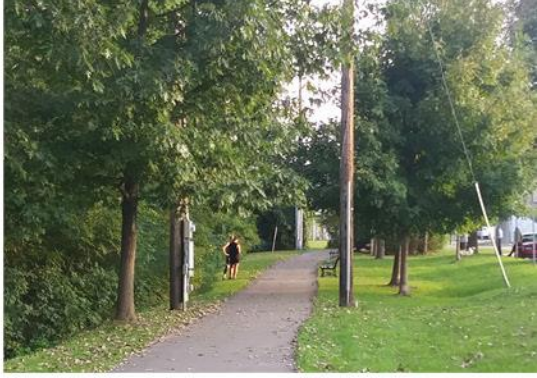

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2045 Long-Range Transportation Plan

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2020–2045

Draft April 2020

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Rural Transportation Advisory Committee

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Bob Getz, County Citizen

Susquehanna County

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Chapter 1: Plan Purpose and Preparation

Purpose

This Long-Range Transportation Plan aims to guide development and maintenance of an efficient transportation system, promoting efficient mobility that is aligned with the economic development and conservation goals of the Northern Tier Regional Planning and Development Commission's (NTRPDC's) five-county service region: Bradford, Sullivan, Susquehanna, Tioga, and Wyoming counties. NTRPDC serves as the Rural Planning Organization (RPO) for Pennsylvania's Northern Tier, and thus is responsible for regional long-range transportation planning. NTRPDC also leads the region's Rural Transportation Advisory Committee (RTAC) and works closely with partners at all levels of government for the ongoing development, maintenance, and operation of the region's multimodal transportation system. This LRTP includes an analysis of the region and projects and planning activities to maintain, improve, and, where appropriate, expand the region's transportation system.

Figure 1: Northern Tier's member counties and location

The region's transportation system includes:

- 7,478 linear highway miles
- 1,786 state and 317 local bridges,
- 3 airports,
- 138 miles of rail, and
- 2 public transportation providers.

This LRTP has been developed in accordance with Moving Ahead for Progress in the 21st Century (MAP-21), enacted in 2012 along with Fixing America's Surface Transportation (FAST Act), the current transportation legislation enacted in 2015.

While the federal planning requirements for Metropolitan Planning Organizations (MPOs) do not formally extend to RPOs, Pennsylvania's RPOs, including NTRPDC, have signed memorandums of understanding with PennDOT that hold them to the same planning requirements as MPOs. NTRPDC works with the Pennsylvania Department of Transportation's (PennDOT's) Central Office and two local PennDOT engineering districts, as well as the Federal Highway Administration (FHWA) to fulfill these requirements. NTRPDC works in collaboration with representatives from county government (elected officials and planning department staff), transit authorities, aviation, rail and trail organizations, business, and industry. The Northern Tier's Rural Transportation Advisory Committee functions as a technical planning committee,

and meets at regularly scheduled intervals. As such, the Northern Tier is prepared to respond to a federal planning requirement for the RPO, if so revised by the FHWA planning regulations.

The long-range transportation planning process is intended to consider the near- and longer-term transportation needs of the region, prioritize the most-needed projects, and align them with projections of available funding through data analysis and local input. The LRTP is updated approximately every five years to ensure that transportation investment policies and projects remain responsive and directive to the region's needs and evolve to maintain consistency with current state and federal initiatives. The prioritized list of projects (known as the transportation program) is revisited every two years to ensure it properly reflects regional priorities and available funding.

Preparation

Participants

The LRTP was developed with input from the Rural Transportation Advisory Committee; transportation stakeholders from meetings held in August 2019, October 2019, December 2019, and February 2020; and in coordination with PennDOT's Central Office; Engineering Districts 3-0 and 4-0; and FHWA. In the August meeting, a schedule and summary of the draft was given to the RTAC members. Gannett Fleming reviewed components of the draft and the changes from the last LRTP update. Gannett Fleming requested input on new or major changes for industries in the area. The performance measures were discussed with the group and suggestions for potential local performance measures were requested. Gannett Fleming created a transportation survey to identify transportation needs. In the October meeting, a completed chapter 3 and 6 changes were discussed. The updated information in the bike/ped plan was incorporated into the LRTP. Under the financial analysis, Gannett Fleming shared that the reduced funding will affect the number and types of projects in the future. The transportation results garnered over 500 replies. It was decided that a local bridge subcommittee will be formed once again. In the December meeting, Northern Tier presented the projects that were on the LRTP that have been funneled through the TIP. The meeting went in depth of the completed chapters up to that point. In the February meeting, Northern Tier added in Major Corridors to cover any projects that needed to be added in the future. Chapters 1-6 were assembled in a preliminary draft. Northern Tier and Gannett Fleming stated that chapters 7-11 were currently being edited. County outreach meetings were held with all counties during the first week of February 2020.

Current and Emerging Issues

Since the 2015–2040 LRTP, a number of state initiatives have influenced transportation planning practices in Pennsylvania:

- PennDOT has advanced its **Asset Management** program aimed at preserving pavement and bridges in a state of good repair; the program emphasizes proactive maintenance and rehabilitation to extend facility life cycles and reduce the number of poor-rated pavements and bridges.

- PennDOT introduced **Performance Measurement** to quantify asset conditions, safety, and system reliability for accountable reporting.
- PennDOT has issued and implemented **the PennDOT Connects Policy** which invites communities to collaborate in project planning to address state and local goals within the project area. The PennDOT Connects initiative has been beneficial in gathering critical information for potential transportation projects. The Northern Tier RPO is committed to continuing and expanding PennDOT Connects. Benefits have been seen with the early collaboration between the RPO, PennDOT, and local municipal officials and stakeholders. PennDOT Connects helps to identify issues early on the planning process for potential transportation projects.
- PennDOT has allocated highway and bridge funds directly to the Interstate system from the overall budget and thereby **reduced funds for Regional Transportation Improvement Programs**.

The 2045 long-range transportation plan addresses:

- **PennDOT's current planning practices;**
- **FAST Act and evolving federal requirements; and**
- **Longstanding system maintenance issues in the region.**

At the federal level, the FAST Act continued to refine transportation planning and funding policies in several ways. Specifically, it:

- consolidated funding programs;
- instituted a performance-based program focused on
    - (PM 1) safety improvement,
    - (PM 2) NHS pavements, bridges carrying the NHS, and pavements on the Interstate, and
    - (PM3) performance of the NHS, freight movement on the Interstate, and the Congestion Mitigation and Air Quality Improvement (CMAQ) Program, which PennDOT had been anticipating for several years;
- reformed the environmental review process to excelerate project delivery by adding specific new timeframes for environmental notices and reviews, exempting common mid-century bridges from some environmental review allowing at-risk and bridges and emergency reconstruction projects to be eligible for emergency exemptions or expedited procedures;
- reduced dedicated bicycle and pedestrian funding, but made them eligible for funding through the Transportation Alternatives Set-Aside Program (TA Set-Aside); and
- called for a national freight policy and provided incentives for state-level freight planning.

In the Northern Tier region, longstanding transportation issues persist and there are emerging technological changes:

- While Act 89 increased transportation funding, it has not been sufficent to address years of deferred maintenance and improvement projects, particularly poor-rated bridges.
- Activity associated with the Marcellus shale industry fluctuates but continues to impact the region with high volumes of heavy truck traffic moving across the state and local highway network. It also has increased use of the rail network to import materials for gas extraction and pipeline construction.
- Electric vehicle charging stations have been installed at hotels in Towanda and South Waverly, Bradford County.
- The availability of Uber and Lyft drivers for on-demand travel is very limited. Very occassional trips are made to large metropolitan regions, e.g., between the Tunkhannock area and the Scranton/Wilkes-Barre area.

Plan Overview

This LRTP for the 2020–2045 planning period provides:

- an overview of the most significant trends and issues affecting transportation in Pennsylvania's Northern Tier;
- a framework for transportation decisions to support community development and economic development;
- a financial plan, consistent with state and federal transportation regulations that require long-range plans to be fiscally constrained and determined by Year of Expenditure;
- an analysis of social and environmental impacts of representative projects;
- a listing of specific projects and long-term project types to be funded with projected state and federal revenue; and
- a meaningful basis for implementation through various planning activities and commitments to environmental coordination.

The projects listed in this LRTP (see Appendix A) reflect specific facility needs in the near term and categories of needs that align with projected funding through 2045. The LRTP project list serves as a source list for biennial Transportation Improvement Program (TIP) updates. NTRPDC can update the project list at any time to add new needs and project priorities identified through asset management analyses and planning studies.

Public Participation

NTRPDC conducted a public survey on transportation in Fall 2019 to measure satisfaction with transportation conditions and gather input, such as problem locations. The survey yielded 540 responses, with Question 10, regarding rail freight and trucking impacts, generating the most comments (205). The results of the survey are shown in Chapter 3 where the current condition of transportation facilities and services is discussed. The survey notice, reminder and report are provided in Appendix E.

After the draft plan was assembled, it was made available for public review at the NTRPDC office in Towanda, as well as at the planning offices in each county and on the NTRPDC website (NorthernTier.org). Additionally, copies were made available upon request. The RTAC hosted a teleconference public meeting on March 23, 2020, to hear public comments on the draft plan. No comments were received.

On March 25, 2020, the ACM meeting was held virtually with 56 people in attendence. The presentation was submitted to members for review prior to the meeting and four comments were received and addressed. NTRPDC presented their environmental analysis and received no comments in response.

Public Comments received by email:

Comment:

"My concern is that in 25 years all of the County's and municipalities bridges will need to be replaced. I think we need to review this again.

Alan M Hall"

Response:

During a phone call, it was explained to Mr. Hall the process of bridges moving from the LRTP into the TYP and the TIP. It was also explained that District 3-0 and 4-0 were working together share resources and expertise to help get more local bridges designed.

Comment:

1. Reading, Blue Mountain, and Northern Railroad (Reading & Northern) is mentioned only in passing (not listed prominently as were a couple of other smaller units). With all the talk about transporting CNG by rail (as well as the current active local presence of this carrier) and the huge potential adverse impact here, it would seem that this "issue" should be addressed.

2. Ditto (as an impact issue) for what we understand to be the request for siding(s) for a silica (or other) facility in nearby Tunkhannock Township.

Response:

Thanks for the comments. We are replying back to those that we received. In regards to the Reading, Blue Mountain and Northern. We reached out to them and all the Railroads for updates and information to update our LRTP. We didn't receive any updated information from them. That is why there isn't much information in the LRTP. The other Railroads did give some updates.

Copies of published notices are included in Appendix D.

Chapter 2: The Northern Tier Region

This chapter characterizes the Northern Tier region: its popluation, economy and workforce, land use patterns, and sensitive environmental resources. See Map 1, Major Communities, and Map 2, County Subdivisions, for geographic context.

People

Population Change

The Northern Tier region experienced steady population growth from 1980 through 2010. From 2000 to 2010, however, growth slowed to less than one percent, far behind Pennsylvania's 3.4 percent growth rate. A net 1,655 residents resulted from population increases in Susquehanna, Tioga, and Wyoming counties and losses in Bradford and Sullivan counties. See Table 1. Note: These figures do not account for the influx of temporary workers associated with Marcellus shale gas extraction.

Population projections prepared by the Pennsylvania State Data Center in 2014 indicated that the region's growth rate through 2040 would remain below 2.0 percent and population growth and loss would continue to be uneven.

Table 1: Historical Population and Projected Population Change, 1980 – 2040

	Bradford	Sullivan	Susquehanna	Tioga	Wyoming	Northern Tier	PA
Population Count, 1980	62,919	6,349	37,876	40,973	26,433	174,550	11,863,895
Population Count, 1990	60,967	6,104	40,380	41,126	28,076	176,653	11,881,643
Population Count, 2000	62,761	6,556	42,238	41,373	28,080	181,008	12,281,054
Population Count, 2010	62,622	6,428	43,356	41,981	28,276	182,663	12,702,379
Change, 1980-2010	-297	79	5,480	1,008	1,843	8,113	838,484
Percent Change, 1980-2010	-0.5%	1.3%	16.0%	2.5%	9.7%	5.2%	7.1%
Change, 2000-2010	-139	-128	1,118	608	196	1,655	421,325
Percent Change, 2000-2010	-0.2%	-2.0%	2.6%	1.5%	0.7%	0.9%	3.4%
Population Count, 2010	62,622	6,428	43,356	41,981	28,276	182,663	12,702,379
Projection, 2020	64,106	6,608	42,335	43,227	28,460	184,736	13,230,170
Projection, 2030	65,812	6,531	41,525	44,136	28,146	186,150	13,759,594
Projection, 2040	67,051	6,482	40,133	44,325	27,269	185,260	14,132,588
Change, 2010-2040	4,429	54	-3,223	2,344	-1,007	2,597	1,430,209
Percent Change, 2010-2040	7.1%	0.8%	-7.4%	5.6%	-3.6%	1.4%	11.3%

Source: U.S. Census Bureau; Pennsylvania State Data Center

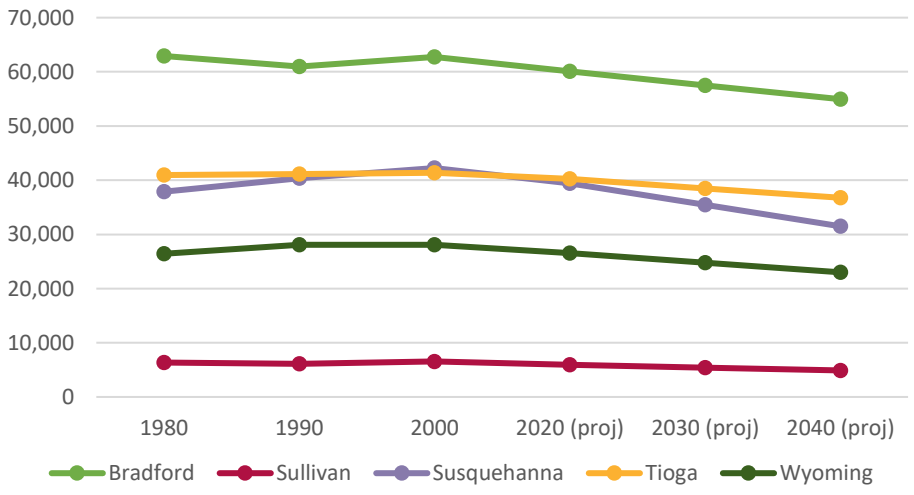
The most recent population estimates from the U.S. Census Bureau (2018 figures) indicate that population decline has occurred in all five counties since 2010. Estimated population losses range from 357 residents in Sullivan County to 2,767 residents in Susquehanna County, totaling more than 7,360 across the region. Using these estimates as a basis for revised popuation projections, the Northern Tier region could lose more than 31,000 residents (18.3 percent of its 2010 population) by 2040. See Table 2 and Figure 2.

Table 2: 2018 Population Estimates and Revised Population Projections, 2020– 2040

	Bradford	Sullivan	Susquehanna	Tioga	Wyoming	Northern Tier
Population Count, 2010	62,622	6,428	43,356	41,981	28,276	182,663
Population Count, 2018 (est.)	60,833	6,071	40,589	40,763	27,046	175,302
Change, 2010-2018	-1,789	-357	-2,767	-1,218	-1,230	-7,361
Percent Change, 2010-2018	-2.9%	-5.6%	-6.4%	-2.9%	-4.3%	-4.0%
Revised Projection, 2020	60,066	5,918	39,403	40,241	26,519	172,147
Revised Projection, 2030	57,511	5,408	35,450	38,501	24,762	161,632
Revised Projection, 2040	54,955	4,898	31,497	36,761	23,005	151,116
Change, 2020-2040	-7,667	-1,530	-11,859	-5,220	-5,271	-31,547
Percent Change, 2020-2040	-12.8%	-25.9%	-30.1%	-13.0%	-19.9%	-18.3%

Source: U.S. Census Bureau; Pennsylvania State Data Center; Gannett Fleming

Figure 2: Historical Population and Revised Population Projections, 1980–2040



Source: U.S. Census Bureau; Pennsylvania State Data Center; Gannett Fleming

Population Composition

Based on the 2018 population estimate, nearly 35,000 residents in the Northern Tier (19.9 percent) were under 18 years of age—a 7.0 percent decline in that age group since 2010. Only Tioga County increased its youth population from 2010 to 2018. Bradford experienced the largest numeric decline while Sullivan saw the largest percentage decline among youth. See Table 3.

Table 3: Youth Population Trend (<18 years), 1980–2018

	Bradford	Sullivan	Susquehanna	Tioga	Wyoming	Northern Tier
Youth Count, 1980	19,669	1,780	11,407	12,198	8,426	53,480
Youth Count, 1990	16,547	1,410	10,838	10,394	7,738	46,927
Youth Count, 2000	16,022	1,366	10,764	9,812	7,164	45,128
Youth Count, 2010	14,377	1,154	8,049	7,982	5,953	37,515
Youth Count, 2018 (est.)	13,383	644	7,509	8,153	5,220	34,908
Change, 2010-2018	-994	-510	-540	171	-733	-2,607
Percent Change, 2010-2018	-6.9%	-44.2%	-6.7%	2.1%	-12.3%	-7.0%

Source: U.S. Census Bureau

According to the 2018 population estimate, the region was home to 39,078 seniors 65 years and older (22.2 percent of the total population)—a nearly 20 percent increase in seniors since 2010. The numbers of seniors increased in all five counties. Bradford had the largest numeric increase while Wyoming had the highest rate of increase (26.6 percent). See Table 4.

Table 4: Senior Population Trend (65+ years), 1980–2018

	Bradford	Sullivan	Susquehanna	Tioga	Wyoming	Northern Tier
Senior Count, 1980	7,657	1,036	4,922	4,909	2,959	21,483
Senior Count, 1990	8,940	1,275	6,185	6,151	3,537	26,088
Senior Count, 2000	9,865	1,434	6,546	6,608	3,717	28,170
Senior Count, 2010	11,152	1,557	7,845	7,562	4,528	32,644
Senior Count, 2018 (est.)	12,957	1,718	9,620	9,049	5,734	39,078
Change, 2010-2018	1,805	161	1,775	1,487	1,206	6,434
Percent Change, 2010-2018	16.19%	10.35%	22.62%	19.67%	26.63%	19.71%

Source: U.S. Census Bureau

The combined trends of a declining youth population and an increasing senior population will significantly impact future transportation demand and services in the region. A declining youth population can stress school bus fleets that must cover the same service areas even when student populations (and thus state and federal funding) decline. An increasing elderly population can result in decreased peak period traffic associated with work commutes, increased leisure/health care-related trips during off-peak hours, and a need for public transportation or transportation services for non-drivers.

The combined trends of a declining youth population and an increasing senior population will significantly impact future transportation demand and services in the region.

Population Density

With an overall population density of 44.3 people per square mile, the Northern Tier is among Pennsylvania's least densely populated regions. The region represents less than nine percent of the state's land area and one percent of its population (2018 estimate).

Among the five counties, Sullivan has the smallest population size and density, and the fewest muncipalties. Wyoming has the second-smallest population, yet the highest density. Bradford, the largest county in population and land area, has the second-highest population density. Susquehanna and Tioga are similar across all categories of population size, density, and number of munipalities. See Table 5.

Table 5: Population Density, 2010 and 2018 (estimate)

	Size in Square Miles	Population 2010	Population 2018 (est.)	Persons per Square Mile
Bradford	1,147	62,622	60,833	53.0
Sullivan	450	6,428	6,071	13.5
Susquehanna	823	43,356	40,589	49.3
Tioga	1,134	41,981	40,763	35.9
Wyoming	397	28,276	27,046	68.1
Northern Tier	**3,955**	**182,663**	**175,302**	**44.3**
Pennsylvania	44,743	12,702,379	12,807,060	286.2

Source: U.S. Census Bureau

Diversity and Minority Populations

It is the Federal Highway Administration (FHWA's) longstanding policy to ensure nondiscrimination in federally funded activities. Furthermore, it is FHWA's continuing policy to identify and prevent discriminatory effects by actively administering its programs, policies, and activities to ensure that social impacts to communities and people are recognized early and continually throughout the transportation decision-making process, i.e., from planning through

implementation. Long-range transportation plans refer to racial and ethnic minorities, as well as those living in poverty, as "Environmental Justice" populations. The intent is to avoid unfair distribution of the benefits and burdens of transportation infrastructure and services. NTRPDC acknowledges that the benefits and burdens of transportation decisions across population groups will need to be considered from project planning through construction.

The most recent U.S. Census Bureau Amercian Community Survey (ACS) estimates (2013-2017) indicate that the Northern Tier population remains predominantly White/Caucasian with small percentages of minority race (non-White) populations (totaling 2.5 percent) and a small ethnic Hispanic/Latino population (1.5 percent). In contrast, Pennsylvania's non-white population was 16.9 percent and its Hispanic/Latino population was 6.8 percent—signficantly more diverse. See Table 6.

Table 6: Racial Composition, 2017

	Population	White	Black/ African American	American Indian/ Alaska Native	Asian	Other Race/ More than One Race	Hispanic / Latino
Bradford	61,546	59,678	362	39	365	828	881
Sullivan	6,192	5,818	158	32	28	110	110
Susquehanna	41,716	40,699	262	84	160	316	696
Tioga	41,550	40,349	238	50	224	560	517
Wyoming	27,760	26,991	188	22	101	383	497
Northern Tier	178,764	173,535	1,208	227	878	2,197	2,701
% of Total NT Population		97.1%	0.7%	0.1%	0.5%	1.2%	1.5%
Pennsylvania	12,790,505	10,378,174	1,417,611	24,995	417,525	297,320	874,833
% of Total PA Population		81.1%	11.1%	0.2%	3.3%	2.3%	6.8%

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

The 10 most racially diverse municipalities are home to nearly one-third (31.2 percent) of the region's minority population.

Table 7 shows the rankings for the 10 most racially diverse municipalities in the region. These 10 municipalities contain nearly one-third (31.2 percent) of the region's minority population. Minority populations tend to be located in the most densely populated municipalities.

