allegheny County	Study of alternate uses for tunnel, including possibility of conversion for bike usage.
West End/South Hills Potential Trail Network Study	Multimodal Connectivity	SPC	Study to determine potential trail network utilizing underused or unused right-of-way.
PA-28 Active Traffic Management Study	Freeway and Arterial Operations	PennDOT 11-0	Study flex lanes and other Active Traffic Management strategies.
Parkway North HOV Conversion Study	Freeway and Arterial Operations	PennDOT 11-0 , Port Authority of Allegheny County	Consider converting existing HOV lanes in the median of the Parkway North (I-279) to a Port Authority Busway or other use.
US 40 Road Safety Audit	Freeway and Arterial Operations	SPC	Road Safety Audit on US 40, east of Uniontown to Somerset County line.
Route 8 Corridor Operations Planning Study	Freeway and Arterial Operations	SPC	Study to improve operations along Route 8 between Wildwood and Bakerstown.
Western RTMC Region Truck Parking Study	Freight Management	SPC , PennDOT Central Office	Determine needs and locations for possible expansion of truck parking. Study possibility of installing Truck Parking Management System. Consider potential public-private partnership opportunities with private truck stop facilities. Coordinate with planned PennDOT Truck Parking Study.
Western RTMC Region Winter Truck Restriction Impact Study	Freight Management	SPC , PennDOT Central Office	Study impact of winter truck restrictions on parallel corridors and determine best practices for future winter operations.

* Primary stakeholder in **bold**

Chapter 6. ROP Coordination and Maintenance

Coordination and Maintenance

The first Regional Operations Plans in Pennsylvania were published in 2007. Since then, SPC has continued to update their ROP every four years. This has led to continuity and continued momentum for introducing and completing operations-based projects in the region. Regional Operations Plans for the remainder of the region were not updated though and momentum was lost for further operations advancements.

It is intended that this process of updates should be continued every four years for the entire Western RTMC Region. Each update should include the status of any previous ROP projects, in addition to the discussion of current issues and needs, and the resulting additional projects to mitigate those issues and needs. An interim update should also be considered for 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 be aligned so that it is published in the year 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 would be ideal but, given the varying LRTP update schedules of the five planning partners in the region, this would not be possible (see **Table 4**).

Additionally, 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 partners will formally adopt this ROP and the recommendations included herein. Finally, the ITS projects recommended in this document should be considered for PennDOT's statewide Device Deployment Plan compiled each year.

Emerging Transportation Trends

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 and other stakeholders should be incorporated into future updates of this document.

Another transportation trend not discussed in detail elsewhere in this plan is the rise of micromobility. This includes traditional bike share systems, but also emerging technology such as e-assist bicycles, electric scooters, and electric skateboards. Electric scooters in particular have seen a rapid rise in usage in other American cities though they are currently not allowed by law in Pennsylvania. In future ROP updates, these types of mobility options will likely need to be considered as the transportation environment and the laws guiding it evolve.

Appendix A. Meeting Minutes



MINUTES

TO: Dominic D'Andrea, Southwestern Pennsylvania Commission

FROM: Anthony Castellone, Pennoni Associates Inc.

DATE: January 4, 2019

OTHERS: Josh Spano, Evan Schoss, Stan Niemczak, Steve Cunningham, Adam Smith, Mario Toscano, Allie Slizofski

SUBJECT: On-Call Consultancy Services
Work Order 1 Pre-Kick-Off – Regional Operations Plan Update

A project coordination Teleconference commenced at 3:00 PM for the subject project. This project is the update of SPC's Regional Operations Plan (ROP) last revised for 2014-15.

The salient points of this meeting were as noted:

1. Brief conference call to establish first Steering Committee and Stakeholder Meetings for ROP update.
2. Jacobs needs about 2 weeks to prepare materials. Approximately 1-2 hrs needed for initial Steering Committee meeting and 2-3 hrs needed for initial Stakeholder Committee meeting.
3. First meetings will be located at SPC. Subsequent Stakeholder Meetings will be at individual Districts 10, 11, 12.
4. SPC (D'Andrea) indicated that Planning Tab will not be completely filled-out with next Turbo file update for QA/QC.
5. ROP update needs to be consistent with "higher level" TSMO Guidelines (PennDOT).
6. A Multimodal section will be required as Port Authority of Allegheny County (PAAC) is the 2nd largest transit agency in the Commonwealth behind SEPTA.
7. Pennoni mentioned that Western Region is more urbanized than recent Central Region (rural) and questioned whether similar ROP format can be applied.

8. Per SPC, make-up of ROP Stakeholders will include: PennDOT (Traffic/ITS, Safety, Construction), Penna Turnpike and TMA's. PennDOT DE or ADE should be at "kick-off" meeting. Dom D'Andrea will shoot list to group for input.
9. Jacobs to provide Draft Agenda's prior to Kick-off meetings for review, comment at January 11 Coordination Call.
10. March 2019: Three PennDOT District Stakeholder Meetings over a period of 2-3 days anticipated. A Steering Committee meeting will also occur at SPC.

The meeting ended at approximately 4:00 PM.

NEXT STEPS:

1. Now: SPC to send Outlook Invite for first Steering Committee Meeting (January 16th)
2. Now: SPC to will provide SharePoint access to Key Team members; need names, emails, phone numbers
3. Jan 02: Jacobs to provide Draft Kick-Off Meeting Agenda's.
4. Jan 11: Quick Coordination Call before first meeting (after 3PM)
5. Jan 16: Steering Committee Kick-Off at SPC, 10am – Noon.
6. Jan 30: Stakeholder Meeting Kick-Off at SPC, 10am - Noon

MINUTES

TO: Domenic D’Andrea, Southwestern Pennsylvania Commission

FROM: Anthony Castellone, Pennoni Associates Inc.

DATE: January 9, 2019

OTHERS: Frank Cavataio, Josh Spano, Evan Schoss, Stan Niemczak, Steve Cunningham, Adam Smith, Allie Slizofski, Jay Goldstein

SUBJECT: On-Call Consultancy Services
Work Order 1 Coordination Mtg #2 – Regional Operations Plan Update

A project coordination Teleconference commenced at 11:00 AM for the subject project. This project is the update of SPC’s Regional Operations Plan (ROP) last revised for 2014-15. The objective of this meeting was to discuss the Steering Committee Meeting Kick-Off confirmed at SPC, 10am – Noon on January 16, 2019, specifically the Agenda and PowerPoint presentation.

The salient points for the discussion are as noted:

1. Steering Committee “Kick-Off” meeting confirmed for January 30, 2019 at SPC (10am – Noon).
2. Presenters and Agenda were determined, specifically
 - Welcome and Introductions – SPC (D’Andrea)
 - TSMO Overview – PennDOT (Cavataio)
 - ROP Process Overview – Jacobs (Niemczak)
 - Roadway Tiering System – Jacobs (Smith)
 - Stakeholder Meeting Planning – Jacobs (Cunningham)
 - Wrap-Up / Next Steps – Jacobs (Niemczak)
3. Western Region RTMC may cover projects outside of SPC region (e.g., PennDOT D1-0). Not enough budget in this ROP update to cover 8 additional counties, 1 PennDOT District and 2 MPO’s.
4. Meetings at PennDOT Districts within SPC’s region will occur in March and May.

5. Jacobs will “pull up” One Map via embedded PowerPoint link
6. SPC (D’Andrea) noted that Roadway Tiering System should include information regarding Trails, Transit Stops, Park-n-Rides and Bike Lanes. Some of this information can be provided by SPC for incorporation into “One Map” database. PennDOT Central Office will need access to SharePoint site.
7. Jacobs plans to bring Bottleneck, Congestion, Crash, etc. maps of Allegheny County.
8. SPC (D’Andrea) noted that the “Smart Moves” poll is part of the long-range planning process. Pennoni (Castellone) to share with Team.
9. PennDOT (Cavataio) noted that there are “different” goals between Stakeholders and Steering Committee members. The ROP is only one piece of the puzzle.
10. SPC (D’Andrea) noted that some projects were not captured in previous ROP.
11. Congested corridors in region in process of being updated by PennDOT BOMO.
12. The CMT site’s most recent update was 2015. The information is there, but site mapping is not working so well. PennDOT is in process of revamping the site to be consistent with FHWA performance metrics.

The meeting ended at approximately 11:50 AM.

ACTIONS:

1. Pennoni will bring PowerPoint presentation hand-outs for Steering Committee use and notes
2. SPC will provide sign-in sheet for attendees, minutes.
3. Jacobs to bring sample Allegheny County Congestion Maps, etc.
4. SPC will try to incorporate SPC data into PennDOT One Map prior to meeting.
5. SPC will get PennDOT BOMO access to project SharePoint site.
6. Pennoni to share SPC’s SmartMoves poll
7. SPC to provide Lunch at/around noon with “invoice” option for State employees for both Kick-Off Meetings.



Meeting Minutes

Owner / Agreement	SPC / Regional Operations Plan (ROP) Update
Project	WO #1 - Development of the Southwestern Pennsylvania Commission Regional Operations Plan
Meeting Name	Steering Committee Meeting #1
Date / Time / Location	1-16-19 / 10:00 AM-12:00 PM / SPC Conference Center, Pittsburgh
Attendees	See Sign-in Sheet

A project Steering Committee meeting commenced at 10:00 AM for the subject project. This project is the update of SPC’s Regional Operations Plan (ROP) last revised for FY 2014-15. The objective of the meeting was to discuss the relevance of needs identified in previous ROPs and provide overview of material to be presented at the first ROP stakeholder meeting. The salient points of this meeting were as noted:

Welcome and Introductions

1. Following introductions, SPC (D’Andrea) gave a brief overview of the meeting’s goals indicating that the final ROP document will be a “working” planning document that outlines the need for Projects, Studies and Initiatives for the next 4+ years; including a summary of what has been completed from previous ROPs and what “remains” to be done.
2. A brief overview of the previous ROP was summarized, noting that Traffic Signal initiatives (e.g., ARLE, GLG, SINC/SINC-UP) and Traffic Incident Management System (TIMS) initiatives have been dominant; the latter producing two (2) strong TIM teams (Cranberry Township, PennDOT Tunnels) working with the state-wide PennTime team. A Freight Management Plan was completed in 2018.
3. Seven (7) priority areas from previous ROP are anticipated to remain with this update, depending on feedback received. *Team will need to confirm.*
4. SPC requested that *Steering Committee members advise the ROP Study Team of any suggested changes to Stakeholder lists provided.* ROP Steering Committee will see work products before ROP Stakeholders.
5. The Stakeholder “Kick-Off “meeting will be January 30 at SPC. Follow-up meetings at each PennDOT District have been scheduled.



TSMO Overview

6. A PowerPoint presentation by PennDOT Central Office (Cavataio) and Jacobs (Niemczak) included a brief Overview of the meaning and importance of TSMO (i.e., Performance Metrics), Regional ROP Process Overview, PennDOT’s TSMO Guidebook and One Map tool.
7. The TSMO Guidebook is the “roadmap to the ROP”.
 - PAST ROPs – Traditional project development process put “Operations” on sidelines
 - CURRENT ROP – Operations need to be integrated into Project Life Cycle
8. For the Central Region ROP, a pilot for future ROPs, 40 projects were prioritized while PennDOT noted that three (previous) ROPs were combined into one. SPC’s ROP update provides an opportunity to implement TSMO initiatives and “performance driven” projects.
9. PennDOT noted that the Western ROP Region includes *PennDOT District 1-0 which will be incorporated into SPC’s ROP by Central Office*. SPC (D’Andrea) added that some RTMC projects will extend into PennDOT D1-0.

ROP Process Overview

10. Jacobs (Niemczak) outlined the ROP process noting that Integrated Corridor Management (ICM) systems are an emerging TSMO tool.
11. In addition to outlining the various chapters of the updated ROP, it was noted that the TSMO Tiering System will impact the prioritization of significant projects by Steering Committee and Stakeholders.
12. PennDOT’s TSMO Mapping Tool can be used to document decisions and Performance Measures moving forward, The TSMO Guidebook provides direction for each chapter developed for SPC’s 2019 ROP Update.
13. Transportation needs and operational issues will be developed and summarized as part of the initial Stakeholder meetings. As part of the ROP process, the Team will try to identify Project Champions. ROP Team anticipates individual PennDOT District-specific input.
14. Jacobs noted that it is important to ‘stay on track’ and deliver by June in order to incorporate into the next Transportation Improvement Plan (TIP) update. The SPC ROP

update Schedule was presented and a general discussion ensued regarding Stakeholder Meeting Planning. This discussion included the following:

- Port Authority of Allegheny County (Silbermann) indicated that safety was not mentioned in the Traffic Operation Goals and stressed the importance of including in one, if not all goals. *It was also suggested to show a graphic in the Stakeholders PowerPoint that shows how the ROP process ties into the Long-Range Transportation Plan (LRTP), TIP, etc.*
- SPC (D’Andrea) challenged the Steering Committee to make this ROP Update “multimodal”. The over-arching goal of the ROP Update is to improve people mobility (which includes but is not exclusive to vehicles).
- PennDOT District 11 (Kravits) indicated that safety needs to be the “over-arching” factor for all Traffic Operation Goals. The current goals seem to be more directed toward mobility, which should be thought of as a benefit to maximizing safety and minimizing crashes. He also suggested that “*critical corridors*” *be included in the roadway tiering system as PennDOT may be taking them over in the future.*
- Unplanned events are generally crashes and “safety” improvements as a result of TSMO projects will be measured through a reduction of unplanned incidents.
- PennDOT Central Office (Gault) mentioned that *PennDOT’s traffic signal personnel should be added to the stakeholder group* to be consistent with what was done in the Central Region.
- PennDOT District 10 (Shanshala) questioned why the roadway tiering system was different than the FHWA Functional Classification. PennDOT Central Office (Gault) responded with “the tiering system was established to better classify roadways based on daily traffic volume and Level of Service.” The roadway tiering is thought to be a better classification, specific to Pennsylvania’s roadway network. Mr. Shanshala also indicated that the steering committee needs to address how major Interstate projects are prioritized and selected for the TIP. An example was mentioned of the need for three lanes on I-79 from the Washington County line extending north through two PennDOT Districts to the Bridgeville interchange.
- SPC (Waple) and PennDOT Central Office (Cavataio) noted that Joe Szczur (PennDOT 12-0) and Doug Tomlinson (PennDOT BOMO) are involved in developing the Interstate TIP in conjunction with FHWA. *Central Office will verify involvement.*

15. Following a brief break, Jacobs (Smith) explained the PennDOT One Map tool and other maps that will be used during the Stakeholder meetings. Steering Committee members provide the following input when debriefed about “Congestion Maps”:

- PennDOT Central Office (Gault) explained that all PennDOT One Map data is received from INRIX. *SPC (D’Andrea) indicated the need to include information on the County-owned facilities to be beneficial to the County planning authority stakeholders.* SPC will see if their GIS data would be useful.
- One-Map currently includes locally-owned NHS roads. One-Map does not include Transit Data, but *PennDOT Central Office may be able to incorporate.*
- Port Authority of Allegheny County (Silbermann) mentioned that it would be helpful to show multi-modal data with transit bottlenecks to identify which facilities with roadway (non-transit) bottlenecks are already using other forms of transit. It was also indicated that speed data is more useful than on time percentage when measuring transit efficiency; but difficult to extract.
- *SPC (D’Andrea) suggested adding Park-n-Ride facilities to “Multimodal Maps”.*
- PennDOT District 11 (Kravits) indicated that SR 51 in the South Hills (Jefferson Hills to Pittsburgh) will be implementing transit priority signal optimization and will be the only facility in the region using such technology.

16. General discussion by many among the group mentioned the need to plan for the upgrade in future traffic signal technology specifically related to communication in traffic signal systems, i.e. adaptive, 5G, etc. PennDOT Central Office (Gault) also indicated that PennDOT needs to find a better solution for maintaining traffic signals and operations than the current fragmented municipal approach.

Stakeholder Meeting Planning

17. Jacobs (Cunningham) initiated coordination for the Stakeholder Meeting, specifically integrating multimodal needs and projects into the TSMO Guidebook format, status summary of previous ROP projects/studies and agency coordination efforts. Of note:

- Avg Vehicle Speed vs Avg Transit (Bus) Speed should be a consideration
- *The ROP Team should identify Transit Signal Priority (TSP) Corridors per SPC.*

- Should regional hospitals be included in Stakeholder meetings? Other institutions such as University's? SPC (D'Andrea) okay with adding to list if they are willing to engage.
- PennDOT Traffic Signal Staff for each District, and Planning/Programming staff, should be added to ROP Stakeholders list. PennDOT 10-0 questioned local Agreements to maintain SINC/SINC-UP timings. SPC (D'Andrea) indicates 1 year with municipal re-application in 3-5 years.
- Pennoni (Castellone) mentioned consideration of future transportation infrastructure and communications (DSRC, 5G?) to support Connected and Automated Vehicles. PennDOT Central Office (Gault) noted ATC controller being rolled-out. Need to better prepare for "retiming" versus "adaptive" to achieve better signal operation and travel efficiencies.

Wrap-Up / Next Steps

- Stakeholders "Kick-Off" scheduled for January 30, 2019 at SPC
- TSMO Team to continue Development of Chapters 1 and 2
- TSMO Team to begin development of Chapter 3
- Anticipate next Steering Committee Meetings to occur in late February or early March. SPC will send a "Doodle Poll" to confirm a date.

The meeting ended at approximately 1:00 PM with informal discussions transpiring over lunch.
Action Items are shown as red, italicized text.

MINUTES

TO: Domenic D’Andrea, Southwestern Pennsylvania Commission

FROM: Anthony Castellone, Pennoni Associates Inc.

DATE: January 25, 2019

OTHERS: Frank Cavataio, Frank Cippel, Josh Spano, Evan Schoss, Stan Niemczak, Steve Cunningham, Adam Smith, Pierce Sube, Allie Slizofski, Jay Goldstein

SUBJECT: On-Call Consultancy Services
Work Order 1 Coordination Mtg #3 – Regional Operations Plan Update

A project coordination Teleconference commenced at 1:30 PM for the subject project. This project is the update of SPC’s Regional Operations Plan (ROP) last revised for 2014-15. The objective of this meeting was to discuss the Stakeholder Meeting Kick-Off at SPC, 10am – Noon on January 30, 2019, specifically the Agenda, PowerPoint and Break-out Session.

The salient points for the discussion are as noted:

1. Pennoni (Castellone) asked Team to review Steering Committee meeting minutes before SPC distributes as Draft.

Welcome and Introductions

2. Meeting will be in large conference room on 4th floor. Everyone agreed that U-shape lay-out was acceptable.
3. SPC (D’Andrea) to introduce Team and initiate self-introductions.
4. PennDOT (Cippel) noted that it is important for speakers to use microphones. SPC will remind committee.

PowerPoint Presentation of ROP Update Process

5. Same presenters as Steering Committee Meeting. Allow 40-55 Minutes, followed by brief rest break.
6. Slide of ROP Process overview, and coordination with LRTP, TIP, etc. added.

7. PennDOT (Sube) will provide “live” demo of One Map
8. SPC (D’Andrea) noted that Team must emphasize that ROP is “inclusive of safety.” No project would be included for consideration at the expense of safety.
9. It was further noted that Team must focus/guide project development on “improving operations, mobility of vehicles and people.”

Break-out Session

10. Start approximately 11:00 following rest break.
11. Breakout sessions leads are:
 - Anthony – D10
 - Adam – D11 (Allegheny)
 - Steve – D11 (Beaver/Lawrence)
 - Stan – D12
12. SPC would like Team to prepare a 1-page “Instruction Sheet” for this session.
13. Maps used will be “District-level” to identify/confirm problem areas and causation.
14. Allie/Melody/Jay can provide extra help for each of these sessions as needed...either floating based on demand or each one helping with a specific District.

Wrap Up/Next Steps

15. Jacobs (brief wrap-up once everyone is settled in and eating lunch)
16. SPC noted that the next Steering Committee meeting (per the Doodle Poll results) will be February 26, 2019

The meeting ended at approximately 2:35 PM.

ACTIONS:

1. SPC to provide Steering Committee Meeting Minutes comments by early next week.
2. SPC to track weather for Wednesday meeting and “cancel” by Monday at latest in case of snow. A call-in number will be provided for meeting as well.

3. SPC to provide Stakeholder Committee “Name Tags”
4. Pennoni will bring PowerPoint presentation hand-outs for Stakeholders use and notes
5. Jacobs to bring Central Region “breakout” session map mark-ups for examples to group
6. Jacobs/Pennoni/Drive to prepare 1-page” Break-out Session Instruction” hand-out
7. SPC to provide Lunch at/around noon with “invoice” option for State employees



Meeting Minutes

Owner / Agreement	SPC / Regional Operations Plan (ROP) Update
Project	Update of the Southwestern Pennsylvania Commission Regional Operations Plan
Meeting Name	Stakeholder Committee Meeting #1
Date / Time / Location	1-30-19 / 10:00 AM-1:00 PM / SPC Conference Center, Pittsburgh
Attendees	See Sign-in Sheet

A project Stakeholder Committee meeting commenced at 10:00 AM for the subject project. This project is the update of SPC’s Regional Operations Plan (ROP) last revised for FY 2014-15. The objective of the meeting was to provide an update on TSMO and the process for this ROP update and identify/confirm issues and needs through stakeholder breakout sessions. The salient points of this meeting were as noted:

Welcome and Introductions

1. Following introductions, SPC (D’Andrea) gave a brief overview of the meeting’s goals, indicating that the final ROP document will be a “working” planning document that outlines the need for Projects, Studies and Initiatives for the next 4+ years; including a summary of what has been completed from previous ROPs and what “remains” to be done. One theme for this update will be “How do we get more efficiency and safety out of our region’s existing infrastructure?”
2. Today’s goals will be to:
 - Introduce PennDOT One Map Tool
 - Identify issues/needs during Break-out Session

A PowerPoint presentation by PennDOT Central Office (Cavataio) and Jacobs (Niemczak) included a brief Overview of the meaning and importance of TSMO (i.e., Performance Metrics), Regional ROP Process Overview, PennDOT’s TSMO Guidebook and One Map tool.

TSMO Overview

1. The TSMO Guidebook is the “Roadmap to the ROP”
 - Past ROPs – Traditional project development process put “Operations” on sidelines
 - ROP Update – “Operations” need to be integrated into Project Life Cycle
2. TSMO started as ITS but migrated to Traffic Operations (Cavataio).



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3. TSMO Guidebook (Publication 851) consists of 5 Parts: Planning, Design, Construction, Maintenance and Operations.

ROP Process Overview

4. Jacobs (Niemczak) explained the 4 TSMO regions and noted that the Western RTMC Region includes *PennDOT District 1-0, which will be incorporated into SPC's ROP by Central Office*. SPC (D'Andrea) added that some RTMC projects will extend into PennDOT D1-0. *PennDOT will develop a consolidated schedule to work concurrently with the remaining counties and PennDOT Districts in the Western RTMC Region.*
5. Jacobs (Niemczak) outlined the ROP process. It was noted that the TSMO Tiering System will impact the prioritization of significant projects by Steering Committee, Stakeholders. The goal will be to optimize the efficiency and safety of existing infrastructure. PennDOT's TSMO Mapping Tool can be used to document decisions and Performance Metrics moving forward via "One Map".
6. Jacobs (Niemczak) described how the ROP Process "fits into" the overall planning process and ultimately, Transportation Improvement Plan (TIP) update.
7. A Congestion Focus will likely guide Traffic Operations Goals; while attempting to improve the reliability and predictability of the network.
8. The TSMO Guidebook provides direction for each chapter developed for SPC's 2019 ROP Update. Jacobs (Niemczak) explained that the Final Deliverable will be consistent with other Regional ROP updates.
9. In addition to outlining the various chapters of the updated ROP, it was noted that the TSMO Tiering System will impact the prioritization of significant projects by Steering Committee and Stakeholders; with local input and recommendations driving the process.
10. Jacobs noted that it is important to "stay on track" and deliver by June in order to incorporate into the next Transportation Improvement Plan (TIP) update. The SPC ROP update Schedule was presented and a general discussion ensued regarding Stakeholder Meeting Planning.

Previous ROP Process Overview

11. Jacobs (Cunningham) provided a brief overview of the previous ROP general focus areas and projects initiated such as ARLE, Green Light Go, Adaptive Systems, DMS & CCTV, Surveillance Camera Motion Intelligence... etc.

12. Posting of travel times on DMS was another initiative instituted, while “Park-n-Rides” should be a consideration for Intermodal Connectivity.
13. The stakeholders were prompted to think about how to apply projects from the previous ROP to areas of need on the current ROP update during the breakout sessions.
14. SPC (Klevan) explained that planning for a Travel Demand Management (TDM) will soon be underway and will somehow be incorporated into the updated ROP. The goal for TDM is to be integrated into regional planning structures and will be supported in parallel with the ROP. Strategies will be identified and set for LRTP and included in the project development. FHWA previously suggested to pursue TDM in a more formal manner, and FHWA (Walston on phone) offered assistance.
15. SPC (Spano) gave an overview on SPC’s coordination with PennDOT, PTC, and local municipalities to train emergency responders on traffic incident management (TIMS). The City of Pittsburgh Fire Department is currently in the process of training through this program. Currently, there are 2 active regional TIM teams.
16. PTC (Leiss) explained PennTime TIMS training objectives, with next WebEx meeting to occur on February 4, 2019. PennSTART’s (Strategic Training And Research Track) proposed 110-acre facility at Penn State that will be used to train emergency responders on a high-speed simulation track; while researching Connected/Automated Vehicle (CAV) interaction (see www.PennSTART.org). Also, he explained the E-Learn on-line training is not available for PDH credits.

ROP Tools

17. Jacobs (Smith) explained the TSMO Tiering System thresholds and criteria, PennDOT One Map, and the 5 maps to be utilized by each District during the breakout session. The audience was prompted to analyze data on the maps during the breakout session to verify the validity of the information.
18. Port Authority of Allegheny County (Silbermann) asked if the load data provided by the Port Authority was integrated within any of the current maps. Jacobs (Smith) responded that the load data is integrated by route on the transit maps. It was not combined with AADT but this *“total person trips” approach will be recommended within the ROP for future analysis. The load data is also planned to be integrated into the prioritizing of projects within this ROP cycle.*

19. SPC (D’Andrea) mentioned that as the group begins the breakout session, to “keep in mind multi-modal solutions” as part of the discussions.

Breakout Session

A breakout session for each PennDOT District (10-0, 11-0, and 12-0) was conducted from approximately 11:00 AM to 12:30 PM.

See the attached link to an FTP site provided by Jacobs for Breakout Session maps with comments: <https://jftt.jacobs.com/download.aspx?ID=509aa42b-fa40-45c5-b1c5-436dee2fd7d6&RID=1c772f73-f263-4954-b81f-5ea552124b78>

These maps provide all stakeholders another chance to review and provide any additional comments to aid the ROP Team in confirming the regional issues & needs leading into the next round of meetings.

An itemized listing of regional issues and needs for each PennDOT District will be compiled from the breakout session input prior to the next meeting.

Wrap-Up / Next Steps

- TSMO Team to continue Development of Chapters 1 and 2
- TSMO Team to begin development of Chapter 3 & 4
- Next Steering Committee Meeting February 26, 2019 10:00 AM at SPC
- Upcoming Stakeholder Meetings (Round 1):
 - PennDOT District 12 – March 14 at 9:30 AM
 - PennDOT District 11 – March 14 at 1:30 AM
 - PennDOT District 10 – March 15 at 9:30 AM

The meeting ended at approximately 1:00 PM with informal discussions transpiring over lunch.
Action Items are shown as red, italicized text.



Meeting Minutes

Owner / Agreement	SPC / Regional Operations Plan (ROP) Update
Project	WO #1 - Development of the Southwestern Pennsylvania Commission Regional Operations Plan
Meeting Name	Steering Committee Meeting #2
Date / Time / Location	2-26-19 / 10:00 AM-12:00 PM / SPC Conference Center, Pittsburgh
Attendees	See Sign-in Sheet

The second project Steering Committee meeting commenced at 10:00 AM for the subject project. This project is the update of SPC’s Regional Operations Plan (ROP) last revised for FY 2014-15. The objective of the meeting was to review previous OneMap comments from the previous Stakeholder meeting.

