CORE TRANSPORTATION INVENTORIES & TRENDS

A. Infrastructure Condition

The infrastructure condition in the SEDA-COG MPO region has generally been improving since the last plan update and performance targets are being met, as will be discussed in later plan chapters. The following section provides a snapshot of the condition as it exists in 2014.

1. Highway & Street Pavement

a. International Roughness Index (IRI)

The International Roughness Index, or IRI, is the current FHWA standard for measuring highway pavement ride quality. The index measures roughness in terms of the number of inches per mile that a laser, mounted in a specialized van, jumps as it is driven across the interstate and expressway system—the lower the IRI number, the smoother the ride. Since the IRI provides an easy-to-collect measure of pavement surface condition that has nationwide consistency and comparability, it was chosen for use in FHWA's Highway Performance Monitoring System.[23]

Figure 14 illustrates the IRI ratings on roadways in the SEDA-COG MPO. The range of IRI values are summarized broadly as Excellent, Good, Fair and Poor. **Figure 15** summarizes IRI values across the Business Plan Network classifications. As can be seen from **Figure 15**, as well as the poor IRI chart in **Figure 16**, trends are maintaining in the region, except for the lower business plan networks. It should also be noted that a number of miles of roadway moved from the Non-NHS >2000 to the NHS-Non Interstate categories between 2010 and 2014. If you consider those combined categories, there were a number of miles (about 20) that moved from the excellent to good category during this time period, which is reflective of the deteriorating roadway conditions in part due to the recent funding emphasis on bridges.

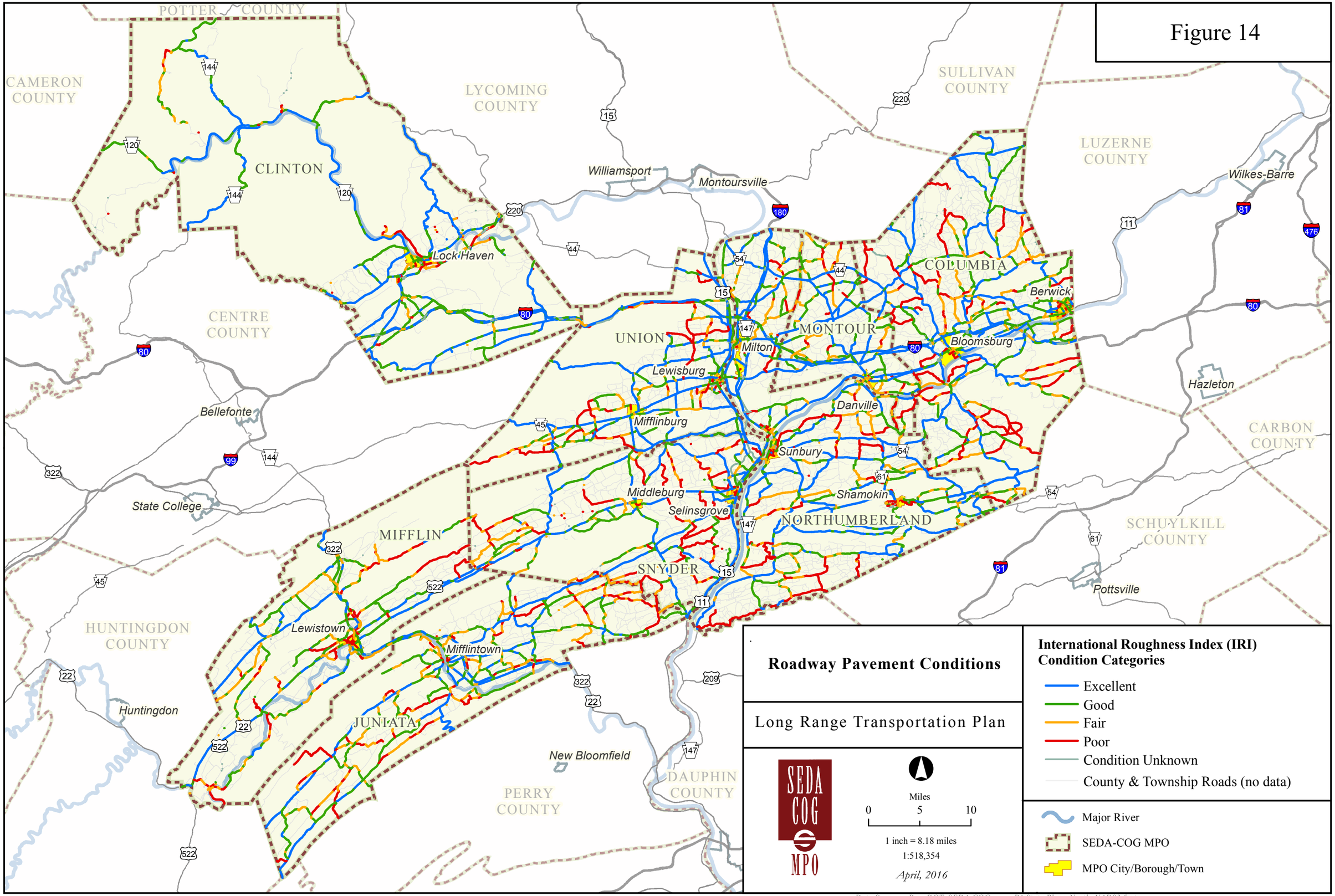
b. Overall Pavement Index (OPI)

The Overall Pavement Index (OPI) is a Pennsylvania-specific parameter that incorporates the IRI and other pavement distress indicators, including cracking, edge deterioration, rutting, and other signs of deterioration that are collected as part of a visual survey process.

Figure 17 summarizes OPI values across the Business Plan Network classifications. As can be seen from **Figure 17**, as well as the poor OPI chart in **Figure 18**, trends are maintaining in the region except for the lower business plan networks. It should also be noted that a number of miles of roadway moved from the Non-NHS >2000 to the NHS-Non Interstate categories between 2010 and 2014. If you consider those combined categories, there were a number of miles (about 90) that moved from the excellent to good category during this time period, which is reflective of the deteriorating roadway conditions in part due to the recent funding emphasis placed on bridges.

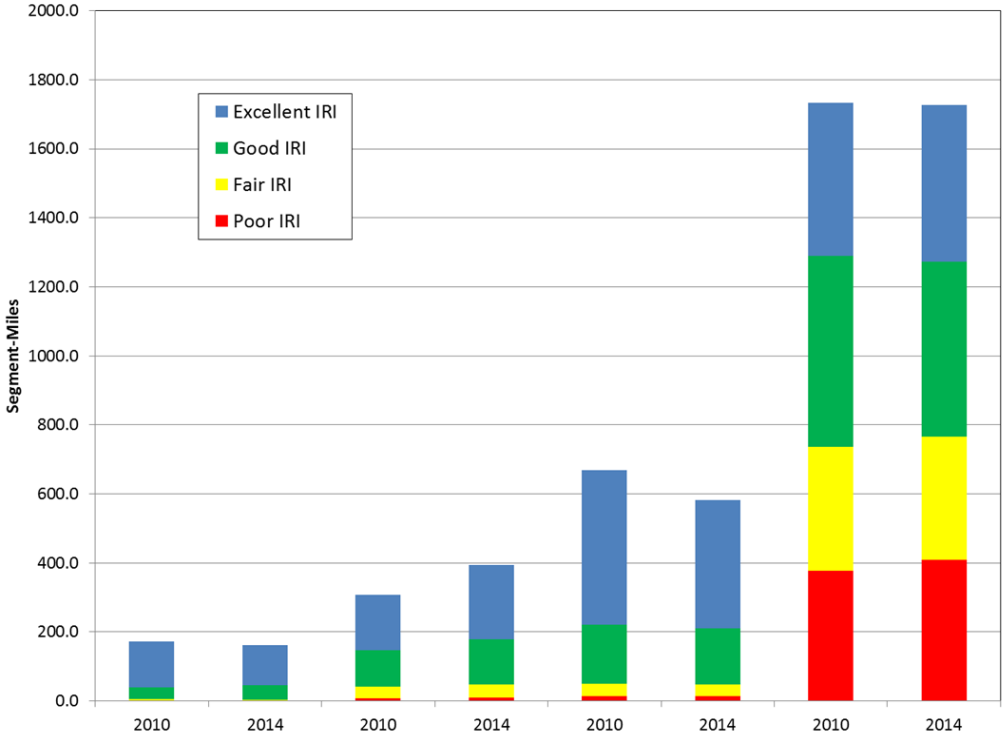
[23] Federal Highway Administration (FHWA), Highway Performance Monitoring System (HPMS) Field Manual, Appendix E: Measuring Pavement Roughness, http://www.fhwa.dot.gov/ohim/hpmsmanl/appe.cfm, 2008.

Figure 14



Data Sources: PennDOT, SEDA-COG PA State Plane North, NAD83 feet

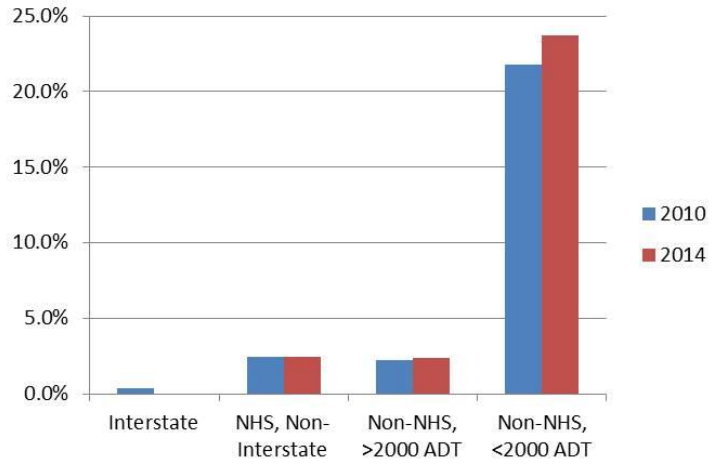
Figure 15. Segment Miles by Business Plan Network with IRI Ratings



	Interstate		NHS, Non-Interstate		Non-NHS, >2000 ADT		Non-NHS, <2000 ADT	
	2010	2014	2010	2014	2010	2014	2010	2014
Excellent IRI	131.5	118.0	158.8	214.7	446.9	372.1	443.3	455.1
Good IRI	35.5	41.2	106.4	132.6	170.8	162.1	553.7	507.4
Fair IRI	4.1	3.7	33.7	37.1	35.5	34.7	358.1	355.8
Poor IRI	0.6	0.0	7.6	9.8	14.8	13.8	378.1	409.5

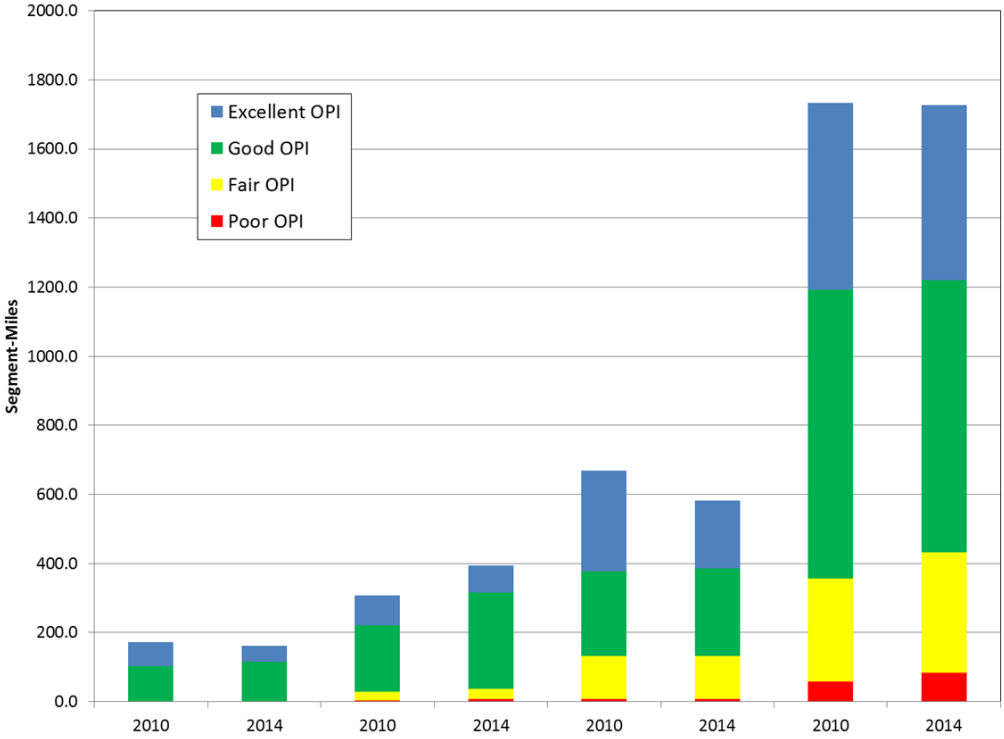
Source: 2014 Performance Measures Annual Report – Pavement, PennDOT.

Figure 16. Poor IRI by Percent of Total Lane Miles, 2010-2014



Source: 2010-2014 Performance Measures Annual Reports – Pavement, PennDOT.

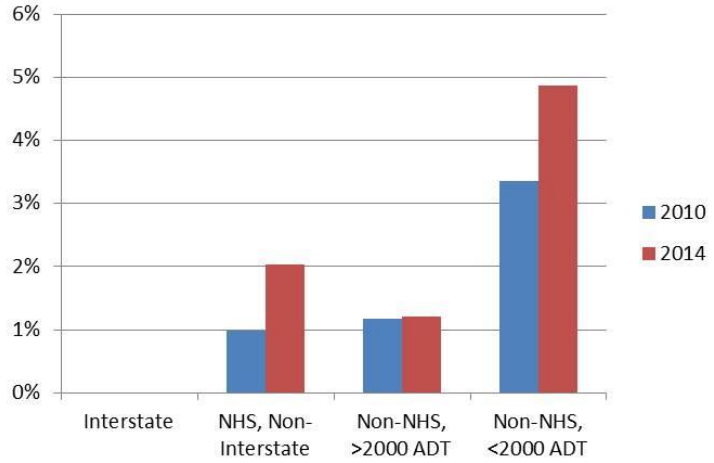
Figure 17. Surface Out-of-Cycle Segment Miles by Business Plan Network with OPI Ratings



	Interstate		NHS, Non-Interstate		Non-NHS, >2000 ADT		Non-NHS, <2000 ADT	
	2010	2014	2010	2014	2010	2014	2010	2014
Excellent OPI	70.0	46.6	85.5	79.0	290.5	198.1	541.2	508.1
Good OPI	101.3	115.1	192.3	278.8	246.1	251.3	835.0	788.1
Fair OPI	0.4	1.0	25.7	28.5	123.6	126.2	298.9	347.6
Poor OPI	0.0	0.0	3.0	8.0	7.8	7.0	58.2	84.0

Source: 2014 Performance Measures Annual Report – Pavement, PennDOT.

Figure 18. Poor OPI by Percentage of Total Lane Miles, 2010-2014



Source: 2010-2014 Performance Measures Annual Reports – Pavement, PennDOT.

2. Bridges

Bridge condition is evaluated during National Bridge Inspection Standards (NBIS) inspections that examine the primary structural components (deck, superstructure, substructure) and auxiliary components (waterway, roadway approaches) and looks for signs of deterioration. Inspections are conducted at various frequencies based on NBIS and PennDOT regulations. Weight restricted and structurally deficient (SD) bridges are inspected more frequently. PennDOT applies the "structurally deficient" classification where deterioration is affecting the bridge's three primary structural components. When quantifying and evaluating the extent of structural deficiency across the full inventory of bridges, it is common to reference the number of SD bridges as well as the total bridge deck area (bridge length times width) of all SD bridges.

a. Bridges of Special Concern

Figure 19, Figure 20, Figure 21, Figure 22 and Figure 23 illustrate a number of bridges of special concern as noted in the SEDA-COG MPO region. These maps identify and illustrate the following:

- Large bridges, including:
  - Bridges longer than 1,000 feet
  - Bridges between 500 and 10,000 feet

  Large bridges are identified because of their high value, both in terms of the connectivity they provide and the costs associated with repair/replacement. These bridges also tend to be more exposed to extreme weather events. Unexpected damage or loss to one or more of these structures would have serious impacts for the MPO's transportation investment plan (TIP).