Table 7: Ten Most Racially Diverse Northern Tier Municipalities, 2017

	Total Population	# and % of Total Minority Races		Predominant Minority Race
Colley Township, Sullivan	647	242	37%	163 Black/African-American
Forks Township, Sullivan	382	52	14%	52 American-Indian/Alaska-Native
Laceyville Borough, Wyoming	474	60	13%	47 Other Race/More than One Race
Columbia Township, Bradford	1,084	85	9%	83 Asian
Factoryville Borough, Wyoming	1,174	105	9%	80 Black/African-American
Elkland Borough, Tioga	1,916	152	8%	117 Black/African-American
Mansfield Borough, Tioga	3,279	214	7%	77 Other Race/More than One Race
Athens Township, Bradford	5,102	200	4%	162 Black/African-American
Sayre Borough, Bradford	5,525	181	3%	81 Other Race/More than One Race
Tunkhannock Township, Wyoming	4,292	119	3%	55 American-Indian/Alaska-Native
Total	23,875	1,410	6%	
Percentage of Northern Tier's Total Racial Minority Residing in the 10 Most Racially Diverse Communities			31.2%	

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

With respect to ethnicity, the Hispanic population does not make up a significant portion of the total population, even in the top 10 municipalities. The four most racially diverse municipalities, including Mansfield Borough, home of Mansfield University, are also in the top 10 most ethnically diverse municipalities. See Table 8.

Table 8: Ten Most Ethnically Diverse Municipalities, 2017

	Total Population	Number and Percentage of Hispanic Ethnicity	
Burlington Borough, Bradford	249	54	22%
Laceyville Borough, Wyoming	474	76	16%
Colley Township, Sullivan	647	59	9%
Braintrim Township, Wyoming	512	33	6%
Wyalusing Borough, Bradford	509	30	6%
Mansfield Borough, Tioga	3,279	157	5%
Harford Township, Susquehanna	1,399	68	5%
New Milford Township, Susquehanna	1,756	82	5%
Athens Borough, Bradford	3,263	104	3%
Tioga Borough, Tioga	781	21	3%
Total	13,869	684	5%
Percentage of Northern Tier's Total Hispanic Population Residing in the 10 Most Ethnically Diverse Communities			25%

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

Income and Poverty Rates

For transportation planning purposes, the FHWA defines "low income" as a household income at or below the U.S. Department of Health and Human Services' poverty guidelines, which are based on income and the size of the household. The poverty rate is the percentage of the population considered to be low-income.

According to the 2013-2017 ACS, the Northern Tier region had a poverty rate of 13.7 percent, which has been steady in recent years and consistent with the state's poverty rate of 13.1 percent. Poverty rates have increased since 2000 in all but Sullivan County. See Table 9.

Table 9: Low Income/Poverty Rates, 1980–2017

	1980	1990	2000	2008-2012	2013-2017
Bradford	13.6%	13.3%	11.8%	14.1%	14.1%
Sullivan	22.3%	18.0%	14.5%	13.9%	13.9%
Susquehanna	18.5%	12.1%	12.3%	12.2%	12.2%
Tioga	21.9%	14.6%	13.5%	15.7%	15.7%
Wyoming	10.7%	11.1%	10.2%	12.3%	12.3%
Northern Tier	**16.5%**	**13.1%**	**12.2%**	**13.7%**	**13.7%**
Pennsylvania	10.5%	11.1%	11.0%	13.1%	13.1%

Source: U.S. Census Bureau, 2008-2012 and 2013-2017 American Community Survey 5-Year Estimates

Benefits and Burdens Analysis

Federal Highway Administration and PennDOT have developed five Core Elements to promote consistency in Environmental Justice assessments across the state. The Core Elements consist of Indentifying and engaging EJ populations, assessing conditions and identifying needs, developing programs (TIP, LRTP), evaluating burdens and benefits of the programs, and identifying and addressing disproportionate and adverse impacts.

To ensure that the Northern Tier RPO meets the principles laid out by the Federal Highway Administration, US census tract data is gathered and an Environmental Justice mapping analysis is completed utilizing Geographic Information Systems (GIS) in order to determine where minority and low-income populations may exist. Projects are then overlaid onto a map and project specific analysis is completed to determine the "benefits and burdens" on how transportation investments are affecting the region's minority and low-income populations.

The method used to identify and locate Environmental Justice (EJ) communities with the Northern Tier RPO region consisted of identifying census block groups where minority and low-income populations exceeded the respective regional thresholds. Data was gathered regionally at the Census block group level for Minority and Low income individuals and then the total number of persons in each of the groups is divided by the region's total population. This provides the regional average for each of the EJ communities. Any census block group that meets or exceeds the regional average, or threshold, is considered to be an EJ sensitive area. All

data is from the Census Bureau's American Community Survey 2010 census data. Census data was mapped using ArcGIS software and the draft Twelve Year Program (TYP) projects were overlaid to get a better picture of potential Benefits and Burdens throughout the region.

Defining Target Environmental Justice Population "Thresholds":

Averages of regional totals for various target populations were calculated as shown below. Northern Tier concluded that using the thresholds whereby areas that fall above or below the average for the service area provides insight to both PennDOT and the RPO for areas of consideration when analyzing the Benefits and Burdens to the transportation system. Census block groups with minority populations and populations with family poverty levels greater than the regional average were considered:

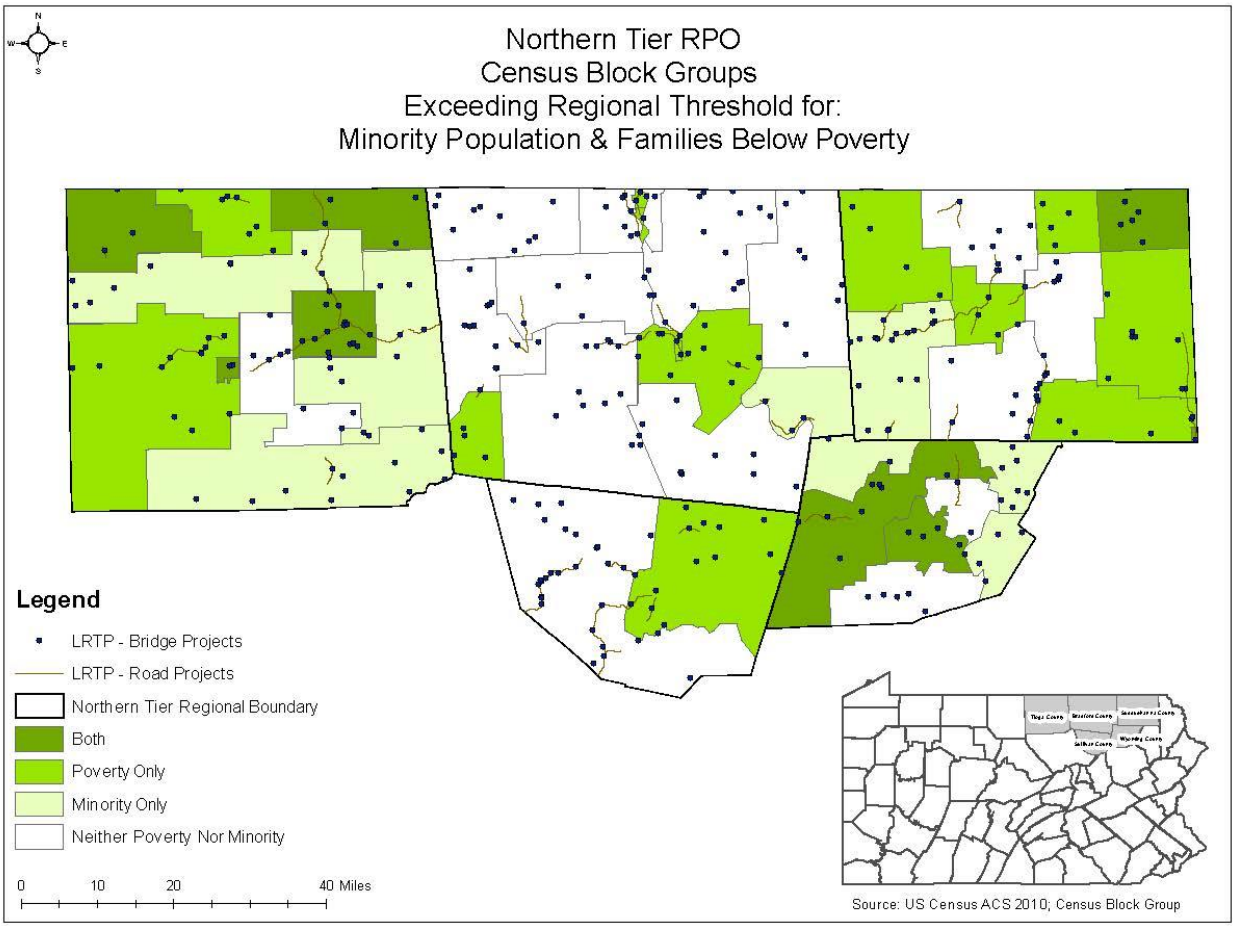
- **EJ Block Group**: a census block group with a population that has either:
  - A higher percentage of families below poverty than the regional average of 4.8% per census block group.
  - A higher percentage of minority residents than the regional average of 2.5% per census block group.

- **Non-EJ Block Group**: a census block group with a population that has both:
  - The same or lower percentage of families below poverty than the regional average of 4.8% per census block group.
  - The same or lower percentage of minority residents than the regional average of 2.5% per census block group.

The maps and analysis depict block groups that have a higher number of minority individuals and a higher number of households in poverty than the "regional threshold". These regional thresholds were determined by taking an average for each category per block group in the region.

- Low Income Regional Average: (8,750 persons/182,663 population) = 4.8%

- Minority Regional Average: (4,576 persons/182,663 population) = 2.5%



Source: NTRPDC GIS

Workforce Travel

According the most recent commutation data from the U.S. Census Bureau (2011-2015 American Community Survey), resident workers (employed people age 16 and older) totaled 78,194 while total jobs in the region were 72,501. The majority of workers have jobs within their county of residence but 5,190 workers travel to other counties within the region and 20,624 commute to counties outside the Northern Tier. In addition, 16,729 workers commute into the region for jobs.

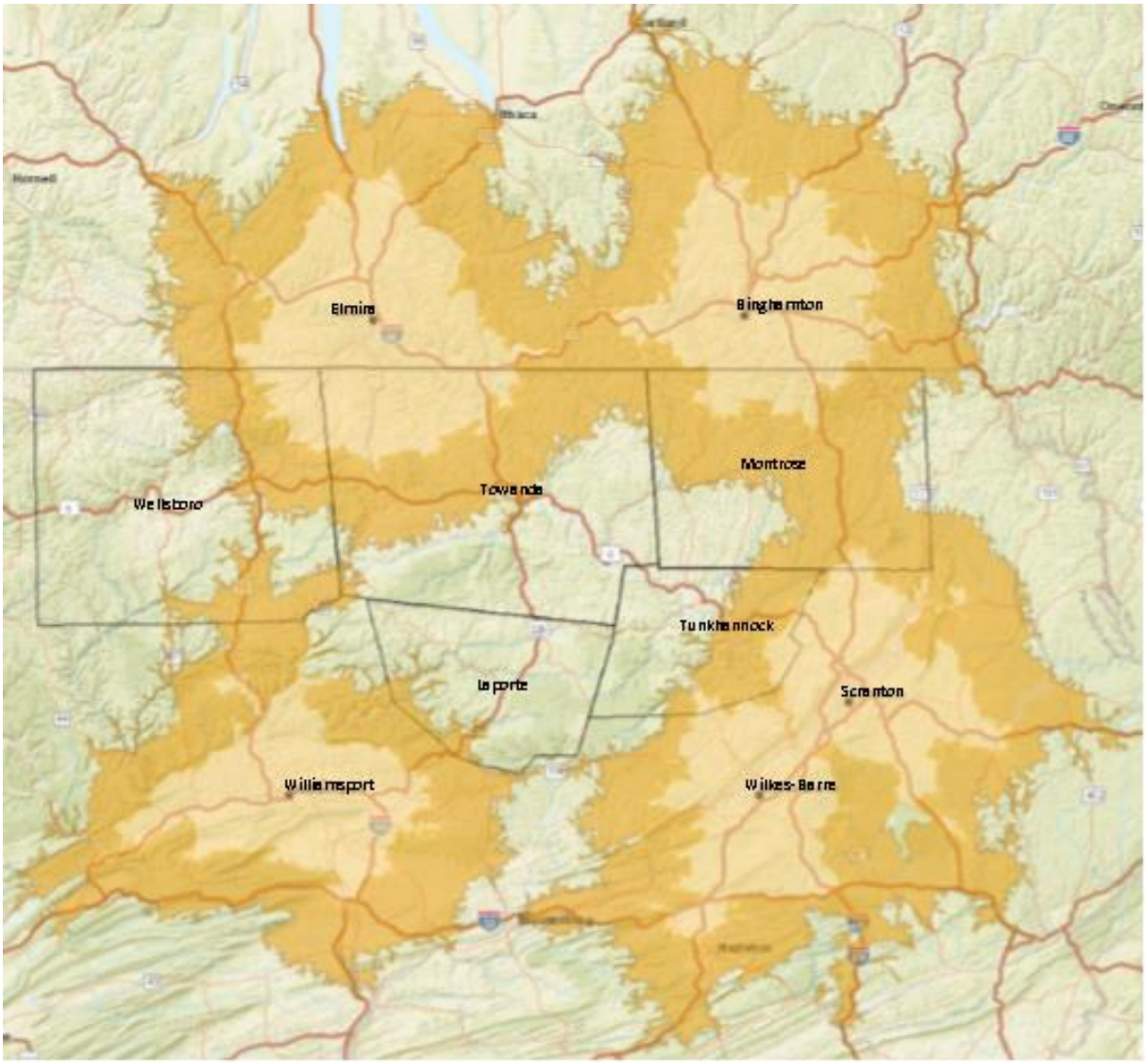
The majority of workers have jobs within their county of residence but many workers travel to jobs in other counties within the region and beyond.

Major economic centers at the edge of the Northern Tier region have a major influence on its commuting patterns. For example, Wyoming County's "laborshed" exhibits a strong relationship with neighboring Lackawanna and Luzerne counties. This is due to the presence of Procter & Gamble in Mehoopany, as well as major employers such as Keystone College near the Wyoming County border. Wyoming County serves

not only as a labor source to Lackawanna and Luzerne counties but also as an employment destination, with 18 percent of Wyoming County jobs being filled by workers from Lackawanna or Luzerne counties.

Figure 3 shows the Northern Tier's relationship with the four nearest metropolitan or economic centers: Scranton/Wilkes-Barre; Williamsport; Binghamton, NY; and Elmira, NY. The figure demonstrates that, with the exception of Sullivan County and western Tioga County, much of the region is within a 45-minute drive of an economic center. This translates to a 1.5-hour daily roundtrip commute.

Figure 3: Iso-chronal Map of Drive Times from Regional Economic Centers, 30- and 45-minute Intervals



Source: NTRPDC GIS

Commuting Patterns

Overall, each of the Northern Tier counties experiences a net labor outflow as more resident workers commute to jobs outside their home county than commute within the same county. Table 10 and Table 11 show commutation patterns for the five Northern Tier counties. Table 10 shows county of employment (job destination) by county of residence (home location) and Table 11 shows the county of residence by county of employment. Figure 4 and Figure 5 illustrate the data. These commutation figures represent significant workforce travel on state and local highways.

Susquehanna County experiences the largest outflow at 9,137 workers, of whom 1,921 commute to other Northern Tier counties and 7,216 travel to work destinations beyond the region. Sullivan County experiences the smallest outflow at 1,120 workers, of whom 535 travel to other counties in the region and 585 commute to counties beyond the Northern Tier.

Wyoming County experiences the largest inbound flow of commuters from other Northern Tier counties (2,575); Bradford County draws more inbound commuters from outside the region (5,357).

Table 10: Resident Workers and their Work Destinations

		County of Residence					
		Bradford	Sullivan	Susquehanna	Tioga	Wyoming	Northern Tier
Total Resident Workers		26,199	2,599	18,647	17,947	12,802	78,194
County of Employment	**Bradford**	79.1%	14.5%	1.4%	3.4%	3.2%	
	Sullivan	0.8%	57.0%	-	-	-	
	Susquehanna	0.5%	0.2%	51.0%	-	2.2%	
	Tioga	1.2%	0.1%	-	77.0%	-	
	Wyoming	2.8%	5.8%	8.9%	0.1%	53.5%	
	County outflows within Northern Tier						
		1,389	535	1,921	628	717	5,190
		5.3%	20.6%	10.3%	3.5%	5.6%	6.6%
County of Employment	**Broome (NY)**	1.4%	-	17.6%	-	-	
	Chemung (NY)	6.7%	-	-	4.9%	0.2%	
	Columbia	-	1.7%	-	-	-	
	Lackawanna	0.3%	-	12.4%	0.2%	22.9%	
	Luzerne	0.2%	1.6%	2.0%	-	14.7%	
	Lycoming	1.1%	13.2%	-	3.0%	-	
	Potter	-	-	-	2.2%	-	
	Steuben (NY)	0.5%	-	-	5.4%	-	
	Tioga (NY)	2.9%	0.5%	1.2%	-	-	

	Other	2.5%	5.5%	5.5%	3.8%	3.1%	
	County outflows beyond Northern Tier						
		4,087	585	7,216	3,500	5,236	20,624
		15.6%	22.5%	38.7%	19.5%	40.9%	26.4%

Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates

Table 11: Regional Workers and their County of Residence

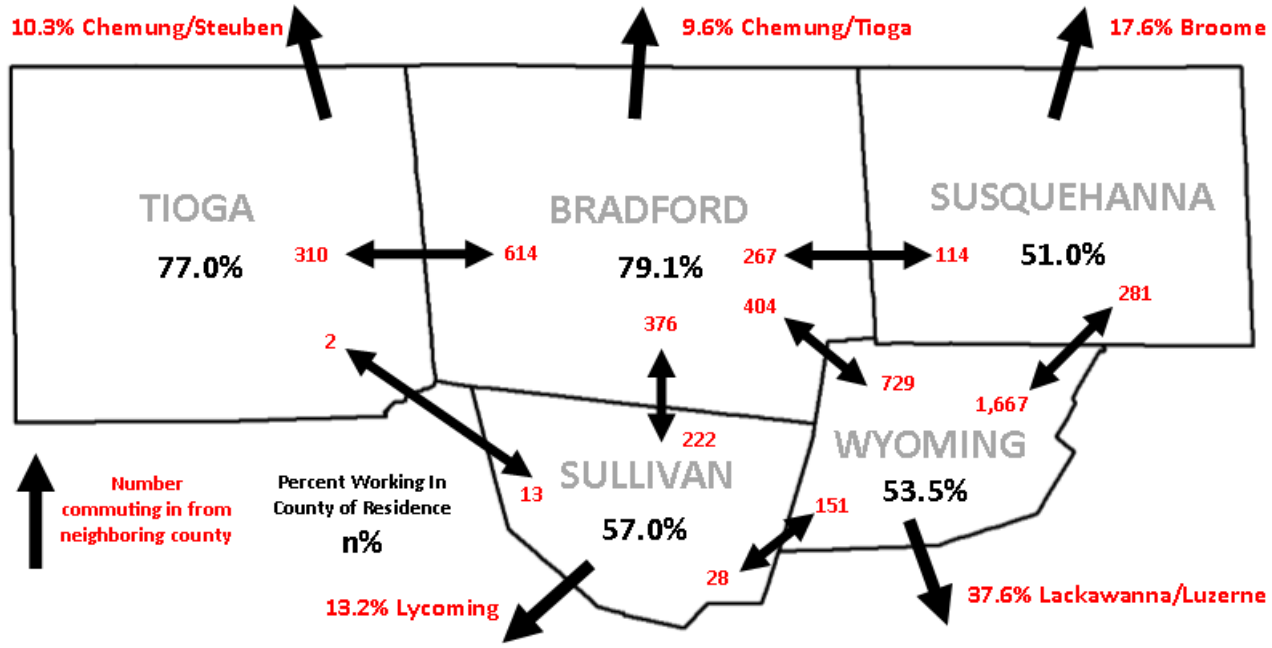
		County of Employment					
		Bradford	**Sullivan**	**Susquehanna**	**Tioga**	**Wyoming**	**Northern Tier**
	Total Workers (Filled Jobs)	27,755	2,157	12,725	17,242	12,622	72,501
County of Residence	**Bradford**	74.7%	10.3%	0.9%	1.8%	5.8%	
	Sullivan	1.4%	68.7%	-	-	1.2%	
	Susquehanna	1.0%	0.5%	74.8%	-	13.2%	
	Tioga	2.2%	0.6%	-	80.1%	0.2%	
	Wyoming	1.4%	1.3%	2.2%	-	54.3%	
	County Inflows within Northern Tier						
		1,665	274	394	310	2,575	5,219
		6.0%	12.7%	3.1%	1.8%	20.4%	7.2%
County of Residence	**Broome (NY)**	1.0%	-	4.3%	-	0.1%	
	Chemung (NY)	3.4%	0.5%	0.6%	0.9%	0.0%	
	Columbia	-	3.4%	-	-	0.2%	
	Lackawanna	0.3%	-	6.4%	10.7%	10.7%	
	Luzerne	0.6%	1.3%	0.4%	-	10.3%	
	Lycoming	0.9%	7.1%	0.1%	2.4%	0.2%	
	Potter	-	0.2%	-	3.3%	-	
	Steuben (NY)	0.8%	-	0.1%	4.0%	-	
	Tioga (NY)	8.0%	-	0.4%	-	-	
	Wayne	-	-	3.6%	-	-	
	Other	4.3%	6.1%	6.2%	7.5%	3.5%	
	County Inflows from beyond Northern Tier						
		5,357	401	2,812	4,966	3,193	16,729
		19.3%	18.6%	22.1%	28.8%	25.3%	23.1%

Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates

For workers who commute within the region, the most significant county-to-county journey-to-work numbers are commuters from Bradford and Susquehanna counties employed in Wyoming

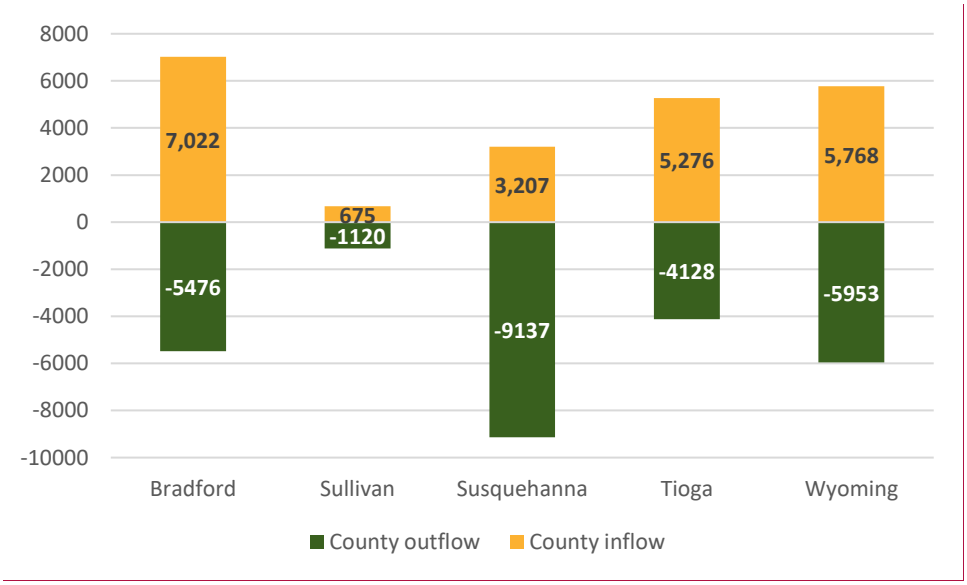
County (729 and 1,667 workers, respectively). Tioga County sends more than 600 workers into Bradford County. Cross-county commuting among the remaining counties in the region is fairly unremarkable, with no more than 400 moving from any one county to another. Again, see Figure 4 for illustration.