The salient points of this meeting were as noted:

Welcome and Introductions

1. Following introductions, SPC (D’Andrea) gave a brief overview of the meeting’s goals indicating that a 3rd Steering Committee meeting will occur in May. A “save the date” will be forthcoming.
2. Ongoing Long-Range Transportation Planning (LRTP) meetings are ongoing with Districts. The LRTP will be completed by June 24 and incorporated into ROP update. **SPC hopes to have the list of Operations projects by March Stakeholder meetings.**

Progress Update

3. A brief review of progress and schedule was provided by Jacobs (Niemzcak). A 60% ROP document is planned to be complete by April.
4. Stakeholder Meetings Planned for mid-March (Cunningham). Team will be looking at different strategies and tactics that can be applied to each “issue” area.
5. Multimodal Tools / Strategies – PennDOT working with SEPTA on train arrivals and departures (Cavataio).



6. Amy (PAAC) asked if bus lanes and queue jump lanes could be considered as part of ROP. *It was agreed that these types of projects could be considered.*

Confirmation of Regional Issues and Needs

7. Reviewed what Team heard at last Stakeholder Break-out session.
8. Maps with written comments are available on SharePoint site.
9. Review of District 12-0 maps will be performed via a WebEx / Skype meeting since District 12-0 was unable to attend today's meeting. *SPC (D'Andrea) will coordinate.*
10. Priority areas will include traffic signals and ITS devices where applicable.
 - Break-out session review commenced at 10:30 AM

Wrap-Up / Next Steps

- Next Steering Committee Meetings to occur March 14 (Districts 11-0 and 12-0) and March 15 (District 10-0).

The meeting ended at approximately 12:00 PM with informal discussions transpiring over lunch. *Action Items are shown as red, italicized text.*

Agreement # / Name	E03575 / Maintenance and Traffic Open End / Work Order 11
Project	Development of the Regional Operations Plans for the Western RTMC Region (D1, D10, D11, and D12)
Meeting Name	Stakeholder Committee Meeting #1
Date / Time / Location	03-13-2019 / 1:00 PM-3:00 PM / PennDOT District 1-0
Attendees	See Sign-in Sheet

Meeting Purpose: Initial meeting of the project stakeholder committee.

Meeting Minutes:	Action Items:
1. Welcome and Introductions <ul style="list-style-type: none"> Greg Maser welcomed everyone with some opening remarks and led a round of introductions. 	
2. TSMO Overview <ul style="list-style-type: none"> Frank Cavataio provided an overview of TSMO, including its meaning and importance to PennDOT, updates on progress, and future plans. 	
3. ROP Process Overview <ul style="list-style-type: none"> Steve Cunningham provided an overview of the ROP process including background, strategy, outline, stakeholder involvement, and schedule. Steve noted that the Central RTMC ROP is available on the PennDOT TSMO website to reference as an example of what the final product of this process might look like. Steve noted that the PowerPoint slides from this presentation will be distributed to the group with the meeting minutes. 	<ul style="list-style-type: none"> ➤ PowerPoint presentation provided as attachment to this document.
4. Previous ROP Overview <ul style="list-style-type: none"> Steve discussed the previous Northwest ROP, completed in 2007, including the regional needs and a brief summary of the status of the previously recommended projects. 	
5. ROP Tools <ul style="list-style-type: none"> Adam Smith discussed the Roadway Tiering System and some of the top corridors in the Northwest Region. Pierce Sube gave a brief overview and demonstration of the PennDOT One Map tool. 	<ul style="list-style-type: none"> ➤ TSMO One Map registration instructions included with this document.
6. Breakout Sessions <ul style="list-style-type: none"> Breakout sessions were held for each of the four (4) planning organizations within the District. Maps were displayed showing congestion, crashes, roadway tiering, and planned events. 	

<ul style="list-style-type: none"> • Comments from the sessions can be found on the attached maps. 	
<p>7. Wrap Up/Next Steps</p> <ul style="list-style-type: none"> • Jim Foringer provided some closing remarks including discussion of recent impacts on alternate routes with more proactive interstate truck restrictions during winter events. • The next Stakeholder Meeting is scheduled for May 29, again at District 1-0. • Steering Meeting (conference call/webex) will be held in early May. 	<ul style="list-style-type: none"> ➤ Impact of truck restrictions and possible projects to improve alternate routes will be included as one of the regional issues in the ROP process. ➤ Jacobs will reach out to steering committee for availability as well as send out the invite for the stakeholder meeting.



Meeting Minutes

Owner / Agreement	SPC / Regional Operations Plan (ROP) Update
Project	WO #1 - Development of the Southwestern Pennsylvania Commission Regional Operations Plan
Meeting Name	Stakeholder Committee Meeting #2
Date / Time / Location	3-14-19 / 1:30 PM-3:30 PM / PennDOT D11-0, Bridgeville
Attendees	See Sign-in Sheet

A project Stakeholder Committee meeting commenced at approximately 1:40 PM for the subject project. This project is the update of SPC’s Regional Operations Plan (ROP) last revised for FY 2014-15. The objective of the meeting was to discuss potential TSMO solutions to the operations issues and needs identified at the first ROP stakeholder meeting. The salient points of this meeting were as noted:

Welcome and Introductions

1. Following introductions, SPC (D’Andrea) gave a brief overview of the meeting’s goals and objectives for D11-0 Counties Allegheny, Beaver and Lawrence.
2. Jacobs (Cunningham) outlined the meetings goals, noting that TSMO process is “data driven”.

Progress Update

3. The Pennoni Team led by Jacobs (Cunningham) described those TSMO tools and strategies from the Guidebook that can be applied to those “issues and needs” identified during the previous stakeholder meeting.
4. Jacobs (Cunningham) reviewed the project schedule and noted that *the Stakeholder group would reconvene in approximately 2 months.*

Tools/Strategies in TSMO Guidebook

5. Jacobs (Cunningham) outlined the ROP process using PennDOT’s TSMO Mapping Tool and tools and strategies outlined in the TSMO Guidebook.
6. It was noted that a local champion for TIM Teams is critical for successful engagement and results.



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7. One strategy, Integrated Corridor Management (ICM), is currently being utilized as a pilot project for parallel facilities along I-76 (www.Transform76.com).
8. PennDOT Central Office noted that smaller corridors would be considered for ICM as a pilot.

Multimodal Tools / Strategies

9. Jacobs (Smith) provided brief overview of Transit, Active Transportation and Freight TSMO strategies.
10. One strategy that might be applicable as a multimodal tool is the use of “flex lanes” (formerly “hard shoulder running”) for PAAC.
11. Another potential tool mentioned were “Bike-n-Ride” lots and DMS messaging. Would this sub-region of SPC benefit from “e-bike” deployment?

Regional Operations Issues and Needs

12. PennDOT Central Office (Sube, Cavataio) provided a brief “One Map” demonstration. *Instructions for TSMO data access will be provided with Meeting Minutes.* PennDOT noted that you cannot change information already there.
13. SPC (D’Andrea) reiterated that the ROP update document would be a “companion document” to the Long-Range Transportation Plan (LRTP).

BREAK-OUT DISCUSSIONS (2 Rooms)

- Breakout sessions were used to review maps of the operations issues and needs identified at the previous stakeholder meeting and confirmed at the recent steering meeting. Maps were developed for Beaver/Lawrence Counties, Allegheny County, and for Downtown Pittsburgh and its vicinity.
- Stakeholders discussed which TSMO-related solutions should be applied to each identified area, developing rough sketches of projects which could potentially be included in the ROP document.
- Potential ROP projects included Transit Signal Priority on key corridors, ICM strategies on the Parkways, Smart Parking systems at major Park-n-Ride lots, a number of bike

network projects, and a variety of studies, generally focusing on multimodal improvements.

Wrap-Up / Next Steps (D'Andrea)

- Ongoing Development of ROP document.
- ROP Project Development.
- Next Steering Committee Meeting to occur May 8, 2019.
- Next Stakeholder Committee Meetings to occur in late May.

The meeting ended at approximately 3:30 PM.

Action Items are shown as red, italicized text.



Meeting Minutes

Owner / Agreement	SPC / Regional Operations Plan (ROP) Update
Project	WO #1 - Development of the Southwestern Pennsylvania Commission Regional Operations Plan
Meeting Name	Stakeholder Committee Meeting #2
Date / Time / Location	3-14-19 / 9:30 AM-11:30 AM / PennDOT D12-0, Uniontown
Attendees	See Sign-in Sheet

A project Stakeholder Committee meeting commenced at 9:35 AM for the subject project. This project is the update of SPC’s Regional Operations Plan (ROP) last revised for FY 2014-15. The objective of the meeting was to discuss potential TSMO solutions to the operations issues and needs identified at the first ROP stakeholder meeting. The salient points of this meeting were as noted:

Welcome and Introductions

1. Following introductions, SPC (D’Andrea) gave a brief overview of the meeting’s goals and objectives.
2. A brief overview of the District was provided by Joe Szczur, PennDOT 12-0 District Executive. I-70 modernization has been the major focus given its 57 miles, 113 structures, 32 interchanges and \$521M spent to date. Approximately \$350M in projects is anticipated thru 2024. Also, Westmoreland County is the Commonwealth’s largest County behind Allegheny. Mr. Szczur is proud of the work the District is accomplishing with its “smart spine” arterial upgrades including: US 30, US 19, US 119 and US 22. The District is “all in” on use of technology to maximize efficiency, safety, etc.
3. Jacobs (Cunningham) outlined the meetings goals, noting that TSMO process is “data driven”.

Progress Update

4. The Pennoni Team led by Jacobs (Cunningham) described those TSMO tools and strategies from the Guidebook that can be applied to those “issues and needs” identified during the previous stakeholder meeting.
5. Jacobs (Cunningham) reviewed the project schedule and noted that *the Stakeholder group would reconvene in approximately 2 months.*



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Tools/Strategies in TSMO Guidebook

6. Jacobs (Cunningham) outlined the ROP process using PennDOT’s TSMO Mapping Tool and tools and strategies outlined in the TSMO Guidebook.
7. One strategy, Integrated Corridor Management (ICM), is currently being utilized as a pilot project for parallel facilities along I-76 (www.Transform76.com).
8. PennDOT Central Office (Gault) noted that smaller corridors would be considered for ICM as a pilot.
9. PennDOT 12-0 (Szczur) indicated that I-70 is the key E/W corridor in District and incident management is critical. There are not many “good” Detour routes for the facility and “better connections” are necessary.
10. Pennoni (Castellone) noted that future designs should consider Connected Automated Vehicles (CAV) lane width reduction requirement; i.e., 12-foot standard may reduce to 11 or even 10-feet.

Multimodal Tools / Strategies

11. Jacobs (Smith) provided brief overview of Transit, Active Transportation and Freight TSMO strategies.
12. PennDOT 12-0 (Szczur) noted that I-70 is seeing much more truck traffic due to higher tolls on Penna Turnpike (I-76).

Regional Operations Issues and Needs

13. Pennoni (Castellone) mentioned consideration of future transportation infrastructure and communications (DSRC, 5G?) to support Connected and Automated Vehicles. PennDOT Central Office (Gault) noted ATC controller being rolled-out. Need to better prepare for “retiming” versus “adaptive” to achieve better signal operation and travel efficiencies.
14. District 12-0 (Dean) noted that getting a TIM team all in one room at the same time has been a challenge in the past; especially west of Washington. An Incident Management Plan (IMP) has been developed for the Southern Beltway I/C with I-79.
15. Also, long-wall mining will be back by 2024; perhaps requiring off-site improvements (\$1M planned) if needed during an incident (Szczur).

BREAK-OUT DISCUSSIONS

- PennDOT Central Office (Sube, Cavataio) provided a brief “One Map” demonstration. *Instructions for TSMO data access will be provided with Meeting Minutes.* PennDOT noted that you cannot change information already there.
- Breakout sessions were used to review maps of the operations issues and needs identified at the previous stakeholder meeting and confirmed at the recent steering meeting. Maps were developed for each of the four D12 counties as well as an overall District map.
- Stakeholders discussed which TSMO-related solutions should be applied to each identified area, developing rough sketches of potential projects which could be included in the ROP document.
- Potential ROP projects included corridor ITS deployments, traffic signal improvements, a TIM team, Integrated Corridor Management of I-79 and parallel corridors, and Dynamic Curve Warning systems.

Wrap-Up / Next Steps

- Ongoing Development of ROP document.
- ROP Project Development.
- Next Steering Committee Meeting to occur May 8, 2019.
- Next Stakeholder Committee Meetings to occur in late May.

The meeting ended at approximately 11:30 AM.

Action Items are shown as red, italicized text.



Meeting Minutes

Owner / Agreement	SPC / Regional Operations Plan (ROP) Update
Project	WO #1 - Development of the Southwestern Pennsylvania Commission Regional Operations Plan
Meeting Name	Stakeholder Committee Meeting #2
Date / Time / Location	3-15-19 / 9:30 AM-11:30 AM / PennDOT D10-0, Indiana
Attendees	See Sign-in Sheet

A project Stakeholder Committee meeting commenced at approximately 9:30 AM for the subject project. This project is the update of SPC’s Regional Operations Plan (ROP) last revised for FY 2014-15. The objective of the meeting was to discuss potential TSMO solutions to the operations issues and needs identified at the first ROP stakeholder meeting. The salient points of this meeting were as noted:

Welcome and Introductions

1. Following introductions, SPC (D’Andrea) gave a brief overview of the meeting’s goals and objectives for D10-0 Counties Butler, Armstrong, and Indiana. .
2. Jacobs (Cunningham) outlined the meetings goals, noting that TSMO process is “data driven”.

Progress Update

3. The Pennoni Team led by Jacobs (Cunningham) described those TSMO tools and strategies from the Guidebook that can be applied to those “issues and needs” identified during the previous stakeholder meeting.
4. Jacobs (Cunningham) reviewed the project schedule and noted that the *Stakeholder group would reconvene in approximately 2 months.*

Tools/Strategies in TSMO Guidebook

5. Jacobs (Cunningham) outlined the ROP process using PennDOT’s TSMO Mapping Tool and tools and strategies outlined in the TSMO Guidebook.



6. One strategy, Integrated Corridor Management (ICM), is currently being utilized as a pilot project for parallel facilities along I-76 (www.Transform76.com).
7. Jacobs (Cunningham) noted that smaller corridors requiring traffic signal enhancements could also be considered for ICM as a pilot project.

Multimodal Tools / Strategies

8. Jacobs (Smith) provided brief overview of Transit, Active Transportation and Freight TSMO strategies; including a summary of the previous Stakeholder meeting.

Regional Operations Issues and Needs

9. PennDOT Central Office (Sube, Cavataio) provided a brief “One Map” demonstration. *Instructions for TSMO data access will be provided with Meeting Minutes.* PennDOT noted that you cannot change information already there.

BREAK-OUT DISCUSSIONS

- Breakout sessions were used to review maps of the operations issues and needs identified at the previous stakeholder meeting and confirmed at the recent steering meeting.
- Stakeholders discussed which TSMO-related solutions should be applied to each identified area, developing rough sketches of projects which could potentially be included in the ROP document.
- Potential ROP projects included corridor ITS deployments, traffic signal improvements, a TIM team, Integrated Corridor Management of the I-79 and US 19 parallel corridors, and continued fiber deployment.

Wrap-Up / Next Steps (D’Andrea)

- Ongoing Development of ROP document.
- ROP Project Development.
- Next Steering Committee Meeting to occur May 8, 2019.
- Next Stakeholder Committee Meetings to occur in late May.

The meeting ended at approximately 11:00 AM

Action Items are shown as red, italicized text.

Agreement # / Name	E03575 / Maintenance and Traffic Open End / Work Order 11
Project	Development of the Regional Operations Plans for the Western RTMC Region (D1, D10, D11, and D12)
Meeting Name	Stakeholder Committee Meeting #1
Date / Time / Location	04-30-2019 / 1:00 PM-3:00 PM / Skype
Attendees	Frank Cavataio (PennDOT BOMO) Courtney Lyle, Greg Maser, and Ed Orzechowski (PennDOT D1) Adam Marshall and Dave Tomaswick (PennDOT D10) Frank Cippel and Todd Kravits (PennDOT D11) Bryan Walker and Emily Zarichnak (PennDOT D12) Doug Barch (Western RTMC) Steve Cunningham, Stan Niemczak, and Adam Smith (Jacobs)

Meeting Purpose: Initial meeting of the project steering committee. Confirmation of Regional Operations Issues and Needs.

Meeting Minutes:	Action Items:
1. Welcome and Introductions <ul style="list-style-type: none"> Adam Smith welcomed everyone with some opening remarks and led a round of introductions. 	
2. Role of Steering Committee <ul style="list-style-type: none"> Steve Cunningham discussed the role of the Steering Committee in the ROP process and provided an overview of goals for each of the planned Steering Meetings Frank Cavataio added that the goal for the future is for the ROP to be the "gateway to funding for TSMO" projects. 	
3. Progress Update <ul style="list-style-type: none"> Steve provided an update on work completed since the Western ROP kickoff meeting, as well as the schedule and coordination with the SPC ROP process. 	
4. Stakeholder Meeting Planning <ul style="list-style-type: none"> Steve and Adam discussed the agenda and materials to be presented at the upcoming Stakeholder Meeting, including the TSMO Guidebook and multimodal tools and strategies, as well as the breakout session map template. 	
5. Confirmation of Regional Issues and Needs <ul style="list-style-type: none"> Adam led the group through the series of congestion, crash, and special event maps for each of the four planning partner regions, discussing stakeholder input and confirming operations issues and needs to move forward with in the ROP process. 	<ul style="list-style-type: none"> ➤ Jacobs will develop the Regional Operations Issues and Needs maps based on the Steering Committee discussions.

<ul style="list-style-type: none"> This information will be translated into Regional Operations Issues and Needs maps to be used in the breakout sessions at the upcoming Stakeholder Meeting. These maps will include existing ITS devices and traffic signals, and callouts for each of the confirmed issues and needs. The breakout sessions will be used to discuss which tools/strategies can be best applied to each of these locations and corrid 	
<p>6. Wrap Up/Next Steps</p> <ul style="list-style-type: none"> Adam and Frank provided some closing remarks on next steps, including development of the issues and needs maps, the upcoming SPC Steering Meeting on May 8, and development of the ROP document. The next Stakeholder Meeting is scheduled for May 29, again at District 1-0. The next Steering Meeting (conference call/webex) is anticipated for July. 	



Meeting Minutes

Owner / Agreement	SPC / Regional Operations Plan (ROP) Update
Project	WO #1 - Development of the Southwestern Pennsylvania Commission Regional Operations Plan (ROP) Update
Meeting Name	Steering Committee Meeting #3
Date / Time / Location	5-8-19 /10:00 AM-12:00 PM @ SPC, 5-9-19/9:00 AM- 10:00 AM Telecom
Attendees	See Sign-in Sheet

The third ROP Steering Committee meeting commenced at 10:00 AM on Wednesday, 5/8/19. This was followed by a 9:00 AM teleconference with D12-0 on Thursday, 5/9/19. This project is the update of SPC’s Regional Operations Plan (ROP) last revised for FY 2014-15. The objective of the meeting was to review proposed projects developed from the previous Stakeholder meetings. The salient points of these meetings were noted:

Wednesday, May 8

Welcome and Introductions

1. Following introductions, SPC (D’Andrea) gave a brief overview of the meeting’s goals indicating that a final Steering Committee meeting will occur in June. A “save the date” will be forthcoming. A 60% Draft ROP document is in Steering Committee hands for review and comment. *Dom requested initial comments by May 10, 2019.*
2. SPC handed out a list of projects developed from Long Range Planning meetings. The list that was handed out was pared down from the overall list to provide only Safety & Operations projects relevant to the ROP. SPC (D’Andrea) noted that specific projects not identified in some of the counties are captured in “set-aside” line items.

Progress Update

3. A brief review of progress and schedule was provided by Jacobs (Smith).
4. PennDOT 11-0 (Kravits) mentioned need for Truck Parking in case of incidents. It was mentioned that PTC has an RFP for such a study from Carlisle to the east along I-76 and along the Turnpike’s NE Extension.

Next Steps

5. *Prioritization discussion will need to occur for the parallel western region ROP which includes PennDOT D1-0.* This information needs to be reflected in SPC’s ROP update per D’Andrea. All stakeholders will be included in the final ROP document per Jacobs (Smith).



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6. PAAC (Masciotra) questioned “Mission” of not adding capacity. Does this include Transit Capacity? Jacobs (Smith) noted that this referred to additional travel lanes. PAAC suggested that ROP Strategies should include Transit Queue Jumping, strategically place transit lanes and smaller infrastructure projects.

Break-out

7. Reviewed what Team heard at last Stakeholder Break-out sessions.

PennDOT D10-0

- Recommended extending D11-0 SR 28 ITS Study to Kittanning
- Consider adding “Butler By-Pass/ Kittanning Bypass” ITS Study
- Include above (and other noted) Study’s to “Studies/Initiatives” block on Map
- Add Signal Removals per SPC’s SINC-UP program?

PennDOT D11-0

- PennDOT (Kravits) recommended a study to improve coordination between the WRTMC and the PA Turnpike’s Traffic Operations Center, particularly for the I-76/I-376 loop, including incident management, construction detours, communications (fiber), device sharing, traveler information, and weather operations Todd recommended including an upgrade of the WRTMC as part of the ROP.
- PAAC (Masciotra) recommended removing some of the recommended studies for transit expansion and bike/ped access improvements for the light rail system as these will be covered in the Port Authority’s upcoming Long-Range Planning and First/Last Mile Planning efforts.
- Discussed inclusion of District Ownership of the McKnight Road signal corridor as part of the Parkway North ICM project.

The meeting ended at approximately 12:00 PM Wednesday, following lunch.

PennDOT District 12-0:

Thursday, May 9 TELECOM

- Adam Smith, Stan Niemczak (Jacobs)
- Anthony Castellone, Jay Goldstein (Pennoni)
- Domenic D’Andrea (SPC)
- Bryan Walker, Emily Zarichnak (PennDOT D12)
- Frank Cavataio (PennDOT BOMO)

Team to provide comments on first four chapters of ROP document by next Friday. Final D12 ROP Stakeholders meeting May 30th

Quick overview of possible project solutions brought up thus far:

- Adaptive Signal Systems
- Timing improvements
- Transit Signal Priority
- Possible Pilot Project for PennDOT ownership of signals (have yet to identify a specific corridor)

There is a region wide need for truck parking analysis which has also been mentioned by District 1 and will likely be a region-specific effort. (western region as a whole)

There is a need for a comprehensive analysis of location specific needs for ITS devices. i.e. gaps in CCTV/DMS.

Prioritization for projects will be discussed at the region level prior to finalizing the ROP document.

General Discussion Points:

PennDOT (Walker) questioned whether detour improvements on specific corridors could be included as part of the ROP? Jacobs (Niemzak) noted that geometric solutions can be identified as part of the integrated corridors approach and certainly any ITS devices to provide alerts during incident management can be included but specific geometric improvements might be added costs to this type of project.

PennDOT Central Office (Ryan McNear) can provide more data specific info at PennDOT Central Office on detours and incident management issues.

Jacobs (Smith) mentioned the importance of the prioritization of projects in each “category” to make the ROP document as useful as possible. This will be discussed in a more detailed manner as the Team moves closer to finalizing the ROP document.

SPC (D’Andrea) does not want a numerical priority identified to specific projects as part of the ROP document.

Jacobs (Niemzak) noted that “Prioritization” can be identified by benefits of the project that should be highlighted in the document. A comprehensive and cognitive approach will need to be taken when getting funding for specific projects.

MAP Session:

Jacobs (Smith) noted specific project solutions on District 12’s map with input from PennDOT (Walker). “Parallel Corridor” projects were mentioned to improve operations on corridors parallel to I-79. Other project modifications:

- For I-79 ICM project north of Washington, District ownership of the US 19 signals was added.
- Added US 40 Road Safety Audit (Summit Inn to Youghioghney River) to list of studies.
- Revised US 119 Signal Improvements project scope to the portion of US 119 south of Connellsville due to anticipated interchange project replacing signals north of the city.

Jacobs (Smith) to coordinate a current transit project with Westmoreland Transit Authority and an identified possible ROP project

Event management studies for Key Bank Pavilion and Steelers Training Camp suggested, though SPC (D'Andrea) questions who holds responsibility for following through with the project? Local Municipalities, specific organization, PennDOT District? *Jacobs (Smith) to coordinate with relative stakeholders.*

The meeting ended at approximately 10AM. *Action Items are shown as red, italicized text.*

Agreement # / Name	E03575 / Maintenance and Traffic Open End / Work Order 11
Project	Development of the Regional Operations Plans for the Western RTMC Region (D1, D10, D11, and D12)
Meeting Name	Stakeholder Committee Meeting #2
Date / Time / Location	05-29-2019 / 1:00 PM-3:00 PM / PennDOT District 1-0
Attendees	See Sign-in Sheet

Meeting Purpose: Second meeting of the project stakeholder committee.

Meeting Minutes:	Action Items:
<p>1. Welcome and Introductions</p> <ul style="list-style-type: none"> Steve Cunningham welcomed everyone with some opening remarks and led a round of introductions. 	
<p>2. Progress Update</p> <ul style="list-style-type: none"> Adam Smith provided a progress update, including discussion of schedule and of the corresponding SPC-led ROP process. 	
<p>3. Tools/Strategies in TSMO Guidebook</p> <ul style="list-style-type: none"> Steve Cunningham provided an overview of tools and strategies provided in the TSMO Guidebook, noting how they may be applied to the operations issues and needs to develop projects for the ROP. While discussing the TIM Team strategy, Frank Cippel noted the success of a recent Tunnel TIM Team training with Pittsburgh emergency responders. While discussing Queue Warning and Variable Speed Limit tools, Doug Barch noted that these modules have been added to OpenATMS, so can be smoothly integrated into RTMC operations. While discussing Freight Management tools, it was discussed that elimination of PennDOT's rest areas in the region is currently being discussed. 	
<p>4. Regional Operations Issues and Needs</p> <ul style="list-style-type: none"> Adam provided a brief summary of the various regional issues and needs determined through the previous stakeholder meeting process. Regional Issues and Needs include traffic signal improvements on major arterials, ICM on I-80 and parallel corridors/detour routes, ITS devices on major routes, and crash prevention ITS devices at problem locations. 	

Meeting Minutes:	Action Items:
<p>5. Breakout Sessions</p> <ul style="list-style-type: none"> • Breakout sessions were held for each of the four (4) planning organizations within the District. Maps were displayed showing the confirmed issues and needs locations. • Comments from the sessions can be found on the attached maps. 	
<p>6. Wrap Up/Next Steps</p> <ul style="list-style-type: none"> • The next Stakeholder Meeting will be scheduled for August. • The SPC ROP is anticipated to be finalized in June/July and will be integrated into the overall Western RTMC ROP document. 	<ul style="list-style-type: none"> ➤ Jacobs will reach out to stakeholder committee for availability for August meeting.



Meeting Minutes

Owner / Agreement	SPC / Regional Operations Plan (ROP) Update
Project	WO #1 - Development of the Southwestern Pennsylvania Commission Regional Operations Plan
Meeting Name	Stakeholder Committee Meeting #3
Date / Time / Location	5-30-19 / 1:30 PM-3:00 PM / PennDOT D11-0, Bridgeville
Attendees	See Sign-in Sheet

A project Stakeholder Committee meeting commenced at 1:37 PM for the subject project. This project is the update of SPC's Regional Operations Plan (ROP) last revised for FY 2014-15. The objective of the meeting was to discuss list of potential TSMO improvement projects discussed at second stakeholder meeting, prioritization of project and ROP roles, including responsibility of stakeholders. The salient points of this meeting were as noted:

Welcome and Introductions

1. Following introductions, SPC (D'Andrea) gave an overview of the meeting's goals and objectives as well as a brief summary of the ROP Process which is in the "home stretch".

Progress Update

2. Jacobs (Smith) provided a ROP study progress update and schedule review. The Pennoni/Jacobs team is currently working on the final two chapters of the ROP.
3. Today's meeting is to confirm / receive feedback on projects developed during previous Stakeholder Meetings.