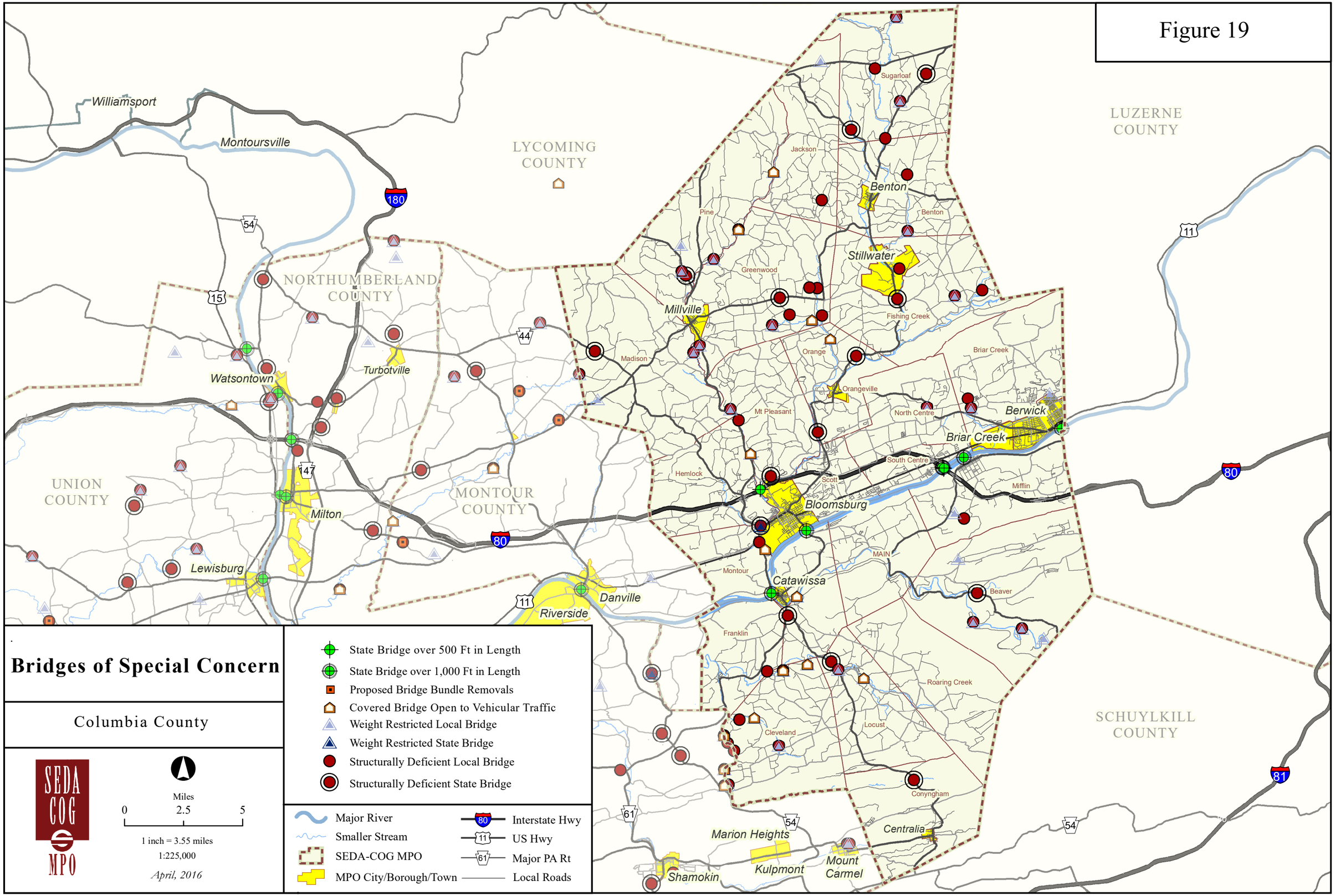
- Weight-restricted (posted) state & local bridges
  These bridges have limitations on the amount of weight they can carry, whether by design or progressive deterioration/damage to the structure. Many of these bridges are on their way to becoming structurally deficient and may be inspected more often to affirm their integrity.

- Structurally-deficient (SD) state & local bridges
  These bridges have additional limitations on the amount of weight they can carry. Some are closed and others may be closed immediately if an inspection deems it necessary. These bridges are most in need of rehabilitation or replacement.

- Covered bridges
  The SEDA-COG MPO is home to a number of covered bridges. Most are considered historic and receive special protection from modification or replacement.

- Closed bridges and bridge bundles to be removed
  The SEDA-COG MPO received a 2017-2020 TIP allocation for removing numerous bridges (many packaged into bundles). The bridges were either closed previously or carry very low traffic volume and have the owner's endorsement for removal. See "Bridge Removals" in the Issues and Implications chapter for additional discussion.

Figure 19



Bridges of Special Concern

Columbia County

SEDA COG MPO

Miles
0 2.5 5

1 inch = 3.55 miles
1:225,000

April, 2016

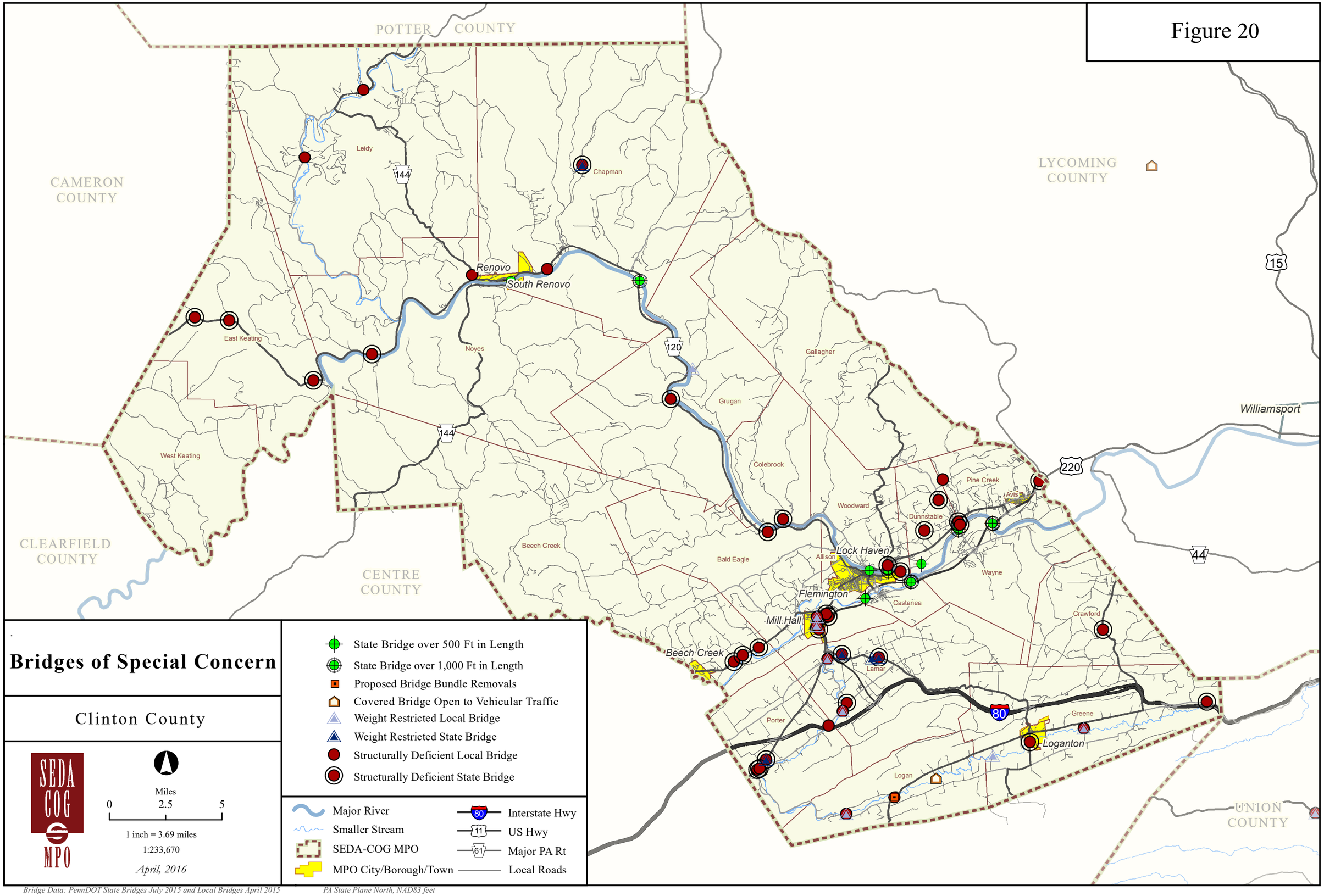
- State Bridge over 500 Ft in Length
- State Bridge over 1,000 Ft in Length
- Proposed Bridge Bundle Removals
- Covered Bridge Open to Vehicular Traffic
- Weight Restricted Local Bridge
- Weight Restricted State Bridge
- Structurally Deficient Local Bridge
- Structurally Deficient State Bridge

- Major River
- Smaller Stream
- SEDA-COG MPO
- MPO City/Borough/Town
- Interstate Hwy
- US Hwy
- Major PA Rt
- Local Roads

Bridge Data: PennDOT State Bridges July 2015 and Local Bridges April 2015

PA State Plane North, NAD83 feet

Figure 20



Bridges of Special Concern

Clinton County

- State Bridge over 500 Ft in Length
- State Bridge over 1,000 Ft in Length
- Proposed Bridge Bundle Removals
- Covered Bridge Open to Vehicular Traffic
- Weight Restricted Local Bridge
- Weight Restricted State Bridge
- Structurally Deficient Local Bridge
- Structurally Deficient State Bridge

- Major River
- Smaller Stream
- SEDA-COG MPO
- MPO City/Borough/Town
- Interstate Hwy
- US Hwy
- Major PA Rt
- Local Roads

SEDA COG MPO

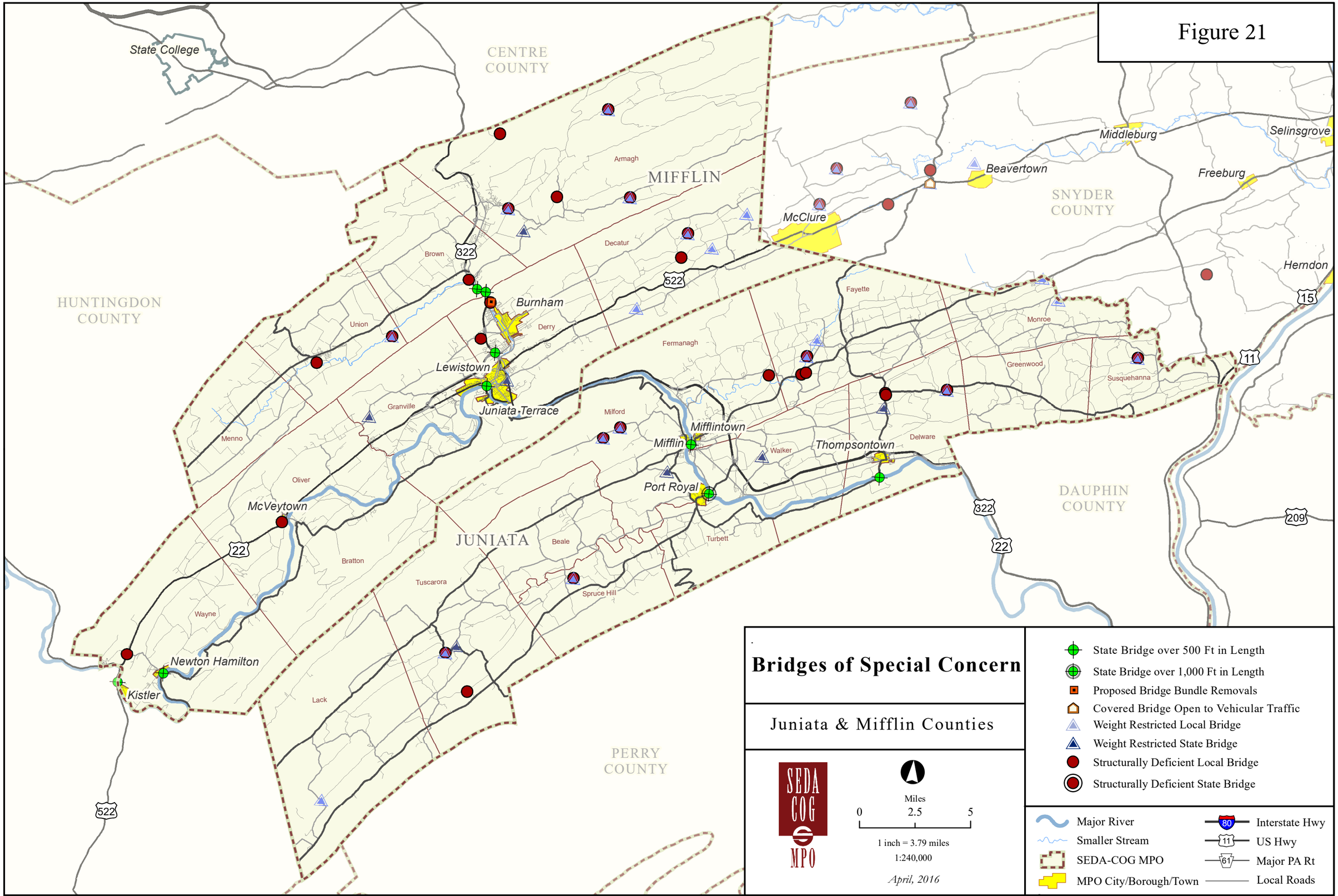
Miles
0 2.5 5
1 inch = 3.69 miles
1:233,670

April, 2016

Bridge Data: PennDOT State Bridges July 2015 and Local Bridges April 2015

PA State Plane North, NAD83 feet

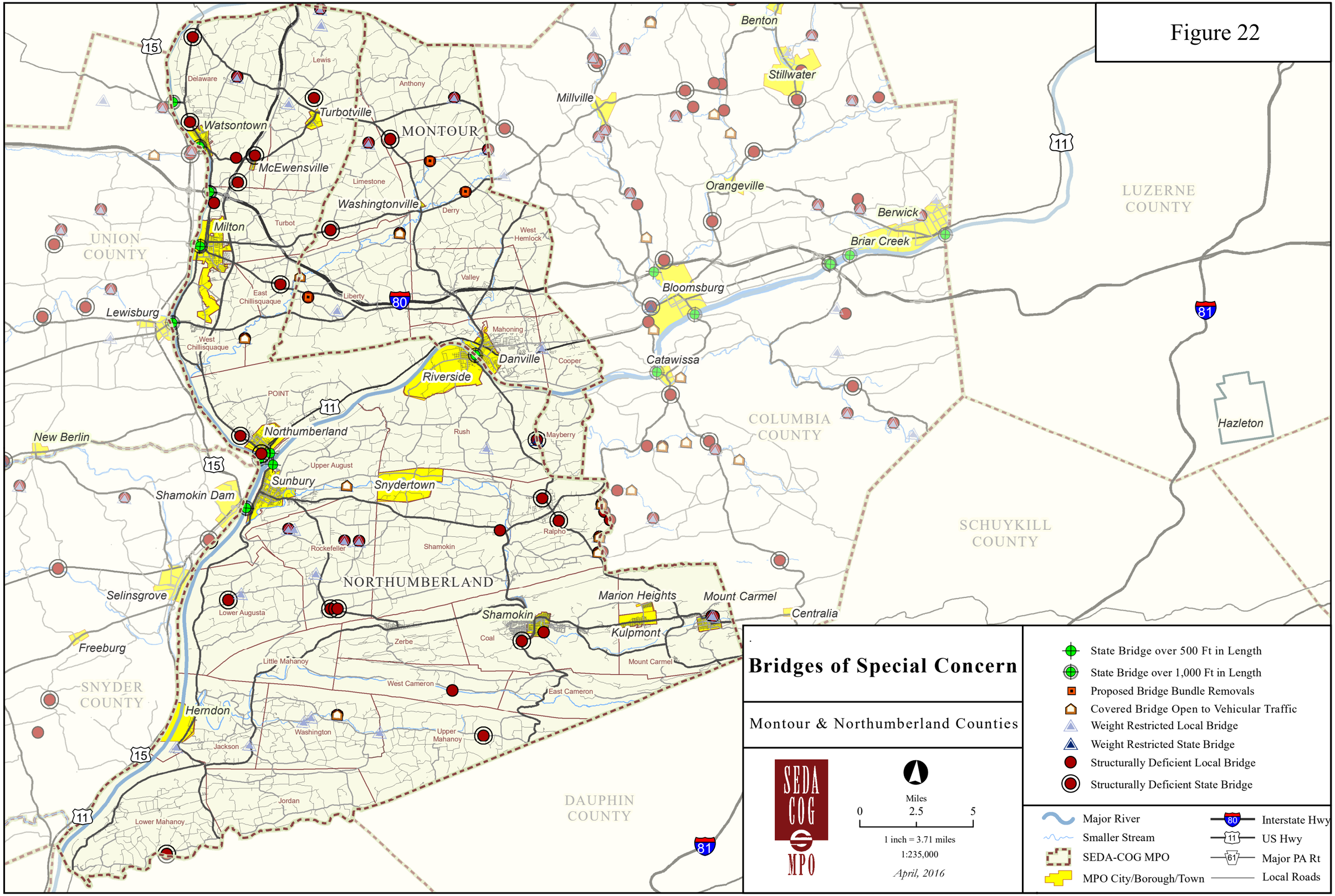
Figure 21



Bridge Data: PennDOT State Bridges July 2015 and Local Bridges April 2015

PA State Plane North, NAD83 feet

Figure 22



Bridges of Special Concern

Montour & Northumberland Counties

SEDA COG MPO

Miles
0 2.5 5
1 inch = 3.71 miles
1:235,000
April, 2016

- State Bridge over 500 Ft in Length
- State Bridge over 1,000 Ft in Length
- Proposed Bridge Bundle Removals
- Covered Bridge Open to Vehicular Traffic
- Weight Restricted Local Bridge
- Weight Restricted State Bridge
- Structurally Deficient Local Bridge
- Structurally Deficient State Bridge