Figure 4: Resident Worker Commuter Flows



Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates

Figure 5: Northern Tier Worker Commuter Flows



Source: U.S. Census Bureau, 2011-2015 American Community Survey

Travel Time to Work

According to the 2013-2017 ACS, the mean travel time to work for resident workers was higher than the state average for Sullivan and Susquehanna residents and lower than the state average for residents of the remaining Northern Tier counties. The lack of public transportation and major freeways as well as longer commute distances contribute to longer travel times.

Regional commutation patterns represent significant workforce travel and travel time on state and local highways.

Mean travel time correlates to commuting patterns. Bradford and Tioga counties retain a higher percentage of resident workers and have shorter mean travel times than Sullivan, Susquehanna, and Wyoming counties, which have higher mean travel times to work. See Table 12.

Resident workers of the Northern Tier region and Pennsylvania are spending more time commuting today as compared to 1980 and 1990. This may be due to changes in the local and regional economy (what types of jobs are available and where they are located) over the past few decades.

Table 12: Mean Travel Time to Work (in minutes), 1980–2017

	1980	1990	2000	2010	2013-2017
Bradford	18.6	17.8	22.6	22.7	22.5
Sullivan	23.9	21.8	25.3	27.9	31.5
Susquehanna	22.8	22.2	26.2	26.8	28.0
Tioga	19.8	19.5	23.1	22.6	23.9
Wyoming	22.0	21.4	26.2	24.5	25.6
Northern Tier	n/a	n/a	n/a	n/a	n/a
Pennsylvania	21.9	21.6	25.2	25.5	26.7

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

Beyond mere roadway or transportation/capacity needs, this baseline data should inform decision-making related to future planning strategies. For example, should the region analyze commuter patterns by industry to identify outbound commuter skill sets and wages paid, and recruit employers accordingly? Would commuter data support carpool and vanpool serivice and save resident workers money on travel costs (fuel, vehicle maintennce, insurance, etc.)? In any event, the data prove just how critical transportation infrastructure is to the Northern Tier's economy.

Journey to Work by Travel Mode

Like most regions in Pennsylvania, most journey-to-work trips from the Northern Tier are made by private automobile. More than 90 percent of all workers reported using a private automobile

to get to work, and more than 80 percent drove alone. These figures represent continued increases in vehicle use—particularly of single occupant vehicles—since 1990. See Table 13 and Table 14.

Table 13: Journey to Work by Travel Mode (percentage of workers), 2013–2017 ACS

	# Workers	Single Occ. Vehicle	Carpool	Public Trans.	Walk	Bicycle, Taxi Cab, Other	Work at Home
Bradford	26,100	80.9%	8.8%	0.2%	4.7%	1.0%	4.4%
Sullivan	2,547	78.4%	11.1%	0.1%	2.7%	0.3%	7.4%
Susquehanna	18,157	82.9%	8.7%	0.1%	2.4%	0.5%	5.4%
Tioga	17,942	79.9%	9.3%	0.7%	4.4%	1.0%	4.8%
Wyoming	12,832	82.5%	8.7%	0.6%	1.8%	0.5%	6.0%
Northern Tier	77,578	80.9%	9.3%	0.3%	3.2%	0.7%	5.6%
Pennsylvania	5,976,599	76.4%	8.5%	5.6%	3.8%	1.4%	4.4%

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

Table 14: Mode Split Trend (percentage of workers), 1980–2017

	Single-Occupant Vehicle					Carpool				
	1980	1990	2000	2010	2013-2017	1980	1990	2000	2010	2013-2017
Bradford	58.4%	72.7%	77.5%	77.9%	80.9%	24.3%	11.8%	11.4%	11.0%	8.8%
Sullivan	49.4%	65.4%	70.7%	80.9%	78.4%	31.1%	16.1%	13.3%	9.3%	11.1%
Susquehanna	56.3%	72.5%	78.3%	80.3%	82.9%	28.0%	15.1%	12.5%	10.4%	8.7%
Tioga	56.3%	67.2%	75.0%	76.8%	79.9%	26.5%	15.9%	12.7%	10.9%	9.3%
Wyoming	61.8%	75.5%	81.3%	79.4%	82.5%	27.0%	15.3%	10.9%	11.5%	8.7%
Northern Tier	**57.7%**	**71.7%**	**77.5%**	**78.6%**	**80.9%**	**26.3%**	**14.2%**	**12.0%**	**10.8%**	**9.3%**
	Walk					Work at Home				
	1980	1990	2000	2010	2013-2017	1980	1990	2000	2010	2013-2017
Bradford	9.9%	6.3%	4.9%	4.6%	4.7%	5.7%	6.8%	5.0%	4.5%	4.4%
Sullivan	8.8%	8.0%	10.2%	4.7%	2.7%	9.4%	7.7%	4.5%	2.9%	7.4%
Susquehanna	7.9%	4.3%	3.8%	2.9%	2.4%	6.6%	6.8%	4.4%	5.5%	5.4%
Tioga	10.4%	8.8%	5.7%	5.6%	4.4%	5.6%	6.6%	5.2%	0.5%	4.8%
Wyoming	5.9%	4.5%	3.2%	3.5%	1.8%	4.2%	3.7%	3.6%	4.4%	6.0%
Northern Tier	**8.9%**	**6.2%**	**4.7%**	**4.3%**	**3.2%**	**4.5%**	**6.2%**	**4.6%**	**4.9%**	**5.6%**

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

Susquehanna County had the highest percentage of single-occupant vehicle (SOV) trips of any county (82.9 percent), with Wyoming County at a close second (82.5 percent). Tioga and Wyoming counties each experienced a 3.1 percentage point increase in SOV use. Only Sullivan County experienced a decline (2.5 percent).

Carpooling accounted for 9.3 percent of all commuting trips in the Northern Tier, with Sullivan County reporting the highest rate (11.1 percent). Carpooling was much more common in the 1980s, when more than 26 percent of workers carpooled—nearly triple today's figures. Use of carpooling as a means of journey-to-work has dropped in all counties since 2010 except Sullivan County, most notably in Wyoming County where it dropped by 2.8 percent.

The Northern Tier has a relatively high percentage of workers who work from home.

On average, walking to work is uncommon in the Northern Tier; only 3.2 percent of all workers walk to work. However, the percentage of workers who walk to work in Bradford and and Tioga counties outpaces the statewide average by at least 1.1 percentage points. Furthermore, the percentage of workers walking to work in Bradford County has increased since 2010.

The Northern Tier has a relatively high percentage of workers who work from home, at 5.6 percent. Each county's rate was higher than the state average of 4.4 percent. Sullivan County had the highest rate in the region, with 7.4 percent. Sullivan and Tioga counties had the largest growth rate among at-home workers.

Household Access to a Vehicle

Rural regions such as the Northern Tier that rely heavily on the private automobile for mobility have relatively higher rates of vehicle access, i.e., fewer households with zero vehicles and more households with multiple vehicles. Table 15.

Table 15: Percentage of Households by Number of Vehicles Available in the Household, 2000–2017

	0 Vehicles			1 Vehicle			2 Vehicles			3 or more Vehicles		
	2000	2010	2017	2000	2010	2017	2000	2010	2017	2000	2010	2017
Bradford	7.0	6.9	7.0	33.1	30.5	29.7	42.3	40.5	39.4	15.9	22.0	23.8
Sullivan	5.8	5.8	5.5	34.6	30.0	29.5	40.6	42.6	41.7	14.4	25.1	23.4
Susquehanna	6.4	4.9	5.2	31.6	29.3	30.1	42.6	42.8	40.3	15.7	23.0	24.4
Tioga	5.9	6.3	5.1	34.4	29.9	30.8	41.1	40.4	40.0	17.1	23.4	24.1
Wyoming	5.4	5.0	4.7	30.3	28.3	31.9	43.1	41.6	38.2	21.2	25.1	25.3
Northern Tier	**6.4**	**6.9**	**5.5**	**32.7**	**30.5**	**30.4**	**42.2**	**40.5**	**39.9**	**18.7**	**23.1**	**24.2**
Pennsylvania	12.8	11.4	11.1	34.9	35.7	34.1	37.0	37.0	36.4	12.8	17.8	18.4

Source: U.S. Census Bureau, 2013–2017 American Community Survey, Table DP04

Across the Northern Tier, household access to zero, one, or two vehicles has declined while access to three or more vehicles has increased. The same trend is true statewide.

Table 16 shows that households with no workers make up the largest portion of households without access to a vehicle, yet these households may have other transportation needs. As the number of workers per household increases, vehicle ownership typically becomes more feasible.

Table 16: Households Without Access to a Vehicle, 2017

	Households	0 workers		1 worker		2 workers		3+ workers		Total	
		#	%	#	%	#	%	#	%	#	%
Bradford	24,851	1,200	5	420	2	116	<1	13	<1	1,749	7
Sullivan	2,648	116	4	21	1	8	<1	0	<1	145	5
Susquehanna	17,404	688	4	146	1	40	<1	33	<1	907	5
Tioga	16,121	560	3	183	1	71	<1	9	<1	823	5
Wyoming	10,801	393	4	76	1	36	<1	0	<1	505	5
Northern Tier	**71,825**	**2,957**	**4**	**846**	**1**	**271**	**<1**	**55**	**<1**	**4,129**	**6**
Pennsylvania	5,007,442	342,574	7	161,526	3	39,820	1	9,947	<1	561,878	11

Source: U.S. Census Bureau, 2013–2017 American Community Survey, Table B08203

Since 2012, the number of in-state registered vehicles has increased by less than one percent and varied widely by county. Bradford, Suquehanna, and Wyoming counties experienced minor declines in in-state registered vehicles while Sullivan and Tioga counties in-state registered vehicles increased. See Table 17.

Table 17: In-State Registered Vehicles, 2012 and 2017

	In-State Registered Vehicles, 2012	In-State Registered Vehicles, 2017	Change 2012-2017	Percent Change, 2012-2017
Bradford	71,578	71,023	-555	-0.8%
Sullivan	8,140	8,179	39	0.5%
Susquehanna	47,470	47,342	-128	-0.3%
Tioga	49,294	52,339	3,045	6.2%
Wyoming	34,223	33,645	-578	-1.7%
Northern Tier	210,705	212,528	1,823	0.9%
Pennsylvania	11,107,777	11,142,307	34,530	0.3%

Source: Center for Rural Pennsylvania

Built Environment

Communities in the region range in character from small towns and villages—most established during the lumber and railroad era—to rural farm communities. Population growth, and the development needed to house residents and employ workers, has been steady, but across such a large region, the impact is quite small.

Historic and Archeological Resources

Historic and archeological resources are those sites, buildings, other structures, and districts that have been evaluated and deemed significant to local, state, or national history. In the Northern Tier, there are 47 sites listed on the National Register (including National Historic Districts: Athens, Towanda, Wyalusing, Eagles Mere, Montrose, Wellsboro, and Tunkhannock); 176 sites eligible for listing; and 771 known archeological sites. Additionally, there is one locally designated historic district in Wellsboro and 89 local bridges that have been evaluated as historic. There are also 230 Century Farms that have been identified in the region. The same family must own the farm for at least 100 consecutive years. The criteria requires that a family member must live on the farm on a permanent basis; and the farm must consist of at least 10 acres of the original holding, OR gross more than $1,000 annually from the sale of farm products. Finally, additional survey work captured data on another 236 sites for future evaluation of historic resources.

Development in the 21st Century

Since the early 2000s, the Marcellus shale natural gas industry has been the driver of most commercial and industrial development and even some housing in the region. Current industry-serving projects include:

Since the early 2000s, the Marcellus shale natural gas industry has been the driver of most development in the region.

- A Liquified Natural Gas (LNG) processing plant to be built by New Fortress Energy in Wyalusing, Bradford County, along Route 6. The 40-acre plant will use existing pipelines to receive natural gas and will include a logistics hub for transportation and distribution via both truck and rail. Tanker trucks with a 10,000-gallon nominal capacity will use the plant's planned 18 loading bays. An estimated four million gallons of LNG will be produced daily with capacity to hold six million gallons on site. New Fortress expects to begin operations in 2021.
- Compressed Natural Gas (CNG) station to be built by Xpress Natural Gas in Susquehanna County near Route 409.
- A 5.5-acre office/warehouse complex to be built by BKV Operating LLC, an oil and natural gas company, at the top of Mile Hill in Wyoming County.
- A transfer station for unloading fracking sand to be built by Reuther & Bowen at the intersection of Route 92 and Route 6 in Tunkhannock, Wyoming County. This same

intersection is where a different firm proposed to construct a sand plant in 2015; their plan was abandoned due to public oppositition regarding health hazards.

Other development planned or under consideration and not related to Marcellus shale activity in the region includes:

- An 80-acre mulch yard in Gibson, Susquehanna County
- Redevelopment of the Skyline Motel site in Tunkhannock, Wyoming County; specifics are unknown at this time.
- A senior center in Brookhaven
- A (waste) transfer station in Susquehanna County
- 911 Center and State Police Barracks in Susquehanna County

County and Local Land Use and Development Policy

Through comprehensive planning, counties provide guidance to municipalities on land use planning for development and conservation as well as for associated transportation and infrastructure. Each of the Northern Tier counties has a comprehensive plan and an open space plan. See Table 18.

Table 18: County Planning, Northern Tier

	Year of Most Recent Comprehensive Plan	Year of Most Recent Recreation, Greenways, and Open Space Plan
Bradford	2018	2006
Sullivan	2011	2010 regional plan
Susquehanna	2018	
Tioga	2017	
Wyoming	2019	

Source: Pennsylvania Department of Community and Economic Development (DCED)

Municipalities (not the state or counties) regulate land use in Pennsylvania. The Pennsylvania Municipalities Planning Code is the enabling legislation that empowers municipalities to enact and administer various community planning tools, such as the comprehensive plan, zoning ordinance, and subdivision and land development ordinance (SALDO), among others.

A review of the Pennsylvania Department of Community and Economic Development's (DCED's) municipal statistics summary shows that municipalities in the region are not using all of the land use management tools available to them. Within the Northern Tier, just over half (86) have a municipal comprehensive plan, though fewer (60) have a municipal planning commission to review and guide development proposals. More detailed land management ordinances, such as zoning or subdivision and land development ordinances, are less common.

Table 19 shows the number of municipalities and their land use and development tools by county.

Table 19: Municipal Land Use and Development Controls, Northern Tier

	Municipalities	Comprehensive Plan	Zoning Ordinance	Subdivision/Land Development Ordinance	Planning Commission
Bradford	51	23	15	8 municipal; 41 county	19
Sullivan	13	5	3	3 municipal; 8 county	4
Susquehanna	40	20	10	9 municipal; 26 county	11
Tioga	39	24	16	11 municipal; 23 county	16
Wyoming	23	14	10	6 municipal; 16 county	10
Total	166	86	54	37 municipal	60
% of Municipalities with Plans/Ordinances		52%	33%	22% municipal	36%

Source: DCED

This general lack of planning at a municipal level in the Northern Tier can contribute to uncoordinated development, including inadequate transportation infrastructure. For example, dirt and gravel roads in a rural community at the edge of town may be sufficent for relatively low volumes of traffic. However, one or more large residential developments and a few businesses could quickly increase traffic volumes and require more maintenance or improvement. With the development of the Natural Gas Industry in the Northern Tier region, it has caused land use development and transportation challenges. Due to the sporadic development of natural gas pads and fracking techniques, there has been an increased use of the transportation system. This has impacted the state and local roads with increased traffic volumes and added wear and tear to the roads. Heavy loads and increased truck traffic have caused physical and structural wear resulting in increased maintenance costs.

Natural Environment

Geography

All five Northern Tier counties are located squarely within the Appalachian region. The northern majority of the region lies within the Allegheny Plateau, a portion of the much larger Appalachian Uplands that run from New York State to Alabama. This portion of the plateau exhibits significant topographical relief and mountain peaks that have been softened by glacial action and erosion. The southern portion of the region lies in the more rugged Ridge and Valley province of the Appalachian region. The rugged terrain results in steep grades that can slow truck traffic and congest heavily traveled regional corridors. See Map 3, Topographic Features.

Climate

Climate is an important factor in this rural region where travel options are limited, particularly in winter. Average daily highs range from 34 degrees in January to 82 degrees in July; lows, from 16 degrees in January to 59 degrees in July. Precipitation ranges from 2 to almost 4 inches per month; average annual rainfall is 35.75 inches and average annual snowfall is 36 inches.

The global climate is changing, partly due to human activities related to greenhouse gas emissions. According to the Pennsylvania Environmental Protection Agency (EPA), the state's climate has undergone a long-term warming of more than 1° C (1.8° F) over the past 110 years. Pennsylvania's climate has also become wetter, with an average 10 percent increase in the amount of precipitation. By 2050, the state can expect to see an additional 8 percent increase in precipitation.

Flooding events due to heavy precipitation combined with steep slopes can cause secondary landslides that lay overtop roadways or cause them to collapse—both requiring temporary closure and emergency repairs. These slides require funding to be redirected from the TIP, ultimately defering paving projects. As of this LRTP update, there are 26 slides in the Northern Tier region of District 3-0 and 9 slides in the Northern Tier region of District 4-0 that are considered high priorities to the two PennDOT districts.

Precipitation combined with steep slopes can lead to landslides that require temporary roadway closure and emergency repairs.