Summary of Potential Improvement Projects

4. Jacobs (Cunningham) outlined the ROP process' seven, higher-level categories used to address operational and safety deficiencies:
 1. Traffic Signals
 2. Traffic Incident Management
 3. Traveler Information
 4. Operational Teamwork/Institutional Coordination
 5. Multimodal Connectivity
 6. Freeway and Arterial Operations

7. Freight Management

5. Today's meeting will primarily be utilized to confirm and prioritize those previously identified projects.
6. Regarding Freight Management, there is a substantial need for Truck Parking due to driver travel time restrictions. Two (2) studies have been identified.
7. Future Regional Studies should look at "person trips" – how many people are moving within the network, while "missing bike connections" should focus on the "last mile".
8. Traffic Incident Management initiatives (TIM) have been successful in the District.
9. An ITS Regional Gap Study is likely warranted to evaluate the need for future, critical DMS, CCTV, HAR and/or RWIS.

Long-Range Planning Projects

10. SPC (D'Andrea) noted that discussions are already taking place with PennDOT, and in each County, on those long-range (LRTP) projects presented on hand-out; the handout includes only the Operations and Safety related projects from the LRP discussions. These projects will be incorporated in to the ROP. LRTP to adopted in late June.
11. Most ROP projects are "shorter-term" – 4-year time horizon.

BREAK-OUT DISCUSSIONS

Breakout session instructions provided by Jacobs (Smith). Stakeholders were to review maps of the operations issues and needs identified at the previous stakeholder meeting and prioritize projects utilizing stickers. Projects discussed included:

- Beaver / Lawrence County – *One Map missing DMS? Turnpike is a District Stakeholder, and this should be included.*
- SR 65 Signal Upgrades – Consider PennDOT ownership since ADT > 25K. Also, arterial ITS considerations.
- There is a need for Truck Parking along I-376 corridor
- Veteran's Bridge Junction Control

- SR 8 – Arterial ITS considerations
- Smart Parking: South Hills Village, Ross Park ‘n Ride, Wilkinsburg, Carnegie (PAAC)
- Consider Freeway Service Patrols on SR 28
- Queue Detection built into ATMS (PennDOT / Barch)
- Variable Speed Limits: SR 28, I-279, I-376, I-79
- Existing RWIS: Penn Hills, Crafton. Expand?
- Traffic Signal Improvements / Coordination required along Route 8 Corridor/Wilkinsburg due to heavy pedestrian conflicts
- District will need to address control, staffing for those PennDOT-owned signals outside the City limits
- PennDOT considering rehabilitating the RTMC; likely removing the video wall (Kravits)
- Birmingham Bridge Study - How to improve currently unprotected bike lanes adjacent to high speed vehicular lanes.
- *The Wabash Tunnel should be included in the South Hills Tail Network Study* (Purcell)
- North Portal of Liberty Bridge at McCardle is the District’s highest Crash location (Kravits). Also, need to eliminate weaving at Ft. Pitt/Ft Duquesne bridge (best would be to eliminate outbound ramp from downtown).
- *Add to Studies: Ft Pitt / West End / CBD Traffic Operations (SPC?)*

Wrap-Up / Next Steps (D’Andrea)

- Ongoing Development of ROP document.
- Final Steering Committee Meeting to occur late June.

The meeting ended at approximately 3:00 PM.

Action Items are shown as red, italicized text.



Meeting Minutes

Owner / Agreement	SPC / Regional Operations Plan (ROP) Update
Project	WO #1 - Development of the Southwestern Pennsylvania Commission Regional Operations Plan
Meeting Name	Stakeholder Committee Meeting #3
Date / Time / Location	5-30-19 / 9:30 AM-11:00 AM / PennDOT D12-0, Uniontown
Attendees	See Sign-in Sheet

A project Stakeholder Committee meeting commenced at 9:38 AM for the subject project. This project is the update of SPC’s Regional Operations Plan (ROP) last revised for FY 2014-15. The objective of the meeting was to discuss list of potential TSMO improvement projects discussed at second stakeholder meeting, prioritization of project and ROP roles, including responsibility of stakeholders. The salient points of this meeting were as noted:

Welcome and Introductions

1. Following introductions, SPC (D’Andrea) gave an overview of the meeting’s goals and objectives as well as a brief summary of the ROP Process.

Progress Update

2. Jacobs (Smith) provided a ROP study progress update and schedule review. The Pennoni/Jacobs team is currently working on the final two chapters of the ROP.
3. It was noted that this ROP is the first to follow the PennDOT TSMO process.

Summary of Potential Improvement Projects

4. Jacobs (Cunningham) outlined the ROP process’ seven categories used to address operational and safety deficiencies:
 1. Traffic Signals
 2. Traffic Incident Management
 3. Traveler Information
 4. Operational Teamwork/Institutional Coordination
 5. Multimodal Connectivity
 6. Freeway and Arterial Operations
 7. Freight Management



5. Today's meeting will primarily be utilized to confirm and prioritize those previously identified projects.
6. Regarding Freight Management, there is a substantial need for Truck Parking due to driver travel time restrictions.
7. Future Regional Studies should look at "person trips" – how many people are moving within the network.

Long-Range Planning Projects

8. SPC (D'Andrea) noted that discussions are already taking place with PennDOT on those long-range (LRTP) projects presented on hand-out; the handout includes only the Operations and Safety related projects from the LRP discussions. These projects will be incorporated into the ROP.
9. Most ROP projects are "shorter-term" – 4-year time horizon.

BREAK-OUT DISCUSSIONS

Breakout session instructions provided by Jacobs (Smith). Stakeholders were to review maps of the operations issues and needs identified at the previous stakeholder meeting and prioritize projects utilizing stickers. Some notable projects discussed include:

- Salem Township / PennDOT Lead – 2 Signals, future PennDOT ownership?
- Study Initiatives: Regional / SPC Lead, ITS Gap Study / PennDOT, TIM Team / All, Steelers Summer Camp – OUT, Key Bank Pavilion / Owner
- I-79 ICM from Washington to Allegheny County Line – PennDOT Lead
- US 19 Corridor – Future PennDOT Ownership, Command/Control w/ RTMC
- I-79/US19 Waynesburg I/C, CCTV, DMS (future Type A's) - PennDOT Lead
- I-70/US 40 Detour Routing – PennDOT Lead
- Queue Warning systems per ICM: I-70/Jefferson, Southpointe/I-79, McClelland/I-79
- *ADD RWIS' – Interstates, SR 30, US 40 (4 existing)*
- US 40 Dynamic Curve Warning – SPC Road Safety Audit
- US 30 Dynamic Curve Warning
- US 119 Traffic Signal Improvements south of Connellsville -PennDOT Lead
- Greensburg Traffic Signal Improvements - Per SPC Study, includes 1 Roundabout
- US 119 / US 30 Queue Detection System?

Wrap-Up / Next Steps (D'Andrea)

- Ongoing Development of ROP document.
- Final Steering Committee Meeting to occur late June.

The meeting ended at approximately 11:00 AM.

Action Items are shown as red, italicized text.



Meeting Minutes

Owner / Agreement	SPC / Regional Operations Plan (ROP) Update
Project	WO #1 - Development of the Southwestern Pennsylvania Commission Regional Operations Plan
Meeting Name	Stakeholder Committee Meeting #3
Date / Time / Location	5-31-19 / 9:00 AM-11:00 AM / PennDOT D10-0, Indiana
Attendees	See Sign-in Sheet

A project Stakeholder Committee meeting commenced at 9:35 AM for the subject project. This project is the update of SPC’s Regional Operations Plan (ROP) last revised for FY 2014-15. The objective of the meeting was to discuss list of potential TSMO improvement projects discussed at second stakeholder meeting, prioritization of project and ROP roles, including responsibility of stakeholders. The salient points of this meeting were as noted:

Welcome and Introductions

1. Following introductions, SPC (D’Andrea) gave an overview of the meeting’s goals and objectives as well as a brief summary of the ROP Process. Process is in the “homestretch” and will populate the next 4 years of the TIP.

Progress Update

2. Jacobs (Smith) provided a ROP study progress update and schedule review. The Pennoni/Jacobs team is currently working on the final two chapters of the ROP and will finalize over the next month.

Summary of Potential Improvement Projects

3. Jacobs (Cunningham) outlined the ROP process’ seven categories used to address operational and safety deficiencies:
 1. Traffic Signals
 2. Traffic Incident Management
 3. Traveler Information
 4. Operational Teamwork/Institutional Coordination
 5. Multimodal Connectivity
 6. Freeway and Arterial Operations
 7. Freight Management



PENNONI ASSOCIATES INC.
CONSULTING ENGINEERS

4. Today's meeting will primarily be utilized to confirm and prioritize those previously identified projects.
5. Regarding Freight Management, there is a substantial need for Truck Parking due to driver travel time restrictions.
6. Future Regional Studies should look at "person trips" – how many people are moving within the network.
7. The future expansion of a system-wide "communications network" will dictate the success of those technological advance projects.

Long-Range Planning Projects

8. SPC (D'Andrea) noted that discussions are already taking place with PennDOT on those long-range (LRTP) projects presented on hand-out; the handout includes only the Operations and Safety related projects from the LRP discussions. These projects will be incorporated into the ROP. The LRTP will be adopted that SPC's Commission Board meeting in June.
9. Most ROP projects are "shorter-term", i.e., 4-year time horizon.

BREAK-OUT DISCUSSIONS

- Breakout session instructions provided by Jacobs (Smith). Stakeholders were to review maps of the operations issues and needs identified at the previous stakeholder meeting and prioritize projects utilizing stickers. Project "recap" and discussions included:
 - Need for Truck Parking, Weigh Station in Cranberry
 - SR 422 Corridor ITS (CCTV/DMS)
 - SR 356 Adaptive project (planned)
 - Bridge De-icing System (SR 28 over Buffalo Creek and US 422 over Allegheny River)
 - RWIS expansion needs

Wrap-Up / Next Steps (D'Andrea)

- Ongoing Development of ROP document.
- Final Steering Committee Meeting to occur late June.

The meeting ended at approximately 10:00 AM.

Action Items are shown as red, italicized text.



Meeting Minutes

Owner / Agreement	SPC / Regional Operations Plan (ROP) Update
Project	WO #1 - Development of the Southwestern Pennsylvania Commission Regional Operations Plan (ROP) Update
Meeting Name	Steering Committee Meeting #4
Date / Time / Location	6-26-19 / 10:00 AM-12:00 PM @ SPC
Attendees	See Sign-in Sheet

The final ROP Steering Committee meeting commenced at 10:00 AM. This project is the update of SPC’s Regional Operations Plan (ROP) last revised for FY 2014-15. The objective of the meeting was to review the final DRAFT ROP Update document. The salient points of this meeting are noted below:

Welcome and Introductions

1. Following introductions, SPC (D’Andrea) gave a brief overview of the meeting’s goals, specifically
 - Summarize the 100% ROP draft,
 - Finalize projects, studies, and initiatives,
 - Review priorities, and
 - Discuss next steps for the ROP.

Progress Update

2. Jacobs (Smith) discussed inclusion of LRTP summary in ROP document.
3. SPC (D’Andrea) noted that the LRTP was adopted Monday and final edits are currently underway. SPC (Waple) said that the final version should be ready by next week.
4. ROP Document Review per Jacobs (Smith):
 - 60% draft covered chapter 1-4
 - 100% draft add chapters 5 & 6
 - Chapter 5- strategies and projects
 - Strategies and TSMO Matrix



- Recommended projects
 - Recommended studies and initiatives
 - Long Range Planning Projects
 - Chapter 6 – ROP coordination and maintenance
 - Continue to update every 4 years
 - Discussion of connected autonomous vehicles
 - Incorporate issues and needs within PennDOT Western RTMC ROP
5. Review of Projects, Studies, and Initiatives (Jacobs) included,
- 44 projects
 - High priority = 15
 - Other recommended = 29
 - 19 studies and initiatives
 - High priority = 2
 - Other recommended = 17

Priority was established during previous stakeholder meeting and break-out sessions.

Projects:

- TIM.02 – PA-28 Freeway Service Patrols
 - SPC (Spano) noted the Freeway Service Patrol contract is up for renewal, so expansion of service could be coordinated with that.
- TIM.04 – I-79 Curve Warning
 - District 10 noted that low-cost improvements were installed approx. 1 year ago. Recent crash data should be reviewed to ensure problem persists.
- TI.01 – Hogback Hill RWIS
 - SPC (Waple) noted SPC has an operations/safety study planned to begin in the Fall which will look at PA-28 from Kittanning to I-80.
- TI.10 – US 22 (Monroeville) Arterial ITS
 - SPC (D’Andrea) noted that CCTV/DMS through Monroeville would be beneficial. Adaptive signal system already installed. Mount CCTV to signal poles?
- MC.01 – South Hills Village Smart Parking
 - Port Authority (Masciotra) noted that South Hills Village Parking Garage is the only Port Authority lot which isn’t free. This deters potential users. This project should note a need to evaluate potential changes to pricing.
- MC.05 – Carnegie Smart Parking
 - Port Authority (Masciotra) noted a need for improved pedestrian connections to West Busway near Park-n-Ride. Consider possible road diet on Main St./Mansfield Blvd.? Also, there is nearby rail that is not in use which could be converted to bike trails connecting to Heidelberg, Scott Township, and other

areas nearby. This should be coordinated with the West End/South Hills Bike Network Study.

- MC.06 – Wilkesburg Smart Parking
 - Port Authority (Masciotra) noted eventual plan to introduce Transit-Oriented Development at this site. Note in project that this should be considered and coordinated with, depending on timing of that development and cost of potential Smart Parking system.
- FA.01 – Bates St. Interchange Improvements
 - SPC (D’Andrea) mentioned that the Hazelwood Green project is coordinating with PennDOT to widen the Parkway and improve the Glenwood interchange.
- FA.02 – I-79 ICM
 - SPC (D’Andrea) mentioned the I-76 Parallel Signal pilot currently underway and noted that western PA candidates for this approach should be identified, hence the inclusion of this and other similar projects in the ROP.
- FA.04 – Parkway North ICM
 - SPC (D’Andrea) mentioned that communications are currently installed for the US 19 signals.

Studies:

- ITS Gap Study – SPC (D’Andrea) noted a preference for renaming this to ITS Strategic Plan. It would look at prioritizing ITS deployments over the next 5-10 years.
- PennDOT/Turnpike Coordination – SPC (D’Andrea) noted that Port Authority ops center should also be included in this study. Jacobs (Smith) mentioned the Cranberry TMC as well.
- Park-n-Ride Study – discussed that this should be revised to a regional study to include Park-n-Rides in other surrounding counties. SPC (Waple) also noted that SPC has an upcoming Regional Transit Coordination Study which should coordinate with this effort.
- Parkway North HOV Study – remove reference to Busway Conversion to broaden scope (could become congested pricing lanes, etc.). Rename to HOV Conversion Study.
- Rt. 8 Corridor Operations Planning Study – SPC (Waple) mentioned this study which is currently planned (limits: Wildwood to Bakerstown) and asked that it be included in ROP.
- Freight Studies should be renamed to note they cover entire Western RTMC Region.
- SPC (Walfoort) noted that PennDOT is planning a Statewide Truck Parking study. The Truck Parking Study identified in the SPC ROP should note this and coordinate whether SPC effort should be undertaken or allow PennDOT study to handle this if it is to begin

soon enough. SPC (Walfort) also noted a need for better staging opportunities and coordination in addition to the more discussed issue of overnight parking.

Wrap-Up / Next Steps:

- *Provide review of 100% draft by July 12*
- Anticipate final ROP document by end of July
 - Allegheny County (Ogoreuc) asked if the *100% draft should be distributed to the Stakeholder Group for review as well*. SPC (D'Andrea) agreed that this could be done.
- Dates to make note of: –
 - August 29, SPC will hold regional operations and safety forum
 - October 1 SPC Freight Forum
- Western RTMC ROP
 - Final northwest regional stakeholder meeting in August
 - Jacobs (Smith) noted that the *final Steering Meeting for the Western RTMC effort would include Steering members from the complete Western RTMC region and would likely occur in September/October*.

The meeting ended at approximately noon. *Action Items are shown as red, italicized text.*

Agreement # / Name	E03575 / Maintenance and Traffic Open End / Work Order 11
Project	Development of the Regional Operations Plans for the Western RTMC Region (D1, D10, D11, and D12)
Meeting Name	Stakeholder Committee Meeting #3
Date / Time / Location	08-26-2019 / 1:00 PM-3:00 PM / PennDOT District 1-0
Attendees	See Sign-in Sheet

Meeting Purpose: Final meeting of the project stakeholder committee.

Meeting Minutes:	Action Items:
<p>1. Welcome and Introductions</p> <ul style="list-style-type: none"> Adam Smith welcomed everyone with some opening remarks and led a round of introductions. 	
<p>2. Progress Update</p> <ul style="list-style-type: none"> Adam provided a progress update, including discussion of schedule, finalization of the ROP document, and the final steering meeting to be held on September 23 at SPC. 	
<p>3. Summary of Potential Improvement Projects</p> <ul style="list-style-type: none"> Steve Cunningham provided an overview of the types of projects planned for inclusion in the ROP, summarized by the seven priority areas. 	
<p>4. Breakout Sessions</p> <ul style="list-style-type: none"> Breakout sessions were held for each of the four (4) planning organizations within the District. Maps were displayed showing the potential ROP projects. Stakeholders voted on prioritization of projects with sticker dots for "high" and "normal" priorities. Comments and voting results from the sessions can be found on the attached maps. 	
<p>5. Wrap Up/Next Steps</p> <ul style="list-style-type: none"> Frank Cavataio noted the importance of the ROP moving forward, saying that operations projects should be on a region's ROP in order to get funding. Frank also noted that more funding for operations projects needs to be identified. The final Steering Meeting will be held on Monday, September 23 at SPC in Downtown Pittsburgh. The 100% draft ROP is anticipated to be finalized for review by September 10 with the final version completed by early October. 	<ul style="list-style-type: none"> ➤ Jacobs will finalize the 100% draft for review by September 10.

Appendix B. Project Maps

ERIE COUNTY POTENTIAL ROP PROJECTS

*High Priority Projects denoted by **RED** text

LEGEND

- ✕ RWIS
- ◆ CAMERA
- DYNAMIC MESSAGE SIGN
- HAR-BEACON
- HAR-TRANSMITTER
- TRAFFIC SIGNAL

Interstate Corridor ITS Projects

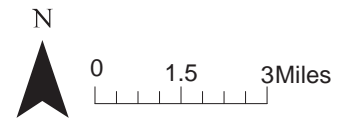
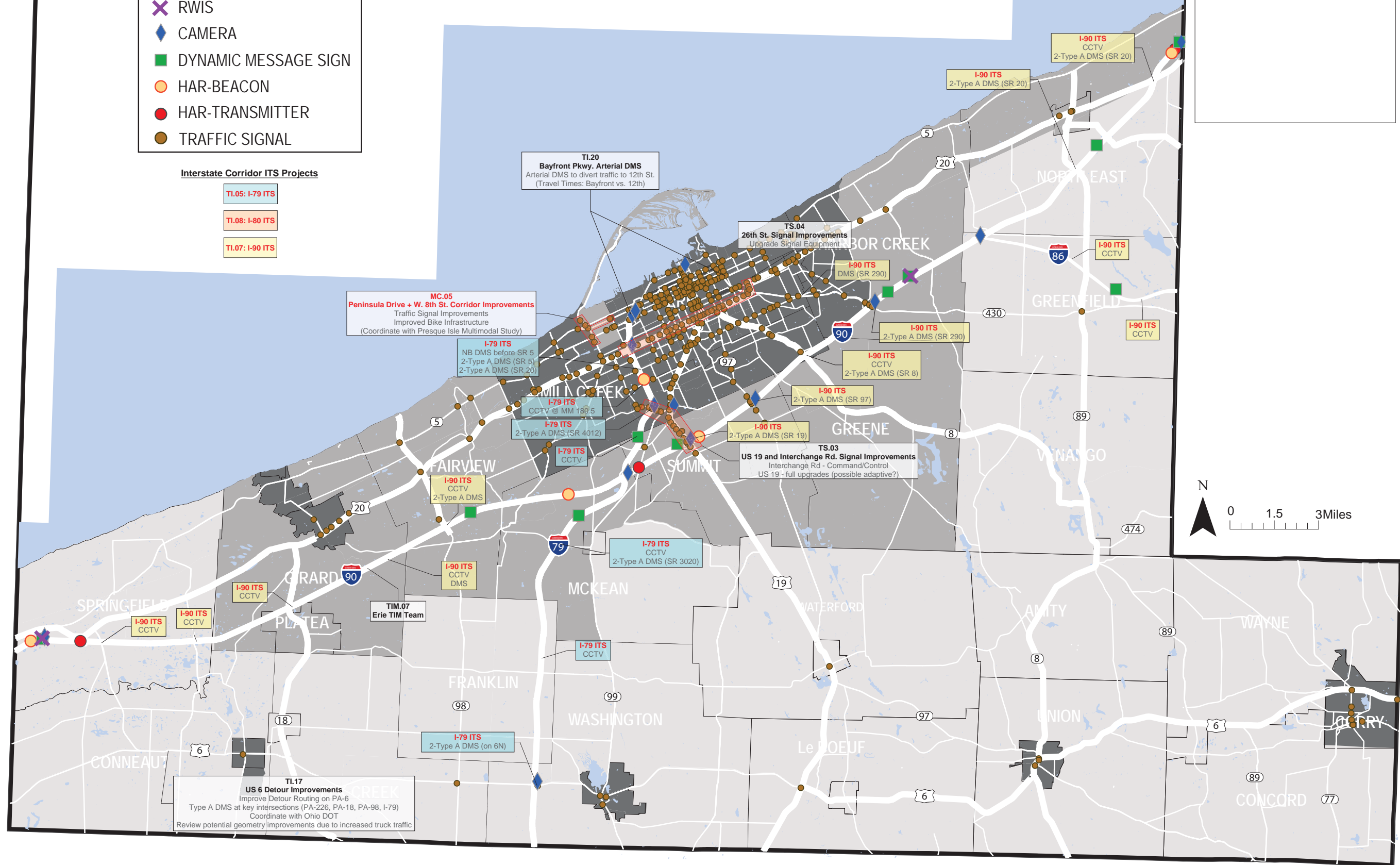
TI.05: I-79 ITS

TI.08: I-80 ITS

TI.07: I-90 ITS

Potential Studies/Initiatives

- Regional Truck Parking Study
- Regional Winter Truck Restriction Impact Study
- Downtown Erie Event Management Study/Planning



CITY OF ERIE + MILLCREEK TOWNSHIP

POTENTIAL ROP PROJECTS

*High Priority Projects denoted by RED text

LEGEND

- ✕ RWIS
- ◆ CAMERA
- DYNAMIC MESSAGE SIGN
- HAR-BEACON
- HAR-TRANSMITTER
- TRAFFIC SIGNAL

Interstate Corridor ITS Projects

TL.05: I-79 ITS

TL.08: I-80 ITS

TL.07: I-90 ITS

MC.05
Peninsula Drive + W. 8th St. Corridor Improvements
 Traffic Signal Improvements
 Improved Bike Infrastructure
 (Coordinate with Presque Isle Multimodal Study)

TI.20
Bayfront Pkwy. Arterial DMS
 Arterial DMS to divert traffic to 12th St.
 (Travel Times: Bayfront vs. 12th)

I-79 ITS
 2-Type A DMS (SR 5)

I-79 ITS
 NB DMS before SR 5

I-79 ITS
 2-Type A DMS (SR 20)

I-79 ITS
 CCTV @ MM 180.5

I-79 ITS
 2-Type A DMS (SR 4012)

I-79 ITS
 CCTV

I-90 ITS
 2-Type A DMS (SR 19)

TS.03
US 19 and Interchange Rd. Signal Improvements
 Interchange Rd - Command/Control
 US 19 - full upgrades (possible adaptive?)

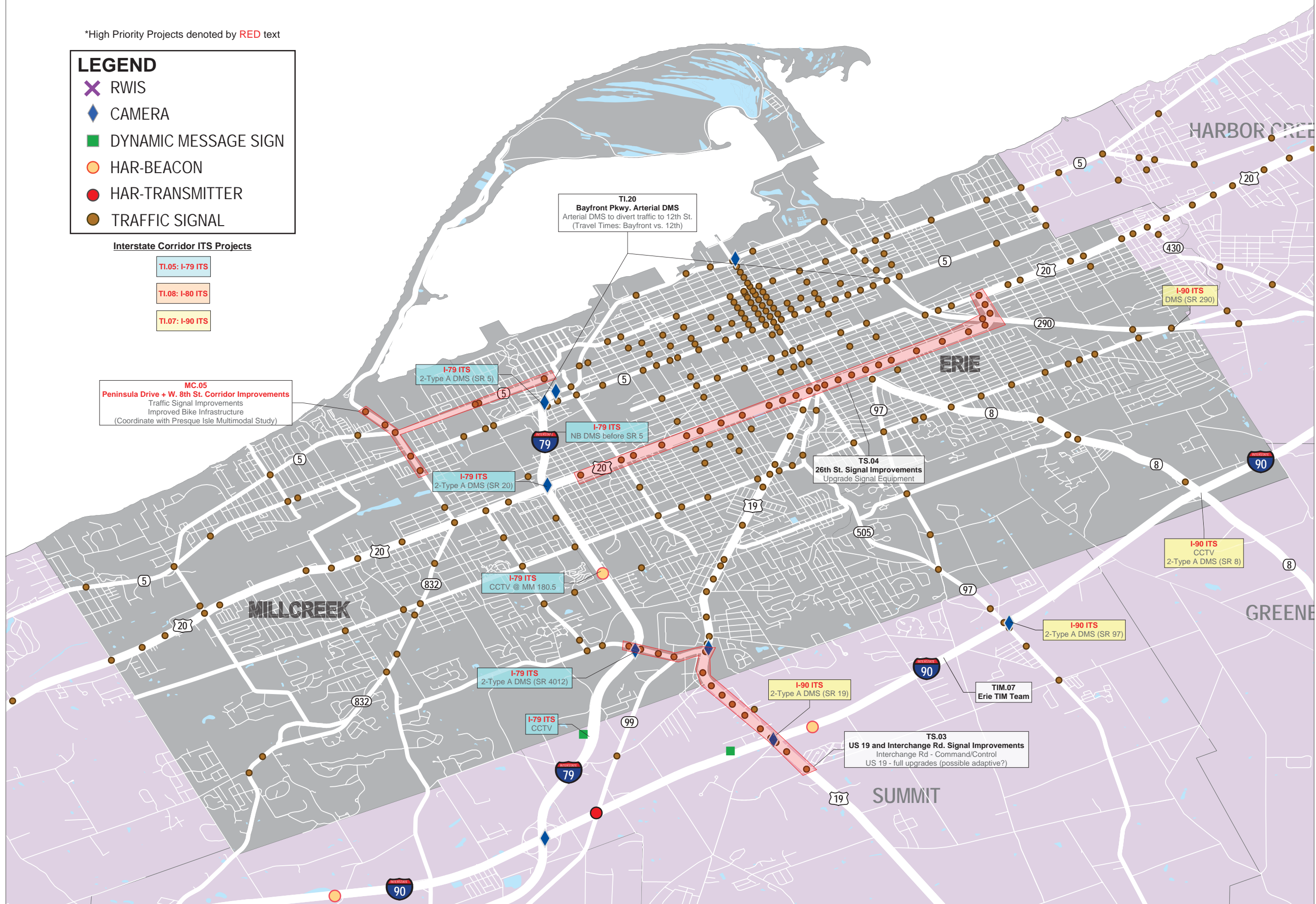
TS.04
26th St. Signal Improvements
 Upgrade Signal Equipment

I-90 ITS
 DMS (SR 290)

I-90 ITS
 CCTV
 2-Type A DMS (SR 8)

I-90 ITS
 2-Type A DMS (SR 97)