- Major River
- Smaller Stream
- SEDA-COG MPO
- MPO City/Borough/Town
- Interstate Hwy
- US Hwy
- Major PA Rt
- Local Roads

Bridge Data: PennDOT State Bridges July 2015 and Local Bridges April 2015

PA State Plane North, NAD83 feet

Figure 23

CLINTON COUNTY
LYCOMING COUNTY
CENTRE COUNTY
UNION
SNYDER
MIFFLIN COUNTY
JUNIATA COUNTY
MONTOUR COUNTY
COLUMBIA COUNTY
NORTHUMBERLAND COUNTY

Loganton
Gregg
White Deer
West Buffalo
Kelly
Lewis
Buffalo
Lewisburg
Mifflinburg
East Buffalo
Hartleton
Hartley
Limestone
New Berlin
Union
Jackson
Center
Adams
Middle Creek
Penn
Monroe
Middleburg
Franklin
West Beaver
Spring
Beaver
Beavertown
Freeburg
Washington
McClure
West Perry
Perry
Chapman
Herndon
Watsontown
Turbotville
McEwensville
Milton
Washingtonville
Millville
Bloomsburg
Danville
Riverside
Catawissa
Northumberland
Shamokin Dam
Sunbury
Snydertown
Selinsgrove

80 15 54 44 147 45 11 61

Bridges of Special Concern

Snyder & Union Counties

SEDA COG MPO

Miles
0 2.5 5
1 inch = 3.39 miles
1:215,000
April, 2016

- State Bridge over 500 Ft in Length
- State Bridge over 1,000 Ft in Length
- Proposed Bridge Bundle Removals
- Covered Bridge Open to Vehicular Traffic
- Weight Restricted Local Bridge
- Weight Restricted State Bridge
- Structurally Deficient Local Bridge
- Structurally Deficient State Bridge

- Major River
- Smaller Stream
- SEDA-COG MPO
- MPO City/Borough/Town
- Interstate Hwy
- US Hwy
- Major PA Rt
- Local Roads

Bridge Data: PennDOT State Bridges July 2015 and Local Bridges April 2015

PA State Plane North, NAD83 feet

b. State Bridges

The general integrity of state-owned bridges was evaluated in terms of the FHWA's sufficiency rating, as provided by PennDOT. The sufficiency rating, which was developed as a prioritization tool for allocating improvement funds, assesses bridges on a scale from 0 (poor) to 100 (very good) based on structural adequacy, whether the bridge is functionally obsolete and the level-of service provided to the public. It should be noted that PennDOT's system for identifying structurally deficient bridges differs somewhat from FHWA's sufficiency rating scheme.

PennDOT prepares a Performance Measures Annual Report for Bridges where structurally deficient percentages by bridge count and deck area are measured against target values. These performance measures are consistent with the FHWA rulemaking that established new requirements for performance management. FHWA's new requirements were intended to ensure an efficient investment of federal transportation funds for state bridges (equal to or greater than 8 feet in length) and county/locally-owned bridges (equal to or greater than 20 feet in length).

Table 17 shows the number of bridges on state routes that are greater than eight feet in length within each of the SEDA-COG MPO counties, based on the Asset Management Bridge Works Excel Spreadsheet by County. Included in this table are the total number of closed and posted bridges as well as the number of structurally deficient bridges. The locations of structurally deficient bridges are mapped along with the other Bridges of Special Concern in **Figure 19, Figure 20, Figure 21, Figure 22 and Figure 23.**

Table 17. Status of Bridges on the State Route System, 2016

County	Total Count	Total Deck Area (Msf)*	Closed Bridges	Posted Bridges	SD Count	% SD by Count	SD Deck Area (Msf)*	% SD by Deck Area
Clinton	248	1.3671	0	6	28	11.3%	0.0631	4.6%
Columbia	303	1.1672	0	1	12	4.0%	0.0101	0.9%
Juniata	254	0.5880	0	8	53	20.9%	0.0669	11.4%
Mifflin	184	0.8632	0	3	19	10.3%	0.0338	3.9%
Montour	133	0.3270	0	1	2	1.5%	0.0026	0.8%
Northumberland	340	1.4737	0	1	17	5.0%	0.0112	0.8%
Snyder	240	0.4595	0	1	4	1.7%	0.0101	2.2%
Union	197	0.4225	0	1	6	3.0%	0.0148	3.5%
SEDA-COG MPO	**1899**	**6.6682**	**0**	**22**	**141**	**7.4%**	**0.8147**	**3.2%**

Source: State Bridge Reports, Report A1-STATE_PUBLIC, PennDOT, 2016.
* Msf = Million Square Feet

a. Local Bridges

Table 18 shows the number of county and municipal bridges that are greater than 20 feet in length within each of the SEDA-COG MPO counties, based on the Asset Management Bridge Works Excel Spreadsheet by County. Included in this table are the total number of closed and posted bridges as well as the number of structurally deficient bridges. The locations of the structurally deficient local bridges are mapped along with the other Bridges of Special Concern on **Figure 19, Figure 20, Figure 21, Figure 22 and Figure 23.**

Table 18. Status of Bridges on Local Route System (Length 20' or Greater), 2016

County	Total Count	Total Deck Area (Msf)*	Closed Bridges (County)	Posted Bridges (County)	SD Count (County)	% SD by Count	SD-Deck Area (Msf)*	% SD by Deck Area
Clinton	20	0.0337	1 (0)	10 (1)	12 (2)	60.0%	0.0272	80.7%
Columbia	89	0.1104	1 (1)	37 (27)	37 (24)	41.6%	0.0399	36.1%
Juniata	36	0.0293	1 (0)	9 (0)	15 (0)	41.7%	0.0117	39.9%
Mifflin	50	0.0735	1 (1)	6 (0)	12 (2)	24.0%	0.0154	21.0%
Montour	27	0.0300	3 (2)	6 (6)	9 (5)	33.3%	0.0104	34.7%
Northumberland	92	0.1216	2 (2)	25 (22)	16 (13)	17.4%	0.0190	15.6%
Snyder	33	0.0405	0 (0)	8 (0)	8 (0)	24.2%	0.0066	16.3%
Union	42	0.0536	2 (2)	17 (15)	11 (11)	26.2%	0.0125	23.3%
SEDA-COG MPO	**389**	**0.4926**	**11 (8)**	**118 (71)**	**120 (57)**	**30.8%**	**0.1427**	**29.0%**

Source: State Bridge Reports, Report B1-LOCAL_PUBLIC, PennDOT, 2016.
* Msf = Million Square Feet

Since 2010, PennDOT has invested approximately $670 million to preserve more than 2,200 bridges across the Commonwealth. With the passage of Act 89 in November 2013, the amount of funding dedicated to transportation projects will be increasing in the coming years and many of those dollars will be dedicated to reducing the amount of structurally deficient bridges in the SEDA-COG MPO region.

b. Status of Inventories (>20', <20')

A significant effort has been placed on finding, inventorying and assessing the local bridges in the area and across the Commonwealth. **Table 19** summarizes data on locally-owned bridges with a length between 8 feet and 20 feet using proportions from PennDOT's Bridge Management System as a predictive tool for estimating the number of local bridges of length 8 feet to 20 feet that may be expected. The actual number of local bridges of length 8 feet to 20 feet is given in the right-most column of the table. The original estimate of bridges between 8 feet and 20 feet was about one third of the actual numbers found and inventoried to date.

Table 19. Estimated vs. Found Local Bridges 8 to 20 Feet in Length

	State Owned Bridges		Locally Owned Bridges			
	Length over 20'	Length 8' to 20'	Length over 20'	Estimated Number of Bridges Length 8' to 20' *	Length over 20'	Actual Number of Bridges Length 8' to 20' **
Number of Structures	1174	719	388	238	388	**450**
	62%	38%	62%	38%	46%	54%
Deck Area	6,318,959	329,433	489,339	25,755	489,339	**81,000**
	95%	5%	95%	5%	86%	14%

* Estimates based on proportions in state owned network.
** Actual number based on inventory results.

Source: SEDA-COG MPO, 2015.

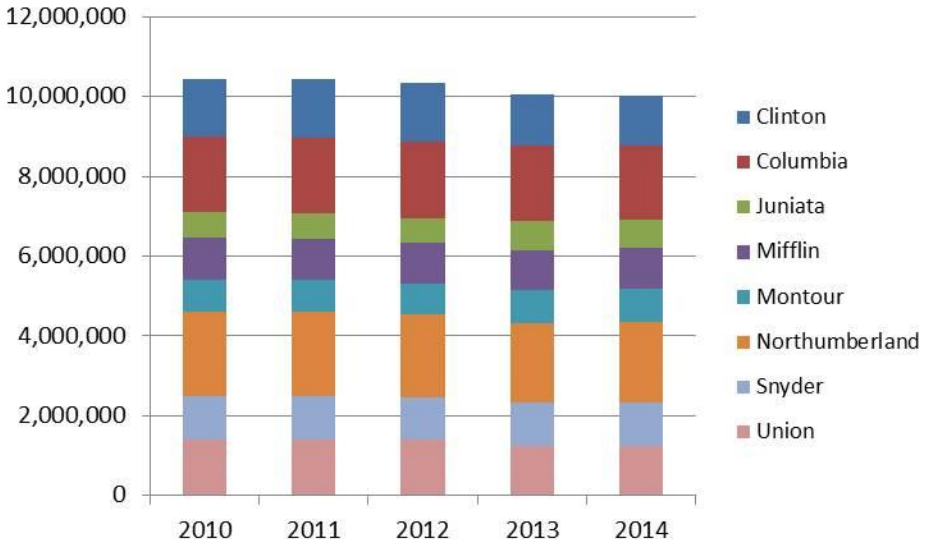
3. Infrastructure Demand & Performance

a. Highway

The demand for highway facilities is most commonly expressed in terms of traffic volume. It is convenient to summarize traffic volume in terms of total traffic volume during one day (24-hour period), which accounts for a full cycle of daily travel activity. Finally, to account for travel distance, the volume is normalized according to the roadway mileage and expressed in terms of Daily Vehicle Miles Traveled (DVMT). **Figure 24** illustrates the trend of flat or decreasing DVMT during the 5-year period from 2010 to 2014. A total decrease of about 4 percent was observed during the 5-year period.

Historically, increases in DVMT have fueled increases in transportation revenue. However, nationwide DVMT has been flat or decreasing since its peak in the mid-2000s. While the decrease was initially viewed as an anomaly, the trend has been sustained for more than a decade, and transportation departments are now factoring the trend into future investment plans. With flat DVMT and a fixed gas tax as the primary transportation revenue source, the dollars flowing into transportation investment will also be flat or reducing—especially when coupled with increased fuel economy, alternative vehicle fuels, and the next generation having lower vehicle ownership rates. Plus, over time, the dollar value erodes due to inflation in costs.

Figure 24. Daily Vehicle Miles of Travel by County, 2010-2014



Source: Pennsylvania Highway Statistics Reports, 2010-2014 Highway Data, Publication 600.

Figure 25 and **Figure 26** illustrate total traffic volume and heavy truck[24] traffic volume, respectively, in terms of average daily volume. Total traffic volume is expressed here as Average Daily Traffic (ADT) volume, while truck traffic volume is expressed as Average Daily Truck Traffic (ADTT). The highest traffic volume corridors, symbolized in dark red and representing volumes greater than 15,000 ADT, are I-80, I-180, US 15, US 11, and PA 147. Within the more urbanized areas, traffic volume intensifies on the major

[24] Heavy trucks include vehicles with more than two axles, such as tractor trailer combinations, certain buses, garbage and recycling trucks, dump trucks, concrete trucks, and other service and construction vehicles.

thoroughfares. However, as a dominantly rural area, the largest mileage of roadways in the SEDA-COG MPO region falls into the 2,000 to 10,000 ADT range. These are mostly two-lane roads and include the two, three, and four digit state routes. Traffic volumes on locally owned roadways are not shown.

The volumes of heavy trucks shown in **Figure 26** illustrate the primary pathways followed by freight moving vehicles. The highest volume corridors generally mirror those with high total volume—i.e., I-80, I-180, US 15, US 11, and PA 147. Added to these corridors are US 322, US 220, and parts of PA 54 in the easternmost part of Northumberland County. A large proportion of the heavy truck traffic on the major routes (I-80, I-180, US 11, and US 15) are through truck trips, having neither an origin nor a destination within the MPO area. Also, the volume of truck traffic is a key indicator in the life and performance of roadway pavement. Where truck traffic is high, the required pavement designs are more substantial and costly, and pavement maintenance investments (e.g., joint repair, overlays, reconstruction) are needed more frequently.

a. Operational Capacity & Level-of Service

Present and future traffic congestion was evaluated using data from the PA Statewide Travel Demand Model, as revised in 2014[25]. The model estimates the amount of vehicular traffic wanting to travel between origins and destinations and then assigns the traffic to the roadway system on logical paths. The resulting model provides traffic volume (passenger vehicles and trucks), travel times and a comparison of traffic volume to the roadway capacity.

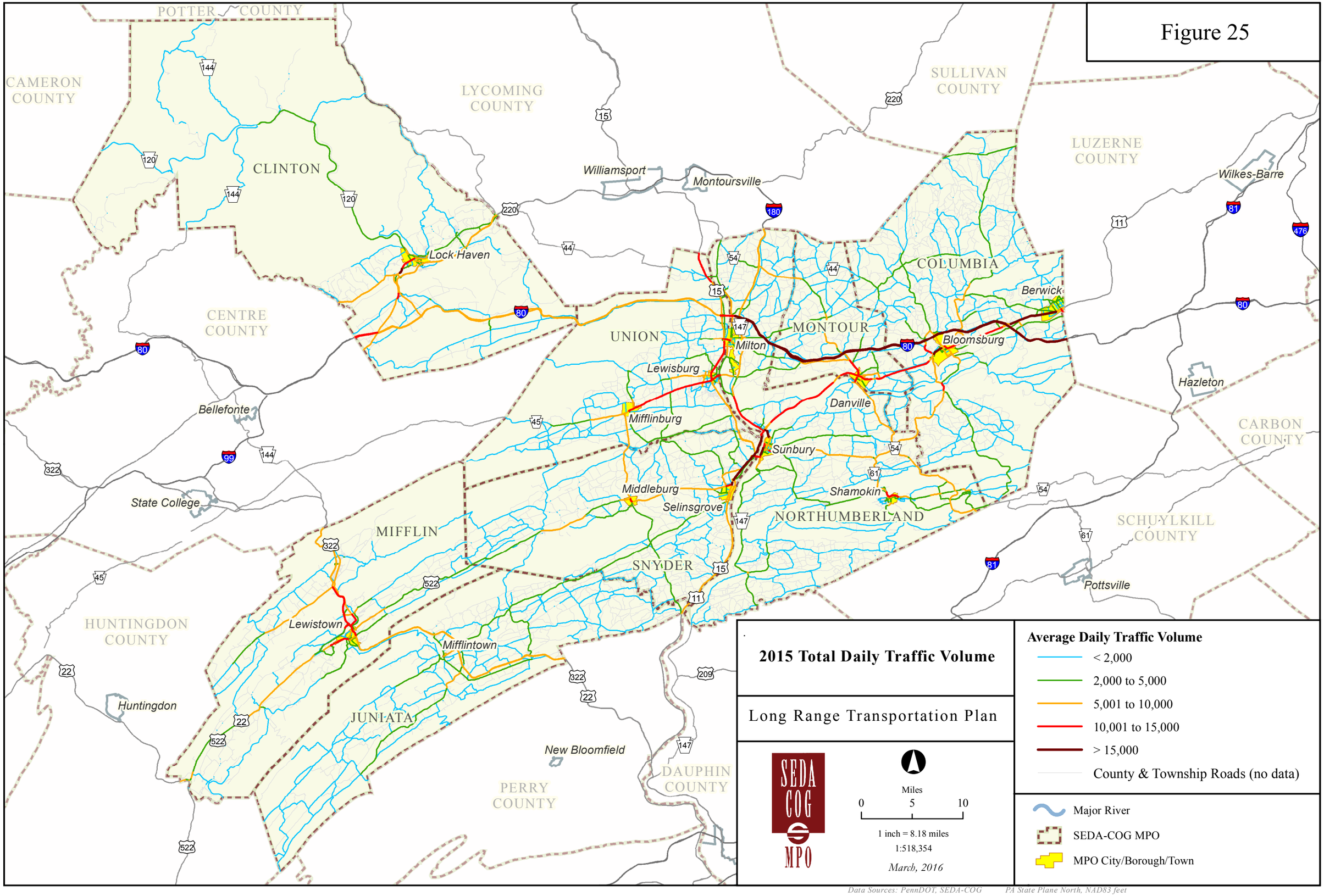
The volume-to-capacity (v/c) ratio provides a planning level analysis tool for assessing congestion. At v/c less than 0.80, congestion is not likely to be a recurring issue. At v/c between 0.8 and 1.0, congestion begins to manifest itself, especially during peak hours where the corridor is signalized, is within an urbanized area, has steep grades, or a high volume of heavy trucks. At v/c greater than 1.0, congested conditions are evident during more of the day, and peak hours are particularly problematic. This does not necessarily mean that traffic comes to a standstill, but it does indicate the flow is less stable. Distances between cars close up, speeds decrease, and an otherwise minor disturbance (e.g., a signal that does not clear the entire queue during a cycle, disabled cars along the roadside) can result in disproportionately large backups. The reliability of the roadway declines, as it becomes harder to predict travel time.