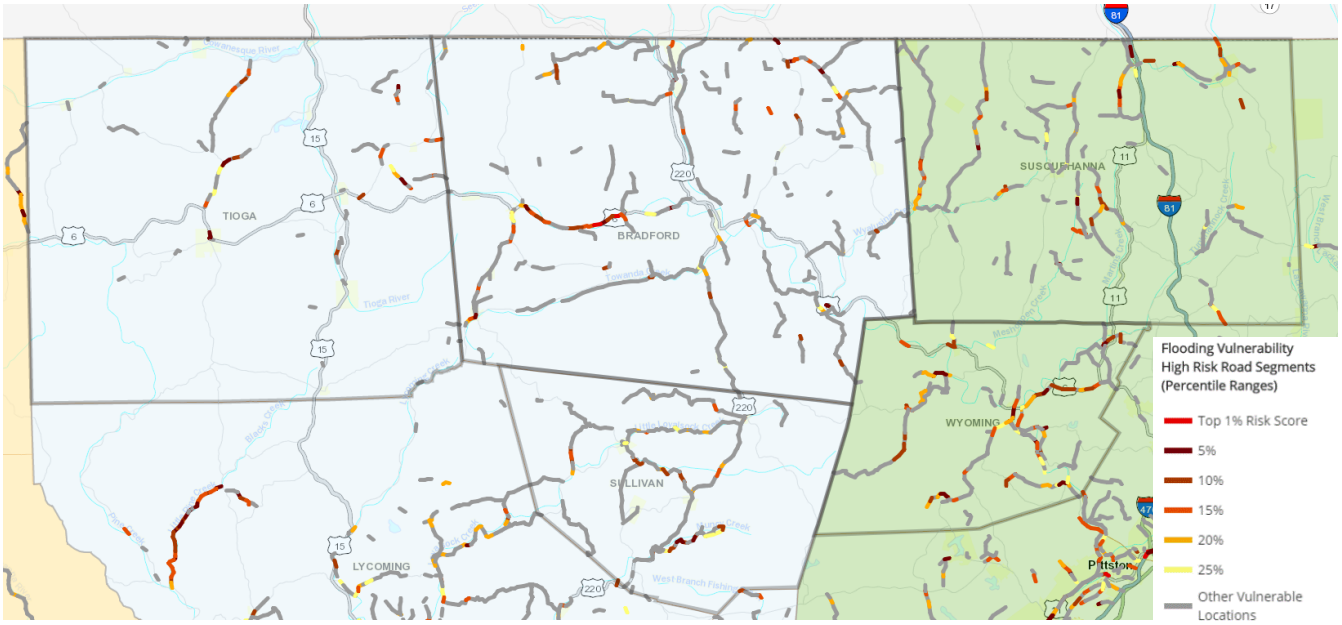
District 3-0 Slide Priorities:

County	SR/Sect.	Seg.	Off	Current Restrictions	Priority
Bradford	6-154	1080	860	Climing lane closed and shifted to passing lane (barrier)	1
Bradford	220-236	610	1972	none	6
Bradford	1014	0020	0300	road closed	
Bradford	1022	160	616	Lane closed / 1 lane with stop sign control (big feet)	
Bradford	1024	0020	0575	Shoulder Closed (big feet)	
Bradford	1033	42	0	none	
Bradford	1033	50	0	none	
Bradford	1033	100	1700	Lane closed / 1 lane with stop sign control (delineators)	
Bradford	1043	0340	1183	Lane closed / 1 lane with stop sign control (big feet)	
Bradford	2028	60	1500	Lane closed / 1 lane with stop sign control (big feet)	
Bradford	3002-014	0242	1000	road closed with access to properties	
Bradford	3011	20	141	none	
Bradford	3015	10	3224	none	
Bradford	3015	30	1050	road closed	
Bradford	4013	30		none	
Bradford	4017-028	10	1600	Lane closed / 1 lane with signal control (barrier)	Bid
Bradford	4024-023	40	2025	Lane closed / 1 lane with stop sign control (barrier)	7
Bradford	4026	0060	1750	partial lane closure (big feet)	
Bradford	4027	0160	0250	None	
Sullivan	154-63S	0160	0000	None	
Sullivan	2003-023	180	845	Lane closed / 1 lane with stop sign control (barrier)	5
Sullivan	4014-029	40	350	road closed	
Tioga	49	550		none	
Tioga	660-015	320	2190	none	10
Tioga	2027-12S	60	2825	Road Closed	9
Tioga	3014	110	545	none / Partial rock repair in place	

District 4-0 Slide Priorities:

County	SR	Sect	SEG	OFF	SEG	OFF	Field View	To PMC	To County	Description	Temporary Fix	Estimate	Completed	Permanent Fix	Estimate	Completed
Susquehanna	171		530				3/30/2017	6/26/2017	6/13/2017	Jail Hill Retaining Wall/ Slope Failure	Clean Ditch so no more water infiltrates under the road. Remove guiderail and install properly the nested sections to span 25'-0". (RC-52M)	$10,739.42		Clean Ditch so no more water infiltrates under the road. Shut down 1 lane. Bench down and install a post-and-panel wall in front of old wall.	$547,950.00	
Susquehanna	1009		40	1464	40	1730	3/30/2017	6/26/2017	6/12/2017	Melrose Slide				Clean Ditch so no more water infiltrates under the road. Access from top with Rock access road. R-6 Rock Slope, R-8 key at bottom.	$209,286.00	
Susquehanna	167		400	1461			4/24/2017	6/26/2017	6/1/2017		Clean Ditch so no more water infiltrates under the road. Reach from the Roadway Rock Slope Treatment R-5 Rock Slope, R-7 at bottom.	$25,051.02		Clean Ditch so no more water infiltrates under the road. Access Road. Rock Slope Treatment R-5 Rock Slope, R-7 key at bottom.	$67,669.22	
Susquehanna	92		370	2745				7/20/2017	7/19/2017	Rock Cut Slope	Scaling existing Rock Slopes	$40,900.00		Cut back Rock Cut Slope, presplit blasting, design given to Maintenance 2/19/15.	$300,731.80	
Susquehanna	858		40	400												
Susquehanna	106		232	3367			5/31/2018	7/29/2019	6/19/2019	Embankment Repair				R-6, R-4 Rock Slope, 150' L, 20' H	$58,324.44	
Wyom ing	87		30	775	30	900	2/16/2017	3/28/2017	6/19/2017	45' High slope repair, access by access road.	Geowraped 2A, 3 Layers outer lane and shoulder, new GR MPT temp sianal	$58,097.00	12/5/2017	Rock slope, wall or Key at bottom, 200+ foot access road	$328,336.50	
Wyoming	4015		70	350			4/30/2018		7/30/2018	GRS	Cross Sections completed and given to Rich Bohr. Rich provided Wyoming County with plan/ sections for temporary fix. Very similar to 87 above. 87 plan was modified to fit 4015.					
Wyoming	4008		60				4/5/2019									

Below is a map from PennDOT's Extreme Weather Vulnerability Study. This map provides an assessment of flooding vulnerabilities and risks statewide using information in PennDOT's Road Condition Reporting System (RCRS)



Sensitive Natural Resources

The following sections provide a brief introduction to sensitive resources in the region. Chapter 9, Environmental Screening, provides a more thorough inventory and an assessment of the potential impacts of planned transportation projects on these varied resources.

Sensitive Lands

Much of the Northern Tier's land surface is environmentally sensitive. More than half of the region is characterized by steep slopes (slopes >12 percent) while another third can be classified as fertile farmland. Table 20, as well as Map 4, Environmental Features, shows the distribution of the region's environmentally sensitive lands by county.

Table 20: Environmentally Sensitive Land (in acres), Northern Tier

Environmental Feature	Bradford	Sullivan	Susquehanna	Tioga	Wyoming	Northern Tier
Floodplains	47,761	7,221	29,990	30,710	17,692	128,158
Prime Farmland	63,884	16,249	61,934	52,489	22,800	217,356
Farmland of Statewide Importance	351,615	32,370	190,517	284,645	65,008	924,155
Steep Slopes (>12 percent)	430,917	129,202	314,601	443,310	154,975	1,473,005
Wetlands	21,338	7,817	19,774	11,571	12,849	72,502

Source: Northern Tier GIS

Sensitive Waters

The Pennsylvania Department of Environmental Protection classifies each water body for existing and designated human and other biological uses based on water quality. These uses can be explored using PA DEP's eMapPA application. The highest-ranking classifications are High Quality (HQ) and Exceptional Value (EV) cold-water fisheries.

In addition, the Pennsylvania Fish and Boat Commission classifies streams by their ability to support trout populations and varied fishing experiences. Wild Trout, Class A Wild Trout, and Wilderness Trout streams are the classifications considered sensitive by PennDOT's "Linking Planning and NEPA" protocol. These classifications, among others, are mapped on the Commission's interactive map. The number and miles of streams in the Northern Tier region can be found in Table 67: Water Quality Resources on page 116.

State Conservation Lands

More than 400,000 acres of the Northern Tier is conserved by state agencies.

A little over 8 percent of the Northern Tier's land is comprised of state forest. Much of these lands were originally owned by lumber and land holding companies. The Tioga State Forest is the largest state forest in the region, spanning 161,890 acres across Bradford and Tioga counties. The 114,552-acre Loyalsock State Forest spans Sullivan and Lycoming counties. There are no state forests in Susquehanna or Wyoming counties.

There are several State Game Lands (SGL) in the region, totaling nearly 300 square miles. These lands are managed by the Pennsylvania Game Commission for hunting, trapping, and fishing.

Each county has some SGL acreage, but Sullivan County is home to the largest acreage at 34 percent of the region's state game lands.

There are seven state parks in the region totaling more than 5,600 acres: Ricketts Glen and Worlds End in Sullivan County, Mt. Pisgah in west-central Bradford County, Salt Springs in Susquehanna County, and Colton Point, Hills Creek, and Leonard Harrison in Tioga County. There are no state parks in Wyoming County. See Table 21 for the distribution of state lands by county.

The Northern Tier region has 220 total Stafford Act Properties: 187 acquired, 25 proposed, and 8 no status available. The Stafford Act is a 1988 amended version of the Disaster Relief Act of 1974. It created the system in place today by which a presidential disaster declaration or an emergency declaration triggers financial and physical assistance through FEMA.

There are fourteen LWCF properties in the Northern Tier region. The Land and Water Conservation Fund (LWCF) Federal program supports the protection of federal public lands and waters – including national parks, forests, wildlife refuges, and recreation areas – and voluntary conservation on private land. The LWCF provides matching grants to state and tribal governments for the acquisition and development of public parks and other outdoor recreation sites.

Table 21: State Lands (in acres), Northern Tier

Environmental Feature	Bradford	Sullivan	Susquehanna	Tioga	Wyoming	Northern Tier
State Forests	25,164	43,327	0	139,674	0	208,165
State Game Lands	54,857	64,472	14,190	25,412	29,425	188,356
State Parks	1,302	2,562	405	1,360	0	5,629
Total	81,323	110,361	14,595	166,446	29,425	402,150 13.86% of NT

Source: Northern Tier GIS

Air Quality

The U.S. EPA has determined that air quality in the region is attaining established goals. In past years, Tioga and Wyoming counties were provided specific Congestion Mitigation and Air Quality (CMAQ) funds to help mitigate the effects of air pollution from motorized vehicles. With a track record of air quality attainment, funding has been discontinued though planned projects must be reviewed to ensure continued attainment.

Chapter 3: The Northern Tier's Transportation System

Chapter 3 of the LRTP provides an overview of transportation facilities and conditions within the Northern Tier region, spanning aviation, bicycle and pedestrian, highway and bridge, public transportation, and rail freight modes.

Highway and Bridge Inventory and Assessment

Highways by Jurisdiction

There are 7,470 linear miles of roadway in the Northern Tier—8 miles less than in 2013. While the region has only 1.4 percent of the state's total population, it has a much larger share of state roadway infrastructure: 7.3 percent of PennDOT's roadways and 3.1 percent of roadway miles owned and maintained by other state agencies, such as the PA Department of Conservation and Natural Resources (DCNR). Bradford County has the region's largest roadway network, at nearly 2,500 miles. Sullivan County has the smallest at 556 miles—the smallest in the region, and the fourth-smallest in the state.

Nearly 60 percent of the roadway system in the region is locally owned.

As shown in Table 22, the region's primary reduction in road mileage occurred in Sullivan County (-8.63 miles) as a result of reductions in other agency miles. Changes in road miles in other counties were nominal.

Table 22: Mileage by Jurisdiction

County	PennDOT Linear Miles	Other Agency Linear Miles	Local Municipal Linear Miles	Total Linear Miles (2017)	Total Linear Miles (2013)	Change 2013-2017
Bradford	896.01	4.70	1,590.25	2,490.96	2,490.16	0.80
Sullivan	243.83	15.48	296.94	556.25	564.88	-8.63
Susquehanna	793.12	2.01	1,057.68	1,852.81	1,852.91	-0.1
Tioga	623.03	44.95	1,140.16	1,808.14	1,808.34	-0.2
Wyoming	364.74	0.00	397.18	761.92	762.16	-0.24
Northern Tier	2,920.73	67.14	4,482.21	7,470.08	7,478.45	-8.37
Pennsylvania	39,739.45	2,144.78	78,073.36	120,527.36	119,936.02	591.34

Source: 2013 and 2017 Highway Statistics Report, PennDOT

Highways by Functional Classification

Roadways generally perform two functions, to varying degrees: providing traffic mobility (serving through travel) and providing land access (connecting to driveways of homes and businesses). Roadways can be grouped (or "ranked") in terms of the proportion of mobility vs. access they provide.

PennDOT has functionally classified its network of roadways since the mid-1960s, using the Federal Highway Administration's (FHWA's) classifications. The definitions group streets and highways into a hierarchy based on their primary function, as follows:

- **Interstate Highway System** – The Interstate System consists of all presently designated freeway routes meeting the Interstate geometric and construction standards for future traffic. The Interstate system is the highest classification of arterial roads and streets and provide the highest level of mobility, at the highest speed, for long uninterrupted distances. Interstate 81 through Susquehanna County is currently the only designated Interstate in the Northern Tier region.
- **Other Arterials** – These consist of limited-access freeways, multi-lane highways, and other important highways supplementing the Interstate system that connect, as directly as practicable, the nation's principal urbanized areas, cities, and industrial centers; serve the national defense; and connect at suitable border points with routes of continental importance. US 6, US 15, and US 220 are arterials in the Northern Tier region.
- **Collectors** – Collectors provide both land access service and traffic circulation within residential neighborhoods, commercial and industrial areas, and downtown city centers. Collectors connect local roads and streets with arterials and provide less mobility than arterials, at lower speeds and for shorter distances. The Berwick Turnpike SR 4013 and PA 467 in Bradford County; PA 42, PA 154, and PA 487 in Sullivan County; US 11 in Susquehanna County; PA 249, PA 349, and PA 660 in Tioga County; and PA 92 and PA 307 in Wyoming County are examples of collectors.
- **Local Roads** – Local roads and streets provide a high level of access to abutting land but limited mobility for through traffic.

Mileage by roadway classification is provided in Table 23. The distribution of miles across the functional classification system has been steady over the past five years. There has been a slight decrease in local non-Federal Aid linear miles in Sullivan County of approximately 2 percent since 2013. No significant increases were seen across the Northern Tier region.

Table 23: Mileage by Functional Classification of Highways

	Federal-Aid Linear Miles					Non-Federal-Aid Linear Miles		Total Linear Miles
	Inter-State	Other Frwy/ Expwy	Other Principal Arterials	Minor Arterials	Major Collectors	Minor Collectors	Local	
Bradford	0.0	4.8	60.2	122.0	166.5	215.9	1,921.7	2,491.0
Sullivan	0.0	0.0	0.0	58.3	65.9	38.0	394.1	556.3
Susquehanna	27.2	0.0	0.0	99.4	181.4	181.2	1,363.6	1,852.8
Tioga	0.0	35.1	43.9	96.0	144.4	162.0	1,326.8	1,808.2
Wyoming	0.0	0.0	30.0	55.5	52.0	66.3	558.1	761.9
Northern Tier	27.2	39.9	134.1	431.2	610.2	663.4	5,564.3	7,470.2
Pennsylvania	1,867.6	908.8	4,391.0	8,531.2	13,042.5	6,960.5	84,825.8	120,527.4

Source: 2017 Highway Statistics Report, PennDOT

Highway Travel by Jurisdiction

Total daily vehicle-miles traveled (DVMT) increased 3 percent in Pennsylvania as a whole between 2013 and 2017. However, DVMT decreased nearly 6 percent across the Northern Tier during the same time period: -23 percent in Sullivan County, -10 percent in Bradford County, -10 percent in Tioga County, and -3 percent in Wyoming County. Susquehanna County is the only county to have experienced an increase (5 percent) in DVMT from 2013 to 2017. See Table 24.

Table 24: Total DVMT, 2013-2017

	Total DVMT 2013	Total DVMT 2017	Change 2013-2017
Bradford	1,728,278	1,562,287	-9.60%
Sullivan	263,463	204,088	-22.54%
Susquehanna	1,419,239	1,492,651	5.17%
Tioga	1,567,675	1,404,556	-10.41%
Wyoming	770,762	747,393	-3.03%
Northern Tier	5,749,417	5,410,975	-5.89%
Pennsylvania	270,213,634	278,414,227	3.03%

Source: 2013 and 2017 Highway Statistics Report, PennDOT

Travel volume decreases on PennDOT-owned roads occurred at double-digit rates in Bradford, Sullivan, and Tioga counties. Travel on roadways owned by other state or federal agencies increased dramatically in Bradford (179 percent) and nominally in Tioga (4 percent) according to PennDOT statistics. It declined by 54 percent in Sullivan, perhaps related to the change in agency road miles. Travel on municipal roads increased by 30 percent in Susquehanna and 15 percent in

Wyoming and declined in the other counties, most significantly in Sullivan (-13 percent). See Table 25 and Table 26.

Table 25: DVMT on PennDOT-Owned Roadways, 2013-2017

	PennDOT DVMT 2013	PennDOT DVMT 2017	Change 2013-2017
Bradford	1,366,196	1,196,466	-12.42%
Sullivan	185,222	159,284	-14.00%
Susquehanna	1,332,943	1,375,338	3.18%
Tioga	1,299,938	1,148,977	-11.61%
Wyoming	705,643	672,507	-4.70%
Northern Tier	4,889,942	4,552,572	-6.90%
Pennsylvania	202,391,130	211,309,804	-4.41%

Source: 2013 and 2017 Highway Statistics Report, PennDOT

Table 26: DVMT on Roadways Owned by Other Agencies and Local Municipalities, 2013-2017

	Other Agencies DVMT* 2013	Other Agencies DVMT* 2017	Change 2013-2017	Local Municipal DVMT 2013	Local Municipal DVMT 2017	Change 2013-2017
Bradford	4,479	12,479	179.61%	357,603	353,343	-1.19%
Sullivan	56,423	25,800	-54.27%	21,818	19,004	-12.90%
Susquehanna	0	5,337	-	86,296	111,976	29.76%
Tioga	99,153	102,991	3.87%	168,584	152,589	-9.49%
Wyoming	0	0	-	65,119	74,886	15.00%
Northern Tier	160,055	146,607	-8.40%	699,420	711,798	1.77%
Pennsylvania	4,018,939	4,151,851	3.31%	47,446,221	44,723,430	5.74%

*Includes state and federal agency miles

Source: 2013 and 2017 Highway Statistics Report, PennDOT

Highway Travel by Functional Classification

Among the various highway functional classifications, minor arterials accounted for the greatest portion of DVMT at 24 percent, followed by local service roads at 21.3 percent. Interstates and other freeways/expressways, namely I-81 and US 15, came in third with a combined 19.8 percent of DVMT. See Table 27.

Table 27: Travel by Functional Classification of Highways, 2017

	Federal-Aid DVMT					Non-Federal-Aid DVMT	
	Inter-State	Other Freeway/ Expwy	Other Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local
Bradford	0	58,820	345,424	423,182	207,645	94,094	433,123
Sullivan	0	0	0	101,249	37,781	8,671	56,387
Susquehanna	671,182	0	0	255,324	250,917	114,321	200,907
Tioga	0	352,373	194,465	304,623	191,334	70,377	291,384
Wyoming	0	0	236,612	228,852	102,974	51,908	127,047
Northern Tier	671,182	411,193	776,501	1,313,230	790,651	339,371	1,165,235
as % of NT Total	12.28%	7.52%	14.20%	24.02%	14.46%	6.21%	21.31%
Pennsylvania	72,425,755	26,261,488	55,695,093	50,650,001	32,464,041	5,023,896	35,893,953

Source: 2017 Highway Statistics Report, PennDOT

Statewide, travel demand increased on higher-order roads and declined on low-order roads. Across the Northern Tier, travel demand increased only on the far ends of the spectrum—on Interstates and local roads. Anomalies at the county level include a 13 percent increase in travel on US 220 in "the Valley," Bradford County; a 40 percent decline on local roads in Sullivan County; a 5 percent increase on minor collectors and 19 percent increase on local roads in Susquehanna County; a 7 precent decrease in travel on local roads in Tioga County; and small increases on minor arterials, major collectors, and minor collectors in Wyoming County. See Table 28.

Across the Northern Tier, travel increased only on the far ends of the system spectrum—on Interstates and local roads.

Table 28: Five-Year Trend in Travel by Functional Classification of Highways, 2013-2017

	Federal-Aid DVMT					Non-Federal-Aid DVMT		Total DVMT
	Inter-State	Other Frwy/ Expwy	Other Princ Arter	Minor Arter	Major Coll	Minor Coll	Local	
Bradford		12.6%	-22.3%	-6.3%	-13.2%	-10.8%	-0.5%	-9.6%
Sullivan				-11.4%	-15.2%	-13.3%	-40.4%	-22.5%
Susquehanna	8.8%			-4.3%	-2.6%	4.5%	19.1%	5.2%
Tioga		-11.4%	-11.9%	-11.4%	-10.1%	-9.9%	-7.4%	-10.4%
Wyoming			-15.6%	5.3%	2.5%	0.4%	-0.7%	-3.9%
Northern Tier	8.8%	-8.6%	-17.9%	-5.8%	-7.5%	-4.3%	2.8%	-4.9%
Pennsylvania	13%	14.2%	1.9%	-1.8%	-0.2%	-9.7%	-8.2%	1.2%

Source: 2013 and 2017 Highway Statistics Reports, PennDOT; calculations by Gannett Fleming

Highways by Maintenance Functional Classification

Highway mileage by functional classifcation correlates closely with mileage by maintenance functional classification. Class A and Class B mileage account for Interstate and other freeway/expressway routes, respectively. Class C mileage is principal and minor arterials. Class D mileage refers to major and minor collectors. Class E reflects any remaining PennDOT mileage. See Table 29. The Northern Tier RPO in conjunction with PennDOT District 3-0 and 4-0, will be evaluating the functional classification of the state highways in the region.

Table 29: Highway Mileage by Maintenance Functional Classification

	Linear Miles by Maintenance Functional Classification						Ramps
	A	B	C	D	E	Total	
Bradford	0.00	4.80	179.39	366.00	345.82	896.01	3.24
Sullivan	0.00	0.00	58.28	103.90	81.66	243.83	0.00
Susquehanna	27.24	0.00	99.43	362.58	303.88	793.12	3.74
Tioga	0.00	35.12	139.90	303.00	145.02	623.03	8.85
Wyoming	0.00	0.00	85.48	118.30	160.96	364.74	0.82
Northern Tier	27.24	39.92	562.48	1,253.78	1037.34	2,920.73	16.65
Pennsylvania	1,373.98	836.51	11,888.92	17,314.21	8,325.83	39,739.45	823.01

Source: 2017 Highway Statistics Report, PennDOT

Federal-Aid System

The Federal-Aid Highway System is the network of highways eligible for financial assistance for construction, maintenance, and operations through the Federal-Aid Highway Program. The system includes the Interstate Highway System as well as primary highways and principal secondary and feeder routes, including farm-to-market roads, rural mail and public school bus routes, local rural roads, county and township roads, as well as roads of the county road class and their urban extensions. The highways are selected by PennDOT and local officials and subject to approval by FHWA.

The Federal-Aid System in the Northern Tier region encompasses 1,233.5 state-owned miles and 9.1 locally-owned miles. See Table 30. This reflects an increase of 3.4 miles (2.2 state-owned miles and 1.3 locally-owned miles) since 2013.