TIM.07
 Erie TIM Team



JEFFERSON COUNTY POTENTIAL ROP PROJECTS

*High Priority Projects denoted by RED text

LEGEND

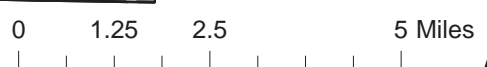
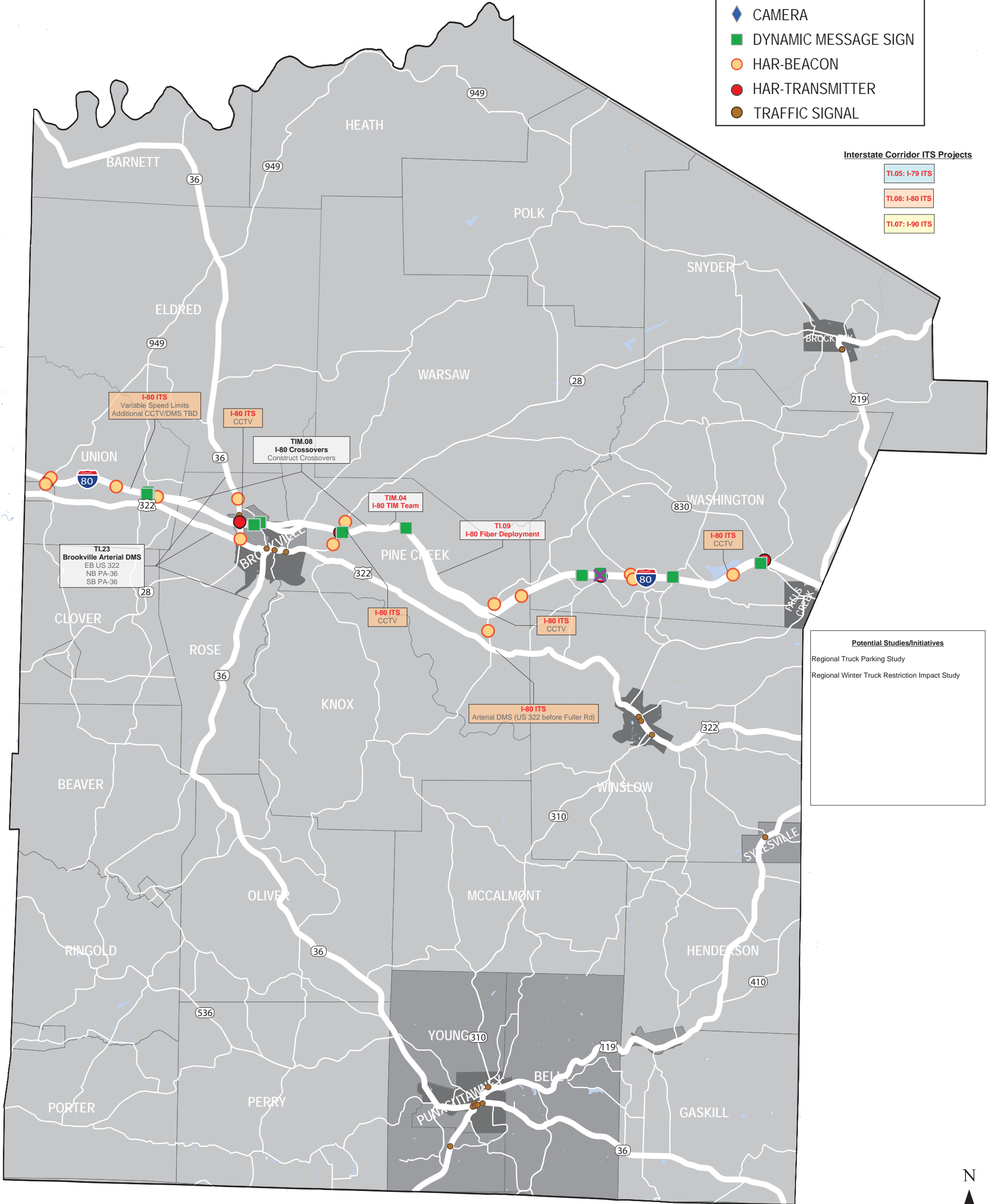
- ✕ RWIS
- ◆ CAMERA
- DYNAMIC MESSAGE SIGN
- HAR-BEACON
- HAR-TRANSMITTER
- TRAFFIC SIGNAL

Interstate Corridor ITS Projects

- TL.05: I-79 ITS
- TL.08: I-80 ITS
- TL.07: I-90 ITS

Potential Studies/Initiatives

- Regional Truck Parking Study
- Regional Winter Truck Restriction Impact Study



MERCER COUNTY POTENTIAL ROP PROJECTS

*High Priority Projects denoted by RED text

LEGEND

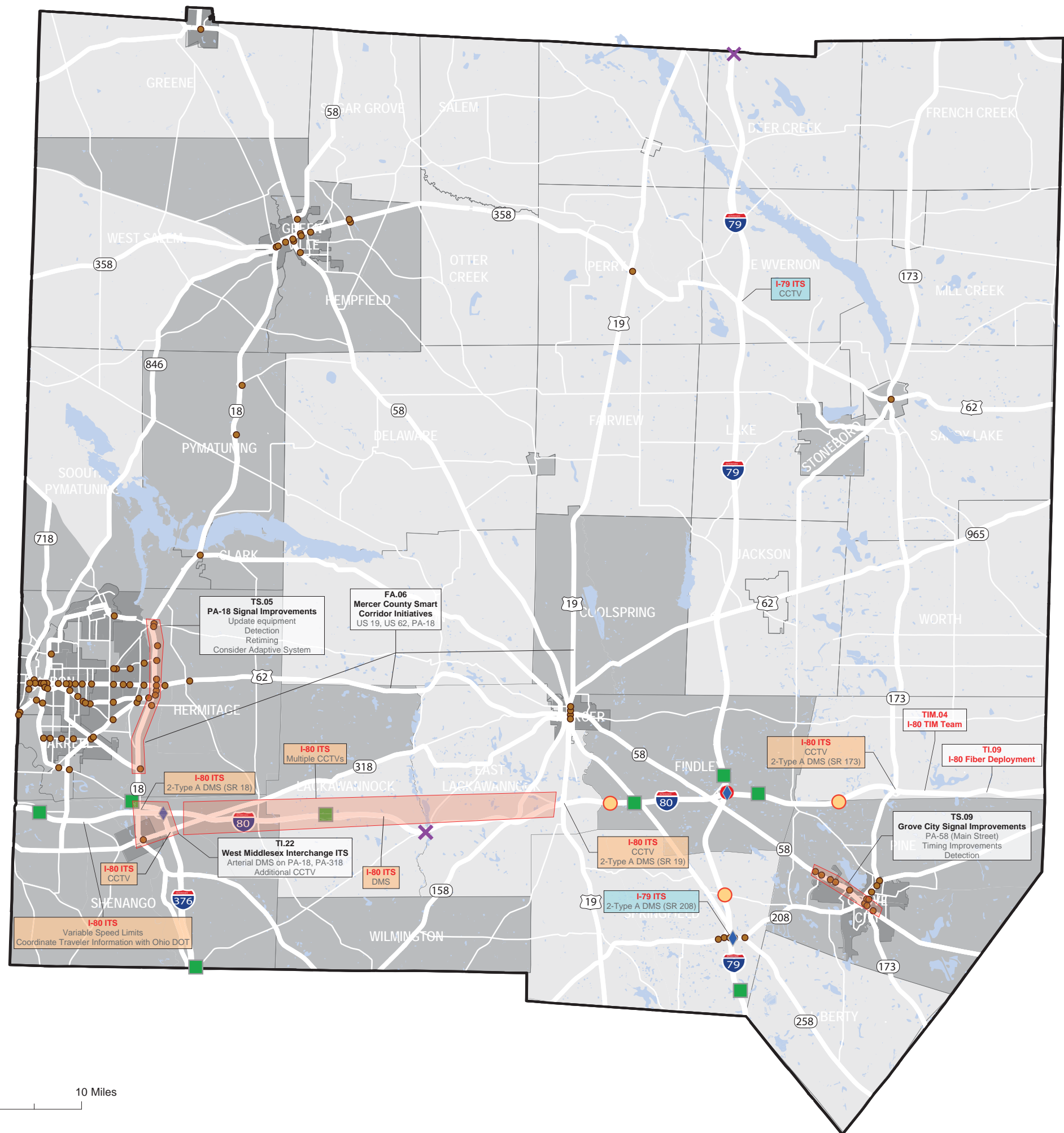
- ✕ RWIS
- ◆ CAMERA
- DYNAMIC MESSAGE SIGN
- HAR-BEACON
- HAR-TRANSMITTER
- TRAFFIC SIGNAL

Interstate Corridor ITS Projects

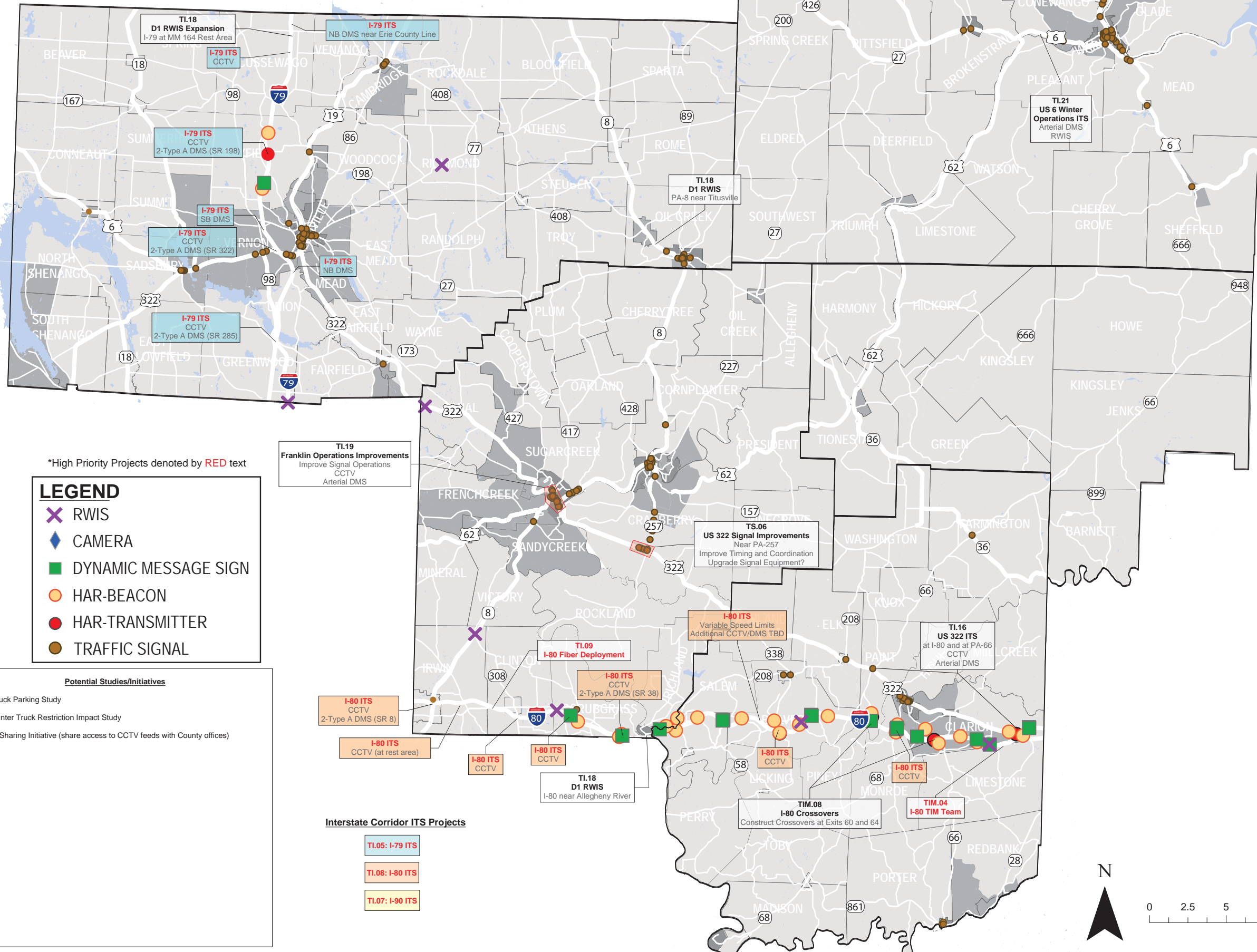
- TL.05: I-79 ITS
- TL.08: I-80 ITS
- TL.07: I-90 ITS

Potential Studies/Initiatives

- Regional Truck Parking Study
- Regional Winter Truck Restriction Impact Study



NORTHWEST RPO (CLARION/CRAWFORD/FORREST/VENANGO/WARREN COUNTIES) POTENTIAL ROP PROJECTS



*High Priority Projects denoted by **RED** text

LEGEND

- ✕ RWIS
- ◆ CAMERA
- DYNAMIC MESSAGE SIGN
- HAR-BEACON
- HAR-TRANSMITTER
- TRAFFIC SIGNAL

Potential Studies/Initiatives

- Regional Truck Parking Study
- Regional Winter Truck Restriction Impact Study
- Data/Video Sharing Initiative (share access to CCTV feeds with County offices)

TI.19 Franklin Operations Improvements
Improve Signal Operations
CCTV
Arterial DMS

TS.06 US 322 Signal Improvements
Near PA-257
Improve Timing and Coordination
Upgrade Signal Equipment?

I-80 ITS CCTV
2-Type A DMS (SR 8)

I-80 ITS CCTV
(at rest area)

I-80 ITS CCTV

I-80 ITS CCTV

TI.18 D1 RWIS
I-80 near Allegheny River

I-80 ITS
Variable Speed Limits
Additional CCTV/DMS TBD

TI.09 I-80 Fiber Deployment

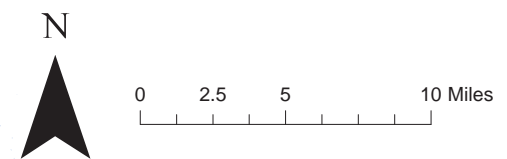
I-80 ITS CCTV
2-Type A DMS (SR 38)

TIM.08 I-80 Crossovers
Construct Crossovers at Exits 60 and 64

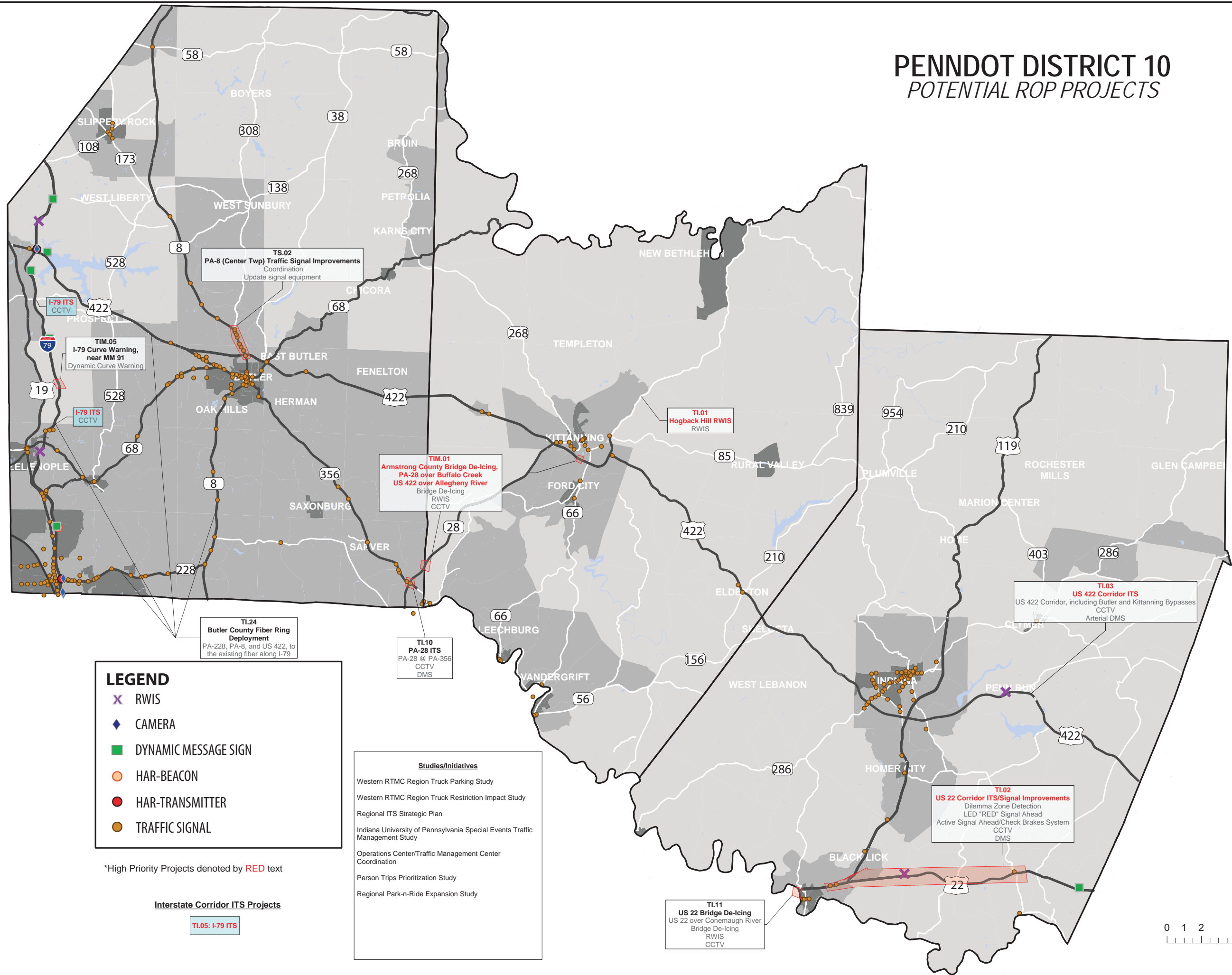
TIM.04 I-80 TIM Team

TI.16 US 322 ITS
at I-80 and at PA-66
CCTV
Arterial DMS

- Interstate Corridor ITS Projects**
- TI.05: I-79 ITS
 - TI.08: I-80 ITS
 - TI.07: I-90 ITS



PENNDOT DISTRICT 10 POTENTIAL ROP PROJECTS



TS.02
PA-8 (Center Twp) Traffic Signal Improvements
Coordination
Update signal equipment

TIM.05
I-79 Curve Warning,
near MM 91
Dynamic Curve Warning

TIM.01
Armstrong County Bridge De-Icing,
PA-28 over Buffalo Creek
US 422 over Allegheny River
Bridge De-Icing
RWIS
CCTV

TL.01
Hogback Hill RWIS
RWIS

TL.03
US 422 Corridor ITS
US 422 Corridor, including Butler and Kittanning Bypasses
CCTV
Arterial DMS

TL.02
US 22 Corridor ITS/Signal Improvements
Dilemma Zone Detection
LED "RED" Signal Ahead
Active Signal Ahead/Check Brakes System
CCTV
DMS

TL.11
US 22 Bridge De-Icing
US 22 over Conemaugh River
Bridge De-Icing
RWIS
CCTV

TL.24
Butler County Fiber Ring
Deployment
PA-228, PA-8, and US 422, to
the existing fiber along I-79

TL.10
PA-28 ITS
PA-28 @ PA-356
CCTV
DMS

LEGEND

- X RWIS
- ◆ CAMERA
- DYNAMIC MESSAGE SIGN
- HAR-BEACON
- HAR-TRANSMITTER
- TRAFFIC SIGNAL

*High Priority Projects denoted by RED text

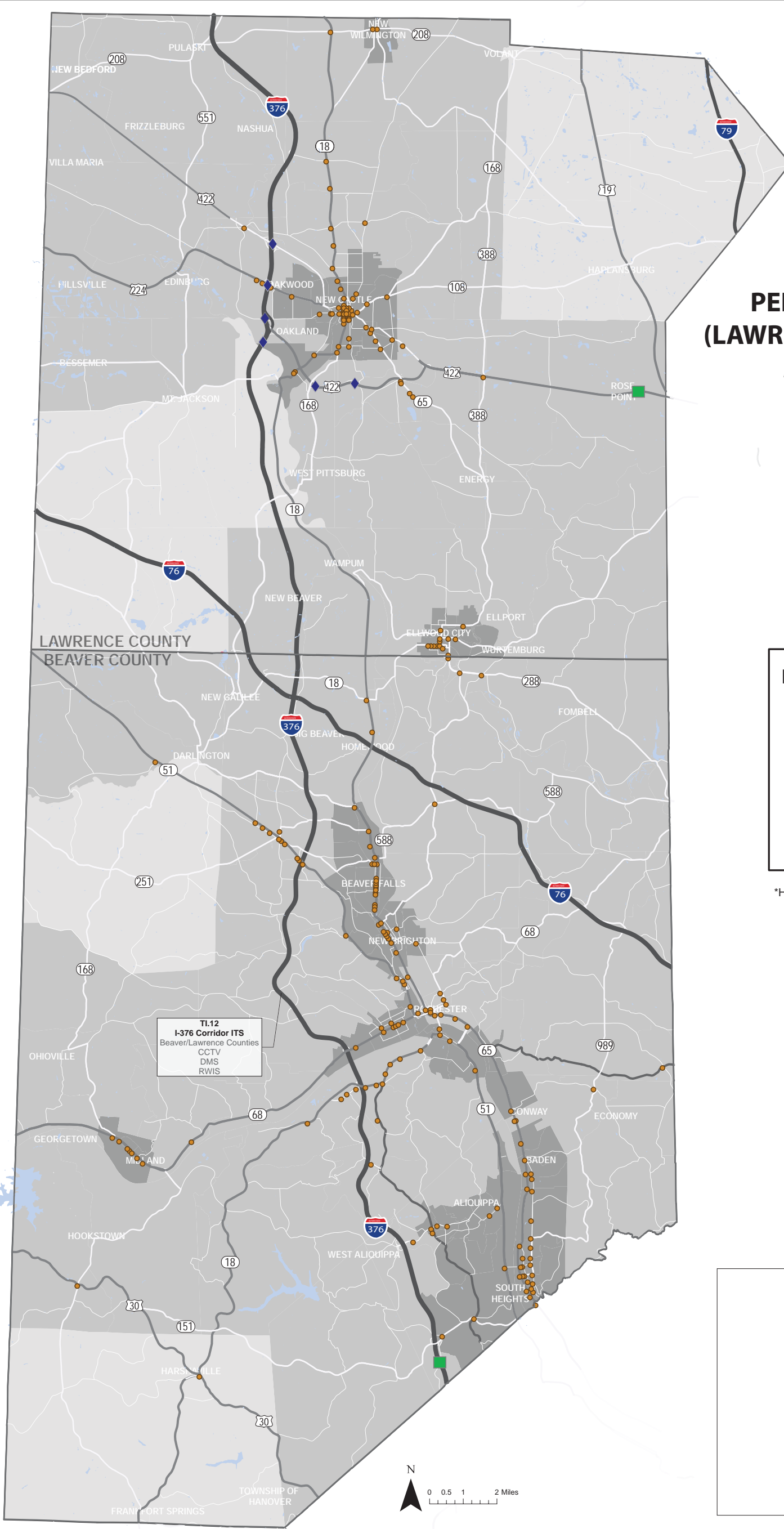
Interstate Corridor ITS Projects

TL.05: I-79 ITS

- Studies/Initiatives**
- Western RTMC Region Truck Parking Study
 - Western RTMC Region Truck Restriction Impact Study
 - Regional ITS Strategic Plan
 - Indiana University of Pennsylvania Special Events Traffic Management Study
 - Operations Center/Traffic Management Center Coordination
 - Person Trips Prioritization Study
 - Regional Park-n-Ride Expansion Study



PENNDOT DISTRICT 11 (LAWRENCE/BEAVER COUNTY) POTENTIAL ROP PROJECTS



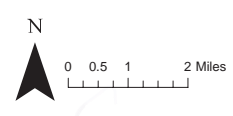
TI.12
I-376 Corridor ITS
Beaver/Lawrence Counties
CCTV
DMS
RWIS

LEGEND

- X RWIS
- ◆ CAMERA
- DYNAMIC MESSAGE SIGN
- HAR-BEACON
- HAR-TRANSMITTER
- TRAFFIC SIGNAL







*High Priority Projects denoted by **RED** text

Potential Studies/Initiatives
see Allegheny map for District 11-0 Studies/Initiatives



PENNDOT DISTRICT 11 (ALLEGHENY COUNTY) POTENTIAL ROP PROJECTS

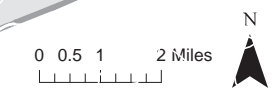
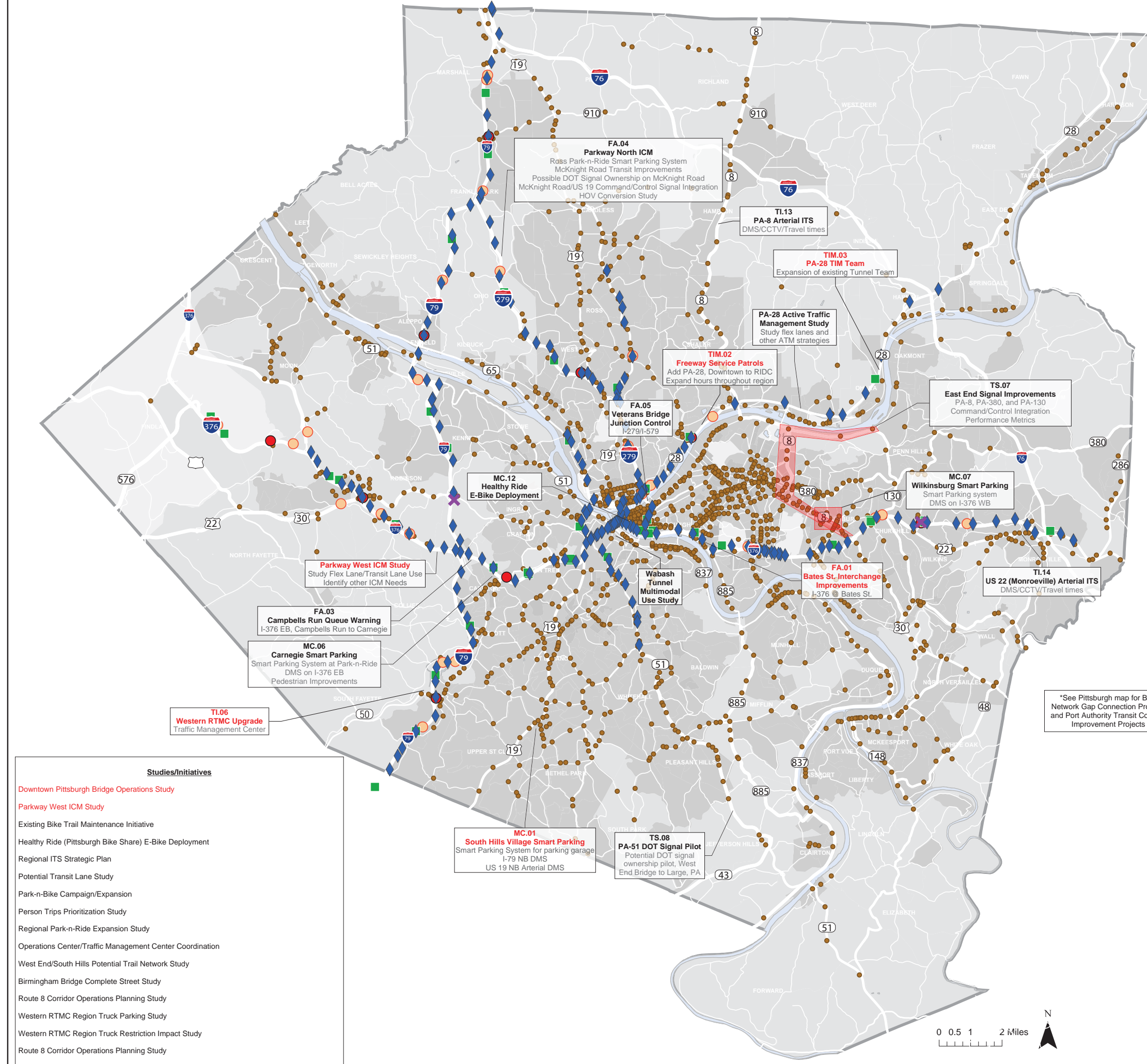
LEGEND

-  RWIS
-  CAMERA
-  DYNAMIC MESSAGE SIGN
-  HAR-BEACON
-  HAR-TRANSMITTER
-  TRAFFIC SIGNAL

*High Priority Projects denoted by RED text

*See Pittsburgh map for Bike Network Gap Connection Projects and Port Authority Transit Corridor Improvement Projects