In the 2012 Base Year model, v/c ratios greater than 1.0 were noted on 4 roadway segments, accounting for about 2 lane miles of the SEDA-COG MPO network. All of the congested segments were on Interstate 80. In the 2040 Future Year model, 52 roadway segments are projected to have v/c ratios greater than 1.0, which would account for about 52 lane miles. The segments were mostly on Interstate 80, but also included US 522 east of Selinsgrove and US 11 east of the intersection with PA 54**.** For this reason, the segments of I-80 through Montour and Columbia County should be monitored, as the combination of heavy trucks and roadway grades may generate congested conditions.

Figure 27 illustrates roadway segments on the 2040 forecasted model network according to v/c ratio ranges. Two red circles are used to point out the segments along US 11/US 522 in Snyder County and I-80 in Columbia County where v/c exceeds 1.0.

[25] The PA Statewide Model files provided for the 2016 LRTP update were draft material and issues reported in the networks, coding, and traffic assignment results were all being addressed at the time this LRTP was prepared. Most significant to the SEDA-COG MPO was the absence of the CSVT roadway in the 2040 future year model.

Figure 25



2015 Total Daily Traffic Volume

Long Range Transportation Plan

SEDA COG MPO

Miles
0 5 10
1 inch = 8.18 miles
1:518,354
March, 2016

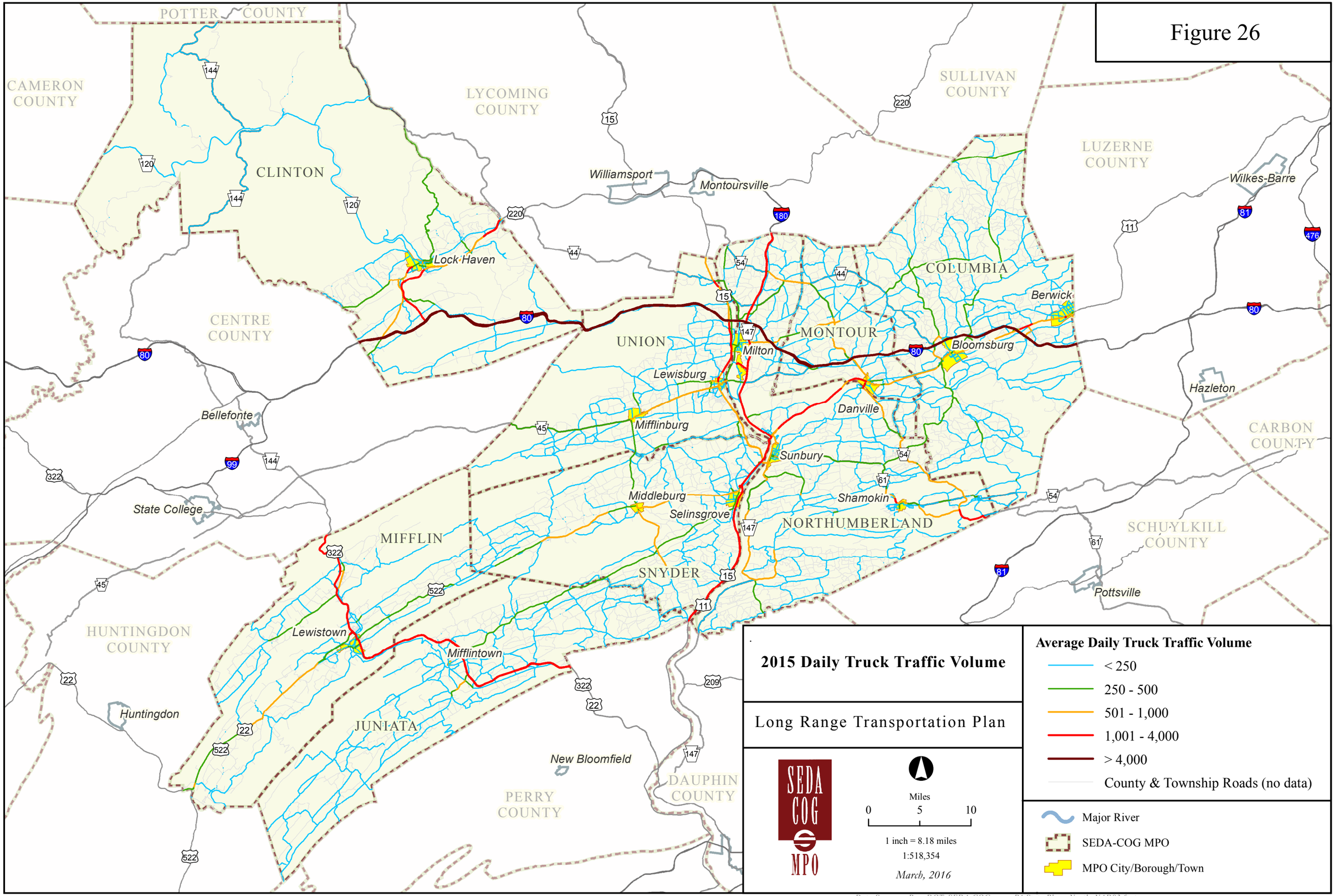
Average Daily Traffic Volume

- < 2,000
- 2,000 to 5,000
- 5,001 to 10,000
- 10,001 to 15,000
- > 15,000
- County & Township Roads (no data)

- Major River
- SEDA-COG MPO
- MPO City/Borough/Town

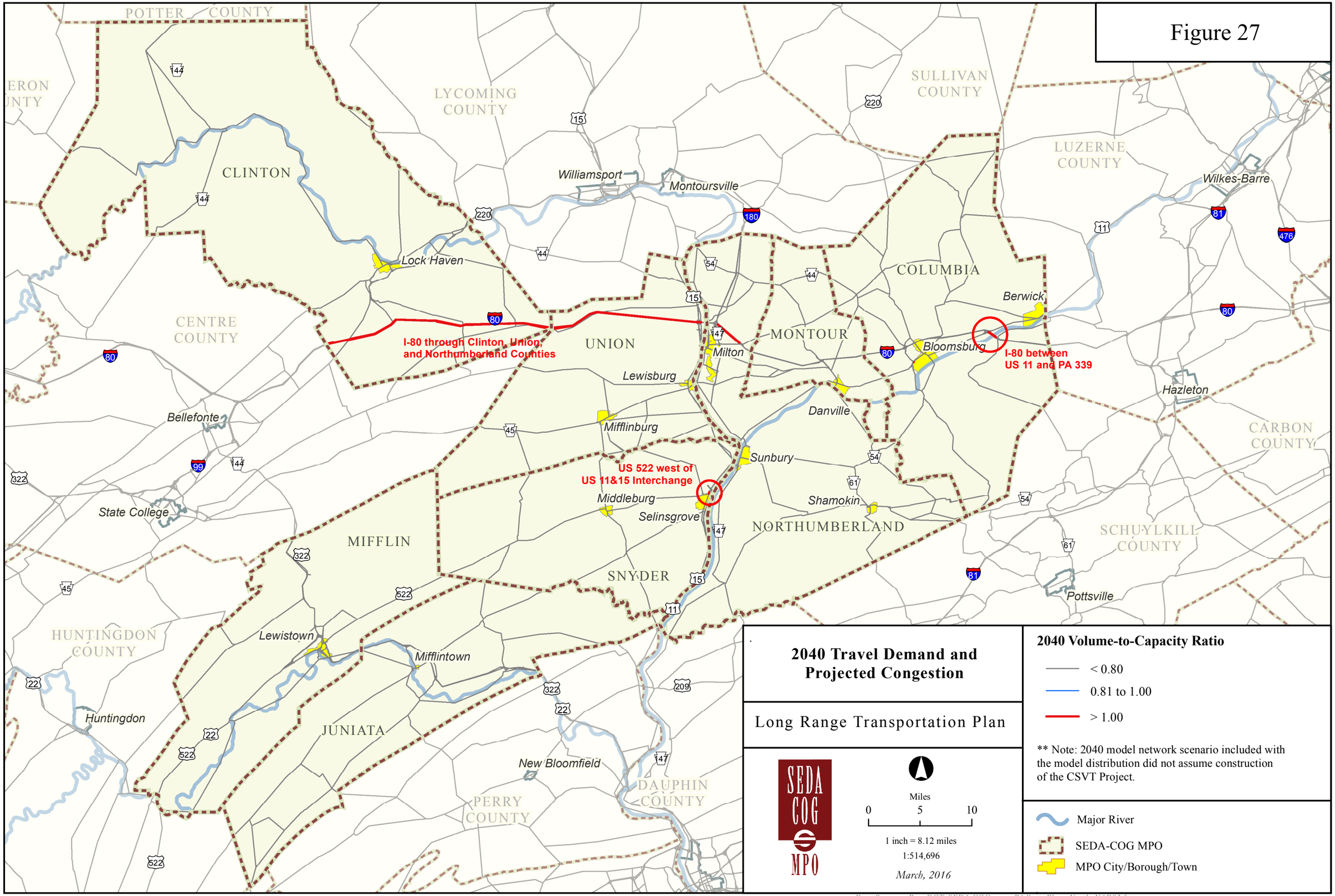
Data Sources: PennDOT, SEDA-COG *PA State Plane North, NAD83 feet*

Figure 26



Data Sources: PennDOT, SEDA-COG PA State Plane North, NAD83 feet

Figure 27



2040 Travel Demand and Projected Congestion

Long Range Transportation Plan

SEDA COG MPO

Miles
0 5 10
1 inch = 8.12 miles
1:514,696
March, 2016

2040 Volume-to-Capacity Ratio

- < 0.80
- 0.81 to 1.00
- > 1.00

** Note: 2040 model network scenario included with the model distribution did not assume construction of the CSVT Project.

- Major River
- SEDA-COG MPO
- MPO City/Borough/Town

Data Sources: PennDOT, SEDA-COG *PA State Plane North, NAD83 feet*

Table 20 summarizes the 2012 and 2040 v/c ratios on roadway links (groups of segments) with projected congestion—i.e., where the 2040 v/c ratio was 1.0 or greater. The rate of change in v/c ratio is an indication of the traffic volume growth trends on the network.

Table 20. Roadways with Projected Congestion in 2040

Route	Segment Location	County	Volume-to-Capacity Ratio	
			Base Year 2012	Future Year 2040
I-80	PA 26 to PA 64	Centre/Clinton	1.00	1.12
	PA 64 to US 220	Clinton	0.93	1.05
	US 220 to PA 477	Clinton	0.95	1.04
	PA 477 to PA 880	Clinton	0.94	1.07
	PA 880 to Mile Run Road	Clinton/Union	0.96	1.10
	Mile Run Road to US 15	Union	0.97	1.10
	PA 147 to PA 254	Northumberland	0.84	1.04
	US 11 to PA 339	Columbia	0.87	1.02
US 11	US 522 to US 11/15 Interchange	Snyder	0.77	1.06

Source: PA Statewide Travel Demand Model, 2015.

Significant traffic congestion in the MPO, both present and in the future, is largely limited to the I-80 corridor and certain connection points along US 522 and US 11. Considering the trend toward decreasing DVMT and construction of CSVT to bypass current areas of congestion, widespread traffic congestion is a diminishing concern. Still, localized areas of congestion, particularly urbanized corridors, are likely to persist.

c. Safety/Crash History

(1) National Safety Policy[26]

The following is an excerpt from the FHWA's Safety program area website, regarding the national policy and direction for transportation safety programs:

> *FHWA is committed to the vision of eliminating fatalities and serious injuries on our Nation's roadways. This approach echoes the Department of Transportation's Strategic Plan, which articulates the goal of "working toward no fatalities across all modes of travel"; the FHWA's strategic goal of ensuring the "nation's highway system provides safe, reliable, effective, and sustainable mobility for all users"; and the emphasis on safety that FHWA renews every year in our strategic implementation efforts.*
>
> *The Toward Zero Deaths (TZD) vision is a way of clearly and succinctly describing how an organization, or an individual, is going to approach safety – even one death on our transportation system is unacceptable. TZD uses a data-driven, interdisciplinary approach that FHWA has been promoting for many years. The TZD approach targets areas for improvement*

[26] From Federal Highway Administration, Safety Program Area website, as accessed 4/18/2016, from http://safety.fhwa.dot.gov/tzd/.

and employs proven countermeasures, integrating application of education, enforcement, engineering, and emergency medical and trauma services.

FHWA administers the Highway Safety Improvement Program (HSIP) with the goal to achieve a significant reduction in traffic fatalities and serious injuries on all public roads. The HSIP requires that each State develop a Strategic Highway Safety Plan (SHSP)[27]. The SHSP is a data-driven, multi-year, statewide-coordinated safety plan that provides a comprehensive framework for reducing highway fatalities and serious injuries on all public roads. An SHSP identifies a State's key safety needs and guides investment decisions towards strategies and countermeasures with the most potential to save lives and prevent injuries. The collaborative process of developing and implementing an SHSP brings together, and draws on, the strengths and resources of all safety partners.

In addition, FHWA, along with the Federal Motor Carrier Safety Administration and the National Highway Traffic Safety Administration, provided technical support to a group of organizations that represent professionals with an active role in highway safety, led by the American Association of State Highway and Transportation Officials. This group developed the National Strategy on Highway Safety Toward Zero Deaths (National Strategy) – an overarching and common vision that drives and focuses collective efforts to eliminate injuries and fatalities on America's roads.

(2) Crash Data and Analysis

The performance of the highway system may also be evaluated in terms of its safety or lack thereof, according to the frequency, severity and distribution of roadway crashes. Such an evaluation not only suggests project locations, but also assists in prioritizing projects in comparison to others. The following evaluation of highway safety considers the history of reportable crashes for the previous 5-year period (January 1, 2010 to December 31, 2014), which was provided by PennDOT Central Office for all state-maintained roadways within the SEDA-COG MPO region.

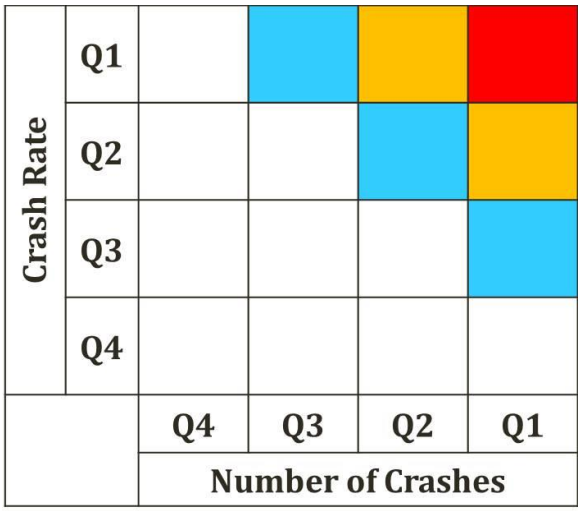
(3) Roadway Segments

Crashes in the PennDOT crash database were identified and summarized by roadway segment. The Crash Rate for each segment was also calculated, and is given in terms of crashes-per-million-vehicle-miles-of-travel, essentially normalizing the number of crashes according to traffic volume and length of the segment.