Table 30: Federal-Aid Highway System

	Federal-Aid Linear Miles		
	State-Owned	Local-Owned	Total
Bradford	344.3	9.1	353.4
Sullivan	124.2	0.0	124.2
Susquehanna	308.1	0.0	308.1
Tioga	319.4	0.0	319.4
Wyoming	137.5	0.0	137.5
Northern Tier	1,233.5	9.1	1,242.6
Pennsylvania	24,651.6	3,521.9	28,173.5
Turnpike			554.4
Toll Bridges			13.6
Grand Total			28,741.5

Source: 2017 Highway Statistics Report, PennDOT

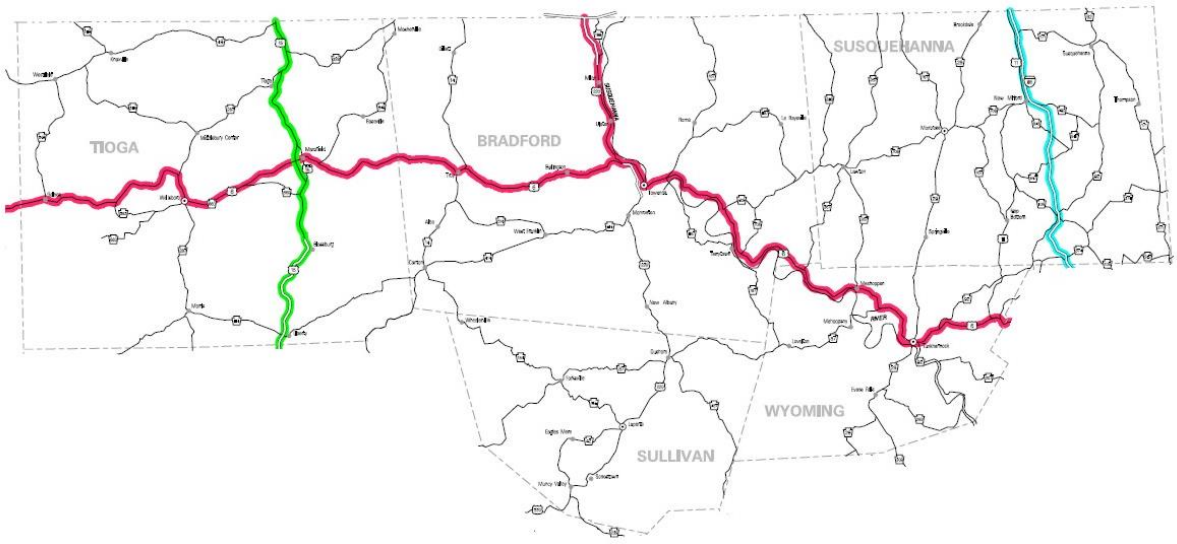
The National Highway System

The National Highway System (NHS) is a network of strategic highways approved by Congress in the National Highway Designation Act of 1995. The NHS includes the Interstate Highway System, the Strategic Highway Network, and highways serving major airports, ports, rail or truck terminals, railway stations, pipeline terminals, and other strategic transport facilities.

The NHS receives dedicated funding that cannot be used on non-NHS highways. These funds are provided through the National Highway Performance Program (NHPP) established in MAP-21 federal legislation and continued in the current FAST Act federal legislation, which was signed into law in 2015.

Segments of the NHS in the Northern Tier include US 6, US 15, I-81, and US 220 north of Towanda, totaling 201.6 miles. There are no NHS highways in Sullivan County. See Figure 6.

Figure 6: NHS Routes in the Northern Tier Region



Source: PennDOT

Over the past five years, there has been no change in NHS mileage in the region and a net 8 percent decline in travel on these segments. Travel on I-81 in Susquehanna County increased, while it decreased on US 6 and US 15 in other counties. Statewide, travel on the NHS increased more than 8 percent from 2013 to 2017. See

Table 31.

Over the past five years, there has been no change in NHS mileage in the region and a net 8 percent decline in travel on these segments.

Table 31: Mileage and Travel on National Highway System Roadways

County	Linear Miles (2017) State	Local	Total	DVMT (2013)	DVMT (2017)	Change 2013-2017
Bradford	65.3	-	65.3	499,575	406,315	-19%
Sullivan	-	-	-	-	-	
Susquehanna	27.2	-	27.2	616,821	671,182	9%
Tioga	79.1	-	79.1	618,418	546,838	-12%
Wyoming	30.0	-	30.0	280,411	236,612	-16%
Northern Tier	201.6	-	201.6	2,015,225	1,860,947	-8%
as % of NT Total	6.9%			35.05%	34.04%	
Pennsylvania	6,380.2	217.0	7,164.9	142,057,916	153,914,485	8%

Source: 2013 and 2017 Highway Statistics Reports, PennDOT

Posted and Bonded Roads

Many of Pennsylvania's older secondary and rural roadways were not designed to support the heavy truck loads they presently carry. As a result, many of these roadways suffer damage, requiring PennDOT to perform maintenance and repair activity more frequently than is normally necessary (known as "excess maintenance"). PennDOT's posting and bonding policies address this problem by limiting loads on vulnerable roadways (posting) and requiring haulers to be financially responsible for excess maintenance on the roadways they use (bonding). In this way, PennDOT can maintain its rural roadways for use by both passenger vehicles and trucks.

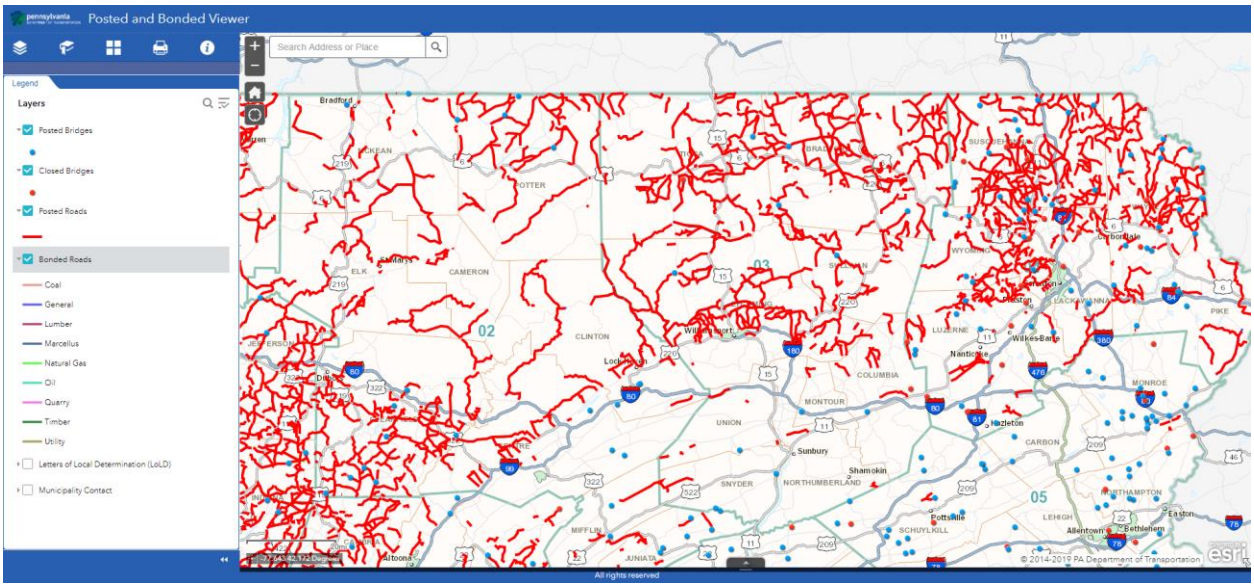
Posting places a weight restriction on a state or locally owned roadway and records the restriction under Title 75. Primary highways are generally not posted, as they are designed and constructed for heavy use. Secondary routes that are not designed or built to carry overweight vehicles may require weight-limit postings.

Bonding is a formal agreement between the road owner and the hauler by which the hauler agrees to be responsible for any damages arising from its hauling. Bonding can be provided by a performance bond issued by an insurance company or by an irrevocable letter of credit. Other forms of security can be reviewed on a case-by-case basis at the posting authority's discretion.

PennDOT's online Posted/Bonded Viewer enables the public, including haulers, to view the status of posted and bonded roads (and posted and closed bridges) across the state. A screenshot of the viewer is shown in Figure 7. This snapshot depicts the extensive roads in Bradford and Susquehanna counties that have been posted or bonded, largely due to the heavy traffic associated with the Marcellus shale industry.

The majority of the region's bonded roads are in Susquehanna County.

Figure 7: Screenshot of PennDOT's Posted and Bonded Viewer



Source: PennDOT

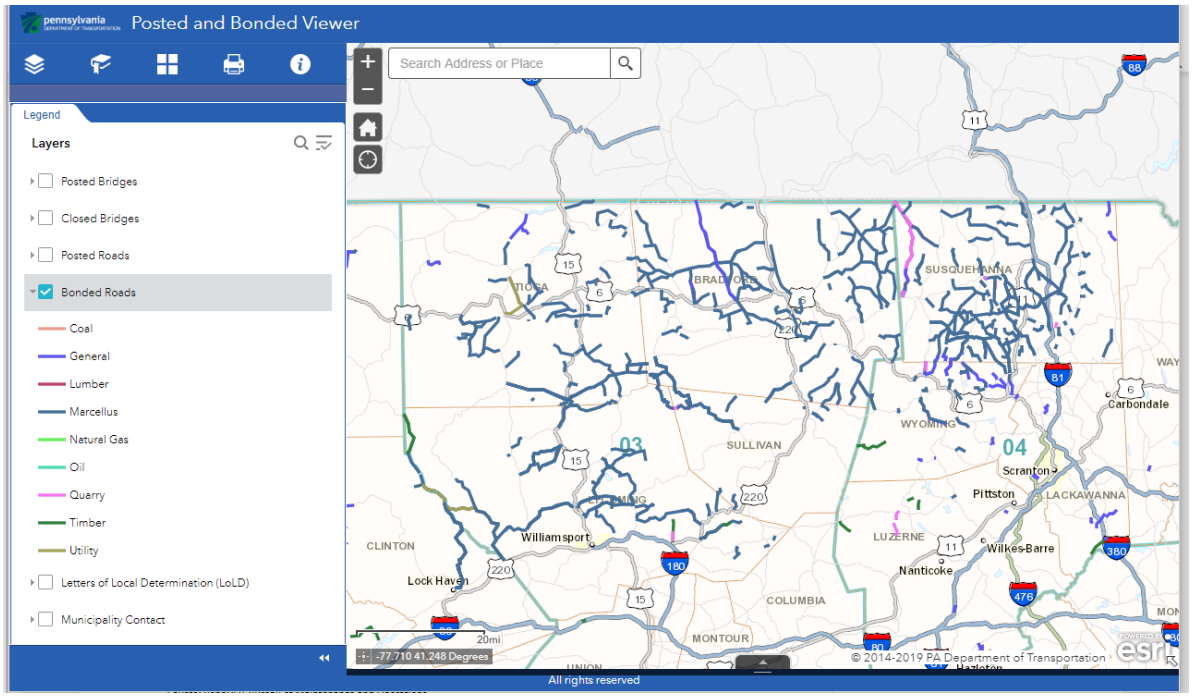
As of 2019, there were 590 bonded roads in the Northern Tier region—the vast majority of which are bonded by the Marcellus shale industry, as shown in Figure 8. Regarding the distribution of bonded roads, the majority of bonded roads are in Susquehanna County (250), followed Bradford County (127) and Tioga County (95). See Table 32.

Table 32: Bonded Roads, Northern Tier

	Number of Bonded Roads, 2013	Number of Bonded Roads, 2019
Bradford	153	127
Sullivan	40	34
Susquehanna	232	250
Tioga	111	95
Wyoming	60	84
Northern Tier	596	590

Source: PennDOT Bureau of Maintenance and Operations

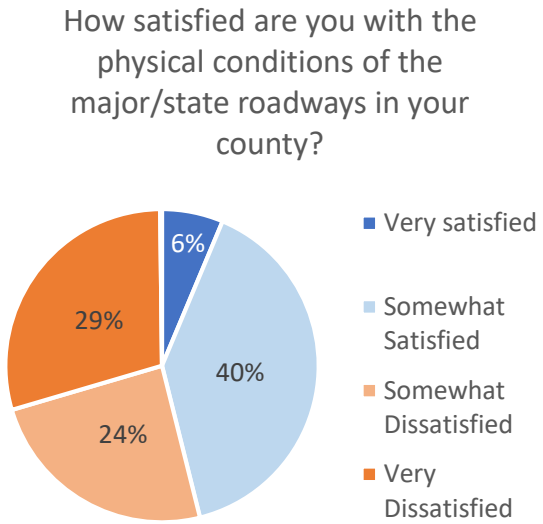
Figure 8: Bonded Roads by Industry (Screenshot)



Source: PennDOT

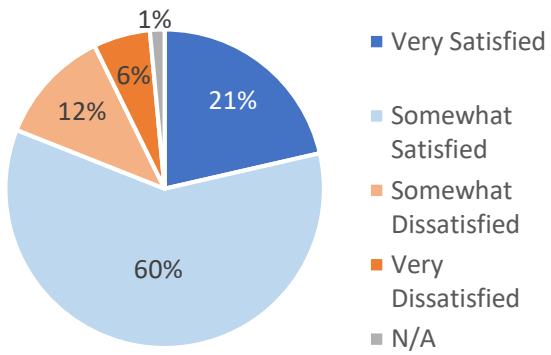
Public Input on Roads

Results of the four questions from the Fall 2019 transportation survey regarding satisfaction with the condition of the Northern Tier's roads are shown below. The survey report with results by county and respondent comments is provided as Appendix E.



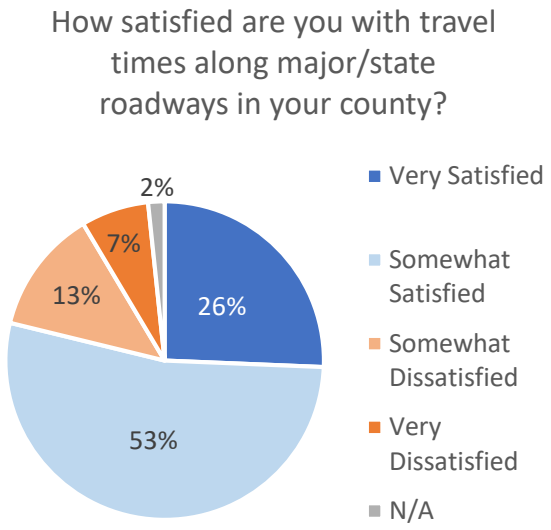
Comments by Category

- General physical conditions (64 comments)
- Potholes (27 comments)
- Drainage (flooding, overflowing ditches, etc.) (14 comments)
- Poor repairs (temporary, patchwork) (12 comments)
- Shoulder conditions (too narrow, nonexistent, etc.) (11 comments)
- Safety hazard (10 comments)
- Maintenance (sweeping, cleaning, painting, etc.) (9 comments)
- Construction (interference, delays, etc.) (8 comments)
- Communication (between local and state entities) (3 comments)
- Other (8 comments)



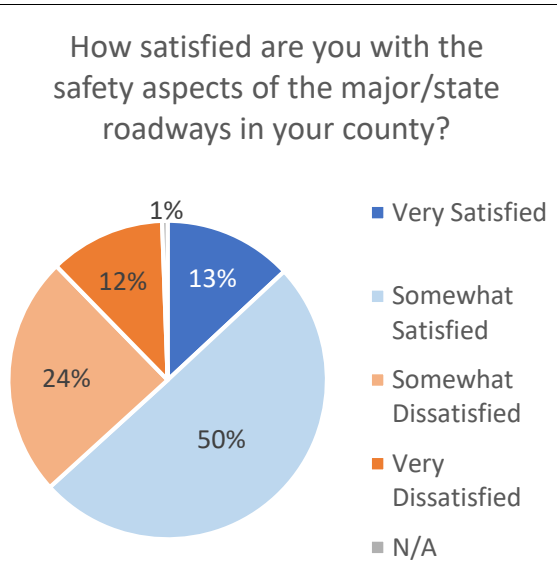
Comments by Category

- Maintenance (sweeping, line striping, trimming vegetation so that signs/signals are visually unobstructed) (9 comments)
- Controls lacking or nonexistent (8 comments)
- Inadequate placement (misleading or inappropriate for road conditions) (8 comments)
- Signal timing (8 comments)
- General traffic control conditions (7 comments)
- Lacking turning lane/signal (6 comments)
- Lacking posted speed limits (2 comments)
- Pedestrian controls/crossing (2 comments)
- Lacking passing zone (1 comment)
- Other (4 comments)



Comments by Category

- Construction (interference, delays, etc.) (13 comments)
- Truck congestion (10 comments)
- General congestion (9 comments)
- Poor road conditions (7 comments)
- Signal timing (3 comments)
- Lacking passing zone (3 comments)
- Inappropriate speed limits (too low to efficiently move traffic)
- Other (5 comments)



Comments by Category

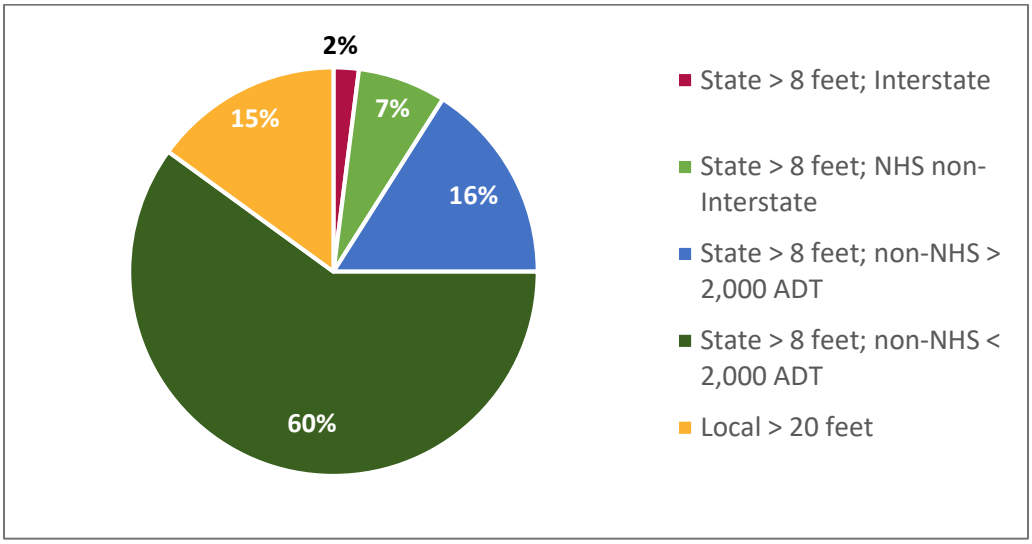
- Driver behavior (24 comments)
- Poor road conditions (roughness, potholes, etc.) (18 comments)
- Speeding (16 comments)
- Enforcement (police presence, posted speed limits) (13 comments)
- General safety hazard (10 comments)
- Trucks (9 comments)
- Traffic controls (7 comments)
- Maintenance (5 comments)
- Obstructed views (5 comments)
- Inappropriate speed limit (too low to efficiently move traffic) (4 comments)
- Nighttime visibility (4 comments)
- Other (5 comments)

Bridges

In a region with hundreds of miles of waterways, bridges are essential to mobility. There are 1,786 state-owned bridges longer than 8 feet and 317 locally owned bridges longer than 20 feet in the Northern Tier region.

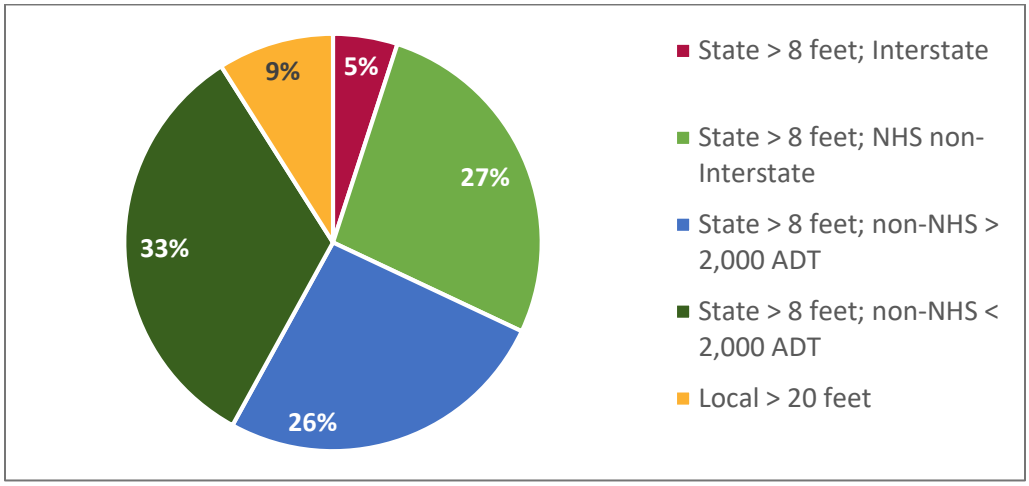
Bridges are found on all types of highways across the region. Figure 9 and Figure 10 show the distribution of bridges by highway type by count and by deck area. Although the majority of these bridges are non-NHS bridges with less than 2,000 ADT and local bridges greater than 20 feet, they represent far less deck area than the bridges on the Interstate Highway System, NHS, and other state roads with more than 2000 ADT.

Figure 9: Percentage of Northern Tier Bridges by Road Category (by Count)



Source: 2018 Performance Measures Annual Report

Figure 10: Percentage of Northern Tier Bridges by Road Category (by Deck Area)



Source: 2018 Performance Measures Annual Report

Minor Bridges

State-owned bridges less than 8 feet long and locally-owned bridges less than 20 feet long are an important part of the transportation system but do not require inspection per FHWA. The smaller state-owned bridges and culverts are well documented by the PennDOT Engineering Districts, however locally-owned bridges and culverts were not inventoried until 2014. PennDOT initiated this statewide inventory of local transportation assets, including bridges and culverts, through its planning partners toward its long-term goal for comprehensive asset management. NTRPDC documented 245 local transportation features—all local bridges—with limited information on physical condition.

Posted and Closed Bridges

Among bridges on the state system greater than 8 feet long, there are 103 structures that are posted with weight limits. The number of posted bridges has increased by 50 across the region since 2013 and more than doubled in Bradford and Tioga counties, due to more county and local bridge postings. See Table 33.