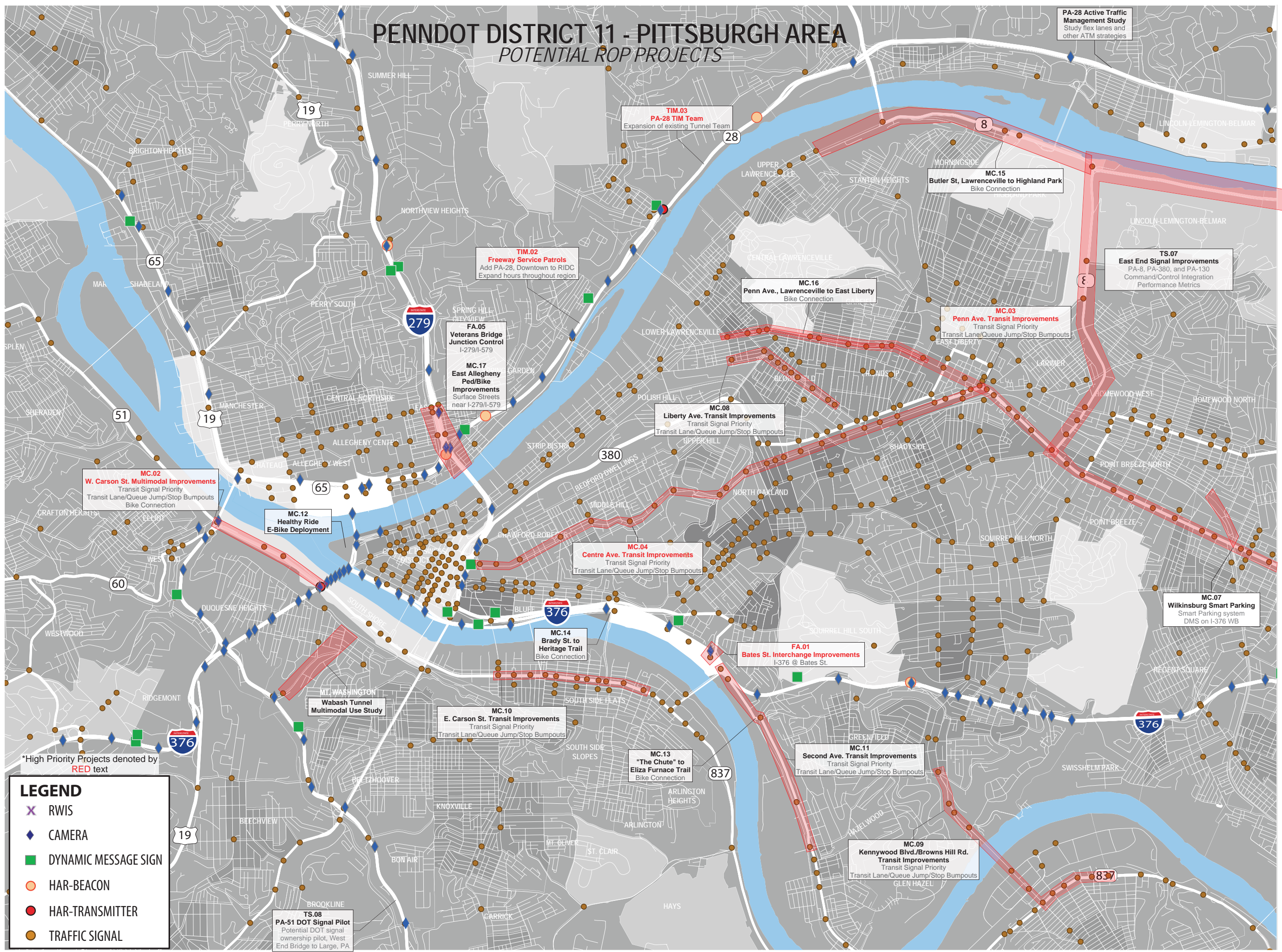
- Studies/Initiatives**
- Downtown Pittsburgh Bridge Operations Study
 - Parkway West ICM Study
 - Existing Bike Trail Maintenance Initiative
 - Healthy Ride (Pittsburgh Bike Share) E-Bike Deployment
 - Regional ITS Strategic Plan
 - Potential Transit Lane Study
 - Park-n-Bike Campaign/Expansion
 - Person Trips Prioritization Study
 - Regional Park-n-Ride Expansion Study
 - Operations Center/Traffic Management Center Coordination
 - West End/South Hills Potential Trail Network Study
 - Birmingham Bridge Complete Street Study
 - Route 8 Corridor Operations Planning Study
 - Western RTMC Region Truck Parking Study
 - Western RTMC Region Truck Restriction Impact Study
 - Route 8 Corridor Operations Planning Study



PENNDOT DISTRICT 11 - PITTSBURGH AREA

POTENTIAL ROP PROJECTS

PA-28 Active Traffic Management Study
Study flex lanes and other ATM strategies



MC.02
W. Carson St. Multimodal Improvements
Transit Signal Priority
Transit Lane/Queue Jump/Stop Bumpouts
Bike Connection

TIM.02
Freeway Service Patrols
Add PA-28, Downtown to RIDC
Expand hours throughout region

FA.05
Veterans Bridge Junction Control
I-279/I-579

MC.17
East Allegheny Ped/Bike Improvements
Surface Streets near I-279/I-579

MC.16
Penn Ave., Lawrenceville to East Liberty
Bike Connection

MC.03
Penn Ave. Transit Improvements
Transit Signal Priority
Transit Lane/Queue Jump/Stop Bumpouts

TS.07
East End Signal Improvements
PA-8, PA-380, and PA-130
Command/Control Integration
Performance Metrics

MC.08
Liberty Ave. Transit Improvements
Transit Signal Priority
Transit Lane/Queue Jump/Stop Bumpouts

MC.04
Centre Ave. Transit Improvements
Transit Signal Priority
Transit Lane/Queue Jump/Stop Bumpouts

MC.07
Wilkinsburg Smart Parking
Smart Parking system
DMS on I-376 WB

MC.14
Brady St. to Heritage Trail
Bike Connection

FA.01
Bates St. Interchange Improvements
I-376 @ Bates St.

MC.10
E. Carson St. Transit Improvements
Transit Signal Priority
Transit Lane/Queue Jump/Stop Bumpouts

MC.13
"The Chute" to Eliza Furnace Trail
Bike Connection

MC.11
Second Ave. Transit Improvements
Transit Signal Priority
Transit Lane/Queue Jump/Stop Bumpouts

MC.09
Kennywood Blvd./Browns Hill Rd. Transit Improvements
Transit Signal Priority
Transit Lane/Queue Jump/Stop Bumpouts

TS.08
PA-51 DOT Signal Pilot
Potential DOT signal ownership pilot, West End Bridge to Large, PA

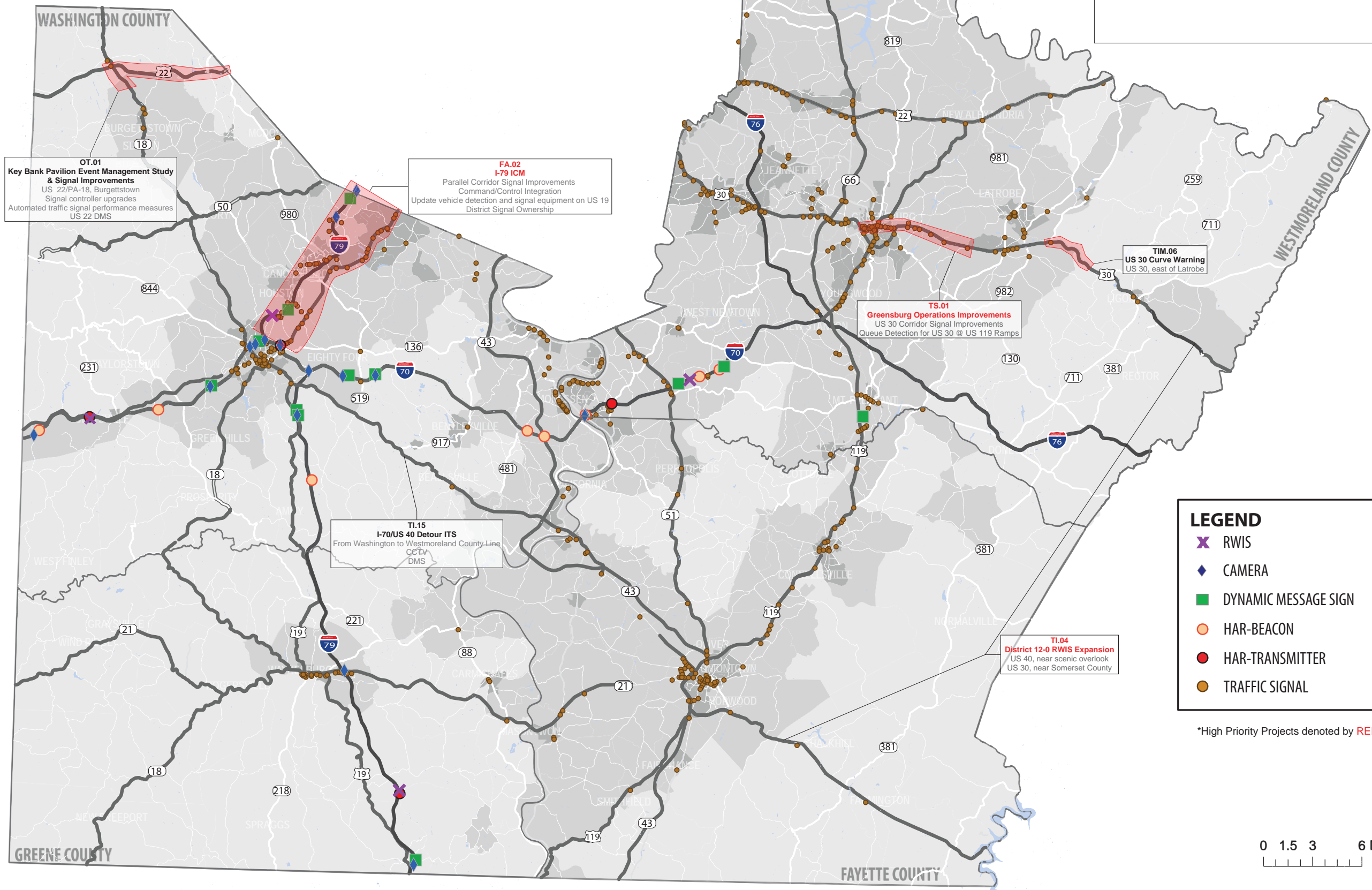
*High Priority Projects denoted by RED text

LEGEND

- X RWIS
- ◆ CAMERA
- DYNAMIC MESSAGE SIGN
- HAR-BEACON
- HAR-TRANSMITTER
- TRAFFIC SIGNAL

PENNDOT DISTRICT 12 POTENTIAL ROP PROJECTS

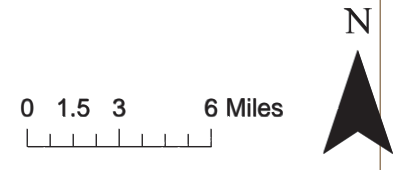
- Studies/Initiatives**
- Western RTMC Region Truck Parking Study
 - Western RTMC Region Truck Restriction Impact Study
 - Operations Center/Traffic Management Center Coordination
 - Key Bank Pavilion Event Management Study
 - US 40 Road Safety Audit (Summit Inn to Youghioheny River)
 - Regional ITS Strategic Plan
 - Person Trips Prioritization Study
 - Regional Park-n-Ride Expansion Study
 - District 12-0 Communications Gap Study



LEGEND

- RWIS
- CAMERA
- DYNAMIC MESSAGE SIGN
- HAR-BEACON
- HAR-TRANSMITTER
- TRAFFIC SIGNAL

*High Priority Projects denoted by RED text



Appendix C. Project Descriptions

TS.01: Greensburg Operational Improvements

FOCUS AREA: Traffic Signals

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Upgrade signal controllers for US 30 traffic signals in vicinity of Greensburg to allow for Automated Traffic Signal Performance Measures. Also install Queue Detection for US 30 at US 119 ramps.

STAKEHOLDERS: PennDOT 12-0

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): Traffic Signal Systems; Queue Detection System; DMS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio; Reduction in Rear End Crashes; Reduced Bottleneck Delay Surrogate

BENEFITS: Improved traffic flow and reduced congestion along an important signalized corridor within the region. Also provide warning to drivers as they approach a congested interchange.

OTHER CONSIDERATIONS AND ISSUES: N/A

TS.02: PA-8 Traffic Signal Improvements

FOCUS AREA: Traffic Signals

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade signal equipment and improve coordination on PA-8 corridor in Center Township, Butler County.

STAKEHOLDERS: PennDOT 10-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

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

TS.03: US 19 and Interchange Rd. Signal Improvements

FOCUS AREA: Traffic Signals

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade signal controllers to allow for command/control functionality on Interchange Road. Upgrade all signal equipment on US 19 and consider installation of adaptive system.

STAKEHOLDERS: PennDOT 1-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

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 a pair of important signalized corridors within the region.

OTHER CONSIDERATIONS AND ISSUES: N/A

TS.04: 26th Street Traffic Signal Improvements

FOCUS AREA: Traffic Signals

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade signal equipment and improve coordination on 26th Street (US 20) corridor in the City of Erie.

STAKEHOLDERS: PennDOT 1-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

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

TS.05: PA-18 Traffic Signal Improvements

FOCUS AREA: Traffic Signals

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade signal equipment and detection, as well as improving timing/coordination on PA-18 in Mercer County.

STAKEHOLDERS: PennDOT 1-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

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

TS.06: US 322 Traffic Signal Improvements

FOCUS AREA: Traffic Signals

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade signal equipment and improve timing/coordination on US 322 corridor near PA-257 in Venango County.

STAKEHOLDERS: PennDOT 1-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

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

TS.07: East End Traffic Signal Improvements

FOCUS AREA: Traffic Signals

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade signal controllers to allow for command/control functionality and performance measures on PA-8, PA-380, and PA-130 in the East End neighborhoods of Pittsburgh. Also consider bike and pedestrian improvements along these corridors.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

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 a series of important signalized corridors within the region.

OTHER CONSIDERATIONS AND ISSUES: N/A

TS.08: PA-51 DOT Signal Pilot

FOCUS AREA: Traffic Signals

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Pilot PennDOT ownership of traffic signals along the PA-51 corridor south of Pittsburgh.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: N/A

PROJECT TYPE: Planning

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Traffic Signal Systems;

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Increased coordination and improved operations by streamlining ownership of traffic signal systems.

OTHER CONSIDERATIONS AND ISSUES: N/A

TS.09: Grove City Signal Improvements

FOCUS AREA: Traffic Signals

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Upgrade signal equipment, including detection, and improve timing along signalized corridor of PA-58 (Main Street) through Grove City in Mercer County.

STAKEHOLDERS: PennDOT 1-0

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

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

TIM.01: Armstrong County Bridge De-Icing

FOCUS AREA: Traffic Incident Management

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install bridge de-icing systems on PA-28 bridge over Buffalo Creek and US 422 bridge over Allegheny River. Install RWIS and CCTV camera at each location to provide weather information and to provide situational awareness.

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): Bridge De-Icing System; RWIS System; CCTV System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Winter Weather Crashes

BENEFITS: Improving safety and reducing incidents on bridge structures with known winter weather-related crash histories.

OTHER CONSIDERATIONS AND ISSUES: N/A

TIM.02: PA-28 Freeway Service Patrol

FOCUS AREA: Traffic Incident Management

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Add PA-28, from Downtown to RIDC, to existing Freeway Service Patrol in Pittsburgh area. Extend hours throughout region.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: 1 year

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: N/A

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Simple

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: Expanded coverage to improve response and clean up of incidents on PA-28 and throughout the region, improving safety and minimizing chances of secondary crashes.

OTHER CONSIDERATIONS AND ISSUES: Freeway Service Patrol contract is currently up for renewal, so expansion of service could be coordinated with the renewal effort.

TIM.03: PA-28 TIM Team

FOCUS AREA: Traffic Incident Management

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Expand existing Tunnel TIM Team to include PA-28 from Downtown to RIDC.

STAKEHOLDERS: SPC; PennDOT 11-0; Local Municipalities; Emergency Personnel

ESTIMATED SCHEDULE: 1 year

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: 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

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

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: 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

TIM.05: I-79 Curve Warning

FOCUS AREA: Traffic Incident Management

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install Dynamic Curve Warning system on southbound I-79, near MM 91.

STAKEHOLDERS: PennDOT 10-0

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS:

\$
(<\$500k)

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 Crash Rate

BENEFITS: Reduce crashes, particularly at high speeds, in the area of this curve along I-79.

OTHER CONSIDERATIONS AND ISSUES: Low-cost improvements were installed approximately one year ago. Recent crash data should be analyzed to ensure problem persists and this project is still needed.

TIM.06: US 30 Curve Warning

FOCUS AREA: Traffic Incident Management

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install Dynamic Curve Warning system on eastbound and westbound US 30 between Latrobe and Ligonier.

STAKEHOLDERS: PennDOT 12-0

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS:

\$
(<\$500k)

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 Crash Rate

BENEFITS: Reduce crashes, particularly at high speeds, in a section of curves along US 30.

OTHER CONSIDERATIONS AND ISSUES: N/A

TIM.07: Erie TIM Team

FOCUS AREA: Traffic Incident Management

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Develop new Traffic Incident Management Team for the I-90 Corridor through Erie County, connecting with Ohio and New York.

STAKEHOLDERS: PennDOT 1-0, Ohio DOT; New York State DOT; Local Municipalities; Emergency Personnel

ESTIMATED SCHEDULE: 1 year

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: 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

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

TI.01: Hogback Hill RWIS

FOCUS AREA: Traveler Information

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install 1 Road Weather Information System (RWIS) on PA-28 at Hogback Hill.

STAKEHOLDERS: PennDOT 10-0

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS:

\$
(<\$500k)

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

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: SPC operations/safety study planned to begin in Fall 2019 looking at PA-28 from Kittanning to I-80.

TI.02: US 22 Corridor ITS/Signal Improvements

FOCUS AREA: Traveler Information

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras and DMS along US 22, east of Blairsville, including the following locations:

- 1 CCTV and 2 DMS @ US 119 interchange
- 2 DMS @ PA-56 interchange
- 1 CCTV at top of hill near Cambria County line

Install safety improvements for signalized intersections, including dilemma zone detection and LED "RED" Signal Ahead signage. Install active Signal Ahead/Check Brakes system for downhill approach to signal.

STAKEHOLDERS: PennDOT 10-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

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

PREREQUISITES AND DEPENDENCIES: N/A

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

BENEFITS: Improve incident response, congestion monitoring, and traveler information along US 22 Corridor. Improve safety on signalized intersection approaches.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI.03: US 422 Corridor ITS

FOCUS AREA: Traveler Information

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras and Arterial DMS along US 422 near Indiana, Kittanning, and Butler, as well as on the major arterial approaches to US 422 in these locations (such as US 119, PA-28, and PA-8).

STAKEHOLDERS: PennDOT 10-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$\$
(\$2M-\$10M)

Life Cycle: 10-15 years

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 422 Corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI.04: District 12-0 RWIS Expansion

FOCUS AREA: Traveler Information

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install Road Weather Information System (RWIS) on US 40 near scenic overlook east of Uniontown and on US 30 near the Somerset County line.

STAKEHOLDERS: PennDOT 12-0

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS:

\$
(<\$500k)

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

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

TI.05: I-79 Corridor ITS

FOCUS AREA: Traveler Information

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras and DMS at strategic locations along the I-79 corridor and at key interchanges.

STAKEHOLDERS: PennDOT 1-0, PennDOT 10-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$\$
(\$2M-\$10M)

Life Cycle: 10-15 years

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 I-79 Corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI.06: Western RTMC Upgrade

FOCUS AREA: Traveler Information

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Upgrade or replace, if necessary, elements of the existing Western RTMC in Bridgeville.

STAKEHOLDERS: PennDOT 11-0, PennDOT Central Office

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$\$\$
(\$2M-\$10M)

Life Cycle: 20-25 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Complex

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

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

BENEFITS: Provide additional space and updated technology capable of managing the Western Region's growing deployment of ITS devices. Upgrade would include personnel training and capability to monitor and control traffic signal networks.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI.07: I-90 Corridor ITS

FOCUS AREA: Traveler Information

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras and DMS at strategic locations along the I-90 corridor and at key interchanges. Also install devices at key adjacent locations along I-86 and on the Bayfront Connector (PA-290). Install variable speed limit system along corridor.

STAKEHOLDERS: PennDOT 1-0

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS:

\$\$\$
(\$2M-\$10M)

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

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; Reduced Crash Rate

BENEFITS: Improve incident response, congestion monitoring, and traveler information along I-90 Corridor. Installation of variable speed limit signing will improve safety, particularly during winter storms which impact the area.

OTHER CONSIDERATIONS AND ISSUES: Coordinate improvements, particularly variable speed limit system with Ohio and New York State DOTs.

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

ESTIMATED COSTS:

\$\$\$
(\$2M-\$10M)

Life Cycle: 10-15 years

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.10: PA-28 ITS

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV camera and Arterial DMS at PA-28/PA-356 interchange.

STAKEHOLDERS: PennDOT 10-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

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 PA-28 Corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI.11: US 22 Bridge De-Icing

FOCUS AREA: Traffic Incident Management

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install bridge de-icing system on US 22 bridge over Conemaugh River. Install RWIS and CCTV camera location to provide weather information and to provide situational awareness.

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): Bridge De-Icing System; RWIS System; CCTV System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Winter Weather Crashes

BENEFITS: Improving safety and reducing incidents on bridge structures with known winter weather-related crash histories.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI.12: I-376 Corridor ITS

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras and DMS along the I-376 Corridor in Beaver and Lawrence Counties, particularly in the vicinity of major interchanges. Install RWIS near Beaver/Allegheny County Line and near New Castle.

STAKEHOLDERS: PennDOT 11-0

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; RWIS System

PREREQUISITES AND DEPENDENCIES: N/A

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

BENEFITS: Improve incident response, congestion monitoring, and traveler information along northern portion of I-376 Corridor. Improve monitoring of weather and roadway conditions, particularly during winter weather. Improve plowing and winter maintenance response.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI.13: PA-8 Arterial ITS

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras and Arterial DMS along PA-8 corridor in Allegheny County.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

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 PA-8 Corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI.14: US 22 (Monroeville) Arterial ITS

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras and Arterial DMS along US 22 through Monroeville and surrounding area.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

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 422 Corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI.15: I-70/US 40 Detour ITS

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras and DMS along I-70 and US 40 corridors for use during detours.

STAKEHOLDERS: PennDOT 12-0

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 I-70 and US 40 Corridors, particularly for use of US 40 as alternate route to I-70 during incidents.

OTHER CONSIDERATIONS AND ISSUES: N/A

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

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

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.17: US 6 Detour Improvements

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras and Type A DMS at key intersections (PA-226, PA-18, PA-98, and I-79). Improve coordination of incidents and detours with Ohio DOT. Review potential geometry improvements to allow for increased truck traffic during detours.

STAKEHOLDERS: PennDOT 1-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$\$
(\$2M-\$10M)

Life Cycle: 10-15 years

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 and traveler information along US 6 Corridor, particularly for use as alternate route to I-90 during incidents.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI.18: District 1-0 RWIS Expansion

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install Road Weather Information System (RWIS) on I-79 at MM 164 Rest Area, PA-8 near Titusville, and I-80 near the Allegheny River.

STAKEHOLDERS: PennDOT 1-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

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

TI.19: Franklin Operations Improvements

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras and Arterial DMS in vicinity of US 322/PA-62 intersection in Franklin. Also, improve signal operations at the intersection.

STAKEHOLDERS: PennDOT 1-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): CCTV System; DMS System; Traffic Signal 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 in Franklin. Improve signal operations and reduce congestion.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI.20: Bayfront Parkway Arterial DMS

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install Arterial DMS with travel time information near terminus intersections of Bayfront Parkway to encourage drivers to encourage use of underutilized 12th Street corridor.

STAKEHOLDERS: PennDOT 1-0

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 City of Erie and divert traffic from Bayfront Parkway to utilize excess capacity on 12th Street.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI.21: US 6 Winter Operations ITS

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install Arterial DMS and RWIS along US 6 corridor in Warren County.

STAKEHOLDERS: PennDOT 1-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): DMS System; RWIS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Travel Time Ratio; Reduced Winter Crash Rate

BENEFITS: Improve traveler information, detour capabilities, and winter road maintenance along the US 6 corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

TI.22: West Middlesex Interchange ITS

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install CCTV camera and Arterial DMS at PA-18/PA-318 intersection in West Middlesex. Mercer County.

STAKEHOLDERS: PennDOT 1-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

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 in the vicinity of the PA-18/PA-318 intersection. Improve detour capabilities along routes.

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

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

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

TI.24: Butler County Fiber Ring Deployment

FOCUS AREA: Traveler Information

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Expansion of fiber optic cable backbone network along PA-228, PA-8, and US 422, connecting to existing fiber on I-79 in Butler County.

STAKEHOLDERS: 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 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

OT.01: Key Bank Pavilion Event Management & Signal Improvements

FOCUS AREA: Operational Teamwork/Institutional Coordination

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install signal controller upgrades to allow for Automated Traffic Signal Performance Measures. Install DMS on US 22 approaching Burgettstown interchange.

STAKEHOLDERS: PennDOT 12-0, PennDOT 11-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: 10-15 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

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

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Travel Time Ratio

BENEFITS: Improve operations on US 22 and within Burgettstown area, particularly during ingress/egress to events at the Key Bank Pavilion.

OTHER CONSIDERATIONS AND ISSUES: N/A

MC.01: South Hills Village Smart Parking

FOCUS AREA: Multimodal Connectivity

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Install Smart Parking System for South Hills Village Parking Garage. Provide notification of parking information on northbound I-79, either through existing DMS sign or a proposed sign if needed. Also install Arterial DMS on northbound US 19. Evaluate potential changes to pricing to encourage more usage.

STAKEHOLDERS: PennDOT 11-0, Port Authority of Allegheny County

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Smart Parking System; DMS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Bottleneck Delay Surrogate; Improved Travel Time Ratio; Increased Usage of Park-n-Ride

BENEFITS: Positively impact mode share by encouraging drivers to park and utilize light rail in and out of congested Pittsburgh area.

OTHER CONSIDERATIONS AND ISSUES: N/A

MC.02: W. Carson St. Multimodal Improvements

FOCUS AREA: Multimodal Connectivity

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: W. Carson St. between Ft. Pitt Bridge and West End. Consider Transit Signal Priority and study possible transit lane, queue jump, and curb bumpout possibilities. Study possible improvements to provide missing bike connection between South Side and West End.

STAKEHOLDERS: PennDOT 11-0, Port Authority of Allegheny County

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 5-10 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Bottleneck Delay Surrogate; Increased Bus Speeds; Increased Bus Ridership; Increased Number of Bicyclists

BENEFITS: Positively impact mode share by improving transit operations and bike infrastructure. This is a key transit corridor as it provides a connection between Downtown and the West Busway. Bike infrastructure would also allow cycling from West End neighborhood which is currently an area of high traffic stress.

OTHER CONSIDERATIONS AND ISSUES: N/A

MC.03: Penn Ave. Transit Improvements

FOCUS AREA: Multimodal Connectivity

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Penn Ave., 40th St. to Fifth Ave. Consider Transit Signal Priority and study possible transit lane, queue jump, and curb bumpout possibilities.

STAKEHOLDERS: City of Pittsburgh DOMI, Port Authority of Allegheny County

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: 5-10 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Bottleneck Delay Surrogate; Increased Bus Speeds; Increased Bus Ridership

BENEFITS: Positively impact mode share by improving transit operations on key corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

MC.04: Centre Ave. Transit Improvements

FOCUS AREA: Multimodal Connectivity

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Centre Ave., Washington Place to East Liberty Garage (Dahlem Pl.). Consider Transit Signal Priority and study possible transit lane, queue jump, and curb bumpout possibilities.

STAKEHOLDERS: City of Pittsburgh, Port Authority of Allegheny County

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: 5-10 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Bottleneck Delay Surrogate; Increased Bus Speeds; Increased Bus Ridership

BENEFITS: Positively impact mode share by improving transit operations on key corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

MC.05: Peninsula Drive + W. 8th St. Corridor Improvements

FOCUS AREA: Multimodal Connectivity

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Update signal equipment and improve operations along Peninsula Drive from Tom Ridge Center to 15th Street. Provide improved pedestrian and bicycle accommodations along Peninsula Drive as well as 8th Street. Along 8th Street, consider pedestrian and bicycle improvements, as well as other traffic calming and streetscaping from Peninsula Drive to Greengarden Avenue.