For crash mapping and trend evaluations, the segments were divided into quartiles for both number of crashes and crash rate, and the quartiles were cross-classified according to the matrix grid shown in **Figure 28**. Quartiles for number of crashes were on the X-axis, and quartiles for crash rate were on the Y-axis. Analyzing crashes with this combined methodology neutralizes many of the shortcomings encountered when relying on the number of crashes or crash rate alone.

[27] The Pennsylvania Strategic Highway Safety Plan may be found at: http://www.justdrivepa.org/Resources/Strategic%20Highway%20Safety%20Plan.pdf.

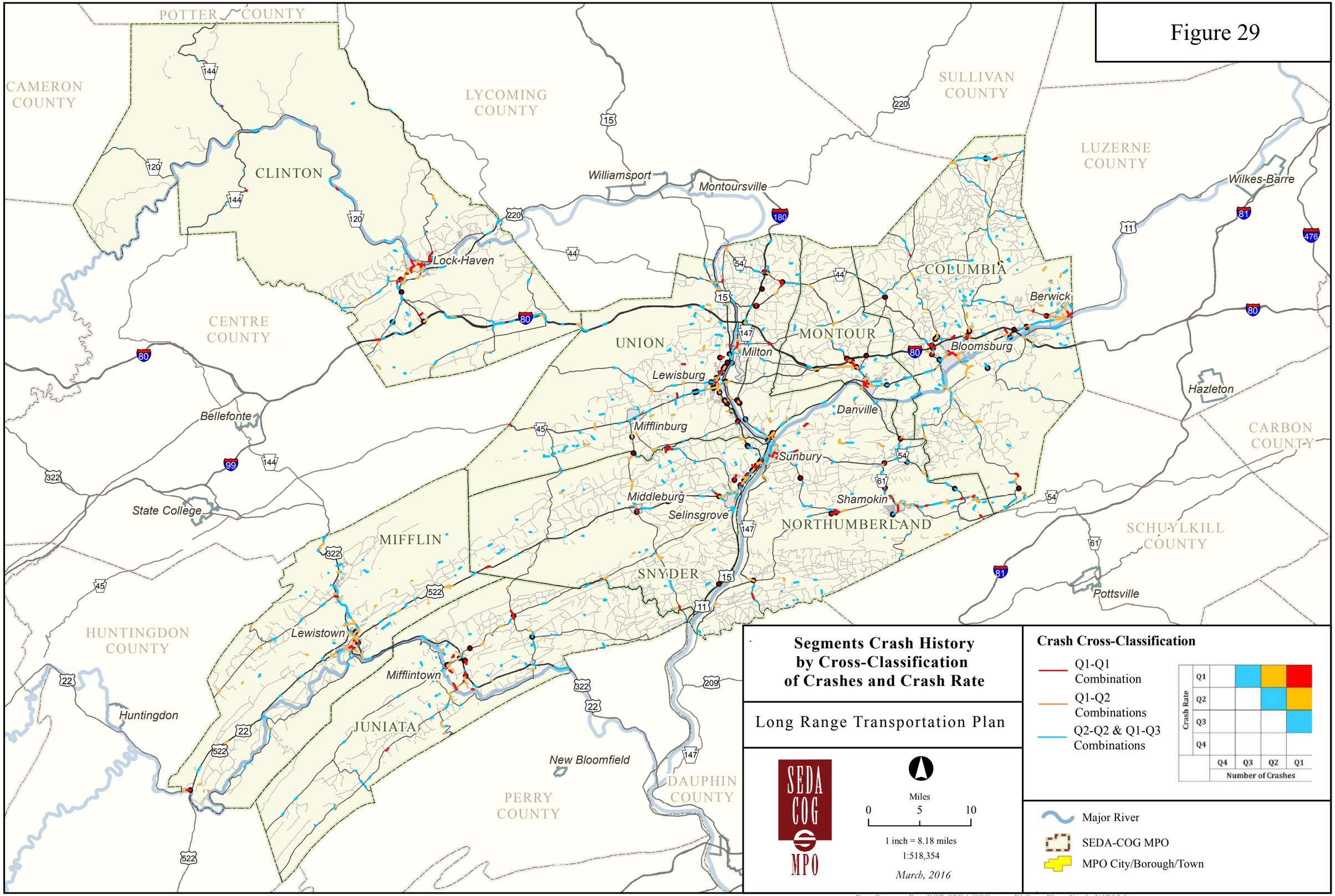
Figure 28. Roadway Segment Quartile Cross-Classification



The roadway segments were cross-classified into the matrix according to their quartile scores, and the mapping in **Figure 29** was created to illustrate the distribution of segments in the higher quartile combinations. The Q1-Q1 combination occurred on approximately 186 (2.5%) of the 7,407 roadway segments in the SEDA-COG MPO region. Segments tended to cluster in the urbanized areas along the primary arterial and higher-level collector streets. The intersections of Q1-Q1 segments likely indicate an intersection of concern, which frequently overlap with the Intersection Safety Implementation Program (ISIP) locations. See **Table 24** and surrounding discussion.

The crash cross classification scheme was created for use in the Project Scoring and Selection Process (see **Appendix D**), since it provided a comprehensive yet concise single measure of the crash history. Projects addressing a safety issue received points according to point values assigned to each cell.

Figure 29



Segments Crash History by Cross-Classification of Crashes and Crash Rate

Long Range Transportation Plan

SEDA COG MPO

Miles
0 5 10
1 inch = 8.18 miles
1:518,354
March, 2016

Crash Cross-Classification

- Q1-Q1 Combination
- Q1-Q2 Combinations
- Q2-Q2 & Q1-Q3 Combinations

Crash Rate	Q4	Q3	Q2	Q1
Q1				
Q2				
Q3				
Q4				
	Q4	Q3	Q2	Q1
	Number of Crashes			

- Major River
- SEDA-COG MPO
- MPO City/Borough/Town

Data Sources: PennDOT, SEDA-COG *PA State Plane North, NAD83 feet*

(4) Fatalities

Fatal crashes and trends form one of the two federally-required performance measures for transportation planning. **Figure 30** identifies the roadway segments where one or more fatalities occurred during the 5-year period of 2010-2014. As described in **Table 21**, 282 total fatalities occurred during this time period, with 24 of these being pedestrian or bicyclist fatalities.

Table 21. Fatalities by County, 2010-2014

County	Total Fatalities	Pedestrian & Bicyclist Fatalities
Clinton	42	4
Columbia	55	2
Juniata	26	3
Mifflin	35	5
Montour	5	0
Northumberland	53	5
Snyder	33	3
Union	33	2
TOTAL	**282**	**24**
Per Year	**56.4**	**4.8**

Source: PennDOT, Pennsylvania Crash Information Tool, Fatality Statistics Report, https://www.dotcrashinfo.pa.gov/PCIT/welcome.html.

(5) Serious Injuries

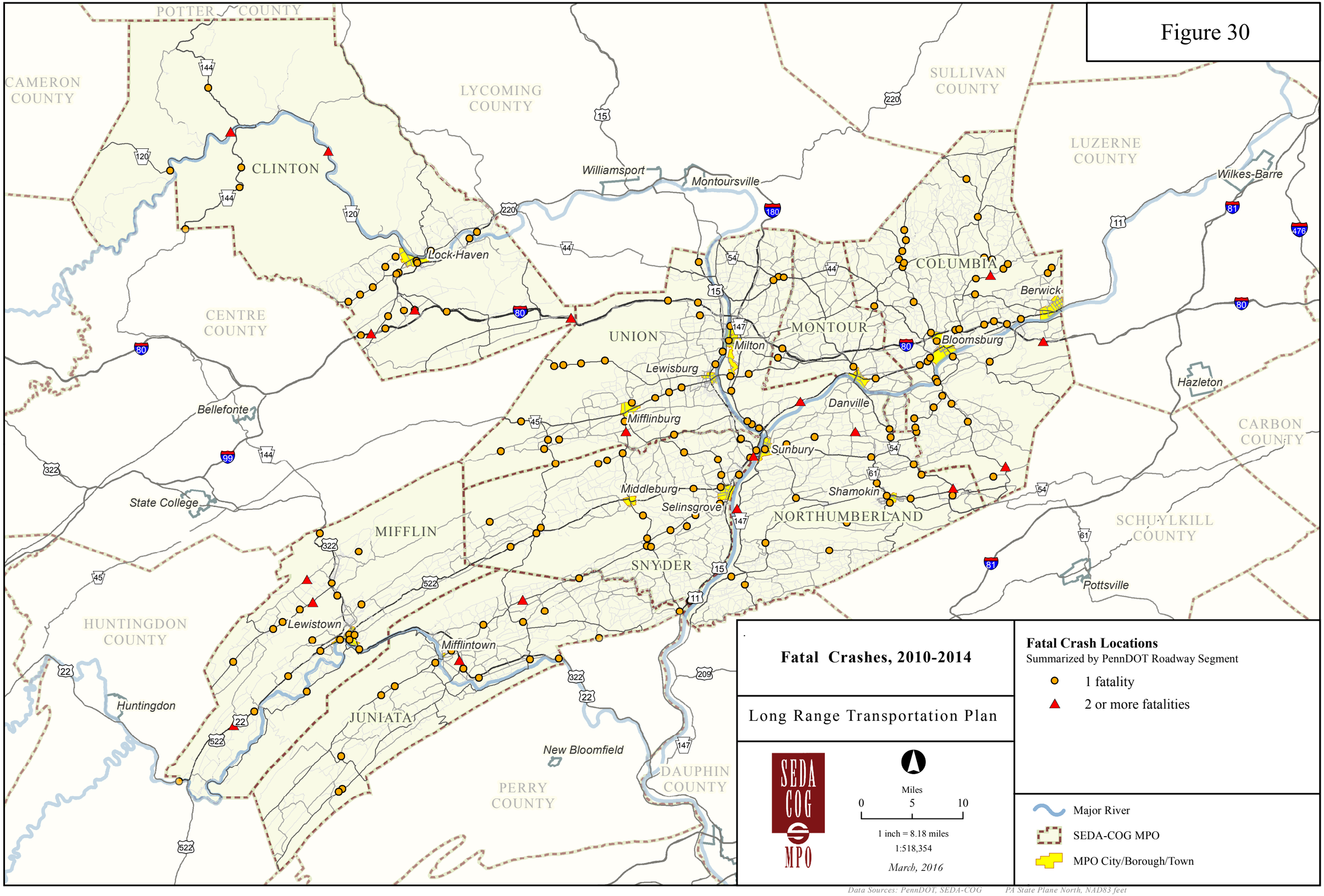
Serious injuries and trends form the second of the two federally-required performance measures for transportation planning. As described in **Table 22**, 618 total serious injuries occurred during the 2010-2014 time period, with 57 of these being pedestrian or bicyclist serious injuries.

Table 22. Serious Injuries by County, 2010-2014

County	Total Serious Injuries	Pedestrian & Bicyclist Serious Injuries
Clinton	87	3
Columbia	109	6
Juniata	51	8
Mifflin	81	12
Montour	31	2
Northumberland	125	19
Snyder	68	3
Union	66	4
TOTAL	**618**	**57**
Per Year	**123.6**	**11.4**

Source: PennDOT, Pennsylvania Crash Information Tool, Fatality Statistics Report, https://www.dotcrashinfo.pa.gov/PCIT/welcome.html.

Figure 30



Data Sources: PennDOT, SEDA-COG PA State Plane North, NAD83 feet

(6) Pedestrian & Bicycle Crashes

Pedestrian and bicyclist fatalities and serious injuries are considered in the federally-required performance measure for transportation planning. **Table 21** and **Table 22** (above) provide a breakout of pedestrian and bicyclist fatalities and serious injuries, respectively. **Figure 35** identifies the roadway segments where one or more pedestrian fatalities occurred during the 5-year period of 2010-2014. Also indicated are the roadway segments where crashes involving pedestrians resulted in one or more serious injuries to pedestrians. Two counties—Mifflin and Northumberland—have noticeably higher fatalities and serious injuries.

(7) Highway Safety Guidance

The Highway Safety Guidance Report is a PennDOT Central Office effort that presents trends and statistics associated with crashes recorded within the geographic area of the MPO. Separate reports are prepared for each Planning Partner. The report links to resources available for assessing, analyzing and alleviating problems that may contribute to the rate of highway accidents and fatalities. The 2015 Report (4th Edition), issued July 2015, was the latest version available. Part of the PennDOT Guidance Report for SEDA-COG MPO presents a trend analysis of 5-year average trends in crash history, placed alongside future goals for the next several 5-year periods.

Figure 31, Figure 32, Figure 33, and Figure 34 illustrate the decreasing trend in Total Fatalities and Total Serious Injuries, both in terms of number and rate per million vehicle miles travelled. Note that the values presented in each bar of **Figure 31 and Figure 33** represent the average per year for the period specified. Comparing the goals for 2010-2014 presented in the guidance to the 2010-2014 crash history described in **Table 21 and Table 22**, the actual "per year' number of Fatalities in the SEDA-COG MPO region were lower than the 5-year Average Goals, out to 2016. The actual number of "per year" Serious Injuries was lower than the 5-year Average Goals, out to 2018.

The trend in both Fatality and Serious Injury Rates (**Figure 32** and **Figure 34**) has been flat during 2010-2014, indicating safety-focused efforts should be sustained and expanded, where possible. The Roadway Safety Review program is one way that the MPO and PennDOT are cooperatively evaluating and developing safety-specific projects. The Safety Review step in PennDOT's project development process is another place where progress can be made when incorporating safety enhancements in new projects.