The number of posted bridges has increased by 50 across the region since 2013 and more than doubled in Bradford and Tioga counties.

Table 33: Posted Bridges

	Posted Bridge Count	Ownership		
		State	County	Boro/Twp
Bradford	46	3	16	27
Sullivan	7	1	1	5
Susquehanna	25	14	7	4
Tioga	17	1	1	15
Wyoming	8	1	2	5
Northern Tier	103	20	27	56

Source: PennDOT (Report A2: Bridges on State Route System, Length 8' or Greater, 9-30- 19; Report B2: Bridges on Local Route System, Length 20' or Greater, 9-30-19)

There are 18 bridges greater than 8 feet that are closed. These closed bridges are on lower-order, secondary roadways, such as four-digit state routes and locally-owned roads. See Table 34.

Table 34: Closed Bridges

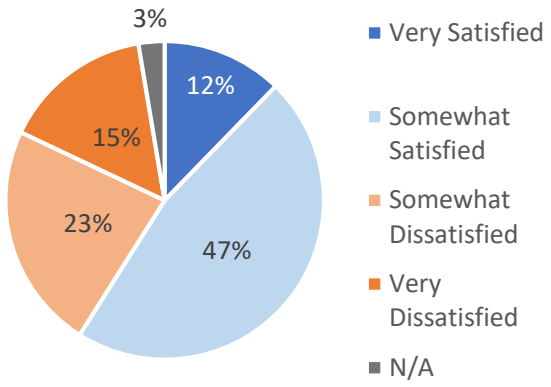
County	Feature Carried	Feature Intersected	Municipality	Ownership	Total
Bradford	SR 3002	Ladds Creek	Albany Township	State	5
	SR 3026	Tributary Sugar Creek	Burlington Township	State	
		No Branch Towanda Creek	Granville Township	Local	
	TR-348	Millstone Creek	Overton Township	Local	
	T-902	Wappasening Creek	Windham Township	Local	
Sullivan	T-310	Muncy Creek	Davidson Township	Local	4
	T-328	Muncy Creek	LaPorte Township	Local	
	T-438	Level Branch	Forks Township	Local	
	T-474	Little Loyalsock Creek	Cherry Township	Local	
Susquehanna	SR 3001	Carter Creek	Auburn Township	State	4
	SR 2017	Norfolk Southern RR	Hop Bottom Township	RR	
	SR 3037	E Branch Wyalusing Creek	Rush Township	State	
	Church St	Salt Lick Creek	New Milford	Local	
Tioga	T-703	Over Mutton Lane Creek	Jackson Township	Local	3
	T-329	Salt Spring Run	Liberty Township	Local	
	T-797	Salt Spring Run	Liberty Township	Local	
Wyoming	SR 2012	Trib S Branck Tunkhannock Creek	Clinton Township	State	4
	T-348	Whitelock Creek	Exeter Township	Local	
	Coolbaugh Mtn Rd.	Whitelock Creek	Exeter Township	Local	
	Adj to SR 4006	Little Tuscorora Creek	Laceyville Borough	Local	

Source: PennDOT One Map 3-11-2020

There has been discussion on the closed bridges in the Northern Tier region. A Bridge Redundancy Study with the Northern Tier RPO, PennDOT Central Office, and PennDOT District 3-0 and 4-0 is in the developmental stages. This study is meant to explore the possibility for reducing the amount of unnecessary bridges in the region. The study will include exploring closed bridges and the need to replace or eliminate them.

Public Input on Bridges

One question regarding bridge conditions was included in the Fall 2019 transportation survey; responses are summarized below. The survey report with results by county and respondent comments are provided in Appendix E.



Comments by Category

- General surface conditions (29 comments)
- Poor repairs (temporary, patchwork) (9 comments)
- Neglect (while other projects have been prioritized) (8 comments)
- Inadequate width (6 comments)
- In construction or closed (5 comments)
- Flood risk (3 comments)
- Drainage (2 comments)
- Maintenance (line striping, sweeping, mowing, etc.) (2 comments)
- Trucks (2 comments)
- Other (14 comments)

Public Transportation Services

Local transportation services in the region are provided by BeST Transit, currently operated by Williamsport's River Valley Transit (RVT), and Susquehanna County Transit. Intercity bus service is provided by the Susquehanna Transit Company.

BeST Transit

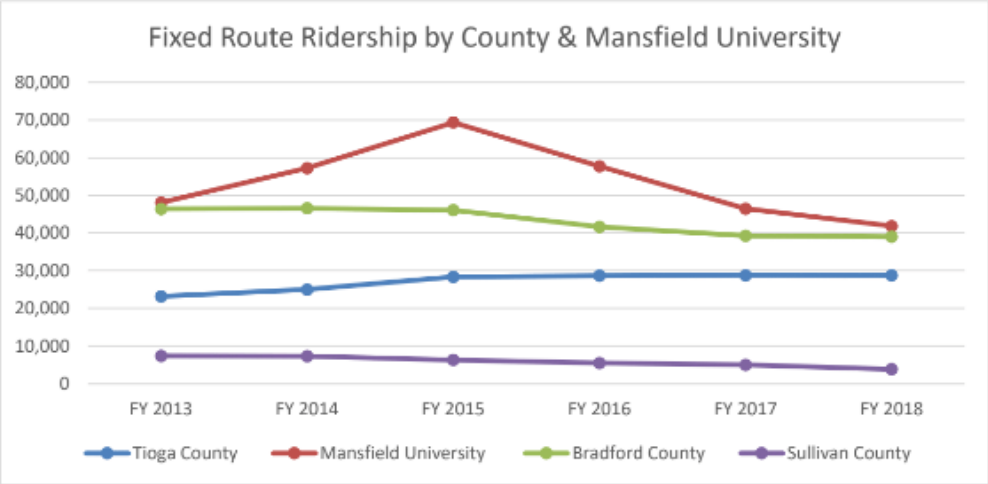
The Endless Mountains Transportation Authority, now known as BeST Transit, contracts with Williamsport's River Valley Transit to provide fixed-route and demand-responsive public transportation services to Bradford, Sullivan, and Tioga counties. According to the Fiscal Year 2017–18 Pennsylvania Public Transportation Performance Report, the three-county service area covers 726 square miles and serves a population of 61,852 residents.

There are five fixed routes in Bradford and Sullivan counties and four fixed routes in Tioga County. The service is limited to mainly weekdays in Tioga County, except for when Mansfield University is in session. BeST operates two deviated fixed routes—one in Bradford County and the other in Sullivan County—from which a rider may request an alternative route within ¼-mile of the regular route.

Since FY 2012-13, ridership by Bradford County and Sullivan County residents declined, while Tioga County ridership rose. Ridership among Mansfield University students peaked in FY 2014-15 before falling to below the FY 2012-13 level in recent years. See Figure 11.

Again per the 2017-18 performance report, of the service's 114,840 total fixed-route passengers, 12,606 (10.9 percent) were seniors. Total ridership reached nearly 160,000 in FY 2014-15 and then declined to less than 120,000 by FY 2017-18. Between FY 2012-13 and FY 2017-18 there was a 54 percent increase in operating costs per passenger (which includes ADA complementary service to disabled indivduals unable to ride fixed-route service independently), a 1.4 percent increase in revenue vehicle miles, and a 6.4 percent decrease in revenue vehicle hours.

Figure 11: Fixed-Route Ridership, BeST Transit



Source: BeST Transit 2018 Service Highlights

BeST's Shared-Ride Service

BeST provides shared-ride bus service to seniors and people with disabilities (PwD) in the same three-county service area. BeST operates 35 paratransit vehicles for this service.

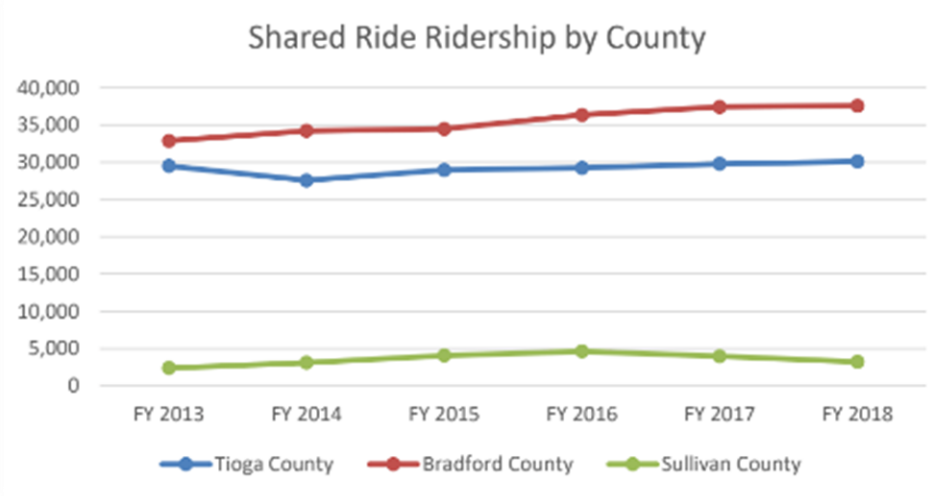
In FY 2017–18, BeST provided 70,991 shared-ride trips. This total was nearly equally split between senior shared-ride trips (45 percent) and other shared-ride trips (47 percent). The remaining 8 percent of trips served persons with disabilities (PwD). Between FY 2012-13 and FY 2017-18, total shared-ride trips increased by 11 percent. Senior trips have increased 8.2 percent and trips serving PwD have declined 9.3 percent.

Shared-ride ridership rose steadily among Bradford County riders from FY 2012-13 to FY 2017-18. In Sullivan County, ridership peaked in FY 2015-16 before falling to the FY 2012-13 level. In Tioga County, ridership dipped in FY 2013-14 and slowly rose to above the FY 2012-13 level. See Figure 12.

While BeST's fixed-route ridership has declined, shared-ride trips have increased since FY 2013.

Shared-ride fare recovery (the percentage of operating costs covered by passenger fares) has been slowly increasing over the past five years, but has not kept pace with increasing costs. In FY 2017–18, the average shared-ride fare was $33.24 and the average shared-ride cost was $41.56.

Figure 12: Shared Ride Ridership, BeST Transit



Source: BeST Transit 2018 Service Highlights

BeST's Facility and Fleet

BeST's operations are based in Athens with a secondary maintenance facility in Mansfield. As of FY 2017-18, BeST operated a fleet of 66 vehicles: 13 for fixed route and deviated route and 53 for paratransit.

BeST continues to update its facilities and fleet. Its capital projects/purchases on the 2019 TIP include:

- Support vehicles
- Garage/office improvements in Athens and Mansfield
- Purchase of minibuses; accessible and standard (non-accessible) minivans
- Support equipment
- Spare components
- Towanda transit center
- Replacement buses
- CNG fuel station in Tioga County

BeST's Future Operations

The goals listed in BeST Transit's FY 2018-19 Service Plan Proposal were to preserve the existing relationship between BeST Transit and RVT; continue to update and improve existing services provided by BeST Transit; and investigate long-term expansion of BeST Transit operations and integration into a larger Transportation Management Authority.

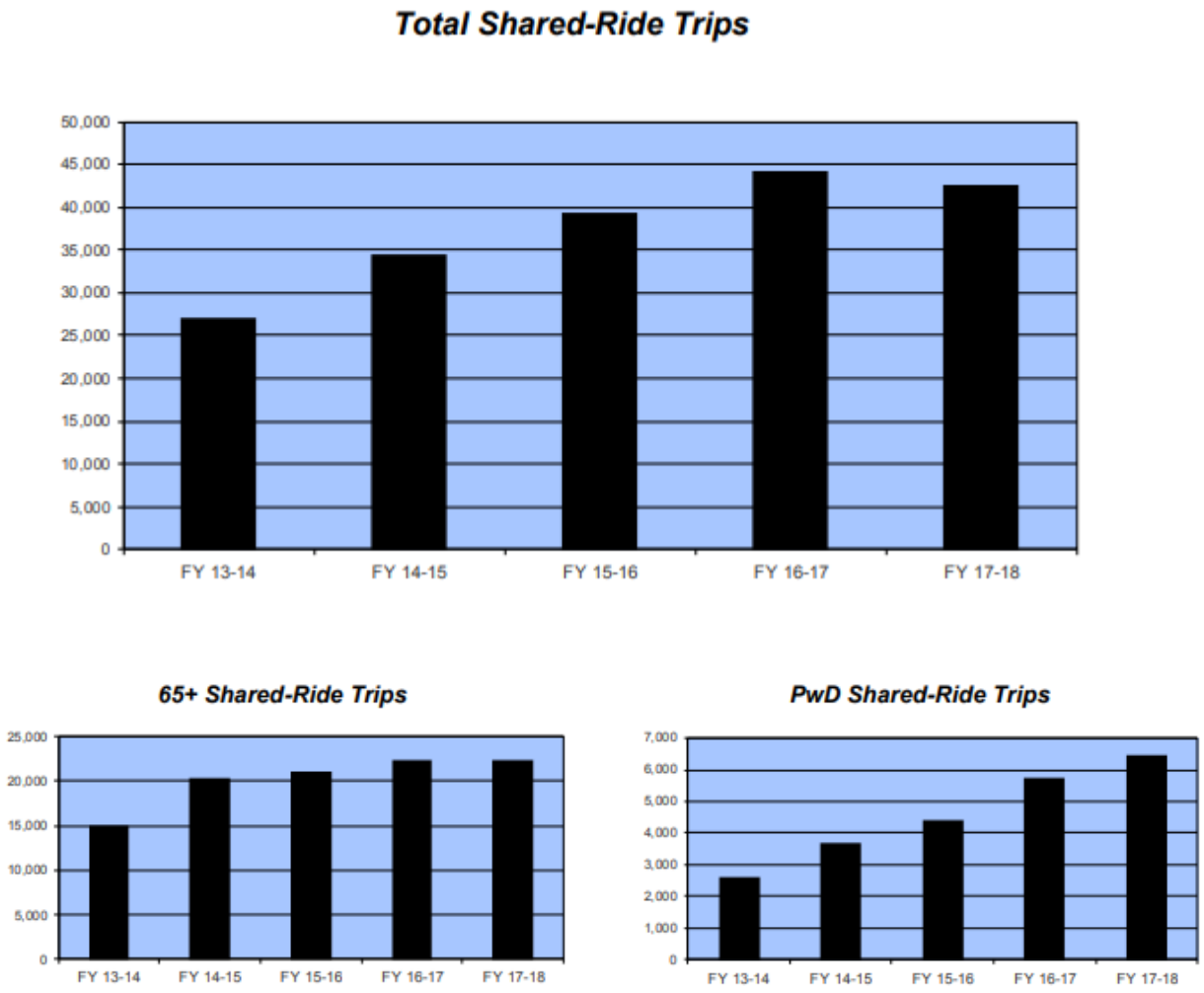
Susquehanna-Wyoming County Transportation

Susquehanna-Wyoming County Transportation provides only shared-ride services within the combined 1,228 square-mile service area. As of the 2010 U.S. Census, the two counties had a combined population of 71,613, including 12,373 residents 65 years and older.

In FY 2017–18, Susquehanna-Wyoming County Transportation provided 42,658 shared-ride trips to seniors, PwD, and others—a small decrease from the previous year as shown on Figure 13. Senior trips comprised 52.5 percent of shared-ride trips, "other" comprised 32.3 percent, and PwD trips represented 15.2 percent. Since FY 2014-15 when service expanded to Wyoming County, total trips have increased 23.8 percent. Senior trips have increased by 9.8 percent while trips serving PwD have risen 77.1 percent. On average, shared-ride fare recovery has decreased since FY 2015–16 as costs have increased.

The agency operates 28 vehicles in maximum service and has capital projects in the 2019 TIP.

Figure 13: SWCT Trip Distribution History, FY 2013-14 to FY 2017-18



Source: Pennsylvania Public Transportation Performance Report, FY 2017-18

Susquehanna Transit Company/Fullington Auto Bus Company

Susquehanna Transit Company ended service along subsidized routes on August 31, 2017. The Fullington Auto Bus Company assumed responsibility for continuing service along these routes on September 1, 2017. The company is located in Clearfield.

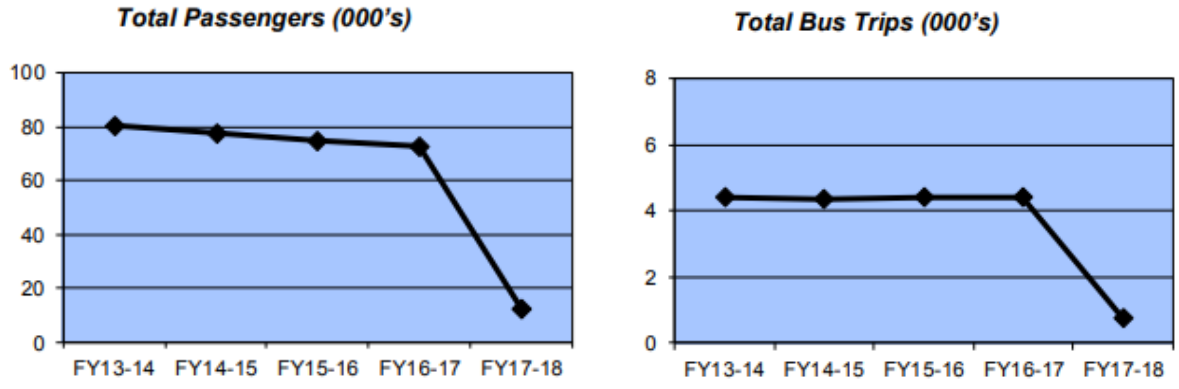
For the the FY 2017-18 Pennsylvania Public Transportation Performance Report, Susquehanna Transit Company reported service to communities in 19 counties across three routes from Williamsport to Philadelphia; Williamsport to Easton; and Harrisburg to Elmira, NY; using its 16 coaches. See Figure 14

Figure 14: Service Routes, Fullington Auto Bus (formerly served by Susquehanna Transit)

Source: Pennsylvania Public Transportation Performance Report, FY 2017-18

As shown on Figure 15, total ridership was relatively steady until the 2017 change in routes. Over the preceding four years, operating revenue per vehicle mile decreased slightly, operating expense per vehicle mile stayed relatively even, and total subsidy per vehicle mile slightly increased. The average fare is $17.09.

Figure 15: Ridership and Trip History, FY 2013-14 to FY 2017-18, Susquehanna Transit



Source: Pennsylvania Public Transportation Performance Report, FY 2017-18

Fullington Auto Bus Company reported a similar declining trend in total ridership and a similar steady trend in total bus trips with a comparable increase in size for both metrics reported for FY 2017-18.

Service Coordination

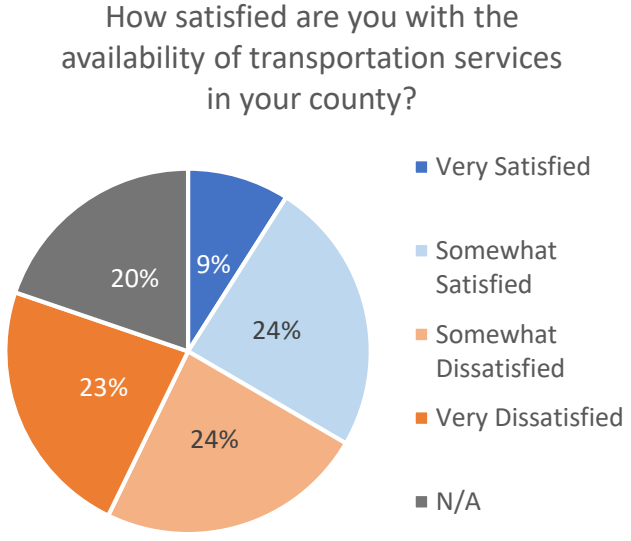
The region's Local Coordinated Transit Plan was updated in 2018-19. To meet the needs and fill the gaps the following five priorities, or goals, were identified:

1. Improve knowledge and information for riders and potential riders, as well as businesses, organizations, and agencies
2. Centralize information on transportation services and funding sources
3. Expand current services via data-driven decisions
4. Improve infrastructure

Coordinate business, organization, and agency actions both within the region and in neighboring regions.

Public Input on Transit

One question regarding public transportation services was included in the Fall 2019 transportation survey; responses are summarized below. The survey report with results by county and respondent comments is provided as Appendix E.



Comments by Category

- Services lacking or nonexistent (57 comments)
- Taxi services (unaffordable, unavailable) (10 comments)
- Limited services for special populations (low-income, seniors, disabled, veterans, single mothers) (8 comments)
- Limited access to medical services (5 comments)
- Limited awareness of available services (5 comments)
- Limited bus schedule (extended hours, number of trips, etc.) (5 comments)
- Over-subsidized (5 comments)
- Limited funding (3 comments)
- Limited services for workers (3 comments)
- Limited services for general population (not on Medicare or Medicaid) (3 comments)
- No passenger rail service (2 comments)
- Other (23 comments)

Airports

There are three public-use airports that serve the Northern Tier: Bradford County Airport, Wellsboro Johnston Airport, and Skyhaven Airport. Major airports immediately outside of the region include Binghamton, Elmira, Wilkes-Barre/Scranton International, and Williamsport Regional.

Bradford County Airport

PennDOT's Bureau of Aviation functionally classified the Bradford County Airport as a general aviation airport. The airport is owned and operated by the Bradford County Airport Authority, which benefits from the representation of private industry. The airport occupies a 339-acre tract near the junction of US 220 and US 6 in Towanda Township, Bradford County.

Competitive fuel prices and maintenance services have made the Bradfrod County airport very attractive to local companies.

Figure 16: Aerial View of the Bradford County Airport

Source: Google Earth

The airport runway is 4,300 feet long and is equipped with high intensity runway lighting (HIRL), including Precision Approach Path Indicator (PAPI) and Runway End Identifier Lighting (REIL). It can accommodate aircraft as large as the Falcon 50, which has a 62-foot wingspan.

Companies such as Procter & Gamble; Towanda Metadyne, Inc.; Frontier Industrial Technology, Inc.; DuPont; Panda Natural Gas Power Plant; and others utilize the airport. Its proximity as well

as competitive fuel prices and maintenance services have made the airport very attractive to these companies.