STAKEHOLDERS: PennDOT 1-0, City of Erie, Millcreek Township

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 5-10 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Bottleneck Delay Surrogate; Increased Number of Bicyclists

BENEFITS: Improve multimodal infrastructure along main corridors for access to Presque Isle State Park.

OTHER CONSIDERATIONS AND ISSUES: Coordinate with recommendations from Presque Isle Multimodal Study.

MC.06: Carnegie Smart Parking

FOCUS AREA: Multimodal Connectivity

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install Smart Parking System for Carnegie Park-n-Ride. Provide notification of parking information on eastbound I-376, either through existing DMS sign or a proposed sign if needed. Include pedestrian improvements outlined in West Busway Transit-Oriented Development Study.

STAKEHOLDERS: PennDOT 11-0, Port Authority of Allegheny County

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS:

\$
(<\$500k)

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Smart Parking System; DMS System

PREREQUISITES AND DEPENDENCIES: Dependent on expanding existing overcapacity Park-n-Ride.

PERFORMANCE MEASURES: Reduced Bottleneck Delay Surrogate; Improved Travel Time Ratio; Increased Usage of Park-n-Ride

BENEFITS: Positively impact mode share by encouraging drivers to park and utilize buses in and out of congested Pittsburgh area.

OTHER CONSIDERATIONS AND ISSUES: Coordinate with proposed West End/South Hills Potential Trail Network Study for possible opportunities to improve access to the station, utilizing nearby rail right-of-way for trails.

MC.07: Wilkinsburg Smart Parking

FOCUS AREA: Multimodal Connectivity

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install Smart Parking System for Wilkinsburg Park-n-Ride. Provide notification of parking information on westbound I-376, either through existing DMS sign or a proposed sign if needed.

STAKEHOLDERS: PennDOT 11-0, Port Authority of Allegheny County

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS:

\$
(<\$500k)

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Smart Parking System; DMS System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Bottleneck Delay Surrogate; Improved Travel Time Ratio; Increased Usage of Park-n-Ride

BENEFITS: Positively impact mode share by encouraging drivers to park and utilize buses in and out of congested Pittsburgh area. While this location is generally overcapacity during weekdays, it can be better utilized for special events on weekends (i.e. Steelers games).

OTHER CONSIDERATIONS AND ISSUES: This location is currently being considered for potential Transit-Oriented Development which would impact existing parking. Coordinate this project with that effort to ensure need for Smart Parking system in the future before implementation.

MC.08: Liberty Ave. Transit Improvements

FOCUS AREA: Multimodal Connectivity

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Liberty Ave., Downtown to Aspen St. Consider Transit Signal Priority and study possible transit lane, queue jump, and curb bumpout possibilities. Improvements to the existing unprotected bike lanes from 34th Street to Baum Boulevard should also be considered as part of the project.

STAKEHOLDERS: City of Pittsburgh DOMI, Port Authority of Allegheny County

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: 5-10 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Bottleneck Delay Surrogate; Increased Bus Speeds; Increased Bus Ridership

BENEFITS: Positively impact mode share by improving transit operations on key corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

MC.09: Kennywood Blvd./Browns Hill Rd. Transit Improvements

FOCUS AREA: Multimodal Connectivity

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Browns Hill Rd./Hazelwood Ave. to Kennywood Blvd./Library St. Consider Transit Signal Priority and study possible transit lane, queue jump, and curb bumpout possibilities.

STAKEHOLDERS: PennDOT 11-0, City of Pittsburgh DOMI, Port Authority of Allegheny County

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: 5-10 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Bottleneck Delay Surrogate; Increased Bus Speeds; Increased Bus Ridership

BENEFITS: Positively impact mode share by improving transit operations on key corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

MC.10: E. Carson St. Transit Improvements

FOCUS AREA: Multimodal Connectivity

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: E. Carson St., 10th St. to 26th St. Consider Transit Signal Priority and study possible transit lane, queue jump, and curb bumpout possibilities.

STAKEHOLDERS: PennDOT 11-0, Port Authority of Allegheny County

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: 5-10 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Bottleneck Delay Surrogate; Increased Bus Speeds; Increased Bus Ridership

BENEFITS: Positively impact mode share by improving transit operations on key corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

MC.11: Second Ave. Transit Improvements

FOCUS AREA: Multimodal Connectivity

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Second Ave., Hot Metal St. to Hazelwood Ave. Consider Transit Signal Priority and study possible transit lane, queue jump, and curb bumpout possibilities.

STAKEHOLDERS: City of Pittsburgh DOMI, Port Authority of Allegheny County

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: 5-10 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Bottleneck Delay Surrogate; Increased Bus Speeds; Increased Bus Ridership

BENEFITS: Positively impact mode share by improving transit operations on key corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

MC.12: Healthy Ride (Pittsburgh Bike Share) E-Bike Deployment

FOCUS AREA: Multimodal Connectivity

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Expand Healthy Ride through pilot of e-assist bicycles.

STAKEHOLDERS: Pittsburgh Bike Share

ESTIMATED SCHEDULE: 1 year

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: 3-5 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Bike Share System

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Increase Usage of Bike Share

BENEFITS: Positively impact mode share by encouraging greater use of Bike Share system. Enable Bike Share to expand to areas which were previously inaccessible due to challenging terrain on standard bicycle.

OTHER CONSIDERATIONS AND ISSUES: N/A

MC.13: "The Chute" to Eliza Furnace Trail Bike Connection

FOCUS AREA: Multimodal Connectivity

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Improve bike connection from Greenfield to Eliza Furnace Trail.

STAKEHOLDERS: City of Pittsburgh DOMI

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: 5-10 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Bottleneck Delay Surrogate; Improved Travel Time Ratio; Increased Bike Usage

BENEFITS: Positively impact mode share by encouraging increase in cycling through improved infrastructure.

OTHER CONSIDERATIONS AND ISSUES: Coordinate with State Route 885/Second Avenue Multimodal Corridor Study.

MC.14: Brady St. to Heritage Trail Bike Connection

FOCUS AREA: Multimodal Connectivity

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Improve bike connection from Oakland/Uptown to Heritage Trail.

STAKEHOLDERS: City of Pittsburgh DOMI

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: 5-10 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Bottleneck Delay Surrogate; Improved Travel Time Ratio; Increased Bike Usage

BENEFITS: Positively impact mode share by encouraging increase in cycling through improved infrastructure.

OTHER CONSIDERATIONS AND ISSUES: Coordinate with State Route 885/Second Avenue Multimodal Corridor Study.

MC.15: Butler St. Bike Connection

FOCUS AREA: Multimodal Connectivity

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Improve bike connection from Lawrenceville to Highland Park.

STAKEHOLDERS: City of Pittsburgh DOMI

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: 5-10 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Bottleneck Delay Surrogate; Improved Travel Time Ratio; Increased Bike Usage

BENEFITS: Positively impact mode share by encouraging increase in cycling through improved infrastructure.

OTHER CONSIDERATIONS AND ISSUES: Consider implementation of recommendations from *Allegheny Riverfront Green Boulevard Strategic Plan* where possible.

MC.16: Penn Ave. Bike Connection

FOCUS AREA: Multimodal Connectivity

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Improve bike connection from Lawrenceville to East Liberty.

STAKEHOLDERS: City of Pittsburgh DOMI

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: 5-10 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Bottleneck Delay Surrogate; Improved Travel Time Ratio; Increased Bike Usage

BENEFITS: Positively impact mode share by encouraging increase in cycling through improved infrastructure.

OTHER CONSIDERATIONS AND ISSUES: N/A

MC.17: East Allegheny Ped/Bike Improvements

FOCUS AREA: Multimodal Connectivity

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Improve pedestrian and bicycle access in North Side Pittsburgh area near I-279 and I-579.

STAKEHOLDERS: City of Pittsburgh DOMI

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: 5-10 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Bottleneck Delay Surrogate; Improved Travel Time Ratio; Increased Bike Usage

BENEFITS: Positively impact mode share by encouraging walking/biking through improved infrastructure.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA.01: Bates St. Interchange Improvements

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Interchange improvements and reconstruction at I-376 Exit 73 (PA-885, Oakland/Glenwood) at Bates Street.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: 3+ years

Life Cycle: 25 years

ESTIMATED COSTS:

\$\$\$\$
(\$10M+)

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Complex

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

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

BENEFITS: Improve operations at congested interchange which provides access to Oakland Business District, UPMC, University of Pittsburgh, Carnegie Mellon University, as well as continuing development along Second Avenue.

OTHER CONSIDERATIONS AND ISSUES: Coordinate with potential road improvements included in Hazelwood Green development project.

FA.02: I-79 Integrated Corridor Management (District 12)

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: High

PROJECT DESCRIPTION AND SCOPE: Traffic Signal Improvements, including updating vehicle detection and signal equipment, and adding command/control capabilities to signals, along US 19 and other signalized corridors paralleling I-79 north of Washington. Pilot PennDOT ownership of traffic signals along US 19 corridor.

STAKEHOLDERS: PennDOT 12-0

ESTIMATED SCHEDULE: 3+ years

Life Cycle: 10-15 years

ESTIMATED COSTS:

\$\$\$
(\$2M-\$10M)

PROJECT TYPE: Deployment/Planning

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

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

BENEFITS: Improving incident management and operations on parallel corridors, optimizing the available capacity adjacent to I-79. Increase coordination and improve operations by streamlining ownership of traffic signal systems.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA.03: Campbells Run Queue Warning

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install queue warning system on eastbound I-376, from Campbells Run to Carnegie. Utilize existing DMS for display of generated queue warning messages as possible. Install additional DMS if needed.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS:

\$
(<\$500k)

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Queue Detection System; 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 area of recurring congestion along I-376.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA.04: Parkway North ICM

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install Smart Parking System for Ross Park-n-Ride. Upgrade signal equipment on US 19 and McKnight Road to allow for command/control functionality. Install Transit Signal Priority on McKnight Road. Pilot PennDOT Ownership of traffic signals along McKnight Road corridor.

STAKEHOLDERS: PennDOT 11-0, Port Authority of Allegheny County

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$\$\$
(\$2M-\$10M)

Life Cycle: 10-15 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Smart Parking System; Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Bottleneck Delay Surrogate; Improved Travel Time Ratio; Improved Bus Speed

BENEFITS: Improving incident management and operations on parallel corridors, optimizing available capacity adjacent to I-279 (Parkway North). Improve bus operations, potentially increasing ridership and positively impacting mode share. Increase coordination and improve operations by streamlining ownership of traffic signal systems.

OTHER CONSIDERATIONS AND ISSUES: In addition to deployments outlined above, proposed studies related to these corridors include the McKnight Road Transit Lane Study and HOV Conversion Study.

FA.05: Veterans Bridge Junction Control

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Install Junction Control System at northbound merge between I-579 and I-279.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Junction Control System

PREREQUISITES AND DEPENDENCIES: N/A

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

BENEFITS: Reducing peak hour queuing by actively managing available capacity.

OTHER CONSIDERATIONS AND ISSUES: N/A

FA.06: Mercer County Smart Corridor Initiatives

FOCUS AREA: Freeway and Arterial Operations

PRIORITY: Normal

PROJECT DESCRIPTION AND SCOPE: Institute Smart Corridor Initiatives along the corridors of US 19, US 62, and PA-18 in Mercer County. Consider adaptive signal technology and increased coordination of signal timing and operations during detours related to incidents on I-80 and other major parallel corridors.

STAKEHOLDERS: PennDOT 1-0

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$\$\$
(\$2M-\$10M)

Life Cycle: 10-15 years

PROJECT TYPE: Deployment

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Traffic Signal Systems

PREREQUISITES AND DEPENDENCIES: N/A

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

BENEFITS: Improving incident-related operations on parallel corridors to I-80 as well as improvements to operations during regular conditions by updating signal equipment, coordination with WRTMC, and other initiatives.

OTHER CONSIDERATIONS AND ISSUES: N/A

Appendix D. 2023 Interim Update

Introduction

Background

The Regional Operations Plan (ROP) completed for the Western Regional Traffic Management Center (RTMC) Region in 2019 was part of a statewide initiative to increase implementation of Transportation Systems Management and Operations (TSMO) projects. This ROP was compiled based on guidance from PennDOT Publication 851 (TSMO Guidebook, Part I: Planning).

This addendum provides an interim update to the 2019 Western RTMC ROP, including the status of existing projects, a discussion of emerging trends related to traffic operations, and identification of new ROP projects which have been proposed during the update process.

Update Process

This interim update was completed through a schedule of approximately six months. A kickoff meeting was held on November 2, 2022, followed by two stakeholder outreach meetings. One with stakeholders and planning partners in the Southwestern Pennsylvania Commission Region and one with stakeholders and planning partners in the greater Western Region. The stakeholder outreach meetings were used to confirm existing project status and gain insight into new traffic operations needs in each respective area. This information was evaluated with the project steering committee – including PennDOT Bureau of Operations (BOO) and PennDOT Districts 1-0, 10-0, 11-0, and 12-0 – and a list of new ROP projects was confirmed. A final meeting of stakeholders was held on March 20th.

This process does not supplant the extensive stakeholder outreach and data analysis completed during the 2019 ROP development. New projects identified within this update process should be considered alongside, and not in place of, previously confirmed projects when funding opportunities arise.

Status of Existing ROP Projects

In the initial 2019 Western RTMC ROP, 65 projects and 23 studies 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. These projects take a holistic approach, maximizing existing capacity of parallel routes and emphasizing multimodal approaches to congestion management. Projects were prioritized based on stakeholder input and discussions into “High Priority” and “Normal Priority” groups. A table is attached which shows the status of each of these previously documented projects. Status updates fall into the following categories shown in **Table 1**.

TABLE 1: 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.

A number of ROP projects have progressed in the region, including a few which have moved into the construction phase. These projects include PA-Route 8 Traffic Signal Improvements in Butler County, PA-Route 28 Freeway Service Patrol in Allegheny County, and Bayfront Parkway ITS Improvements in Erie County. Several projects have seen partial progress of varying degrees. This includes partial progress of the Bates Street Interchange Improvements in Allegheny County and the Western Regional Traffic Management Center Upgrades.

There are a few major projects currently under design: I-79 Integrated Corridor Management in Washington County, South Hills Village Smart Parking in Allegheny County, I-80 Fiber Optic Cable Deployment, and I-376 Corridor ITS in Beaver County.

See Table 4 for a full list of previously documented projects status.

Status of Studies and Initiatives

In addition to the projects, there were a total of 20 studies and initiatives that were identified in the previous ROP, two of which were High Priority. These ranged from Freight Management studies to Multimodal Connectivity studies. While specific projects could be determined for many of the issues and needs, others need further study to best determine the correct mitigation to improve operations.

A few of the studies in the region progressed and two were even completed. Completed studies include the US 40 Road Safety Audit in Fayette County and the SR 8 Corridor Operations Planning Study in Allegheny County and Butler County. A table is attached, which shows the status of each of these previously documented projects. Status updates fall into the following categories shown in Table 2. See page 12 for a full list of previously documented studies and initiatives.

TABLE 2: STUDY STATUS DEFINITIONS

Study Status Choices	Definitions
Documented	Project included in the ROP.
Planned	Study is planned for the future.
Partial Progress	Progress has been made on some component of the project/study. See Notes column for more detail.
Complete	Study has been completed.

Emerging Trends

The stakeholder engagement process was also used to discuss noteworthy regional, industry, and technology-related trends in the region which could impact transportation operations. This discussion included discussion of some general trends, including:

- Funding challenges – Transportation agencies throughout the country are grappling with growing gaps in transportation funding, brought on by reduced gas tax funds, as well as other factors. PennDOT completed the PennDOT Pathways Planning and Environmental Linkages (PEL) Study which evaluates the near-term and long-term revenue options and strategies to mitigate this issue and ensure the Commonwealth’s highways and bridges are maintained in a state of good repair. The PEL Study can be viewed here: https://www.penndot.pa.gov/about-us/funding/Documents/PennDOT-Pathways_PEL-Study.pdf. One outcome of this process could include an increased focus on TSMO projects – prioritizing more efficient usage of existing capacity could decrease funding needs and ensure available funds are spent on projects that maximize potential benefits to safety and mobility.
- Future of work – As the region shifts into a post-pandemic “new normal,” some degree of long-term reduction in peak hour travel is anticipated. Given that capacity-adding projects are generally warranted through analysis of future peak periods, these changes should also result in an increased focus on TSMO solutions which produce improvements within the existing transportation network.

The discussions also included specific planned developments and other location-specific trends, as discussed below.

Erie County MPO

The Erie Metropolitan Planning Organization represents the needs of the 38 municipalities in Erie County as well as the Erie Metropolitan Transit Authority (EMTA), Erie Regional Airport Authority, and the Erie Western Pennsylvania Port Authority. The MPO's vision of is to develop a sustainable transportation system that provides mobility options to all people and the necessary infrastructure to support economic activity and daily life. This is done by prioritizing the maintenance of existing infrastructure while investing in targeted multimodal improvements to enhance safety and accessibility. Priority projects increase multimodal interconnectivity throughout the County. An example is advocacy for more frequent passenger rail to connect with busses, the airport and port as well as the existing road and sidewalk network. Emerging needs in Erie County include storm water management, spread of broadband technology, and lack of emergency management capacity.

Mercer County MPO

The Shenango Valley Area Transportation Study Metropolitan Planning Organization – Mercer County Long Range Plan Update was completed November 2021 and prioritizes the following transportation needs/focuses:

- Improvements to pavement condition
- The desire to spur economic growth through transportation improvements at freight bottlenecks
- A need for mobility options such as expanded transit service for residents to access jobs and resources.
- The desire to improve quality of life and enhance tourism through the development of multi-use trails and improved access to regional destinations

Emerging trends identified by the plan include Freight & E-Commerce, Adaptive Reuse, and Telecommuting. Rising e-commerce will impact land use, both in terms of an increased need for distribution centers, and a decreased need for retail space. A large warehouse/distribution center is currently under construction near the I-80/I-376/SR 760 Interchange. Vacant and underutilized sites are being proposed as development candidates to provide a more park-like, livable, mixed-use place with a sense of community. Mercer County could capitalize on telecommuting as it could easily attract residents from nearby cities with its high quality of life and lower cost of living.

North Central RPO

As with most rural regions, North Central Rural Planning Organization is reliant on private automobiles for personal mobility. Public transportation & ride sharing public transportation services in the region are primarily provided by the Area Transportation Authority (ATA). ATA reports a decrease in ridership from 426,000 in Fiscal Year (FY) 2018-19 to 361,000 in FY 2019-20. The region's total number of crashes has been decreasing each year with decade-lows of 1,926 in 2019 and 1,575 in 2020. More than one million miles per day are traveled by trucks across the region and billions of tons of good are moved in and out of the region per year. North Central's most recent Long Range Transportation Plan, adopted in June 2022, focuses on the following goal areas:

- Safety and Security
- Reliable Multimodal Transportation
- Equity and Access
- Reducing Environment Impacts
- Planning for Changing Demand
- Resiliency
- System Conditions

Northwest RPO

The Northwest Rural Planning Organization region is a rural area with a rather significant topography of hills and streams, therefore producing the need for more bridges. Often time, these bridges are under 20' in length and are owned locally by the counties and the municipalities. While the region's bridges have improved significantly over the last decade, there is still a need to invest in the region's local bridge system especially those rated as "poor." Funding assistance to these municipalities for local bridge is greatly needed.

There is also a need to maintain roadway pavements in state of good repair.

Another regional trend affecting transportation throughout the Northwest region is the increasing utilization of bicycles and on-foot modes of transportation for not just recreational purposes but also for such basic functions of daily life – healthy exercise, commuting to work, conducting commerce and errands, and outdoor experiences. These active transportation trends are due in part to the decreasing use of personal vehicles. Therefore, it is appropriate to include improved bicycle and pedestrian safety and convenience features as part of transportation projects and programs.

Southwestern Pennsylvania Commission (SPC)

The Pennsylvania Turnpike Commission's Southern Beltway officially opened in 2022. This new, 13-mile cashless tolling facility serves as a connection to the Pittsburgh International Airport and I-376 to I-79 in Washington County. In addition to the Southern Beltway, the Pennsylvania Turnpike Commission plans to extend the current Mon Fayette Expressway 14 miles north to PA Route 51 in Jefferson Hills to the Parkway East, I-376 East in Monroeville. This project will complete the 68-mile system allowing continuous travel from West Virginia to an interchange with the Parkway East in Monroeville. The project will also encourage redevelopment of abandoned industrial sites, encourage revitalization of some neighborhoods, and potential relieve traffic congestions on a few different roads in southern and eastern Allegheny County.

The Pittsburgh International Airport is constructing a new \$1.4 Billion, 811,000 square foot terminal, which is scheduled to open in 2025. In addition to the new terminal, there is 4,000 acres of developable land around the Pittsburgh International Airport including 30 million square feet of building space. Clinton Commerce Park, Cherrington Commerce Center, Industry Drive, and Airside Business Park have already seen significant investment and development.

The new 340-acre Ethane Cracker plant in Beaver County opened in 2022. Because of the new development, this may lead to an uptick in drilling within the SPC region as well as the development of other ancillary businesses.

There are several other anticipated development areas regionwide including the I-79 Corridor (Washington County), State Routes 19 and 228 in Butler County, and the Hazelwood Green Site (the site has a median target of 2.8 million sq. feet of mixed-use development).

PennSTART, which will be located in Westmoreland County once completed, is the state-of-the-art facility that will benefit emergency responders, transportation organizations, and research institutions. The new facility will provide access to innovative technologies for testing and education, automated vehicle testing and development, traffic incident management, tolling and ITS technology, work zones, commercial vehicles, transit vehicles, and other emerging technologies.

New ROP Needs and Projects

During the stakeholder engagement process for this interim update, a number of new issues and needs were discussed. These locations were reviewed and, where applicable, new ROP projects have been drafted for consideration. These projects have not undergone the data-heavy prioritization process which was used during the major update in 2019. Therefore, these projects should be considered alongside, but not in lieu of, projects previously included.

In total, 67 new projects have been included in this interim ROP update. They are summarized in **Table 2**. The projects include additional ITS needs, Transit Improvements, traffic signal improvement corridors, multimodal connectivity, intersection improvements, and traveler information. Project summary sheets have also been included as attachments. Projects are numbered sequentially for referencing, but no hierarchy should be assumed from the order given. No quantitative or qualitative prioritization was completed during this interim update. Prioritization can be revisited during a subsequent major ROP update. Cost estimates for this interim update generally follow the approach utilized in subsequent ROPs. This approach places projects into one of four cost categories, as outlined in **Figure 1**.

FIGURE 1: COST ESTIMATE CATEGORIES



TABLE 2: INTERIM UPDATE ROP PROJECT ADDITIONS

Project #	Project	Stakeholders	Improvement Type
IU.01	I-80 DMS Retrofit/Replace	PennDOT 10-0, North Central RPO, Northwest RPO	Antiquated Devices
IU.02	District 1-0 Antiquated Devices	PennDOT 1-0	Antiquated Devices
IU.03	US 22 at Northern Pike Intersection Improvements	PennDOT 11-0	Arterial Operations
IU.04	SR 8 at Wildwood Road Intersection Improvements	PennDOT 11-0	Arterial Operations
IU.05	SR 51 and SR 151 Roundabout	PennDOT 11-0	Arterial Operations
IU.06	Union Avenue/Gass Road/Highland Avenue Roundabout	PennDOT 11-0	Arterial Operations
IU.07	US 19 Ross Township Road Diet	PennDOT 11-0	Arterial Operations
IU.08	SR 151 at Broadhead Road	PennDOT 11-0	Arterial Operations
IU.09	McKnight Road at Seibert Road Improvements	PennDOT 11-0	Arterial Operations
IU.10	Lowries Run Road/Rochester Road Roundabout	PennDOT 11-0	Arterial Operations
IU.11	Sewickley Oakmont Road/ US 19 Intersection Improvements	PennDOT 11-0	Arterial Operations
IU.12	I-80 Fiber Optic Backbone	PennDOT 1-0, PennDOT 10-0, Mercer County MPO, North Central RPO, Northwest RPO	Communications
IU.13	I-70 Fiber Optic Gaps	PennDOT 12-0	Communications
IU.14	I-79 Fiber Optic Gaps	PennDOT 12-0	Communications
IU.15	Parkway East Active Traffic Management (ATM)	PennDOT 11-0	Freeway Operations
IU.16	I-80 Slow Vehicle Warning	PennDOT 10-0	Freeway Operations
IU.17	I-376 Ft. Pitt Tunnel Over Height Truck System	PennDOT 11-0	Freeway Operations
IU.18	I-80 & Applicable State Route Detour Sign Update	PennDOT 1-0, PennDOT 10-0	Incident Management
IU.19	I-79 & Applicable State Route Detour Sign Update	PennDOT 1-0, PennDOT 10-0	Incident Management
IU.20	I-90 & Applicable State Route Detour Sign Update	PennDOT 1-0	Incident Management

Regional Operations Plan (ROP)

Western RTMC Region

Project #	Project	Stakeholders	Improvement Type
IU.21	I-90 Closure Assistance	PennDOT 1-0, New York DOT, OhioDOT, Emergency Responders, Erie MPO	Incident Management
IU.22	I-90 On-Ramp Incident Gates	PennDOT 1-0, Erie MPO, Emergency Responders	Incident Management
IU.23	I-79 & I-80 Emergency Crossovers	PennDOT 1-0, Mercer County MPO, Emergency Responders	Incident Management
IU.24	Erie County Detour Signal Upgrades	PennDOT 1-0, Erie MPO, Local Municipalities	Incident Management
IU.25	Warren County Detour Signal Upgrades	PennDOT 1-0, Northwest RPO, Local Municipalities	Incident Management
IU.26	Venango County Detour Signal Upgrades	PennDOT 1-0, Northwest RPO, Local Municipalities	Incident Management
IU.27	Crawford County Detour Signal Upgrades	PennDOT 1-0, Northwest RPO, Local Municipalities	Incident Management
IU.28	Mercer County Detour Signal Upgrades	PennDOT 1-0, Mercer County MPO, Local Municipalities	Incident Management
IU.29	I-79 Seneca Ramps – TSMO	PennDOT 10-0	ITS
IU.30	SR 8/SR 4010 Intersection ITS	PennDOT 10-0	ITS
IU.31	SR 4020/ Harmony Intersection ITS	PennDOT 10-0	ITS
IU.32	SR 85/ SR 2001 Intersection ITS	PennDOT 11-0, PRT	ITS
IU.33	US 422/ SR 403 Intersection ITS	PennDOT 10-0	ITS
IU.34	I-79 ITS	PennDOT 10-0	ITS
IU.35	US 22 (North Fayette & Robinson) ITS	PennDOT 11-0	ITS
IU.36	SR 65 from I-79 to City of Pittsburgh	PennDOT 11-0	ITS
IU.37	SR 51 from SR 88 to Turnpike	PennDOT 11-0	ITS
IU.38	SR 3069 West Liberty Avenue to the Liberty Bridge Intersection	PennDOT 11-0	ITS
IU.39	I-80 Corridor CCTV	PennDOT 10-0, North Central RPO, Northwest RPO	ITS
IU.40	District 12 CCTV Gaps	PennDOT 12-0	ITS
IU.41	US 22 Corridor ITS/ Signal Fiber Communications	PennDOT 10-0	ITS/ Signal Communications

Regional Operations Plan (ROP)