Figure 31. Five-Year Average (per year) Fatalities

Figure 32. Five Year Average Fatality Rate per VMT

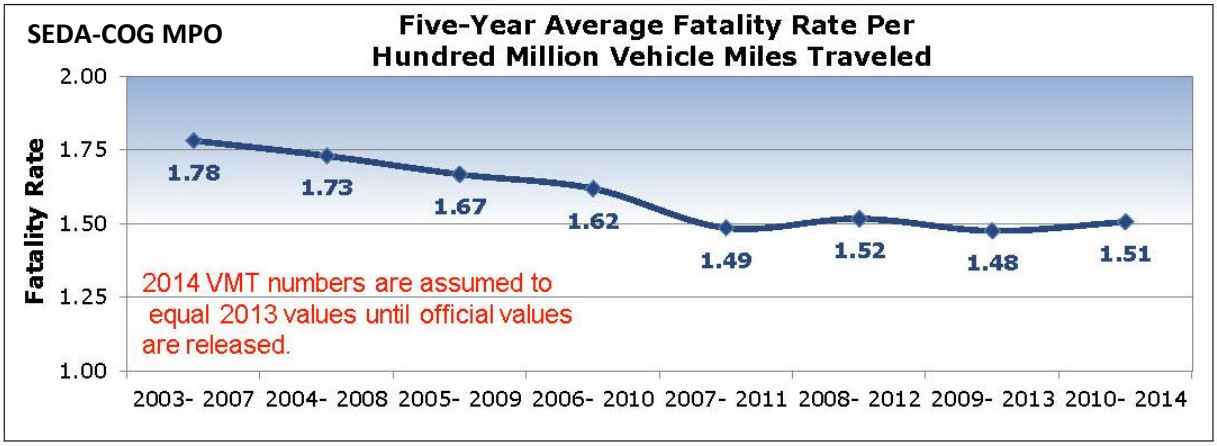


Figure 33. Five-Year Average (per year) Serious Injuries

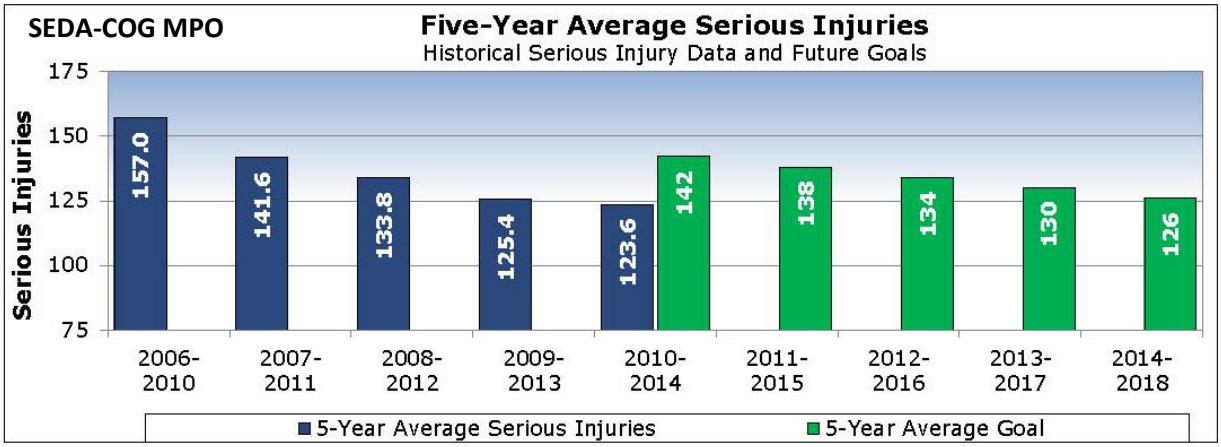
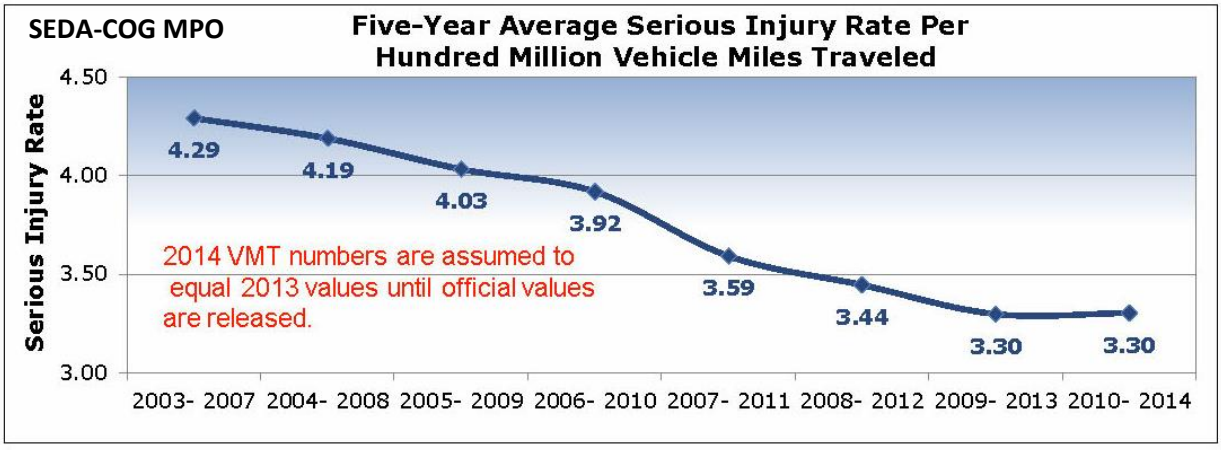
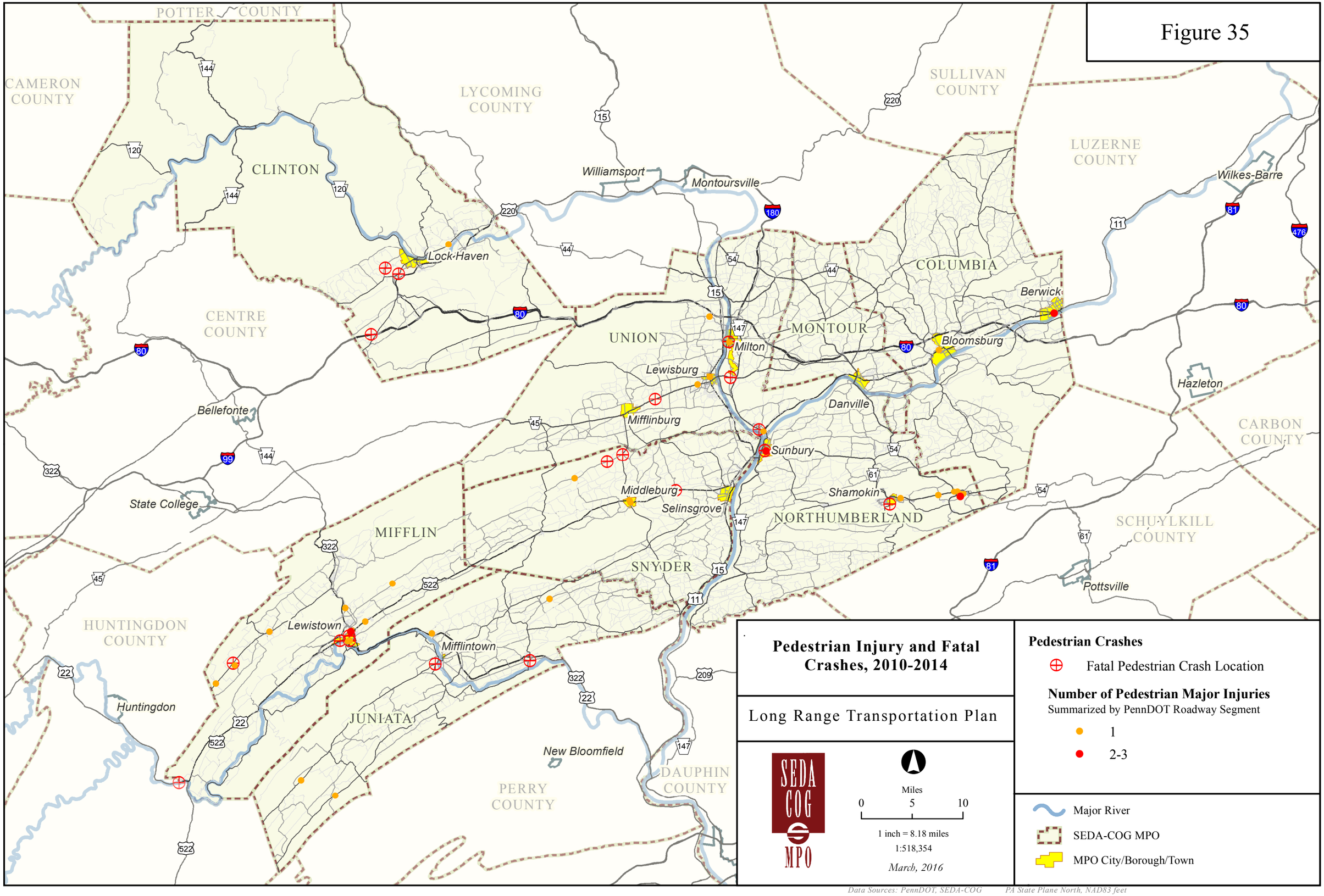


Figure 34. Five-Year Average Serious Injury Rate per VMT



Source: (Figures 31-34) *SEDA-COG MPO Highway Safety Guidance Report, 4th Edition*, July 2015, PennDOT Highway Safety and Traffic Operations Division, p. 17-18.

Figure 35



Pedestrian Injury and Fatal Crashes, 2010-2014

Long Range Transportation Plan

SEDA COG MPO

Miles
0 5 10
1 inch = 8.18 miles
1:518,354
March, 2016

Pedestrian Crashes

Fatal Pedestrian Crash Location

Number of Pedestrian Major Injuries
Summarized by PennDOT Roadway Segment

1

2-3

Major River

SEDA-COG MPO

MPO City/Borough/Town

Data Sources: PennDOT, SEDA-COG *PA State Plane North, NAD83 feet*

(8) High Crash Locations (HCL) List

PennDOT has developed a High Crash Locations List for each Planning Partner. **Table 23** lists the 2015 Highway Safety Guidance Report High Crash Locations (based on 2010-2014 data) for the SEDA-COG MPO. The list was assembled starting with locations from the Statewide High Crash Location List. If the MPO region had less than 25 locations on the Statewide List, additional locations with fatal and injury crashes were derived from the Crash Data Analysis Retrieval Tool (CDART) cluster reports, until 25 locations were provided. The High Crash Locations List draws on data from all injury crashes, including fatalities, as the primary selection criteria.

Table 23. 2015 High Crash Locations

	County	Route	Begin Segment	Begin Offset	End Segment	End Offset	Total Injury Crashes	Fatal Count	ADT
1	Columbia	11	110	2069	160	272	66	0	15,566
2	Snyder	11	320	653	450	169	261	1	19,368
3	Snyder	11	321	381	421	930	258	0	19,632
4	Clinton	150	130	1550	260	1322	238	2	8,692
5	Union	15	150	811	250	0	158	1	7,764
6	Columbia	487	230	1545	310	1260	157	0	8,412
7	Union	15	151	623	251	477	151	1	7,787
8	Columbia	11	370	953	430	2852	134	0	15,306
9	Montour	11	40	0	90	1686	120	0	11,808
10	Mifflin	1005	34	132	70	2001	113	1	8,920
11	Northumberland	147	570	1550	620	122	112	2	8,211
12	Union	45	430	1642	480	1161	91	0	10,653
13	Snyder	522	570	0	614	0	73	1	9,999
14	Columbia	11	300	383	340	382	66	1	6,552
15	Northumberland	61	130	370	180	1359	66	0	7,230
16	Columbia	42	470	2802	540	1086	63	0	14,582
17	Northumberland	61	510	1470	570	557	58	0	11,789
18	Clinton	80	1890	2270	1910	192	55	0	10,121
19	Columbia	11	421	123	431	1927	54	0	7,150
20	Northumberland	11	10	17	50	539	54	0	14,541
21	Northumberland	4004	10	0	40	1121	47	1	8,220
22	Columbia	11	121	0	141	302	45	0	7,783
23	Columbia	42	491	0	531	519	42	0	7,291
24	Mifflin	4013	190	1056	210	2753	38	0	1,436
25	Montour	54	180	1554	210	1891	38	0	3,550

Source: SEDA-COG MPO Highway Safety Guidance Report, 4th Edition, July 2015, PennDOT, p. 8.

(9) Intersection Safety Implementation Plan (ISIP)

The Pennsylvania Intersection Safety Implementation Plan (ISIP) was initially developed by the FHWA in 2010 as an outline for addressing intersection safety. The plan includes specific locations within Pennsylvania, along with recommended countermeasure categories for each location. ISIP improvements can be funded through the HSIP program (subject to HSIP requirements) or through a dedicated ISIP funding pool.

The most recent listing of ISIP locations (2012) for the SEDA-COG MPO included 132 intersections distributed among the MPO counties as described in **Table 24**.

Table 24. Intersection Safety Implementation Plan, Locations by County, 2012

County	Number of ISIP Locations
Clinton	5
Columbia	21
Juniata	7
Mifflin	3
Montour	10
Northumberland	35
Snyder	29
Union	22
TOTAL	**132**

Source: PennDOT, 2012 Highway Safety Guidance Locations.

(10) Roadway Departure Safety Implementation Plan (RDIP)

The Pennsylvania Roadway Departure Safety Implementation Plan (RDIP) was developed by the FHWA in 2012 to address run-off-road crashes. RDIP improvements can be funded through the HSIP program (subject to HSIP requirements) or through a dedicated RDIP funding pool.

d. Roadway Safety Reviews

With support from PennDOT and FHWA staff, SEDA-COG served as a convener in 2015 for examining multiple roads with crash histories that could be improved using highway safety or other funds. A comprehensive road safety review process, using input from a multi-disciplinary team, had not been conducted since 2006. A primary impetus for compiling a new list of crash problem areas and generating potential projects was the 5-year update of the LRTP, along with preparation of the 2017-2020 TIP.

The FHWA encourages planning organizations to routinely perform roadway safety reviews as a process for examining current road usage, identifying deficiencies, and developing needed safety improvements. The objectives of the reviews include: engaging the PennDOT District safety engineers into the MPO transportation planning process; gaining a better understanding of safety issues and concerns at high crash corridors/intersections within the region; and prioritizing and selecting safety improvement projects for inclusion in the MPO's LRTP/TIP.

SEDA-COG staff started the process by reviewing its safety complaint areas tracking sheet, MPO High Crash Locations (HCL) list, Intersection Safety Implementation Plan (ISIP) list, Roadway Departure

Implementation Plan (RDIP) list and LTAP safety reports. Next, MPO staff consulted with PennDOT District Traffic Safety Managers to request their recommendations. From this feedback, a preliminary list and mapping of 30 potential sites or corridors was generated for further evaluation and prospective field views. Following discussion of the 30 potential sites with MPO members and PennDOT officials, it was determined to reduce the number of sites based on information such as crash trends/rates, eligibility for highway safety funding, past studies, and recent or planned projects. The list of 30 locations was reduced to the following 9 locations:

PennDOT District 2-0 Locations:

1. State Route (SR) 150 – Segment 0180 in Flemington Borough (Clinton County)
2. State Route (SR) 150 – Segment 0230 to 0250 in Lock Haven City (Clinton County)
3. State Route (SR) 1005 – Segment 0010 to 0040 in Lewistown Borough/Derry Township (Mifflin County)
4. State Route (SR) 22 – Segment 0010 to 0050 in Wayne Township (Mifflin County)

PennDOT District 3-0 Locations:

1. State Route (SR) 42 – Segment 0480 in Hemlock Township (Columbia County)
2. State Route (SR) 487 – Segment 0280 to 0300 in Bloomsburg Town/Scott Township (Columbia County)
3. State Route (SR) 54 – Segment 0190 in Valley Township (Montour County)
4. State Route (SR) 54 – Segment 0180 Turbotville Borough (Northumberland County)
5. State Route (SR) 11 – Segment 0420 to 0460 in Monroe Township (Snyder County)

The roadway safety reviews were completed in October and November 2015, and the results generated four new highway safety projects for consideration in the TIP and LRTP updates.

4. Freight Movement

a. Highway Freight

(1) Freight Analysis Framework

The FHWA Freight Analysis Framework (FAF)[28] integrates data from a variety of sources to create a comprehensive picture of freight movement among states and major metropolitan areas by all modes of transportation. It is produced through a partnership between Bureau of Transportation Statistics (BTS) and FHWA. This LRTP report references FAF version 3 (FAF3). FAF3 integrates commodity flow data for both domestic and import flows and provides 2007 Baseline and 2040 Horizon assignments of freight and other vehicular traffic to the FAF3 roadway system.

Figure 36 identifies the NHFN (gray highlight) and FAF3 network in the SEDA-COG MPO region and illustrates growth in truck traffic forecasted between 2007 and 2040. Most segments of I-80 are expected to see 50 to 75% growth in heavy trucks, which would add about 8,000 new trucks per day to the current 12,000 trucks per day on I-80.

[28] http://ops.fhwa.dot.gov/FREIGHT/freight_analysis/faf/index.htm.

We note that the FAF3 network does not include CSVT, so much of the truck growth forecasted on US 15 (~55%) and PA 147 (~45%) would likely travel on the CSVT roadway. This would add approximately 3,500 trucks per day to the current 6,500 per day on the US 15 and PA 147 corridors.

b. Railroad Freight

Freight generated within the SEDA-COG MPO region is principally related to manufacturing and the extraction of natural resources. In the year 2014, an estimated 2,689,100 tons of commodities or approximately 26,891 carloads of freight were handled on the SEDA-COG Joint Rail Authority rail lines. **Table 25** shows the carloads by rail line. Principal exports include rail ties, anthracite coal, aggregate, landscaping stone and carbon products. Local industries also receive incoming commodities such as sand, lumber, chemicals, plastics, propane, steel and scrap metal, aggregate, limestone and road salt and agricultural products. Freight associated with the natural gas industry is also present.

Table 25. Carloads on SEDA-COG JRA Lines, 2010-2015

Year	*Operator*				
	JVRR	***LVRR***	***NBER***	***NSHR***	***SVRR***
2011	3,104	17,569	7,751	1,301	370
2012	2,978	17,307	5,432	1,647	216
2013	2,879	17,938	6,758	1,485	150
2014	2,782	15,176	6,684	1,419	120
2015	2,226	10,470	6,962	1,480	132
Total Carloads	***13,969***	***78,460***	***33,587***	***7,332***	***988***

Source: SEDA-COG JRA, 2016.

Major industries currently utilizing rail service within the overall SEDA-COG region include the Marcellus Natural Gas Industry (starting second quarter of 2015, Marcellus traffic shrunk to 10% of 2013 levels), Suburban Propane and UGI, Glenn O. Hawbaker, Bulkmatic, Fisher Mining, Frito-Lay, Wise Foods, Koppers and Big Heart Pet Brands. In addition, industries with private connections to the railway system include Standard Steel, Glenn O. Hawbaker, Transco and Koppers.

The transportation infrastructure is critical in supporting the movement of freight within the SEDA-COG MPO region. This infrastructure provides connections to all major population centers throughout the northeast United States. The primary infrastructure includes the previously described highway and airports, and nine railroads.