The airport functions as a convenient gateway for business personnel who frequently travel long distances, playing a significant role in the economic development of the nearby communities. Air travel to and from the airport can be faster and more economical than ground travel, particularly if overnight lodging costs are avoided. Annual events such as the Fly-In and Drive-In Breakfast and airshows attract both locals and visitors. The airport offers many convenient intermodal connections including taxi service, courtesy vehicles, bus service, and even bicycle and pedestrian access into Towanda.

All facilities are around 20 years old and no major replacements are anticipated. Airport hazard zoning is in place to protect the operation of the airport from conflicting development. The taxiway on the south side has been extended since the last LRTP update. The aviation gas is being moved to the main hangar, with completion slated for Spring 2020.

Table 35: Bradford County Airport

Aircraft based on field: 21 Single-engine: 20 Multi-engine: 1
Annual operations (take-offs and landings): 22,995
Daily operations: 63 Local general aviation: 35% Transient general aviation: 65% Military operations: <1%
Services • Flight instruction • General aviation fueling • Hangar rental • Tourism-related (hunting, fishing, golfing, and fall foliage tours) • Fly-overs of French Asylum (seasonal)

Source: AirNav

Wellsboro Johnston Airport

This general aviation facility on a 112-acre tract in Tioga County has operated since 1940. It was the only remaining state-owned airport until 2001 when the Borough of Wellsboro and Delmar Township formed the Grand Canyon Airport Authority and took ownership of the airport. It was initially known as the PA Grand Canyon Airport, but the name was changed in 2005 to honor its longtime operators.

The airport accommodates smaller aircraft with wingspans less than 49 feet. There is one 3,597-foot runway equipped with lighting.

Table 36: Wellsboro Johnston Airport

Aircraft based on field: 23 Single-engine: 20 Ultralights: 3
Annual operations (take-offs and landings): 3,500-5,700
Daily operations: Local general aviation: 53% Transient general aviation: 44% Air taxi: 4%
Services: • Fueling • Aircraft repair • Air taxi services • Flight instruction • Aerial tours and photography • Aircraft maintenance and modifications • Aircraft parts and accessories sales • General recreational flying

Source: AirNav

The seasonal nature of the airport's use is evident as demand spikes during July and August.

A longer runway would enable the airport to serve larger aircraft, improving this facility as an economic development amenity. A runway extension has been discussed for nearly a decade, but is not without its challenges. Extension to the west would require extensive fill and extension to the east would require a willing property owner, since the land lies in an Agricultural Security Area. Until the natural gas industry took root in Tioga County, an extended runway was considered only a future opportunity. In Spring 2017, the Authority concluded that a runway extension and increase to a B-II facility are not in the best interest of the airport at this time. The runway extension would be justified if the airport receives regular use by large aircraft in the future.

Figure 17: Aerial View of the Wellsboro Johnston Airport

Source: Google Earth

The airport's existing infrastructure includes:

- Two runways
- One parallel taxiway
- One Fixed-Based Operator
- Several aircraft storage T-hangars and an aircraft parking apron
- Fuel storage area (fuel island)
- Runway lighting and visual and navigational aids
- Electrical vault
- Automobile parking
- Tenant facilities, an airport administrative office, and airport maintenance facilities

A Master Plan was completed in July 2017 for the Grand Canyon Airport Authority. This plan describes the existing conditions, forecasts of aviation demand, facility requirements, alternative development concepts, and cost estimates and summary of funding services for the Wellsboro Johnston Airport. The plan states that there are 41 acres of obstructions on airport property and 39 acres of obstructions off-airport. It has been recommended that on-airport obstructions be removed or mitigated in the immediate term. Navigation easements have been proposed for

obstructions located off airport property. The plan explores three alternatives developed for facility layout, and three alternatives developed for runway expansion possibilities.

Projects totaling an estimated $10 million are presented in three development phases: Phase I (0-5 years), Phase II (6-10 years), and Phase III (11-20 years).

Phase I ($5.5 million) includes:

- Install Obstruction Light Runway 28
- Rehabilitate Terminal Apron
- Acquire Airport Equipment
- RW/TW Crack Seal, Seal Coating, and Marking
- Replace Rotating Beacon
- Easement Acquisition for Obstruction Removal
- Obstruction Removal
- Fee Simple Land Acquisition- RPZs and Phase I Development
- In-Place Fuel Farm Improvements
- Realign Gravel Access Road
- Construct 6-Unit T-Hangar
- Demolish T-Hangar Building 7
- Expand Terminal Apron
- Rehabilitate Terminal Building Automobile Parking

Phase II ($2.8 million) includes:

- Construct Snow Removal Equipment (SRE) Building
- Construct Executive Hangar Apron
- Construct Executive Hangar
- Construct T-Hangar Taxilanes
- Construct 6-Unit T-Hangar
- Install REILs on Runway 10
- Install Segmented Circle

Phase III ($1.7 million) includes:

- Construct Connector Taxiway
- Construct Executive Hangar Apron
- Construct Executive Hangar
- Install Security Fence and Manual Gates

Although funding small, rural airports is a challenge, the Wellsboro Johnston Airport serves as a convenient gateway for businesspeople who frequently travel long distances, playing a significant role in the economic development of the nearby communities. Annual events such as the Fly-In and Drive-In Breakfast and airshows attract both locals and out-of-town pilots.

Annual events at the Wellsboro-Johnston Airport attract both locals and out-of-town pilots.

Skyhaven Airport

Skyhaven Airport is a privately-owned, public-use facility located one mile south of Tunkhannock in Eaton Township, Wyoming County. The airport features a 4,206-foot-long asphalt LED-equipped runway in good condition, with pavement markings in fair condition. However, the runway extension is unmarked, obstructed, and currently not available for landings. The airport can accommodate aircraft with a 56-foot wingspan; the King Air E90 is the largest in current use.

Skyhaven made significant efforts to update its facilities and services to serve area businesses since 2014. Businesses such as Ace Robins Oil/Propane Corp., Meshoppen Stone, John Deere, and Vision Air Research use the airport for its convenient location and services. The 3,100-foot runway was extended and paved, and lighting was added to the extension. Trees were removed at the north end of the airport and power lines were removed at the south end of the airport. Two new hangers were added; one 95 feet by 105 feet and the other 125 feet by 95 feet. Skyhaven also replaced its fuel system and built additional taxiways and ramps. In the next five years, the airport plans to add between 10 and 20 more hangers and pave the newly added taxiways and ramps. Skyhaven's owner aims to eventually buy the land to the north of the airport to clear obstructions.

Table 37: Skyhaven Airport

Aircraft based on field: 70 Single-engine: 62 Multi-engine: 8
Annual operations (take-offs and landings): 22,000
Daily operations: 60 Local general aviation: 89% Transient general aviation: 11% Air taxi: <1%
Services: • Fueling • Aircraft parking • Hangar leasing • Flight instruction • Skydiving • Aircraft rental • Aircraft maintenance/restoration (exterior refinishing and painting), avionics (electronics) for smaller aircraft and short-range corporate charters

Source: AirNav

Figure 18: Views of Skyhaven Airport

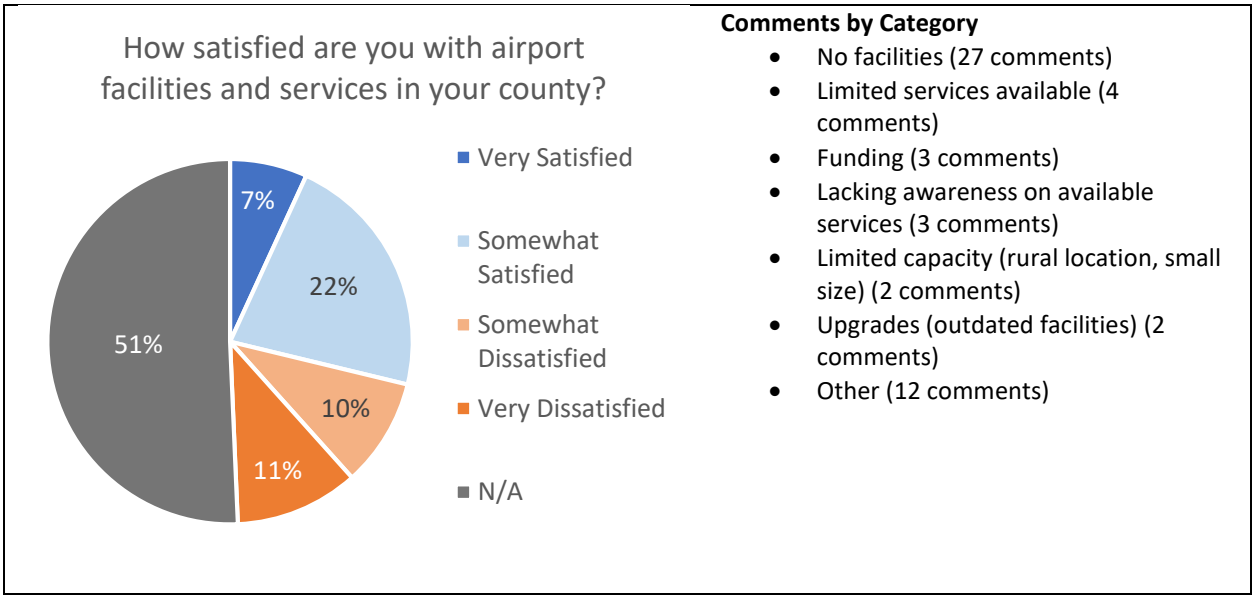
The airport lies adjacent to retailers (Walmart and Mr. Z's Grocery Store) that provide convenient access to pre-flight supplies. Building heights have not been a problem and Eaton Township, the host municipality, has enacted Airport Hazard Zoning to manage the height of future development. The land located to the south of the runway is not in the floodplain and would require little grading if the airport were to expand; cell phone towers and tree growth would be the primary obstructions to future landing areas.

Given the airport's status as a privately-owned facility, it is not eligible for federal funding. It is, however, eligible for grant funding from PennDOT's Bureau of Aviation (BOA) on projects that are not-for-profit (e.g., runway extensions, line painting, etc.). The BOA may provide grants with a 50 percent required local match for items such as fuel systems that generate profit.

Skyhaven Airport plans to add more hangars and pave the newly added taxiways and ramps. Long-term, it aims to clear obstructions.

Public Input on Airports

One question regarding aviation services was included in the Fall 2019 transportation survey; responses are summarized below. This response showed that many citizens are not aware of airport services in their counties or view local airports for limited use, not applicable to the general public seeking scheduled flights. The survey report with results by county and respondent comments is provided in Appendix E.



Comments by Category

- No facilities (27 comments)
- Limited services available (4 comments)
- Funding (3 comments)
- Lacking awareness on available services (3 comments)
- Limited capacity (rural location, small size) (2 comments)
- Upgrades (outdated facilities) (2 comments)
- Other (12 comments)

Rail Freight Facilities

While freight movement in the region is primarily via truck, the importance of rail service should not be underestimated. Rail freight traffic in the Northern Tier is shaped by the region's eastern position in the national rail network and by the structure of the network itself. In the Northern Tier, rail is primarily used to export extracted natural resources and aids in the supply and distribution of manufactured goods, construction materials, and natural-gas-related supplies.

Ownership, connections, and distance combine to influence the pattern and character of current and prospective freight volume. While the Northern Tier is a corridor for substantial volumes of highway traffic on I-81, the region is less accessible from a freight rail perspective. The ability of regional rail to relieve highway congestion is constrained by network position, vertical clearance limitations, facility capacity limitations, and institutional factors.

Rail is primarily used to export extracted natural resources; it also aids in the supply and distribution of manufactured goods, construction materials, and natural-gas-related supplies.

Statewide Freight Planning

In August 2016, PennDOT completed Pennsylvania's first freight movement plan, developed as an integral element of PA On Track, PA's Long Range Transportation and Comprehensive Freight Movement Plan.

As shown in Figure 19, PA On Track included a robust analysis of current and projected freight volumes, values, and generators by region. According to the Region 5 Northern Tier Freight Profile, in 2011 truck and rail freight carriers moved 14 million tons of product by weight, and 8 billion by value. Flow volumes are expected to continue to grow based on increased demand for the region's products, and routes used by these products will experience greater freight traffic volumes.

Pennsylvania's freight rail lines are owned by private companies, therefore rail owners and operators are not eligible for public sector funding assistance for operations and general maintenance of their lines. They can, however, apply to PennDOT's Rail Freight Assistance Program for capital project grants. The balance of this section identifies rail freight line owners and operators and recent grant awards.

PennDOT is currently in the process of updating the statewide Long Range Transportation and Comprehensive Freight Movement Plan and updated freight movement for the Northern Tier region. This will be provided in the next LRTP update.

Figure 19: Northern Tier Freight Trends and Issues Summary

Economic, Demographic, Environmental, and Technology Trends and Issues
• In 2011, 14 million tons, valued at $8 billion, traveled into, out of, or internally/ within the Northern Tier (PREP Region 5) region. • Based on data from Freight Finder™ food and product manufacturers and chemical companies, including P&G and DuPont, are among the region's largest freight generators. • The Northern Tier region has a diverse and growing economy ranging from mining and logging to education services and government. As a result of Marcellus shale development, natural gas-related companies are a growing industry in the region. • One of the region's largest commodities by tonnage is broken stone and riprap. Meat products are a high-value commodity originating from the region, with livestock as a high tonnage and value commodity destined for and moving within the region both in 2011 and projected for 2040. • A Marcellus Shale Freight Transportation Study was completed for the region in November 2011. • There is one urban cluster of a micropolitan statistical area in the region that includes Sayre Borough. It is on the edge of the Philadelphia-NY-DC mega-region and its eastern counties are experiencing some growth as a result.
Modal Infrastructure Trends and Issues
• Truck and rail account for nearly 100 percent of freight movements in the region. Movements by truck account for about 85 percent of the trips by tonnage in both 2011 and 2040. I-84 carries more than 25 percent trucks. • PennDOT invested more than $250 million in modernizing U.S. 15 to the New York State border over a 15-year period, with the northernmost (final) section opening to traffic in 2008. • None of the state's top truck bottlenecks are in the region. • The region is part of Harrisburg-Binghamton emerging rail corridor. • Based out of Wellsboro, the Wellsboro & Corning is an important short-line railroad serving the Marcellus gas extraction industry. The railroad's geographic orientation covers one of the largest and most active portions of the Marcellus shale formation. This has resulted in customers referring to the railroad as the "Main Line to the Marcellus."
Expected Impacts on the Northern Tier Transportation System
• Routes used to meet the increasing international demand for the region's food products will experience greater freight traffic. • Traffic related to Marcellus shale activity will continue to affect the congestion and condition of the region's highway network, especially as numerous vehicles carrying heavy loads of sand and materials used for hydraulic fracturing travel on lower functional class routes.

Source: PA On-Track, 2016

Owners and Operators

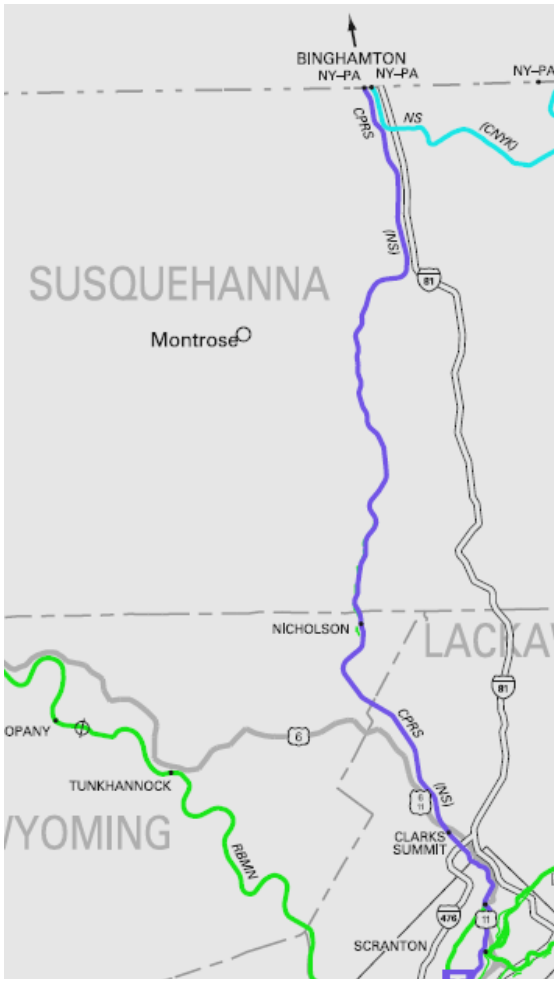
From a rail freight perspective, shippers in the region are served by primarily by shortlines and Class I railroad operators. These include:

- Norfolk Southern (formerly Canadian Pacific Rail)
- The Wellsboro & Corning Railroad
- The Towanda-Monroeton Shippers Lifeline
- The Lehigh Valley Line

Norfolk Southern (formerly Canadian Pacific Rail)

In 2014, Norfolk Southern purchased segments of the Canadian Pacific Rail, including a segment through Susquehanna County. Of all the rail lines in the Northern Tier, NS's line through Susquehanna County is arguably the most important—perhaps one of the top north-south lines in the northeastern United States. The line funnels traffic as it moves west to Buffalo and Toronto, north to New England and Montreal, and south to Allentown, Harrisburg, and southern New Jersey. The line connects with Reading Blue Mountain and Northern at Pittston Junction in the Scranton/Wilkes-Barre area, Norfolk Southern in Binghamton, NY, and CSX and ports in Philadelphia.

Figure 20: Norfolk Southern



Source: Pennsylvania Railroad Map, PennDOT

The Wellsboro & Corning Railroad

The 38-mile Wellsboro & Corning Railroad is an important short line for industries and agriculture in Tioga County. It serves as a switching carrier for both Norfolk Southern (NS) and the Canadian Pacific (CP), connecting Wellsboro with Norfolk Southern's Southern Tier line and yard in Gang Mills, NY, and CP in Corning, NY.

The railroad was owned and operated by Growth Resources of Wellsboro until it was purchased by Genessee & Wyoming Inc. in 2012. Genesee and Wyoming reports that the Wellsboro & Corning Railroad handles a variety of industrial products primarily used in natural resources extraction.

The Tioga Central Railroad of Wellsboro operates excursion and charter trains on a 34-mile segment of the line extending north from Wellsboro, Pennsylvania, to about three miles south of Corning, New York.

Figure 21: Wellsboro & Corning Railroad

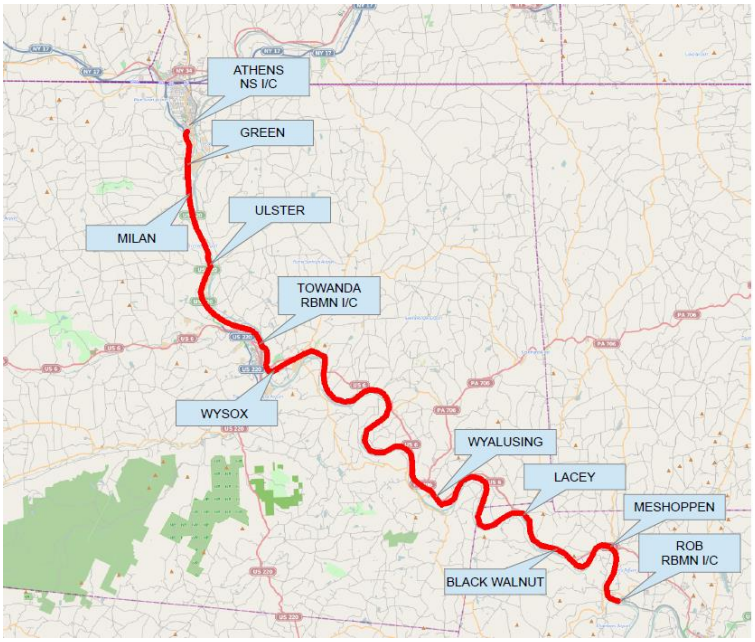
Source: Northern Tier

The Lehigh Railway

Norfolk Southern owns the 56-mile rail line between Athens, in Bradford County, and Mehoopany, in Wyoming County. The line connects to Norfolk Southern's operations between Athens and Gang Mills, NY.

The Lehigh Railway (LRWY) operates services on the line. LRWY began operations in January 2009. Its business on the line expanded from 2,500 rail cars in 2009 to more than 6,200 in 2015. According to its website, LRWY utilizes seven locomotives and nine employees to operate and maintain the line. The railway runs two trains per day, six days per week, and one train on Sundays. LRWY shares administrative offices and staff with the Owego and Harford Railway, Inc., the Meridian Southern Railway, LLC, and the Luzerne and Susquehanna Railway Company in Owego, NY.

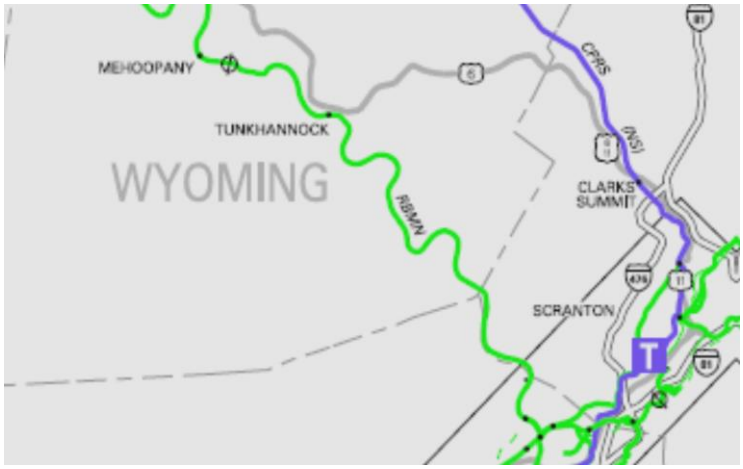
Figure 22: The Lehigh Railway



The Lehigh Railway delivers various chemicals to Towanda; sand to Towanda, Wysox and Wyalusing; wood pulp to Reading Blue Mountain and Northern (RBMN) in Mehoopany; and lime and cement to Meshoppen. Exports include drill cuttings from Meshoppen and Wysox and beef tallow from Wysox.