Western RTMC Region

Project #	Project	Stakeholders	Improvement Type
IU.42	US 22 Corridor ITS/ Signal Improvements	PennDOT 10-0	ITS/ Signal Improvements
IU.43	Corridor M & K Parkway North HOV Conversion Study	PRT, PennDOT 11-0, SPC	Multimodal
IU.44	Corridor G East/ Central Pittsburgh River to River Connection	PRT, PennDOT 11-0, City of Pittsburgh, DOMI	Multimodal
IU.45	Corridor D Library Line Best Use Study	PRT, SPC	Multimodal
IU.46	Corridor E East Busway Phased Extensions	PRT, Local Municipalities	Multimodal
IU.47	Corridor H Allentown/ Downtown LRT Best Use Study	PRT, SPC, City of Pittsburgh, DOMI	Multimodal
IU.48	Corridor F East Busway to Monroeville Rapid Transit	PRT, PennDOT 11-0	Multimodal
IU.49	Corridor J Allegheny Valley Rapid Transit	PRT, PennDOT 11-0	Multimodal
IU.50	Corridor A Airport Corridor Rapid Transit	PRT, PennDOT 11-0	Multimodal
IU.51	North Fayette Trail Connector	PennDOT 11-0, North Fayette Township, Allegheny County, PRT	Multimodal
IU.52	Completing the Loop	Riverlife, PennDOT 11-0, Allegheny County	Multimodal
IU.53	Turtle Creek Connector	Study Corridor Municipalities, PennDOT 11-0, Allegheny County	Multimodal
IU.54	VOPP Trail	Verona, Oakmont, Penn Hills, Plum Borough, PennDOT 11-0, PRT	Multimodal
IU.55	Three Rivers Heritage Trail – Allegheny Valley	Municipalities, PennDOT 11-0, PRT	Multimodal
IU.56	Three Rivers Heritage Trail – Hazelwood to Carrie Furnace	Pittsburgh, Swissvale, Rankin, PennDOT 11-0, PRT	Multimodal
IU.57	Little Pine Creek Connector	Shaler, Etna, PennDOT 11-0, PRT	Multimodal
IU.58	Panhandle Trail Extension	Carnegie, Scott Township, Collier Township, PennDOT 11-0, PRT	Multimodal
IU.59	White Oak Park to South Park Connector	Municipalities, Montour Trail Council, Steel Valley Trail Council, PennDOT 11-0, PRT, Allegheny County	Multimodal

Regional Operations Plan (ROP)

Western RTMC Region

Project #	Project	Stakeholders	Improvement Type
IU.60	The Eastern Pittsburgh Multimodal Corridor Project	PennDOT 11-0, PRT, Allegheny County, SPC	Multimodal
IU.61	Corridor R Homestead to McKeesport Transit Improvements	PRT, PennDOT 11-0	Multimodal
IU.62	SR 68 Jeff and Cunningham Street Signal Improvements	PennDOT 10-0	Signal Improvements
IU.63	Smart Spines – City of Pittsburgh	FHWA, City of Pittsburgh, PennDOT 11-0, PRT	Signal Improvements
IU.64	Mayview/Lesnett/Bank/Chartiers Avenue Intersection Improvements	PennDOT 11-0	Signal Improvements
IU.65	Grove City Outlets Signal Improvements	PennDOT 1-0, Mercer County MPO, Springfield Township	Signal Improvements
IU.66	PA 20 Wesleyville Signal Improvements	PennDOT 1-0, Erie MPO, Wesleyville Borough	Signal Improvements
IU.67	US 19 Corridor Traffic Signal Improvements	PennDOT 1-0, Erie MPO, City of Erie	Signal Improvements

Previous Project Status

Project #	Project Name	Priority Area	Planned Improvements	Stakeholders	Estimated Cost (Capital)	Priority	Project Status	Funding Source	Notes
FA.01	Bates St. Interchange Improvements	Freeway and Arterial Operations	Interchange Improvements	PennDOT 11-0	10M+	High	Partial Progress	STP - Surface Transportation Prog	
FA.02	I-79 ICM (District 12)	Freeway and Arterial Operations	Integrated Corridor Management	PennDOT 12-0	2M- 10M	High	In Design	Capital and CMAQ	Currently in design on the US 19 portion of this project. The US 19 project will include minor signal upgrades and the installation of an adaptive signal system on all traffic signals on US 19 from I-70 to the Allegheny County line.
FA.03	Campbells Run Queue Warning	Freeway and Arterial Operations	Queue Warning, DMS	PennDOT 11-0	<500k	Normal	Documented		ATMS can now build corridors for advanced queue warning systems using existing CMS. No project has been developed to add CMS boards for this purpose.
FA.04	Parkway North ICM	Freeway and Arterial Operations	Smart Parking, Traffic signal Improvements, Transit Improvements	PennDOT 11-0, PRT	2M- 10M	Normal	Documented		
FA.05	Veterans Bridge Junction Control	Freeway and Arterial Operations	Junction Control	PennDOT 11-0	500k-2M	Normal	Documented		Grant application not approved last round.
FA.06	Mercer County Smart Corridor Initiatives	Freeway and Arterial Operations	Traffic Signal Improvements	PennDOT 1-0	2M- 10M	Normal	In Construction		In construction now on SR 19 through Mercer
MC.01	South Hills Village Smart Parking	Multimodal Connectivity	Smart Parking, DMS	PennDOT 11-0, PRT	500k-2M	High	In Design	TSMO	
MC.02	W. Carson St. Multimodal Improvements	Multimodal Connectivity	Transit Improvements	PennDOT 11-0, PRT	500k-2M	High	Documented		
MC.03	Penn Ave. Transit Improvements	Multimodal Connectivity	Transit Improvements	City of Pittsburgh, PRT	<500k	High	Documented		
MC.04	Centre Ave. Transit Improvements	Multimodal Connectivity	Transit Improvements	City of Pittsburgh, PRT	<500k	High	Documented		
MC.05	Peninsula Drive + W. 8th St. Corridor Improvements	Multimodal Connectivity	Traffic Signal Improvements	PennDOT 1-0, City of Erie, Millcreek Township	500k-2M	High	In Design		In design now for Peninsula Drive. Millcreek taking over 8th St.
MC.06	Carnegie Smart Parking	Multimodal Connectivity	Smart Parking, DMS	PennDOT 11-0, PRT	<500k	Normal	In Design	TSMO	Parking availability is funded using TSMO funds transferred from FHWA to FTA. PRT will have a better update on the project status.
MC.07	Wilkinsburg Smart Parking	Multimodal Connectivity	Smart Parking, DMS	PennDOT 11-0, PRT	<500k	Normal	In Design	TSMO	Parking availability is funded using TSMO funds transferred from FHWA to FTA. PRT will have a better update on the project status.
MC.08	Liberty Ave. Transit Improvements	Multimodal Connectivity	Transit Improvements	City of Pittsburgh, PRT	<500k	Normal	Documented		
MC.09	Kennywood Blvd./Browns Hill Rd. Transit Improvements	Multimodal Connectivity	Transit Improvements	PennDOT 11-0, City of Pittsburgh, PRT	<500k	Normal	Documented		
MC.10	E. Carson St. Transit Improvements	Multimodal Connectivity	Transit Improvements	PennDOT 11-0, PRT	<500k	Normal	Documented		
MC.11	Second Ave. Transit Improvements	Multimodal Connectivity	Transit Improvements	City of Pittsburgh, PRT	<500k	Normal	Documented		
MC.12	Healthy Ride (Pittsburgh Bike Share) E-Bike Deployment	Multimodal Connectivity	Bike Share	Pittsburgh Bike Share	<500k	Normal	Documented		
MC.13	"The Chute" to Eliza Furnace Trail Bike Connection	Multimodal Connectivity	Bike Improvements	City of Pittsburgh	<500k	Normal	Documented		
MC.14	Brady St. to Heritage Trail Bike Connection	Multimodal Connectivity	Bike Improvements	City of Pittsburgh	<500k	Normal	Documented		
MC.15	Butler St. Bike Connection	Multimodal Connectivity	Bike Improvements	City of Pittsburgh	<500k	Normal	Documented		
MC.16	Penn Ave. Bike Connection	Multimodal Connectivity	Bike Improvements	City of Pittsburgh	<500k	Normal	Documented		
MC.17	East Allegheny Ped/Bike Improvements	Multimodal Connectivity	Pedestrian/Bike Improvements	City of Pittsburgh	<500k	Normal	Documented		

Regional Operations Plan (ROP)

Western RTMC Region

Project #	Project Name	Priority Area	Planned Improvements	Stakeholders	Estimated Cost (Capital)	Priority	Project Status	Funding Source	Notes
OT.01	Key Bank Pavilion Event Management & Signal Improvements	Operational Teamwork/Institutional Coordination	Traffic Signal Improvements, DMS	PennDOT 12-0, PennDOT 11-0	<500k	Normal	Documented		This project has not progressed very far yet. We believe that the Pavilion will need to get involved in the project to make it successful because there are some traffic flow improvements that need to be made on the site itself.
TI.01	Hogback Hill RWIS	Traveler Information	RWIS	PennDOT 10-0	<500k	High	Documented		
TI.02	US 22 Corridor ITS/Signal Improvements	Traveler Information	CCTV, DMS	PennDOT 10-0	500k-2M	High	In Construction	Federal	ECMS# 114842. Construction phase is in 60-day test period for devices.
TI.03	US 422 Corridor ITS	Traveler Information	CCTV, DMS	PennDOT 10-0	2M- 10M	High	Documented		
TI.04	District 12-0 RWIS Expansion	Traveler Information	RWIS	PennDOT 12-0	<500k	High	Documented		We are currently exploring what type of procurement method could be used to get these devices installed.
TI.05	I-79 Corridor ITS	Traveler Information	CCTV, DMS	PennDOT 1-0, PennDOT 10-0	2M- 10M	High	In Design	TSMO	In Design/Construction
TI.06	Western RTMC Upgrade	Traveler Information	RTMC Upgrade	PennDOT 11-0, PennDOT Central Office	2M- 10M	High	Partial Progress	TSMO	Concept of Operations and Systems Engineering/High Level Concepts being developed currently.
TI.07	I-90 Corridor ITS	Traveler Information	CCTV, DMS, VSL	PennDOT 1-0	2M- 10M	High	In Design	TSMO	In Design/Construction
TI.08	I-80 Corridor ITS	Traveler Information	CCTV, DMS, VSL	PennDOT 1-0, PennDOT 10-0	2M- 10M	High	In Design	TSMO	In Design/Construction
TI.09	I-80 Fiber Deployment	Traveler Information	Fiber Optic Cable	PennDOT 1-0, PennDOT 10-0	10M+	High	In Design	TSMO	In Design/Construction
TI.10	PA-28 ITS	Traveler Information	CCTV, DMS	PennDOT 10-0	500k-2M	Normal	In Construction	Federal	ECMS# 114842. Construction phase is in 60-day test period for devices.
TI.11	US 22 Bridge De-icing	Traffic Incident Management	Bridge De-icing, RWIS, CCTV	PennDOT 10-0	500k-2M	Normal	Documented		
TI.12	I-376 Corridor ITS	Traveler Information	CCTV, DMS, RWIS	PennDOT 11-0	500k-2M	Normal	In Design	TSMO	TSMO funds and Interstate funds approved for design and construction for Beaver County I-376 ITS expansion. Current let date is 6/8/2023.
TI.13	PA-8 Arterial ITS	Traveler Information	CCTV, DMS	PennDOT 11-0	500k-2M	Normal	Documented		
TI.14	US 22 (Monroeville) Arterial ITS	Traveler Information	CCTV, DMS	PennDOT 11-0	500k-2M	Normal	In Design	TSMO	Fully designed and being let under a betterment, SR 2048-A14 on 1/12/2023. Construction planned to be completed by end of 2024.
TI.15	I-70/US 40 Detour ITS	Traveler Information	CCTV, DMS	PennDOT 12-0	500k-2M	Normal	Documented		
TI.16	US 322 ITS	Traveler Information	CCTV, DMS	PennDOT 10-0	500k-2M	Normal	Documented		
TI.17	US 6 Detour Improvements	Traveler Information	CCTV, Type A DMS	PennDOT 1-0	2M- 10M	Normal	Documented		
TI.18	District 1-0 RWIS Expansion	Traveler Information	RWIS	PennDOT 1-0	500k-2M	Normal	Documented		
TI.19	Franklin Operations Improvements	Traveler Information	CCTV, DMS	PennDOT 1-0	500k-2M	Normal	Documented		
TI.20	Bayfront Parkway Arterial DMS	Traveler Information	DMS	PennDOT 1-0	500k-2M	Normal	In Construction		In Construction
TI.21	US 6 Winter Operations ITS	Traveler Information	DMS, RWIS	PennDOT 1-0	500k-2M	Normal	Documented		
TI.22	West Middlesex Interchange ITS	Traveler Information	CCTV, DMS	PennDOT 1-0	500k-2M	Normal	Documented		
TI.23	Brookville Arterial DMS	Traveler Information	DMS	PennDOT 10-0	500k-2M	Normal	Documented		
TI.24	Butler County Fiber Ring Deployment	Traveler Information	Fiber Optic Cable	PennDOT 10-0	10M+	Normal	Documented		
TIM.01	Armstrong County Bridge De-icing	Traffic Incident Management	Bridge De-icing, RWIS, CCTV	PennDOT 10-0	500k-2M	High	Documented		
TIM.02	PA-28 Freeway Service Patrol	Traffic Incident Management	Freeway Service Patrol	PennDOT 11-0	<500k	High	In Construction	TSMO	Contractor on our current FSP contract being tracked separately with the grant funding on SR 28.
TIM.03	PA-28 TIM Team	Traffic Incident Management	TIM Team	PennDOT 11-0, SPC, Local Municipalities, Emergency Personnel	<500k	High	Documented		
TIM.04	I-80 TIM Team	Traffic Incident Management	TIM Team	PennDOT WRTMC, PennDOT 1-0, PennDOT 10-0, Local Municipalities, Emergency Personnel	<500k	High	Documented		
TIM.05	I-79 Curve Warning	Traffic Incident Management	Dynamic Curve Warning	PennDOT 10-0	<500k	Normal	Documented		
TIM.06	US 30 Curve Warning	Traffic Incident Management	Dynamic Curve Warning	PennDOT 12-0	<500k	Normal	Documented		Currently exploring what type of system should be used for this project.

Regional Operations Plan (ROP)

Western RTMC Region

Project #	Project Name	Priority Area	Planned Improvements	Stakeholders	Estimated Cost (Capital)	Priority	Project Status	Funding Source	Notes
TIM.07	Erie TIM Team	Traffic Incident Management	TIM Team	PennDOT 1-0, Ohio DOT, New York State DOT, Local Municipalities, Emergency Personnel	<500k	High	Documented		
TIM.08	I-80 Crossovers	Traffic Incident Management	Emergency Crossovers	PennDOT 10-0	500k-2M	High	Documented		
TS.01	Greensburg Operational Improvements	Traffic Signals	Traffic Signal Improvements	PennDOT 12-0	500k-2M	High	Programmed	CMAQ	CMAQ grants have been awarded and design is to begin in 2023 for projects on US 30 and US 119 in the Greensburg area.
TS.02	PA-8 Traffic Signal Improvements	Traffic Signals	Traffic Signal Improvements	PennDOT 10-0	500k-2M	Normal	In Construction	Federal	ECMS# 110464. Construction to be completed in 2023.
TS.03	US 19 and Interchange Rd. Signal Improvements	Traffic Signals	Traffic Signal Improvements	PennDOT 1-0	500k-2M	Normal	Programmed		Awarded Traffic Signals Technology grant
TS.04	26th Street Traffic Signal Improvements	Traffic Signals	Traffic Signal Improvements	PennDOT 1-0	500k-2M	Normal	In Design		design/construction
TS.05	PA-18 Traffic Signal Improvements	Traffic Signals	Traffic Signal Improvements	PennDOT 1-0	500k-2M	Normal	Documented		
TS.06	US 322 Traffic Signal Improvements	Traffic Signals	Traffic Signal Improvements	PennDOT 1-0	500k-2M	Normal	Documented		
TS.07	East End Traffic Signal Improvements	Traffic Signals	Traffic Signal Improvements	PennDOT 11-0	500k-2M	Normal	Documented		
TS.08	PA-51 DOT Signal Pilot	Traffic Signals	Traffic Signal Improvements	PennDOT 11-0	<500k	Normal	Partial Progress		SR 51 PennDOT ownership pilot is still being discussed as we've been learning from the Eastern side of the state on signal ownership considerations before we implement it.
TS.09	Grove City Signal Improvements	Traffic Signals	Traffic Signal Improvements	PennDOT 1-0	500k-2M	Normal	Documented		

Previous Study Status

Study Name	Priority Area	Description	Stakeholders	Priority	Project Status	Notes
Downtown Pittsburgh Bridge Operations Study	Freeway and Arterial Operations	Study to improve operations in the vicinity of the Downtown river crossings	SPC, PennDOT 11-0, PRT	High	Documented	
Parkway West ICM Study	Freeway and Arterial Operations	Study conversion of shoulders for flex lane or transit lane use. Identify other ICM needs.	PennDOT 11-0	High	Documented	
Regional ITS Strategic Plan	Traveler Information	In addition to ITS device projects identified in this plan, conduct a regionwide study to determine any other remaining ITS coverage gaps and prioritize for future projects.	PennDOT 1-0, PennDOT 10-0, PennDOT 11-0, PennDOT 12-0	Normal	Planned	
District 12-0 Communications Gap Study	Traveler Information	Identify communications needs throughout District (fiber, etc.)	PennDOT 12-0	Normal	Documented	
Indiana University of Pennsylvania (IUP) Special Events Traffic Management Study	Operational Teamwork/ Institutional Coordination	Improve ingress/egress to events at Kovalchick Convention and Athletic Complex	IUP, PennDOT 10-0	Normal	Documented	
Operations Center/ Traffic Management Center Coordination	Operational Teamwork/ Institutional Coordination	Improve coordination between Western RTMC and PA Turnpike Traffic Operations Center, particularly for the I-76/I-376 loop, including incident management, construction detours, communications (fiber), device sharing, traveler information, and weather operations. Port Authority operations center and Cranberry Township TMC should also be included.	SPC, PennDOT 11-0, PA Turnpike Commission, PRT, Cranberry Township	Normal	Documented	
Person Trips Prioritization Study	Operational Teamwork/ Institutional Coordination	Determine feasibility of Roadway Tiering based on total person trips (including transit passengers, cyclists, etc.) instead of AADT.	SPC	Normal	Documented	
Key Bank Pavilion Event Management Study	Operational Teamwork/ Institutional Coordination	Improve ingress/egress to events at Key Bank Pavilion.	Key Bank Pavilion, PennDOT 12-0	Normal	Documented	

Regional Operations Plan (ROP)

Western RTMC Region

Study Name	Priority Area	Description	Stakeholders	Priority	Project Status	Notes
Downtown Erie Event Management Study/Planning	Operational Teamwork/ Institutional Coordination	Improve traffic management for special events, increase Park-n-Ride utilization to reduce congestion in Downtown area.	Erie MPO, City of Erie, EMTA	Normal	Documented	
Data/Video Sharing Initiative	Operational Teamwork/ Institutional Coordination	Share access to CCTV feeds to County offices to improve coordination and incident response.	PennDOT Western RTMC, County Offices	Normal	Documented	
Birmingham Bridge Complete Street Study	Multimodal Connectivity	Improve safety of existing bike lanes. Consider protected bike lane infrastructure and possible vehicular lane reduction.	PennDOT 11-0	Normal	Documented	
Existing Bike Trail Maintenance Initiative	Multimodal Connectivity	Initiative to ensure continued maintenance of bike trails throughout region.	SPC	Normal	Documented	
Regional Park-n-Ride Expansion Study	Multimodal Connectivity	Study possibilities for expanding existing sites or providing additional sites (coordination with upcoming Regional Transit Coordination Study).	SPC	Normal	Documented	
Park-n-Bike Campaign/Expansion	Multimodal Connectivity	Initiative to encourage commuters to transfer to bicycles at established trailheads.	SPC	Normal	Documented	
Potential Transit Lane Study	Multimodal Connectivity	Study feasibility of other transit lane candidates not included in this report.	SPC, PennDOT 11-0, City of Pittsburgh DOMI, PRT	Normal	Documented	
Wabash Tunnel Multimodal Use Study	Multimodal Connectivity	Study of alternate uses for tunnel, including possibility of conversion for bike usage.	SPC, PennDOT 11-0, City of Pittsburgh DOMI, PRT	Normal	Documented	
West End/South Hills Potential Trail Network Study	Multimodal Connectivity	Study to determine potential trail network utilizing underused or unused right-of-way.	SPC	Normal	Documented	
PA-28 Active Traffic Management Study	Freeway and Arterial Operations	Study flex lanes and other Active Traffic Management strategies.	PennDOT 11-0	Normal	Documented	
Parkway North HOV Conversion Study	Freeway and Arterial Operations	Consider converting existing HOV lanes in the median of the Parkway North (I-279) to a Port Authority Busway or other use.	PennDOT 11-0, PRT	Normal	Documented	
US 40 Road Safety Audit	Freeway and Arterial Operations	Road Safety Audit on US 40, east of Uniontown to Somerset County line.	SPC	Normal	Complete	

Regional Operations Plan (ROP)

Western RTMC Region

Study Name	Priority Area	Description	Stakeholders	Priority	Project Status	Notes
Route 8 Corridor Operations Planning Study	Freeway and Arterial Operations	Study to improve operations along Route 8 between Wildwood and Bakerstown.	SPC	Normal	Complete	
Western RTMC Region Truck Parking Study	Freight Management	Determine needs and locations for possible expansion of truck parking. Study possibility of installing Truck Parking Management System. Consider potential public-private partnership opportunities with private truck stop facilities. Coordinate with planned PennDOT Truck Parking Study.	SPC, PennDOT Central Office	Normal	Documented	
Western RTMC Region Winter Truck Restriction Impact Study	Freight Management	Study impact of winter truck restrictions on parallel corridors and determine best practices for future winter operations.	SPC, PennDOT Central Office	Normal	Documented	

New ROP Projects

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

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

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-02: District 1-0 Antiquated Devices Upgrade

PROJECT DESCRIPTION AND SCOPE: Retrofit or Replace existing District 1-0 Antiquated CCTV cameras and DMS.

STAKEHOLDERS: PennDOT 1-0

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: 10-15 years

ESTIMATED COSTS:

\$\$\$
(\$2M-\$10M)

PROJECT TYPE: Antiquated Devices

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): CCTV Systems, DMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

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

BENEFITS: Improve incident response, congestion monitoring, and traveler information along key routes in PennDOT District 1-0.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-03: US 22 at Northern Pike Intersection Improvement

PROJECT DESCRIPTION AND SCOPE: The project is to consist of roadway and intersection improvements on US 22 (William Penn Highway) at SR 2054 (Northern Pike) and Alpine Village Drive/SR 286 (Golden Mile Hwy) to address existing traffic congestion and safety issues.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: \$3.5M

Life Cycle: N/A

PROJECT TYPE: Arterial Operations

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Currently SR 2054 (Northern Pike) intersects with SR 22 at a signalized intersection just 515 feet from where Alpine Village Drive/SR 286 (Golden Mile Hwy) also intersects with SR 22 at a signalized intersection. SR 22 is 4 four lanes wide with back-to-back left turn bays that frequently are insufficient for the demand. The demand is due to the missing direct connection between Northern Pike and SR 286 (Golden Mile Hwy). This causes the left through lanes to be blocked causing SR 22 to be minimized to 1 thru lane in either direction during peak hours regularly.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-04: SR 8 at Wildwood Road Intersection Improvements

PROJECT DESCRIPTION AND SCOPE: The project is to consist of roadway and intersection improvements on SR 8 (William Flinn Highway) at SR 4070 (Wildwood Road) to address existing traffic congestion and safety issues.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: \$6.1M

Life Cycle: 10-15

PROJECT TYPE: Arterial Operations

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: The vertical geometry on the west approach of Wildwood Road limits sight distance which has contributed to near crashes for westbound left turns. Both approaches of SR 4070 (Wildwood Road) will be widened from a shared single lane approach for all movements (L-T-R) to an exclusive left turn lane (L) and shared through right turn lane (L-R). Creation of the exclusive left turn lanes will enable protected left turn phasing to improve levels of service, reduce congestion and idling, and reduce crashes with left turns being performed without conflicting traffic.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-05: SR 51 and SR 151 Roundabout

PROJECT DESCRIPTION AND SCOPE: Reconstruct intersection into a roundabout.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: \$500k-\$2M

Life Cycle: N/A

PROJECT TYPE: Arterial Operations

LEVEL OF EFFORT: High

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

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Traffic flow improvements at SR 51 and SR 151 Intersection.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-06: Union Avenue/ Gass Road/ Highland Avenue Roundabout

PROJECT DESCRIPTION AND SCOPE: Reconstruct intersection into a roundabout.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: \$2M-\$5M

Life Cycle: N/A

PROJECT TYPE: Arterial Operations

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Traffic flow improvements at Union Avenue, Gass Road, & Highland Avenue Roundabout.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-07: US 19 Ross Township

PROJECT DESCRIPTION AND SCOPE: Road Diet - Reduce 4 lanes to 3 lanes, signal upgrades.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: \$500k-\$2M

Life Cycle: N/A

PROJECT TYPE: Arterial Operations

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Traffic flow improvements along US 19 in Ross Township.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-08: SR 151 at Broadhead Road, 5-Legged Intersection

PROJECT DESCRIPTION AND SCOPE: SR 151 at Brodhead Road Intersection Improvements.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: \$2M-\$10M

Life Cycle: N/A

PROJECT TYPE:

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Intersection improvements at SR 151 and Brodhead Road.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-09: McKnight Road at Seibert Road Improvements

PROJECT DESCRIPTION AND SCOPE: McKnight Rd at Seibert Rd Intersection Improvements.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: \$500k-\$2M

Life Cycle: N/A

PROJECT TYPE: Arterial Operations

LEVEL OF EFFORT: Moderate

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

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Intersection improvements at McKnight Road and Seibert Road.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-10: Lowries Run Road/Rochester Road Roundabout

PROJECT DESCRIPTION AND SCOPE: Reconstruction intersection into a roundabout.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: \$2M-\$5M

Life Cycle: N/A

PROJECT TYPE: Arterial Operations

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Intersection Improvements.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-11: Sewickley Oakmont Road/ US 19 Intersection Improvements

PROJECT DESCRIPTION AND SCOPE: Sewickley Oakmont Road/US 19 Intersection Improvements.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: \$3M

Life Cycle: N/A

PROJECT TYPE: Arterial Operations

LEVEL OF EFFORT: Moderate

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

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Intersection Improvements

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

ESTIMATED COSTS:

\$\$\$\$
(\$10M+)

Life Cycle: 25 years

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-13: I-70 Fiber Optic Gaps

PROJECT DESCRIPTION AND SCOPE: Replace any segments of the ITS network along mainline I-70 that still operate with wireless radios with fiber optic cable.

STAKEHOLDERS: PennDOT 12-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$\$
(\$2M)

Life Cycle: N/A

PROJECT TYPE: Communications

LEVEL OF EFFORT: Medium

TECHNOLOGY COMPONENTS *(if applicable):* Communications Infrastructure

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Reliability of the network, possible use of the improved network to enhance rural broadband initiative in certain areas

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-14: I-79 Fiber Optic Gaps

PROJECT DESCRIPTION AND SCOPE: Replace any segments of the ITS network along mainline I-79 that still operate with wireless radios with fiber optic cable.

STAKEHOLDERS: PennDOT 12-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$
(\$1.5M)

Life Cycle: N/A

PROJECT TYPE: Communications

LEVEL OF EFFORT: Medium

TECHNOLOGY COMPONENTS *(if applicable):* Communications Infrastructure

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Reliability of the network, possible use of the improved network to enhance rural broadband initiative in certain areas

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-15: Parkway East I-376 Active Traffic Management (ATM)

PROJECT DESCRIPTION AND SCOPE: Active Traffic Management through the use of ITS infrastructure.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: >\$54M

Life Cycle: N/A

PROJECT TYPE: Freeway Operations

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS *(if applicable):* ITS Devices

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Operational Improvements using ITS Infrastructure.

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

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15

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-17: I-376 Ft. Pitt Tunnel Over Height Truck System

PROJECT DESCRIPTION AND SCOPE: Install DMS and upgraded Lane Control Signs for traveler information that an over height truck is approaching the Ft. Pitt Tunnel. Install traffic signal to stop traffic to allow over height trucks to rout onto SR 19/51 towards the West End Circle using ramps. Also allows for restricting lanes due to temporary work zones from construction and typical maintenance work along with planned and unplanned tunnel closures.

STAKEHOLDERS: District 11-0

ESTIMATED SCHEDULE: 1-3 years

Life Cycle: N/A

ESTIMATED COSTS:

\$\$\$
(\$2M-\$5M)

PROJECT TYPE: Freeway Operations

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Lane Control Signs, DMS, Traffic Signal

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Improved travel time reliability

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

ESTIMATED COSTS: <\$500k

Life Cycle: N/A

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-19: I-79 & Applicable State Routes Detour Sign Update

PROJECT DESCRIPTION AND SCOPE: Update detour signs on I-79 and applicable state route detours.

STAKEHOLDERS: PennDOT 1-0, PennDOT 10-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: <\$500k

Life Cycle: N/A

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-20: I-90 & Applicable State Route Detour Sign Update

PROJECT DESCRIPTION AND SCOPE: Update detour signs on I-90 and applicable state route detours.