The accessibility of rail in this region is a valued amenity for many enterprises, since shipping freight by rail can significantly reduce the transportation costs of bulk products. Although much freight in this region is shipped by truck, rail provides an alternative connection to regional, national and world markets. As the MPO region evolves, and strategies to attract additional employment opportunities are evaluated, it is important to assess the current railway network to provide a better understanding of future needs.

Rail in the SEDA-COG MPO region is generally utilized to serve major industries and business and is considered critical for economic development. The active lines provide a vital connection to supply operations and transport materials and goods to regional markets and beyond. Through connections

with primary freight corridors within the region and surrounding counties, these lines can provide efficient multi-modal options for industries located within the region. Year 2007 Waybill Sample* freight data reported in the *Pennsylvania Intercity Passenger and Freight Rail Plan,* dated February 2010, is shown in **Table 26**.

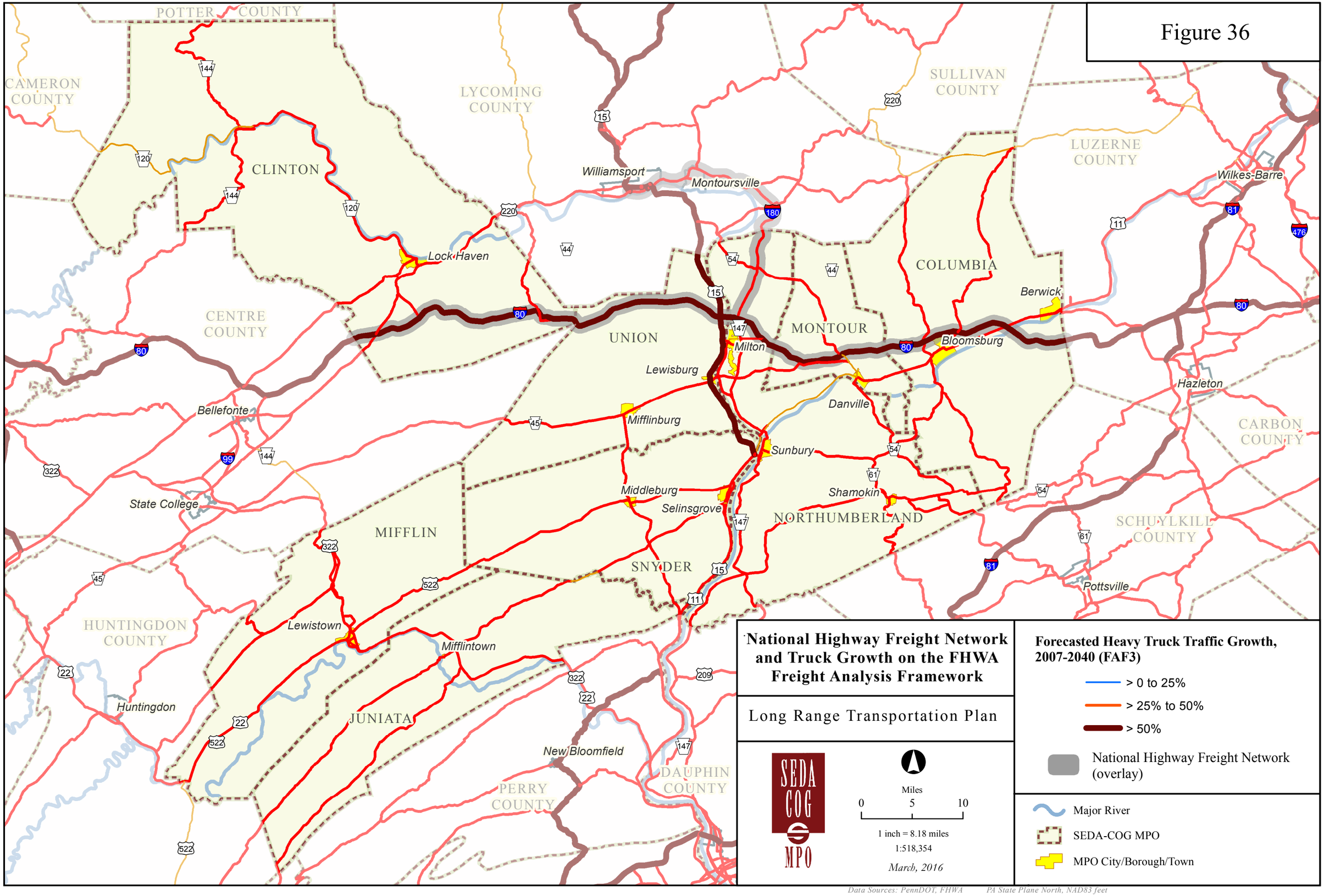
Table 26. Freight Estimates within the SEDA-COG MPO Region

County	Originating Rail Traffic (Tons)	Inbound Rail Traffic (Tons)
Clinton	23,000 - 69,999	140,000 – 329,999
Columbia	1 – 22,999	40,000 – 139,999
Juniata	0	0 – 39,999
Mifflin	70,000 – 129,999	40,000 – 139,999
Montour	0	2,950,000 – 10,000,000
Northumberland	230,000 – 499,999	330,000 – 409,999
Snyder	1 – 22,990	410,000 – 899,999
Union	23,000 – 69,999	40,000 – 139,999

Source:
Pennsylvania Intercity Passenger and Freight Rail Plan, PennDOT, February 2010, http://www.penndot.gov/Doing-Business/RailFreightAndPorts/Planning/Documents/Pennsylvania%20Intercity%20Passenger%20and%20Rail%20Freight%20Plan%20-%20Low%20Res.pdf.

Notes:
Due to a revision in federal requirements, the Draft Pennsylvania State Rail Plan was not required to include Waybill Sample Data. Updated Year 2013 Waybill Sample data was requested, but was not available at the time this Plan was prepared due to proprietary concerns.

Figure 36



National Highway Freight Network and Truck Growth on the FHWA Freight Analysis Framework

Long Range Transportation Plan

SEDA COG MPO

Miles
0 5 10

1 inch = 8.18 miles
1:518,354
March, 2016

Forecasted Heavy Truck Traffic Growth, 2007-2040 (FAF3)

- > 0 to 25%
- > 25% to 50%
- > 50%

National Highway Freight Network (overlay)

- Major River
- SEDA-COG MPO
- MPO City/Borough/Town

Data Sources: PennDOT, FHWA *PA State Plane North, NAD83 feet*

Freight Movement & Activity Centers

Figure 37

Long Range Transportation Plan

SEDA COG MPO

Miles
0 5 10

1 inch = 8.18 miles
1:518,354

October, 2015

Tons of Freight

1,100,000

Total Inbound Tons
Total Outbound Tons

SEDA-COG MPO
Major Place
Major River
Interstate Hwy
US Hwy
Major PA Rt

**Windsor Italian Foods was permanently closed in 2013

SEDA-COG JRA Short Lines

JVRR
LVRR
NBER
NSHR
SVRR
Other Rail Lines

Operator	JVRR	LVRR	NBER	NSHR	SVRR
2011	3,104	17,569	7,751	1,301	370
2012	2,978	17,307	5,432	1,647	216
2013	2,879	17,938	6,758	1,485	150
2014	2,116	11,097	5,258	1,066	120
2015	453	3,312	1,092	363	48
Total Carloads	***11,530***	***67,223***	***26,291***	***5,862***	***904***

Company Name	Total Inbound Tons	Total Outbound Tons	Total Tons
Central Builders Supply Co	96,879.83	12,329,817.30	12,426,697.13
Eastern Industries Inc	26,778.03	3,828,464.68	3,855,242.70
Con Agra Foods Inc	227,932.17	1,221,792.89	1,449,725.05
National Limestone Quarry Inc	46,188.57	625,149.63	671,338.20
Glenn O Hawbaker Inc	13,680.07	626,561.76	640,241.83
Eastern Industries Inc	9,882.14	451,159.28	461,041.42
Scullin Oil Co	169,873.26	203,604.02	373,477.28
Eastern Industries Inc	71,933.52	218,694.38	290,627.90
Del Monte Foods	67,774.15	191,344.68	259,118.83
Eastern Industries Inc	10,034.26	246,766.56	256,800.82
Eastern Industries Inc	9,802.16	245,899.56	255,701.73
Eastern Industries Inc	3,086.28	247,951.56	251,037.84
Melick Aqua Feed	160,667.72	78,337.07	239,004.80
First Quality Products Inc	58,571.26	179,899.45	238,470.71
Conestoga Wood Specialties	55,654.44	158,184.93	213,839.37
Avery Dennison Chemical Div	176,743.66	26,005.77	202,749.42
Clark's Feed Mills	62,556.00	135,525.58	198,081.58
Windsor Italian Foods	157,180.07	26,456.69	183,636.76
Jeff's Auto Body & Recycling	33,515.64	147,640.61	181,156.24
SUPERIOR Plus Energy Svc	78,249.40	95,173.31	173,422.70
Nestlerode Contracting Co	81,714.73	87,889.31	169,604.04
Advanced Concrete Systems Inc	29,829.77	135,392.04	165,221.82
HRI Inc	83,744.40	73,890.26	157,634.66
Empire Kosher Poultry Inc	87,313.09	66,808.48	154,121.58
Dan Ber Concrete & Supply Inc	79,522.76	72,075.76	151,598.53

Sources: PennDOT, ARC 2015, Transearch, Freight Finder
Projection: PA State Plane North, NAD83 feet

c. Air Freight

(1) Airport Operator Survey

In conjunction with its MPO Aviation Subcommittee activities, SEDA-COG conducted a survey of SEDA-COG MPO Airport Operators in 2014. The survey was designed to identify regional aviation capabilities, issues, and needs. The survey asked questions regarding airport use, services and what issues are most important to address in this LRTP.

Figure 38 and **Figure 39** provide the responses to questions about available hangar space**.**

Figure 38: Availability of Hangar Space

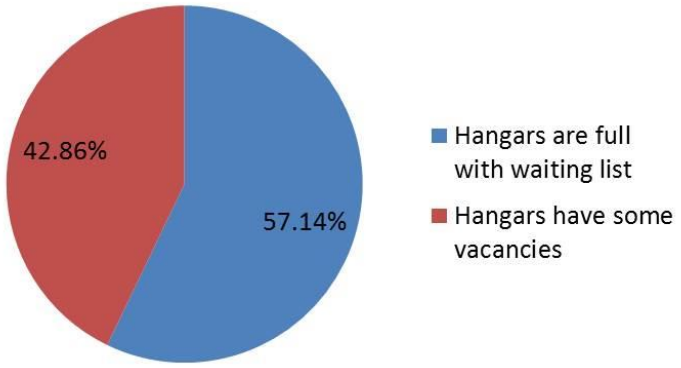
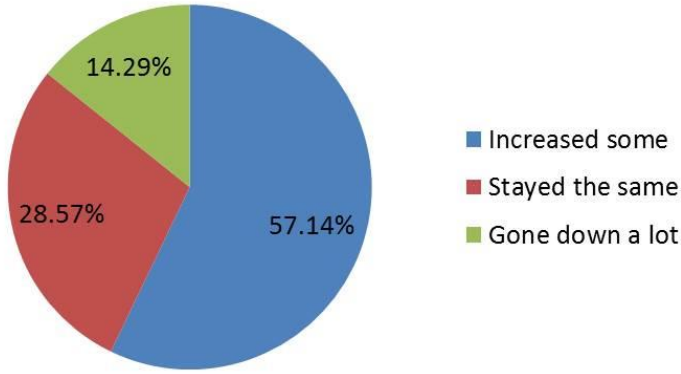
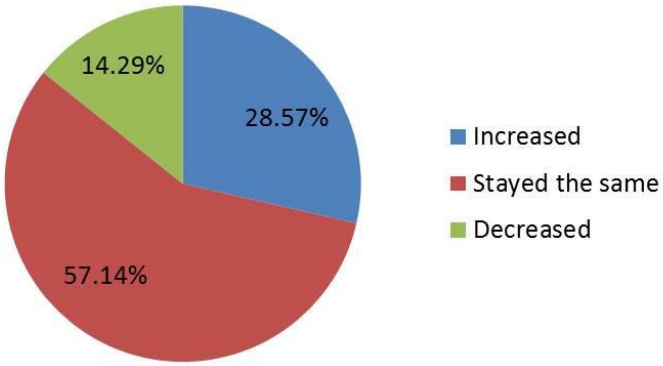


Figure 39: Demand for Hangar Space



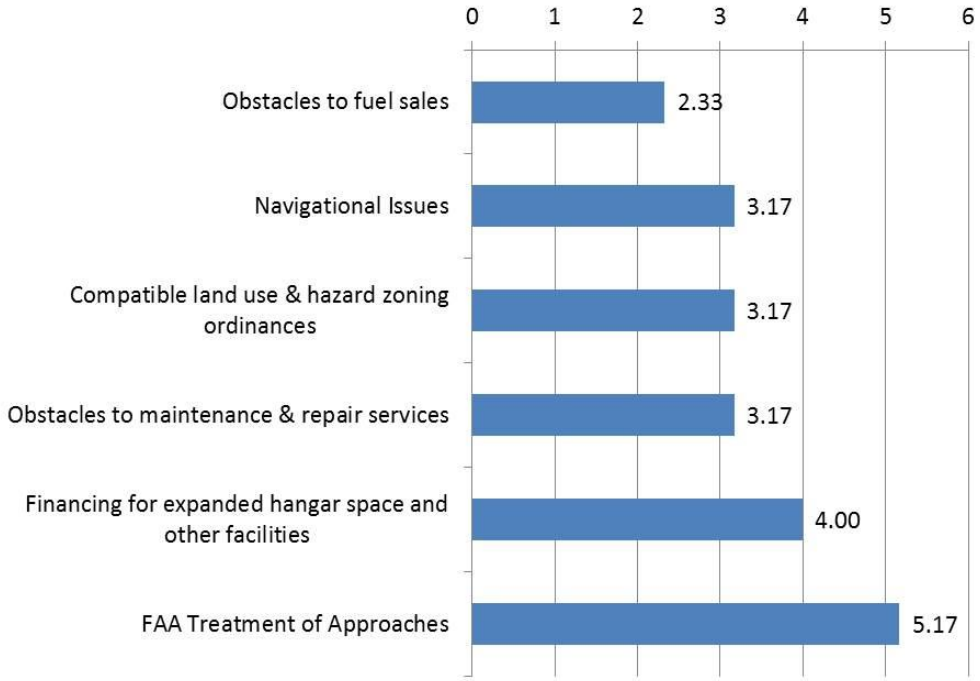
When asked about overall traffic demand, none of the responding airports reported a change in traffic due to Marcellus Shale extraction efforts. Most airports saw no change in demand (**Figure 40**).

Figure 40. Change in Demand



Almost 86% of the responding airports offer repair and maintenance services. A similar proportion of airports have received an FAA notice of Presumed Hazard or Determination of Hazard on one or more of their approaches. Finally, the airports were asked to rank what issues are most important to address in this LRTP. Six issues were ranked with values ranging from "1" as most important to address to a "6" as least important to address. **Figure 41** shows the results (note the lower the value, the more important the issue was considered to address).

Figure 41. Ranked Airport Issues to Address



(2) University General Aviation Survey

A survey of local Universities was also conducted in 2014 to obtain a better understanding of their use of SEDA-COG MPO region general aviation airports. The following figures present the results of this survey.

When asked about the types of travel that students, parents, faculty and other university visitors (guest speakers/lecturers, visiting researchers, etc.) conduct through SEDA-COG MPO general aviation airports, the responses shown in **Figure 42** and **Figure 43** were captured. In addition, 75% of responding Universities stated that their staff had been contacted in the past with requests for information on travel to / from local airports.