STAKEHOLDERS: PennDOT 1-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: <\$500k

Life Cycle: N/A

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-21: I-90 Closure Assistance

PROJECT DESCRIPTION AND SCOPE: Installation of devices and Coordination with neighboring states, New York & Ohio, to manage Interstate closures due to inclement weather events.

STAKEHOLDERS: PennDOT 1-0, New York DOT, Ohio DOT, Emergency Responders, Erie MPO

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: N/A

PROJECT TYPE: Incident Management

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): DMS Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Inter-Agency Communications; Reduced Winter Weather Crashes

BENEFITS: Improve inter-agency communication to reduce impact of winter weather events on the Interstate.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-22: I-90 On-Ramp Incident Gates

PROJECT DESCRIPTION AND SCOPE: Install emergency gates at on-ramps that can be closed to restrict access to I-90 in the event of major incidents.

STAKEHOLDERS: PennDOT 1-0, Erie MPO, Emergency Responders

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$
(<\$500k)

Life Cycle: 10-15 years

PROJECT TYPE: Incident Management

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Emergency Gate Systems

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Incident Response Time, Reduced Incident Clearance Time

BENEFITS: Improved Incident Response Time, Reduced Incident Residual Delays

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-23: I-79 & I-80 Emergency Crossovers

PROJECT DESCRIPTION AND SCOPE: Install Emergency Crossovers on I-79 at Mile Marker 120, and on I-80 at Mile Markers 8, 9, & 12.

STAKEHOLDERS: PennDOT 1-0, Mercer County MPO, Emergency Responders

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

PROJECT TYPE: Incident Management

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Reduced Incident Response Time; Reduced Incident Clearance Time

BENEFITS: Provide improved access for emergency vehicles to access incidents and allow easier relief of trapped queues along northern section of I-81 corridor.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-24: Erie County Detour Signal Upgrades

PROJECT DESCRIPTION AND SCOPE: Upgrade traffic signals along color detour routes in Erie County to allow Unified Command and Control (UCC) and remote communications to allow detour timings to be programmed. Develop detour timing plans.

- Black Detour: 44 Signals
- Blue Detour: 21 Signals
- Green Detour: 17 Signals
- Orange Detour: 18 Signals
- Red Detour: 4 Signals

STAKEHOLDERS: PennDOT 1-0, Erie County MPO

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$\$
(\$2M-\$10M)

Life Cycle: N/A

PROJECT TYPE: Incident Management

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Incident Clearance Time

BENEFITS: Improved traffic flow during incidents

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-25: Warren County Detour Signal Upgrades

PROJECT DESCRIPTION AND SCOPE: Upgrade traffic signals along color detour routes in Warren County to allow Unified Command and Control (UCC) and remote communications to allow detour timings to be programmed. Develop detour timing plans.

- Blue Detour: 2 Signals

STAKEHOLDERS: PennDOT 1-0, Northwest RPO

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: N/A

PROJECT TYPE: Incident Management

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Incident Clearance Time

BENEFITS: Improved traffic flow during incidents

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-26: Venango County Detour Signal Upgrades

PROJECT DESCRIPTION AND SCOPE: Upgrade traffic signals along color detour routes in Venango County to allow Unified Command and Control (UCC) and remote communications to allow detour timings to be programmed. Develop detour timing plans.

- Black Detour: 2 Signals
- Blue Detour: 1 Signal
- Green Detour: 1 Signal
- Orange Detour: 1 Signal
- Red Detour: 3 Signals

STAKEHOLDERS: PennDOT 1-0, Northwest RPO

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$\$
(\$2M-\$10M)

Life Cycle: N/A

PROJECT TYPE: Incident Management

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Incident Clearance Time

BENEFITS: Improved traffic flow during incidents

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-27: Crawford County Detour Signal Upgrades

PROJECT DESCRIPTION AND SCOPE: Upgrade traffic signals along color detour routes in Crawford County to allow Unified Command and Control (UCC) and remote communications to allow detour timings to be programmed. Develop detour timing plans.

- Blue Detour: 2 Signals
- Green Detour: 3 Signals
- Orange Detour: 2 Signals
- Red Detour: 2 Signals

STAKEHOLDERS: PennDOT 1-0, Northwest RPO

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$\$
(\$2M-\$10M)

Life Cycle: N/A

PROJECT TYPE: Incident Management

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Incident Clearance Time

BENEFITS: Improved traffic flow during incidents

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-28: Mercer County Detour Signal Upgrades

PROJECT DESCRIPTION AND SCOPE: Upgrade traffic signals along color detour routes in Mercer County to allow Unified Command and Control (UCC) and remote communications to allow detour timings to be programmed. Develop detour timing plans.

- Black Detour: 18 Signals
- Blue Detour: 14 Signals
- Green Detour: 2 Signals
- Orange Detour: 20 Signals
- Red Detour: 10 Signals

STAKEHOLDERS: PennDOT 1-0, Mercer County MPO

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$\$
(\$2M-\$10M)

Life Cycle: N/A

PROJECT TYPE: Incident Management

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Incident Clearance Time

BENEFITS: Improved traffic flow during incidents

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-29: I-79 Seneca Ramps - TSMO

PROJECT DESCRIPTION AND SCOPE: Currently started FD Phase. Construction to begin in 2024 and be completed same year, possibly extend into 2025. ECMS# 116661

STAKEHOLDERS: PennDOT 10-0

ESTIMATED SCHEDULE: 3 years

ESTIMATED COSTS: \$500k-\$700k

Life Cycle: N/A

PROJECT TYPE: ITS

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable):* Dual DMS, CCTV Camera, and Queue Detection.

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Interstate situational awareness, safety improvements with Dual DMS, CCTV Camera and queue detection.

OTHER CONSIDERATIONS AND ISSUES: Project currently in-design. CON Funds are 50% State & 50% Federal.

IU-30: SR 8/ SR 4010 Intersection ITS

PROJECT DESCRIPTION AND SCOPE: Currently started FD Phase. Construction to begin in 2024 and be completed same year, possibly extend into 2025. MPMS# 117903

STAKEHOLDERS: PennDOT 10-0

ESTIMATED SCHEDULE: 3 years

ESTIMATED COSTS: \$185k

Life Cycle: N/A

PROJECT TYPE: ITS

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (*if applicable*): LED bordered signing

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Replacing Flashing Warning Device in-place and adding additional LED bordered signing to improve safety at intersection.

OTHER CONSIDERATIONS AND ISSUES: Project currently in-design. CON Funds are 100% Federal.

IU-31: SR 4010/ Harmony Intersection ITS

PROJECT DESCRIPTION AND SCOPE: Currently started FD Phase. Construction to begin in 2024 and be completed same year, possibly extend into 2025. CON Funds are 100% Federal. MPMS# 117905

STAKEHOLDERS: PennDOT 10-0

ESTIMATED SCHEDULE: 3 years

ESTIMATED COSTS: \$40k-\$85k

Life Cycle: N/A

PROJECT TYPE: ITS

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (*if applicable*): LED bordered signing

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Adding additional LED bordered signing to improve safety at intersection.

OTHER CONSIDERATIONS AND ISSUES: Project currently in-design. CON funds are 100% Federal.

IU-32: SR 85/2001 Intersection ITS

PROJECT DESCRIPTION AND SCOPE: Currently started FD Phase. Construction to begin in 2024 and be completed same year, possibly extend into 2025. CON Funds are 100% Federal. MPMS# 117907

STAKEHOLDERS: PennDOT 11-0, PRT

ESTIMATED SCHEDULE: 3 years

ESTIMATED COSTS: \$40k-\$85k

Life Cycle: N/A

PROJECT TYPE: ITS

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (*if applicable*): LED bordered signing

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Adding additional LED bordered signing to improve safety at intersection.

OTHER CONSIDERATIONS AND ISSUES: Project currently in-design. CON Funds are 100% Federal.

IU-33: US 422/ SR 403 Intersection ITS

PROJECT DESCRIPTION AND SCOPE: Currently started FD Phase. Construction to begin in 2024 and be completed same year, possibly extend into 2025. CON Funds are 100% Federal. MPMS# 117909

STAKEHOLDERS: PennDOT 10-0

ESTIMATED SCHEDULE: 3 years

ESTIMATED COSTS: \$185k

Life Cycle: N/A

PROJECT TYPE: ITS

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): Flashing Warning Signs, LED bordered signing.

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Replacing Flashing Warning Device in-place and adding additional LED bordered signing to improve safety at intersection.

OTHER CONSIDERATIONS AND ISSUES: Project currently in-design. CON Funds are 100% Federal.

IU-34: I-79 ITS Gaps

PROJECT DESCRIPTION AND SCOPE: Install DMS and CCTV to fill gaps in coverage along I-79 through District 10.

STAKEHOLDERS: PennDOT 10-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: \$500k-\$1M

Life Cycle: N/A

PROJECT TYPE: ITS

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable):* DMS & CCTV Cameras

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: DMS & CCTV Cameras

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-35: US 22 (North Fayette & Robinson) ITS

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras and DMS along US 22 through North Fayette and Robinson Townships.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: \$500k-\$2M

Life Cycle: N/A

PROJECT TYPE: ITS

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): Traveler Information, CCTV ,DMS

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Upgraded signage for travelers on US 22 through North Fayette and Robinson

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-36: SR 65 from I-79 to City of Pittsburgh

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras and DMS along SR 65.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: \$500k-\$2M

Life Cycle: N/A

PROJECT TYPE: ITS

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS *(if applicable):* Traveler Information, CCTV, DMS

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Traffic flow improvements on SR 65 from I-79 to City of Pittsburgh.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-37: SR 51 from SR 88 to Turnpike

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras and DMS along SR 51.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: \$500k-\$2M

Life Cycle: N/A

PROJECT TYPE: ITS

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): Traveler Information, CCTV, DMS

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Traffic flow improvements on SR 51 from SR 88 to Turnpike.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-38: SR 3069 West Liberty Avenue to the Liberty Bridge Intersection

PROJECT DESCRIPTION AND SCOPE: Install CCTV cameras and DMS along SR 3069 along with traffic operational upgrades along the corridor.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: \$500k-\$2M

Life Cycle: N/A

PROJECT TYPE: ITS

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): Traveler Information, CCTV, DMS

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Traffic flow improvements along West Liberty Avenue within the City of Pittsburgh to the North Portal of the Liberty Tunnel.

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

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

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

IU-40: District 12 CCTV Gaps

PROJECT DESCRIPTION AND SCOPE: Install 33 CCTV cameras at all interchanges that don't already have one.

STAKEHOLDERS: PennDOT 12-0

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$\$
(\$4M)

Life Cycle: N/A

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 improve situational awareness

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-41: US 22 Corridor ITS/Signal Fiber Communications

PROJECT DESCRIPTION AND SCOPE: Install fiber optic cable along corridor to connect ITS & signals.

STAKEHOLDERS: PennDOT 10-0, PennDOT 12-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: \$1M-\$4M

Life Cycle: N/A

PROJECT TYPE: ITS

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable):* Fiber Optic Cable

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: US 22 Corridor ITS/Signal Communications Improvements

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-42: US 22 Corridor ITS/ Signal Improvements

PROJECT DESCRIPTION AND SCOPE: SR 22 DMS & CCTV Cameras out towards SR 119 in Southwestern Indiana.

STAKEHOLDERS: PennDOT 10-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: \$500k-\$2M

Life Cycle: N/A

PROJECT TYPE: ITS

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS *(if applicable):* CCTV, DMS

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: US 22 Corridor ITS/Signal Improvements

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-43: Corridor M & K Parkway North Conversion Study

PROJECT DESCRIPTION AND SCOPE: Rapid transit connection between the Downtown-North Shore areas and Ross Township via an exclusive two-way transit facility using the I-279 HOV lanes as a center-running transit facility and continued rapid or commuter-based transit service (depending on ridership projections) as far as north Cranberry Township in Butler County. Ross should be considered as a major transit hub in this study, with local service tie-ins to Corridor M.

STAKEHOLDERS: PennDOT 11-0, SPC, PRT

ESTIMATED SCHEDULE: 3 years

ESTIMATED COSTS: \$57M-\$68M/\$45M-\$54M

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Transit Time and Expansion

BENEFITS: Improved transit flow between the Downtown-North Shore area to Ross Township.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-44: Corridor G East/ Central Pittsburgh River to River Connection

PROJECT DESCRIPTION AND SCOPE: A transit center in the Strip District at or near 21st Street could incorporate a new East Busway station and anchor a vertical connection to the Hill District. A Hill District transit center would tie together east-west bus routes and could offer micro-mobility connections to the rest of the neighborhood. In Oakland, connections to the Downtown-Uptown-Oakland-East End Bus Rapid Transit Project (currently in final design) and other transit lines will be critical to supporting connectivity and maximizing ridership. Linking with transit on Second Avenue and local connections in Hazelwood will support new development while enhancing access to employment, educational and training opportunities in the corridor. In Carrick and Overbrook, new direct connections will open new opportunities that have historically taken significant time to reach via transit. An Overbrook transit center could also eventually link to the Blue Line light rail and the overall South Hills transit network, providing additional connections to Oakland jobs for residents in the South Hills.

STAKEHOLDERS: PennDOT 11-0, PRT, City of Pittsburgh DOMI

ESTIMATED SCHEDULE: 10 years

ESTIMATED COSTS: \$168M-\$218M

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Transit Time and Expansion

BENEFITS: Improved transit flow, new facilities including a transit center, new east busway station, Hill District transit center, potential economic development opportunities

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-45: Corridor D Library Line Best Use Study

PROJECT DESCRIPTION AND SCOPE: The goal of the study will be to evaluate the existing light rail infrastructure to determine if or how it can be better utilized. This could include changing service or mode of the line or focusing on the infrastructure in place and ways to partner with municipalities to improve its usage and overall connectivity.

STAKEHOLDERS: PRT, SPC

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: N/A

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: Moderate

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

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Better utilization of existing light rail infrastructure

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-46: Corridor E East Busway Phased Extensions

PROJECT DESCRIPTION AND SCOPE: The recently completed BEN 2030 FUTURES: Braddock, East Pittsburgh, and North Braddock Joint Comprehensive Plan calls for expansion of rapid transit in these communities beyond the East Busway. Pre-2020 trip patterns show a high rate of travel between East Pittsburgh and McKeesport, which is approximately 10 minutes by car, but 40 minutes by transit. Long transit travel times between the City of Duquesne and East Pittsburgh inhibit residents of Duquesne from accessing jobs in the Turtle Creek Valley. Additional services at a transit center in East Pittsburgh, which is home to Keystone Commons, a major Mon Valley job center and key crossroads in several directions, are also proposed.

STAKEHOLDERS: PRT, Local Municipalities

ESTIMATED SCHEDULE: 10 years

ESTIMATED COSTS: \$121M-\$151M

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Transit Time and Expansion

BENEFITS: Extend East busway to decrease transit trip time between East Pittsburgh and McKeesport.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-47: Corridor H Allentown/ Downtown LRT Best Use Study

PROJECT DESCRIPTION AND SCOPE: The PRT will conduct a study to investigate the best uses for the existing Allentown light rail alignment and the rail spur from Steel Plaza to Penn Station, both of which are physically operational but do not currently operate regularly scheduled service. Both assets require further study to determine what configuration of service and infrastructure would best serve riders in a way that is financially viable for the Authority. There are several issues to address such as how or if it would change bus service in the area and meet ADA law given that the system was built prior to passage of the Act and is currently inaccessible.

STAKEHOLDERS: PRT, SPC, City of Pittsburgh, DOMI

ESTIMATED SCHEDULE: 10 years

ESTIMATED COSTS: \$8M-\$10M

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Capacity upgrades

BENEFITS: Light rail service in Allentown and service between Steel Plaza and Penn Station.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-48: Corridor F East Busway to Monroeville Rapid Transit

PROJECT DESCRIPTION AND SCOPE: Completing a rapid transit connection from Downtown further east to Monroeville could involve dedicated facilities directly connecting to the East Busway at or near the Parkway East. This connection would involve bus-only ramps or bridges rising from the highway to Edgewood Avenue, and a new entrance to the East Busway.

STAKEHOLDERS: PennDOT 11-0, PRT

ESTIMATED SCHEDULE: 5 years

ESTIMATED COSTS: \$117M-\$141M

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Bus Rapid Transit from downtown to Monroeville.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-49: Corridor J Allegheny Valley Rapid Transit

PROJECT DESCRIPTION AND SCOPE: Key elements of this project would emphasize maximizing connections to job centers, neighborhood centers, and major transit routes. The new line could serve commercial centers through the Strip District and Lawrenceville, Morningside, and the Pittsburgh Zoo, then continue on to the upper Allegheny Valley through Verona, Oakmont, and New Kensington. The Brilliant Branch line that begins in Aspinwall could directly link with the AVRR main line near Highland Park via the Brilliant Bridge and link to the East Busway in Larimer.

STAKEHOLDERS: PennDOT 11-0, PRT

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: \$231M-\$298M

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Connect job centers and commercial centers from New Kensington to Pittsburgh's CBD via Allegheny Valley RR. Would also connect Aspinwall via Brilliant Branch.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-50: Corridor A Airport Corridor Rapid Transit

PROJECT DESCRIPTION AND SCOPE: This proposed project will enable faster service to the airport by extending the rapid service currently serving the West Busway well beyond the current terminus in Carnegie Borough. It would extend Port Authority's West Busway (which connects riders Downtown to Carnegie via an exclusive transit right-of-way) in two places.

STAKEHOLDERS: PennDOT 11-0, PRT

ESTIMATED SCHEDULE: 10 years

ESTIMATED COSTS: \$274M-\$325M

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Faster service from downtown to airport

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-51: North Fayette Trail Connector

PROJECT DESCRIPTION AND SCOPE: Connect from the Pointe at North Fayette to the Montour Trail, Pittsburgh Technical College, and Settlers Cabin Park/Pittsburgh Botanical Garden.

STAKEHOLDERS: PennDOT 11-0, North Fayette Township, Allegheny County, PRT

ESTIMATED SCHEDULE: 5 years

ESTIMATED COSTS: \$3M

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: On-road and road-adjacent bicycle accommodations.

OTHER CONSIDERATIONS AND ISSUES: In Design

IU-52: Completing the Loop

PROJECT DESCRIPTION AND SCOPE: Will connect to trail and park systems on either side of the bridge. Riverlife is leading the effort.

STAKEHOLDERS: PennDOT 11-0, Riverlife, Allegheny County

ESTIMATED SCHEDULE: 5 years

ESTIMATED COSTS: N/A

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Bicycle and pedestrian improvements to the West End Bridge.

OTHER CONSIDERATIONS AND ISSUES: Partial Progress

IU-53: Turtle Creek Connector Trail

PROJECT DESCRIPTION AND SCOPE: Trail to connect to the Great Allegheny Passage via the Hot Metal Bridge in Rankin to the Westmoreland Heritage Trail in Trafford.

STAKEHOLDERS: PennDOT 11-0, Study Corridor Municipalities, Allegheny County, PRT

ESTIMATED SCHEDULE: 5 years

ESTIMATED COSTS: N/A

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: On-road/road adjacent bicycle accommodations and shared use paths.

OTHER CONSIDERATIONS AND ISSUES: In Design

IU-54: VOPP Trail

PROJECT DESCRIPTION AND SCOPE: On-road bicycle accommodations and shared use paths

STAKEHOLDERS: PennDOT 11-0, Verona, Oakmont, Penn Hills, Plum Borough, PRT

ESTIMATED SCHEDULE: 5 years

ESTIMATED COSTS: N/A

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: On-road bicycle accommodations and shared use paths.

OTHER CONSIDERATIONS AND ISSUES: In Design

IU-55: Three Rivers Heritage Trail – Allegheny Valley

PROJECT DESCRIPTION AND SCOPE: On road bicycle accommodations and shared use paths from Millvale to Freeport. Design segments include Shaler Township, O'Hara, Harmar, Springdale Township, East Deer Township.

STAKEHOLDERS: PennDOT 11-0, Municipalities, PRT

ESTIMATED SCHEDULE: 5 years

ESTIMATED COSTS: N/A

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: On-road and road-adjacent bicycle accommodations.

OTHER CONSIDERATIONS AND ISSUES: In Design

IU-56: Three Rivers Heritage Trail – Hazelwood to Carrie Furnace

PROJECT DESCRIPTION AND SCOPE: On-road bicycle accommodations and shared use paths. Hazelwood to Rankin Borough.

STAKEHOLDERS: PennDOT 11-0, Pittsburgh, Swissvale, Rankin, PRT

ESTIMATED SCHEDULE: 5 years

ESTIMATED COSTS: N/A

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: On-road bicycle accommodations and shared use paths.

OTHER CONSIDERATIONS AND ISSUES: In Design

IU-57: Little Pine Creek Connector

PROJECT DESCRIPTION AND SCOPE: Extends from Kiwanis Park in Shaler along the west bank of Little Pine Creek to Etna's new riverfront park.

STAKEHOLDERS: PennDOT 11-0, Shaler, Etna, PRT

ESTIMATED SCHEDULE: 5 years

ESTIMATED COSTS: N/A

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: On-road and road-adjacent bicycle accommodations.

OTHER CONSIDERATIONS AND ISSUES: In Design

IU-58: Panhandle Trail Extension

PROJECT DESCRIPTION AND SCOPE: Extends from the terminus of the Panhandle Trail at Walkers Mill to the Carnegie West Busway Station.

STAKEHOLDERS: PennDOT 11-0, Carnegie, Scott Township, Collier Township, PRT, Allegheny County

ESTIMATED SCHEDULE: 5 years

ESTIMATED COSTS: N/A

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Rail-with-trail or rail-to-trail.

OTHER CONSIDERATIONS AND ISSUES: In Design

IU-59: White Oak Park to South Park Connector

PROJECT DESCRIPTION AND SCOPE: Effort underway to plan the corridor to connect these two County parks.

STAKEHOLDERS: PennDOT 11-0, Municipalities, Montour Trail Council, Steel Valley Trail Council, PRT, Allegheny County

ESTIMATED SCHEDULE: 5 years

ESTIMATED COSTS: N/A

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: On-road bicycle accommodations and shared use paths

OTHER CONSIDERATIONS AND ISSUES: Partial Progress

IU-60: The Eastern Pittsburgh Multimodal Corridor Project

PROJECT DESCRIPTION AND SCOPE: The Eastern Pittsburgh Multimodal Corridor (EPMC) Project streamlines travel within these facilities through infrastructure improvements, capital investments, and Active Traffic Management (ATM), among other innovative practices. I-376 Parkway East is the primary route between Downtown Pittsburgh and the PA Turnpike, and is the country's fifth most congested interstate section. Due to physical constraints, an information-driven approach and technological improvements are necessary to improve conditions. \$48.5m towards ATM system: dynamic message boards, variable speed limit systems, wrong way vehicle detection, queue warnings. \$39m for Flood Mitigation on I-376 Westbound Bathtub. \$9m for Arterial Traffic Management to improve incident response and congestion. \$1.2m for sidewalks and pedestrian improvements on Business 22. \$46.5m for hard shoulder running with new ramp to Busway. \$23m for East Busway paving, drainage, and retaining walls. \$23m for Penn Avenue (Wilksburg) Bridge Replacement, with set-aside for other bridges. \$13m in Slope Protection and Stabilization. \$10.5m towards Battery Electric Buses and Charging Infrastructure.

STAKEHOLDERS: PennDOT 11-0, PRT, Allegheny County, SPC

ESTIMATED SCHEDULE: 3-5 years

ESTIMATED COSTS: \$213.2M

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): ATM System, DMS, VWL, Wrong Way Detection

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Reduced congestion and crashes on Parkway East, Flood Mitigation, increased active mobility, increased transit efficiency, reduced emissions.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-61: Corridor R Homestead to McKeesport Transit Improvements

PROJECT DESCRIPTION AND SCOPE: Transit Improvements, Browns Hill Rd./Hazelwood Ave. to Kennywood Blvd./Library St./Eighth Avenue (PA 837)

STAKEHOLDERS: PennDOT 11-0, PRT

ESTIMATED SCHEDULE: 3 years

ESTIMATED COSTS: \$47M-\$58M

Life Cycle: N/A

PROJECT TYPE: Multimodal Connectivity

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: Improved Transit Time

BENEFITS: Improved transit flow and reduced congestion along an important arterial Browns Hill Rd./Hazelwood Ave. to Kennywood Blvd./Library St./Eighth Avenue (PA 837).

OTHER CONSIDERATIONS AND ISSUES: Coordination with the municipalities and PennDOT 11-0.

IU-62: SR 68 Jeff and Cunningham Street Signal Improvements

PROJECT DESCRIPTION AND SCOPE: Replacing nine (9) existing traffic signals and retiming corridors. MPMS# 117264

STAKEHOLDERS: PennDOT 10-0

ESTIMATED SCHEDULE: 5 years

ESTIMATED COSTS: \$3.3M

Life Cycle: N/A

PROJECT TYPE: Signal Improvements

LEVEL OF EFFORT: Moderate

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Replacing nine (9) existing traffic signals and retiming corridors.

OTHER CONSIDERATIONS AND ISSUES: Currently starting PE Phase. CON Funds are 80% Federal & 20% State. CMAQ funds.

IU-63: Smart Spines – City of Pittsburgh

PROJECT DESCRIPTION AND SCOPE: Advanced traffic signal system along 8 corridors, multi-modal advanced signal systems, TMC in the City.

STAKEHOLDERS: PennDOT 11-0, FHWA, City of Pittsburgh, PRT

ESTIMATED SCHEDULE: 5 years

ESTIMATED COSTS: \$29M

Life Cycle: N/A

PROJECT TYPE: Signal Improvements

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): TMC, CCTV, Video Detection Feeds

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: This project seeks to leverage existing and emerging technologies to create a multi-modal advanced signal system which will be able to detect several different roadway users and prioritize their movements based on corridor context and real-time traffic patterns. The Smart Spines project will consist of the following eight corridors and will be divided into two separate phases: Fifth Ave/Washington Blvd, Forbes Ave, Bigelow Blvd, Centre Ave, Second Ave, Saw Mille Run Blvd, West Liberty Ave, and Penn Ave.

OTHER CONSIDERATIONS AND ISSUES: In Design. Funding 38% Federal, 38% City, and 24% State.

IU-64: Mayview/Lesnett/Bank/Chartiers Avenue Intersection Improvements

PROJECT DESCRIPTION AND SCOPE: Mayview/Lesnett/Bank/Chartiers Avenue Intersection Improvements, signalization.

STAKEHOLDERS: PennDOT 11-0

ESTIMATED SCHEDULE: N/A

ESTIMATED COSTS: \$2M-\$5M

Life Cycle: N/A

PROJECT TYPE: Signal Improvements

LEVEL OF EFFORT: High

TECHNOLOGY COMPONENTS (if applicable): N/A

PREREQUISITES AND DEPENDENCIES: N/A

PERFORMANCE MEASURES: N/A

BENEFITS: Intersection Improvements and Signal Upgrades

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-65: Grove City Outlets Signal Improvements

PROJECT DESCRIPTION AND SCOPE: Upgrade signal equipment and improve timing/coordination on PA 208 near the Grove City Outlets in Mercer County.

STAKEHOLDERS: PennDOT 1-0, Mercer County MPO, Springfield Township

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

PROJECT TYPE: Signal Improvements

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 a series of important signalized corridors within the region.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-66: US 20 Wesleyville Signal Improvements

PROJECT DESCRIPTION AND SCOPE: Upgrade signal controllers to allow for command/control functionality and performance measures on US 20 in Wesleyville.

STAKEHOLDERS: PennDOT 1-0, Erie MPO, Wesleyville Borough

ESTIMATED SCHEDULE: 3+ years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

PROJECT TYPE: Signal Improvements

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.

OTHER CONSIDERATIONS AND ISSUES: N/A

IU-67: US 19 Corridor Traffic Signal Improvements

PROJECT DESCRIPTION AND SCOPE: Upgrade signal equipment and improve timing/coordination on US 19 (Peach Street), Liberty Street, and Cherry Street.

STAKEHOLDERS: PennDOT 1-0, Erie MPO, City of Erie

ESTIMATED SCHEDULE: 1-3 years

ESTIMATED COSTS:

\$\$
(\$500k-\$2M)

Life Cycle: 10-15 years

PROJECT TYPE: Signal Improvements

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 a series of important signalized corridors within the region.

OTHER CONSIDERATIONS AND ISSUES: N/A