Figure 42. Percent of Universities Aware of Specific Types of Travel Usage

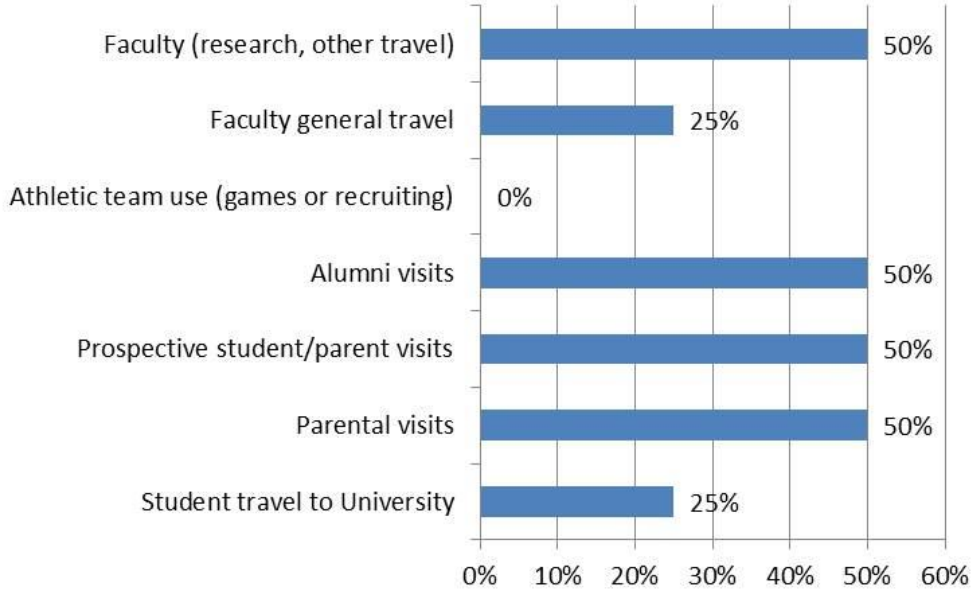
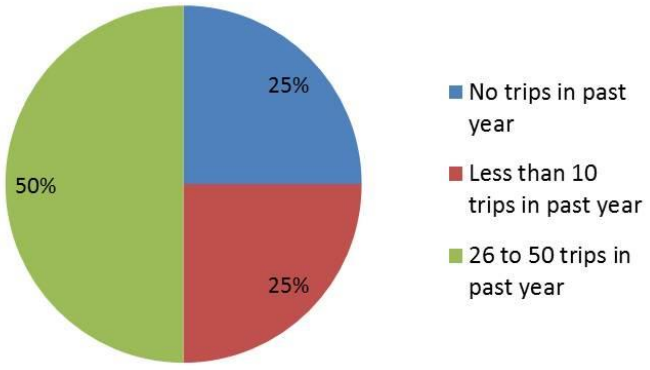


Figure 43. Percent of Universities Aware of Numbers of Trips in Past Calendar Year

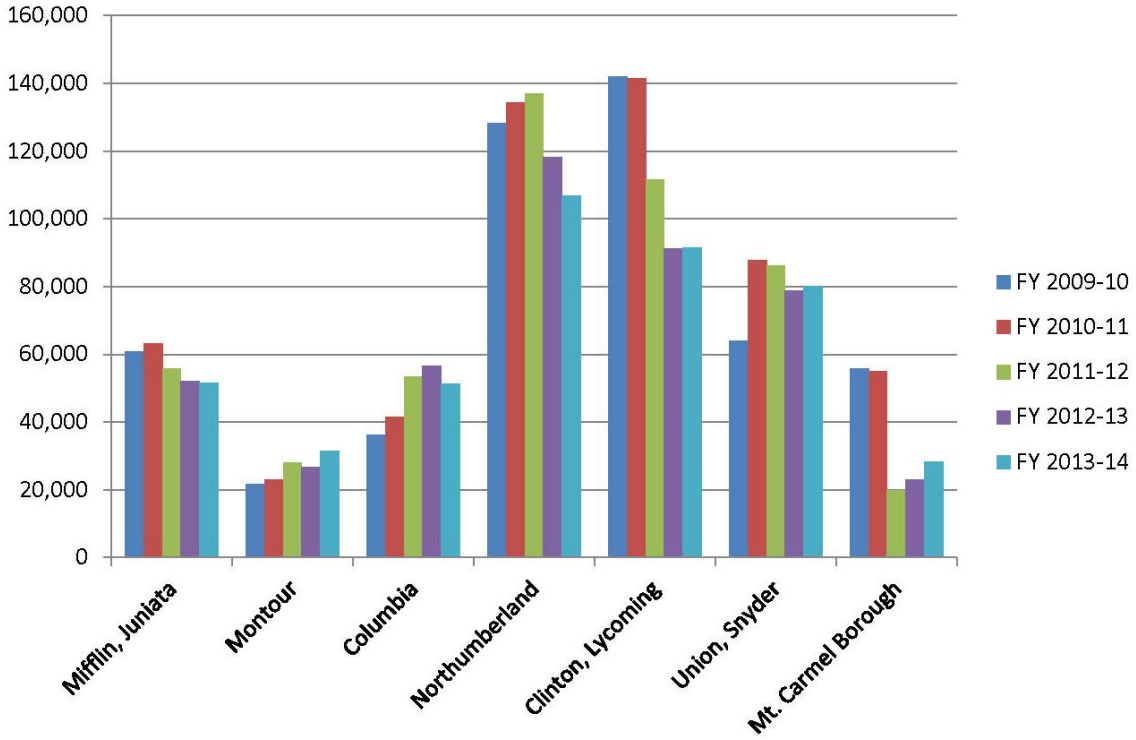


d. Transit

Consistent with trends in the United States, commuting trips on the highway network in the region are made largely in personal, motorized vehicles with public and private transit vehicles providing a small "mode-share" of the trips. Based on the Pennsylvania Public Transportation Annual Performance Report for fiscal year 2013-14, these transit providers together served 463,890 total passengers, which equates to almost 9,000 passengers per week.

Figure 44 illustrates the number of transit trips provided by each shared ride and fixed route transit provider along with 4-year trailing trends, according to data from fiscal years 2010-11, 2011-12, 2012-13 and 2013-14.

Figure 44. Transit Ridership, Fiscal Years 2009/10 to 2013/14



Source: PennDOT Bureau of Public Transportation, PA Public Transportation, Annual Performance Reports, as summarized in the SEDA-COG MPO Regional Performance Measures Report, April 2016.
* Mt. Carmel Borough (LATS) is the only Fixed Route provider in the MPO Region

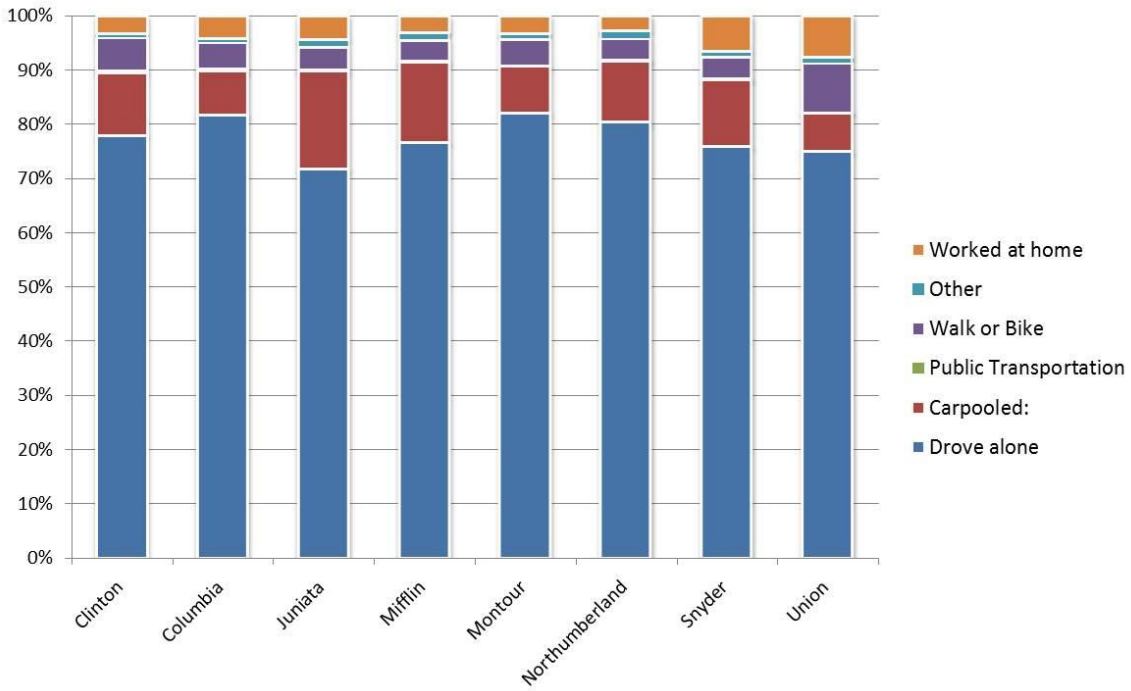
5. Travel Patterns & Trends

A recent analysis of SEDA-COG MPO commute to work trends was completed in 2014 for the Coordinated Public Transit-Human Services Transportation Plan.

Figure 45 summarizes the means of transportation to work by county and for the SEDA-COG MPO and Pennsylvania as a whole. Approximately 80% of the region's residents drove to work alone, with another 10.4% carpooling, 4.5% walking, 0.5% using public transit, and 1.4% using other modes. The remaining 3.2% work at home. These proportions are comparable to the Pennsylvania averages, with carpooling being slightly higher and public transit being noticeably lower than the statewide averages. Juniata

County (18.1%) and Mifflin County (13.4%) have higher rates of carpool usage, likely related to the proximity of larger employment centers in Harrisburg and State College.

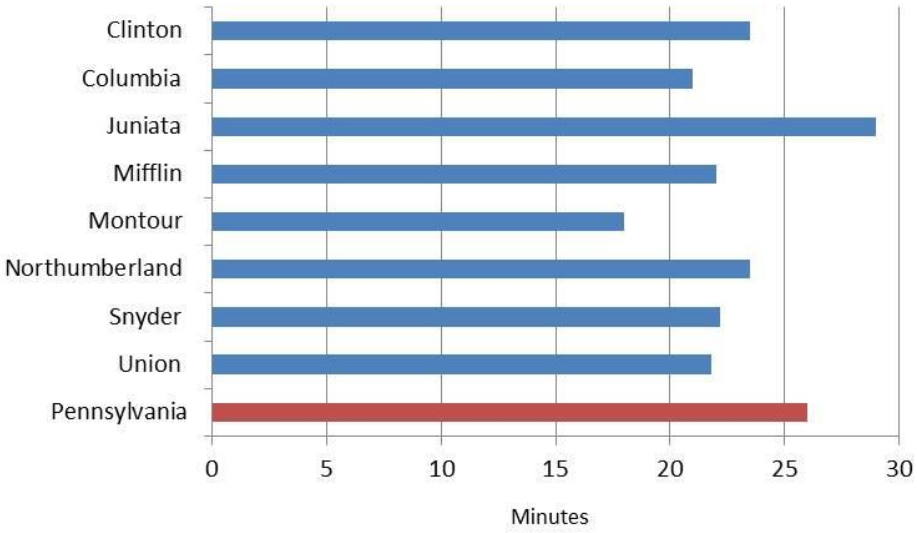
Figure 45. Means of Transportation to Work by County



Source: U.S. Census Bureau, American Community Survey, 2006-2010.

Figure 46 describes travel time to work by county. There is substantial variation in travel time to work among the MPO counties, with the average being in the 20 to 25 minute range. The longest times are from Juniata County (nearly 30 minutes) and shortest are from Montour County (less than 20 minutes).

Figure 46. Travel Time to Work by County



Source: U.S. Census Bureau, American Community Survey, 2006-2010.

Because the MPO region is characterized by dispersed patterns of population and employment, significant variations in commutation trends are noted among the MPO counties. **Table 27** describes the top three commuter destinations by county. One common thread is observed; for all eight counties, the top commute destination was the residents' home county. The home county typically accounted for 50% to 75% of commuter destinations. Columbia County has the largest number of in-county commuters, likely related to the Geisinger Medical Center. Mifflin County has the largest proportion of in-county commuters, indicating a higher level of residence-to-employment balance within the county.

Table 27. Top Three Commute Destinations by County

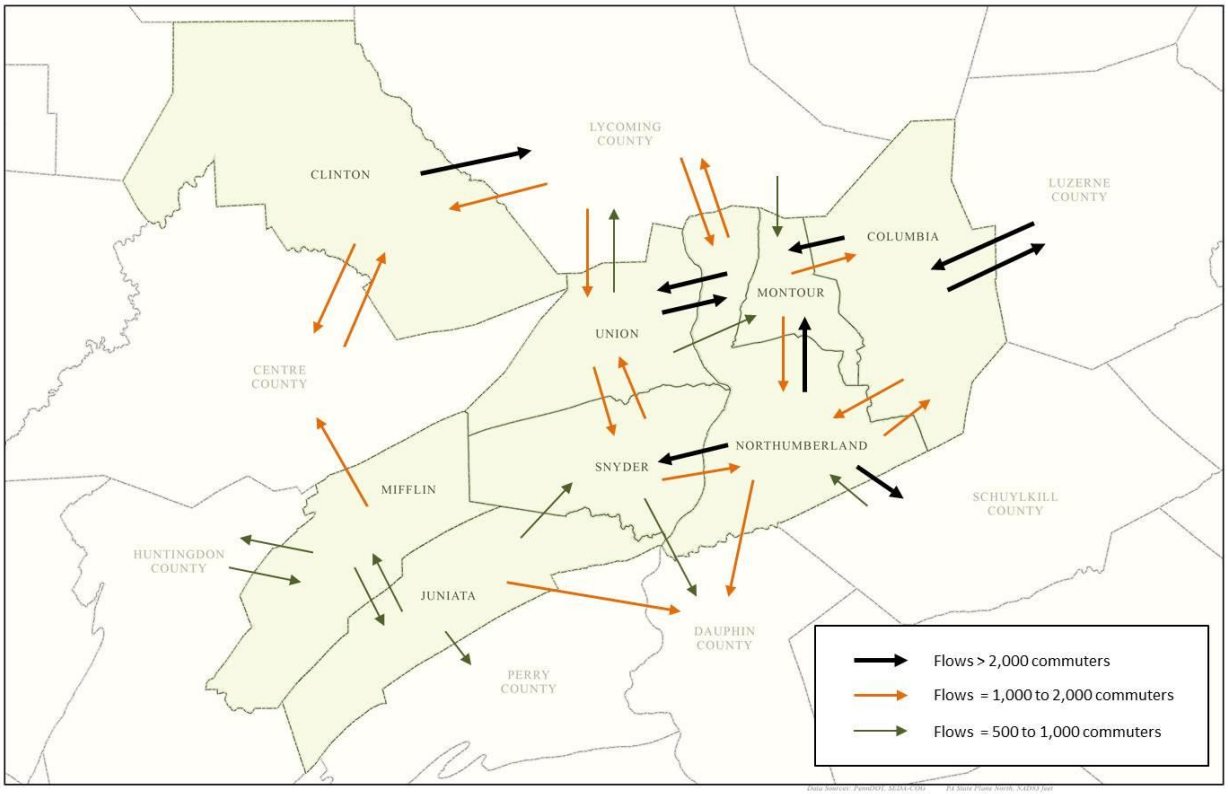
Resident County	Commute Destination County	2006-2010 ACS	
		Number of Commuters	Percent of Resident County's Total Commuters
Clinton County	Clinton County	10,348	62.2%
	Lycoming County	3,077	18.5%
	Centre County	1,723	10.4%
Columbia County	Columbia County	21,877	72.4%
	Luzerne County	2,620	8.7%
	Montour County	2,484	8.2%
Juniata County	Juniata County	5,831	52.3%
	Dauphin County	1,564	14.0%
	Cumberland County	870	7.8%
Mifflin County	Mifflin County	14,290	75.7%
	Centre County	1,469	7.8%
	Huntingdon County	998	5.3%
Montour County	Montour County	4,579	56.6%
	Northumberland County	1,098	13.6%
	Columbia County	1,098	13.6%
Northumberland County	Northumberland County	21,700	52.6%
	Union County	4,154	10.1%
	Montour County	3,815	9.2%
Snyder County	Snyder County	11,685	63.8%
	Union County	1,967	10.7%
	Northumberland County	1,678	9.2%
Union County	Union County	11,559	65.9%
	Northumberland County	2,283	1.3%
	Snyder County	1,341	7.6%

Source: U.S. Census Bureau, 2006-2010 American Community Survey, as summarized in the Coordinated Public Transit-Human Services Transportation Plan, SEDA-COG and Williamsport Area Metropolitan Planning Organizations, May 2014.

Figure 47 illustrates geographically the commuter flow data from the 2006-2010 American Community Survey using directional arrows from county to county. Flows are identified using the following ranges: 500-1,000; 1,000-2,000; and greater than 2,000. The flows reveal how counties are economically linked through the workforce, as well as how highway corridors allow commutation to neighboring economic centers. Northumberland and Montour Counties are major attractors for workers living in other counties, drawing at least 500 commuters from four surrounding counties. Sizeable commuter flows are

noted from Northumberland County into Union County, and from Clinton County into Lycoming County. Significant flows are also noted from Northumberland County into Montour County, from Columbia into Luzerne County, and from Union into Northumberland County. Significant flows out of the MPO track along the major highway corridors to Lycoming County (US 15/220), Centre County (US 322), Dauphin County (US 11/15/322), Schuylkill County (PA 54/61), and Huntingdon County (US 22).

Figure 47. Commutation Flows



Source: U.S. Census Bureau, 2006-2010 American Community Survey.