Plans for the next five years for the Lehigh Railway include adding a 3,600-foot run-around loop in Wyalusing, surfacing and spot ties for the whole line, and a natural gas terminal in Wyalusing.

Figure 23: The Lehigh Valley Line (RBMN)



Source: Pennsylvania Railroad Map, PennDOT

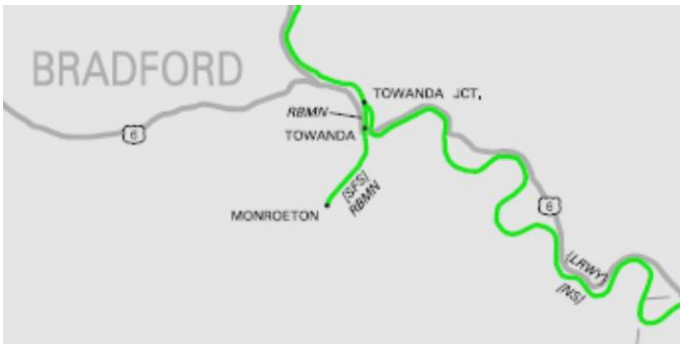
Reading Blue Mountain and Northern owns and operates the Lehigh Valley Line from Mehoopany to Pittston Junction in the Scranton/Wilkes-Barre area.

The line connects on the left bank trackage in Pittston's Duryea yard along the main branch Susquehanna River to New York State railways via the former Lehigh Valley Railroad through the yard at Sayre, PA, reaching Rochester, Buffalo, and Erie, PA.

Towanda-Monroeton Shippers Lifeline

The six-mile Towanda-Monroeton Shippers Lifeline is currently inoperable due to flood damaged, however, it is still considered an active line. Reading Blue Mountain and Northern acquired the northern 1.5 miles nearest Towanda in December 2010. Shaffer's Feed Service, Inc., owns the southern 4.5 miles. Reading Blue Mountain and Northern is the line operater.

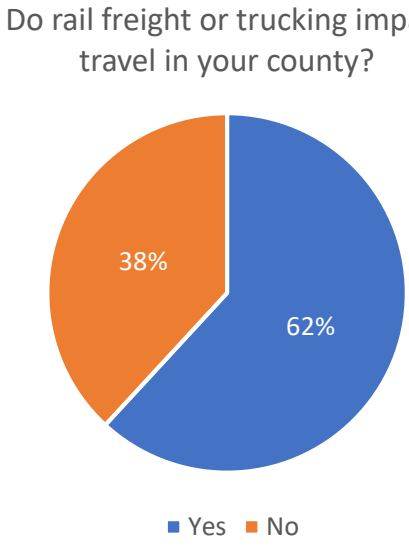
Figure 24: Towanda-Monroeton Shippers Lifeline



Source: Pennsylvania Railroad Map, PennDOT

Public Input on Railroads

One question regarding rail freight was included in the Fall 2019 transportation survey; responses are summarized below. However, many more comments relate to trucking than rail freight. The survey report with results by county and respondent comments is provied in Appendix E.



Comments by Category

- High natural gas traffic (103 comments)
- High truck traffic (general) (42 comments)
- Wear and tear from trucks (39 comments)
- Lacking freight rail (12 comments)
- Driver behavior (15 comments)
- Lacking passing zones (2 comments)
- Air quality and nuisance (from trucks—exhaust, noise, etc.) (5 comments)
- Road capacity (not built for heavy trucks) (6 comments)
- Travel delays (12 comments)
- Travel delays from rail (3 comments)
- Other (12 comments)

Facilities for Bicycles and Pedestrians

Opportunities for bicycling and walking in the Northern Tier include signed and unsigned bicycle routes, sidewalk systems in towns, and both local and regional recreational trails.

Improving safety and connectivity for bicycling and walking are priorities in the Northern Tier.

In 2019, NTRPDC developed a Bicycle and Pedestrian Plan with four primary goals:

1. Improve and expand safe places for bicycling.
2. Extend accessible pedestrian networks throughout towns, including to destinations at the edge of town.
3. Extend, interconnect, and establish new trails.
4. Educate and alert all travelers to traffic laws and safe practices for shared-road travel.

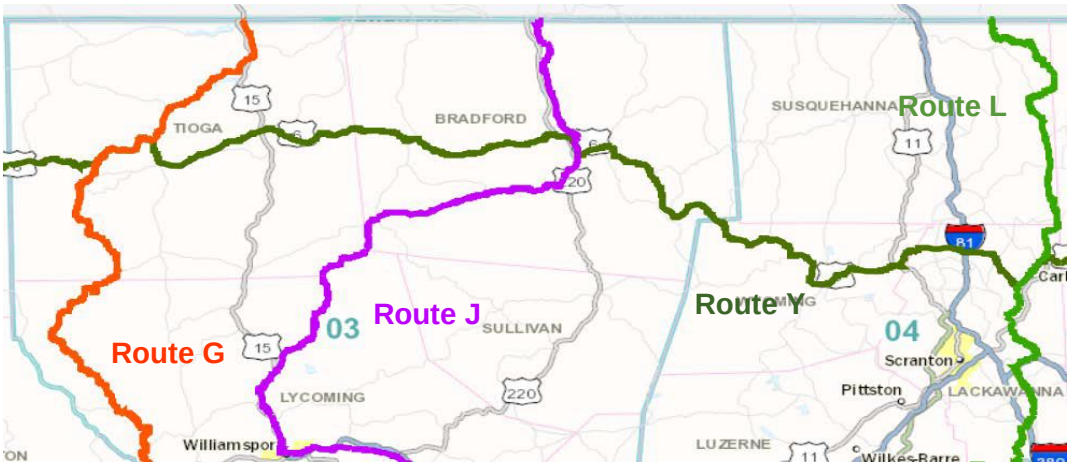
The information in this section is drawn from the plan's conditions and needs analysis. As projects are programmed along these routes, it is the intention to improve conditions where allowable for the cyclists.

Bicycle Routes

To encourage long-distance bicycling, PennDOT established a system of statewide roadways that can be used for bike journeys. These are designated as nine "BicyclePA" routes and are identified by letters. At present, these roadways are suitable only for bicyclists experienced in on-road, in-traffic conditions. Four BicyclePA Routes exist in the Northern Tier region, as shown in Figure 25:

- **Route Y**: follows US 6 across all of the region's counties except Sullivan
- **Route G**: follows US 15, PA 287, US 6, and the Pine Creek Rail Trail in Tioga County
- **Route J**: follows PA 14 in Tioga County
- **Route L**: follows SR 1009 and PA 171 through Susquehanna County

Figure 25: BicyclePA Routes Y, G, J, and L



Source: PennDOT (base map); Gannett Fleming (labels)

Sidewalks

For those who cannot or choose not to drive, the presence and condition of sidewalks, marked crosswalks, and other pedestrian facilities is essential. Sidewalks also serve as public spaces where communities host civic activities and events that connect locals and visitors to the unique aspects of each community. Although the Northern Tier region is rural, there are several towns and villages with sidewalk systems or the potential for daily pedestrian activity based on population and land use patterns, as shown in Table 38.

Table 38: Northern Tier Communities with Sidewalk Systems, by County

Bradford	Sullivan	Susquehanna	Tioga	Wyoming
Alba	Dushore	Friendsville	Blossburg	Factoryville
Athens–Sayre–South Waverly	Eagles Mere	Forest City	Covington	Forkston
Burlington	Forksville	Great Bend	Elkland	Laceyville
Canton	Laporte	Hallstead	Knoxville	Mehoopany
Le Raysville		Little Meadows	Lawrenceville	Meshoppen
Monroeton		Montrose	Liberty	Nicholson
New Albany		New Milford	Mansfield	Tunkhannock
Rome		Hop Bottom	Roseville	
Sylvania		Oakland	Tioga	
Towanda		Susquehanna	Wellsboro	
Troy		Thompson	Westfield	
Wyalusing		Union Dale		

Source: NTRPDC

Off-Road Trails

The D&H Rail-Trail and O&W Rail Trail are both major off-road trails that pass through the Northern Tier and link to communtities beyond the region. Both rail-trails are more than 30 miles long. Approximately 87 percent of the D&H Rail Trail and 25 percent of the O&W Rail Trail lie within the Northern Tier. Regional and local recreational trails are listed in Table 39.

Table 39: Recreational Trails in the Northern Tier

Regional Recreational Trails
Delaware and Hudson Rail Trail (D&H Rail Trail) from the New York State border to Simpson (Lord Avenue at Main Street) in Lackawanna County, where it connects to the Lackawanna River Heritage Trail
Endless Mountain Trail from U.S. 76 east of Montrose in Susquehanna County to the Lackawanna & Western Railroad corridor in Alford, near Lower Alford Pond
Loyalsock Trail within the Loyalsock State Forest in Lycoming and Sullivan counties, from PA Route 87 10 miles north of Montoursville to just north of Laporte (Meade Road, 0.2 miles from U.S. Route 220)
Mid-State Trail from the Maryland border through Blackwell in Tioga County to the New York State border north of Lawrenceville
Ontario and Western Rail Trail (O&W Rail Trail) from Simpson in Lackawanna County to Hancock at the New York State border through the Susquehanna County communities of Forest City, Union Dale, and Herrick Center
Pine Creek Rail Trail from Jersey Shore and Ansonia through Blackwell and the Pine Creek Gorge area (the PA Grand Canyon) to Butler Road north of Wellsboro in Tioga County, connecting to the Triple Divide Trail System from Lake Ontario north of Rochester, NY, to Williamsport, PA
West Rim Trail from Ansonia to near Blackwell along the Western Rim of Pennsylvania's Grand Canyon in Tioga County
Local Recreational Trails
Conservancy Narrow Gauge Rail Trail around the east side of Eagles Mere Lake in Sullivan County, between the Route 42 and Lakewood Avenue intersection to Lakewood's intersection with Linwood Avenue
Iroquois Trail along the Lehigh Valley Railroad's Montrose Branch through Tunkhannock in Wyoming County, between the Bob Massaker Sports Complex to near Sunnyside Road
Seneca Trail along Bowmans Creek and Route 29 from Jenks Road at the Eaton/ Monroe Township line in Wyoming County to Riverside Park at the Tunkhannock River Bridge
Towanda Riverwalk from Bradford County Veterans Memorial Park along Merrill Parkway to Route 6 in Bradford County
Trolley Trail from Old State Road and U.S. 6/U.S./11/Lackawanna Trail in Clarks Summit to Riverside Drive/SR 2033 near church street at the Keystone College campus in Factoryville, Wyoming County

Source: NTRPDC

The 2019 Bicycle and Pedestrian Plan also acknowledged future improvements and gaps to fill within the region's trail network. Planned trails within the region include:

- Marsh Creek Greenway
- Northern Central Rail Trail
- Bradford County Trail
- Diahoga Trail
- Endless Mountains Trail

Known trail gaps were referenced in data from the Pennsylvania Department of Conservation and Natural Resources. See Figure 26.

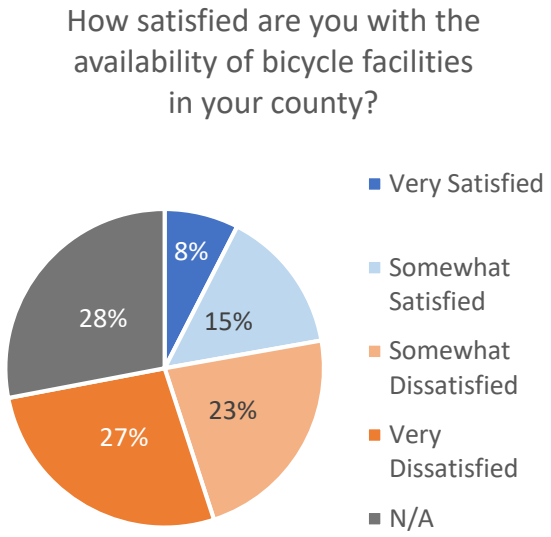
Figure 26: Trail Gaps in the Northern Tier

Gap ID #	Trail System	Name/Location Description	Managed by
133	Loyalsock Trail	North of Laporte section	PA DCNR Bureau of Forestry
78	Mid-State Trail	Charleston Township	Mid-State Trail Association
153	Mid-State Trail	Stony Fork Bridge	Mid-State Trail Association
154	Mid-State Trail	Sand Run Falls Bridge 1	Mid-State Trail Association
171	Mid-State Trail	Sand Run Falls Bridge 2	Mid-State Trail Association
172	Mid-State Trail	Sand Run Falls Bridge 4	Mid-State Trail Association
158	Pine Creek Rail Trail (Triple Trail Divide)	Marsh Creek Greenway	Tioga County Trail Authority
66	Loyalsock State Forest Trail	Connect Loyalsock forestry trails in the Cabbage Hollow area to SGL 12 trails near Sunfish Pond	Highland Lake Snowmobile and Outdoor Recreation Club
94		West of Lake Jean along SR 487	Pennsylvania Cross Country Skiers Association
93	Ricketts Glen State Park Trail		Pennsylvania Cross Country Skiers Association
274	Pine Creek Rail Trail (Triple Trail Divide)	Marsh Creek Greenway, Pine Creek Rail Trail to Wellsboro	Tioga County

Source: PA Department of Conservation and Natural Resources

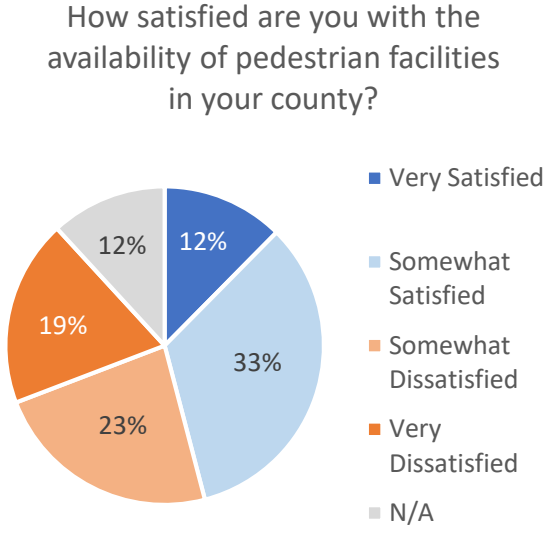
Public Input on Bicycle and Pedestrian Facilities

Two questions regarding the availablity of bicycle and pedestrian facilities were included in the Fall 2019 transportation survey; responses are summarized below. The survey report with results by county and respondent comments is provided in Appendix E.



Comments by Category

- Facilities lacking or nonexistent (38 comments)
- Narrow shoulders (18 comments)
- Safety hazard (15 comments)
- No sharrows or signage (11 comments)
- Off-road trails (5 comments)
- Education (laws, awareness, culture, etc.) (4 comments)
- No bike racks (4 comments)
- On-road accommodations (4 comments)
- Rural terrain (3 comments)
- Other (20 comments)



Comments by Category

- Facilities lacking or nonexistent (21 comments)
- Sidewalk maintenance (rough, uneven, etc.) (18 comments)
- No sidewalks (18 comments)
- Driver inattention (not yielding to peds) (15 comments)
- Pedestrian traffic controls (crosswalks, push button signals, etc.) (9 comments)
- Narrow shoulders (6 comments)
- Safety hazard (3 comments)
- Other (9 comments)

Chapter 4: Performance Measures and Targets

The Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America's Surface Transportation Act (FAST Act) require transportation performance management—a strategic approach that uses data to make investment and policy decisions to achieve national performance goals.

NTRPDC is required to report its regional transportation performance management as plans are updated. NTRPDC has agreed to plan and program projects in support of the PennDOT established targets for federally required performance measures. This chapter reviews recent performance data and includes the current performance measures and performance targets to fulfill this requirement.

Performance Measures

Title 23, Part 490, of the Code of Federal Regulations (23 CFR 490) outlines the national performance goals for the Federal-Aid program. It establishes the **seven goal areas:**

1. Safety
2. Infrastructure Condition
3. Congestion Reduction
4. System Reliability
5. Freight
6. Environmental Sustainability
7. Reduced Project Delivery Delay

The regulations required the Federal Highway Administration (FHWA) to establish final rules on performance measures. The final rules address the seven areas in legislation, identifying the following as performance measures for the system:

- Fatalities and serious injuries, both number and rate per vehicle mile traveled, on all public roads
- Pavement condition on the Interstate Highway System and on the remainder of the National Highway System (NHS)
- Performance (system reliability) of the Interstate system and the remainder of the NHS
- Bridge condition on the NHS
- Traffic congestion
- Freight movement on the Interstate system
- On-road mobile source emissions

PennDOT, in cooperation with MPOs/RPOs, established three series of performance measures per 23 CFR 450.314(h):

- **PM1** Measures: safety performance
  - Adopted by Northern Tier RPO December 11, 2017
- **PM2** Measures: NHS pavements, bridges carrying the NHS, and Interstate pavements
  - Adopted by Northern Tier RPO October 15, 2018
- **PM3** Measures: reliability performance of the NHS, freight movement on Interstates, and Congestion Mitigation and Air Quality Improvement (CMAQ) Program
  - Adopted by Northern Tier RPO October 15, 2018

Performance Targets

NTRPDC opted to adopt and support the statewide performance targets developed by PennDOT.

PennDOT executives and staff from PennDOT's Center for Program Development and Management (CPDM), Bureau of Maintenance and Operations (BOMO), Bureau of Project Delivery (BPD), Engineering Districts, and MPOs/RPOs coordinate to ensure the Statewide Long-Range Transportation Plan (LRTP), Statewide Transportation Improvement Program (STIP), regional Transportation Improvement Programs (TIPs), and regional LRTPs are developed and amended to meet the performance-based planning and programming requirements. This coordination ensures consistency in setting targets to the maximum extent possible. Each MPO/RPO either establishes its own quantifiable targets or adopts the state targets. NTRPDC opted to adopt and support the statewide targets developed by PennDOT.

PM1: Safety Performance

Measures and Targets

FHWA's Safety PM Final Rule[1] establishes five performance measures, calculated as five-year rolling averages:

- Number of Fatalities

[1] The FHWA final rules for the National Performance Management Measures: Highway Safety Improvement Program (Safety PM) and Highway Safety Improvement Program (HSIP) were published in the Federal Register (81 FR 13881 and 81 FR 13722) on March 15, 2016, and became effective on April 14, 2016. The Safety PM Final Rule, also referred to as PM1 Final Rule, establishes safety performance measure requirements for carrying out the HSIP and assessing fatalities and serious injuries on all public roads.

- Rate of Fatalities per 100 Million Vehicle Miles Traveled (VMT)
- Number of Serious Injuries
- Rate of Serious Injuries per 100 Million VMT
- Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries

Pennsylvania's Strategic Highway Safety Plan (SHSP) is aimed at reducing fatalities and serious injuries on Pennsylvania roadways. It targets priority Safety Focus Areas that have the most influence on improving highway safety throughout the state. The SHSP establishes Pennsylvania's statewide goals for reducing fatalities and serious injuries.

Northern Tier Safety Conditions

The Northern Tier region has consistently had fatality rates higher or equal to the statewide rate.

In line with changing federal standards for guiderail and guiderail end treatments, PennDOT plans to upgrade these devices across the roughly 40,000-mile state-maintained highway network. The three year process began in 2019 to replace these guiderail and end treatments to meet the new standards adopted by the American Association of State Highway Transportation Officials' (AASHTO). Along with the anticipated upgrades, PennDOT plans to improve data collection for identifying maintenance needs for guiderails, corrective measures processes, and guiderail end of service life assessments.

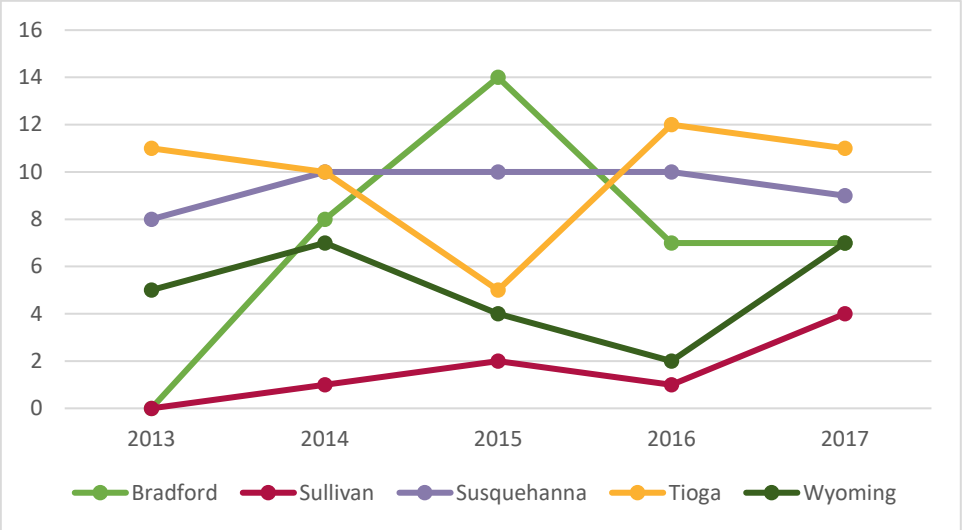
Data from PennDOT's Crash Information Tool show that traffic fatalities in the region declined slightly from 2013 to 2016 but increased again in 2017, to one fatality more than the 2013 figure. Bradford County is the only county to have fewer traffic fatalities in 2017 than in 2013. Throughout the region, the fatality rate mirrors the trend seen in total fatalities. Statewide, the fatality rate remained constant during the five-year time period, at 1.1. The Northern Tier region has consistently had fatality rates higher or equal to the statewide rate. The same is true for each county, with three exceptions (Sullivan in 2013, Tioga in 2015, and Wyoming in 2016). Still, Sullivan was the only county to experience a significant increase in fatality rate during the five-year time period, jumping from 0.0 to 5.4. See Table 40 and Figure 27.

Table 40: Traffic Fatalities, 2013 - 2017

	Traffic Fatalities					Fatalities per 100 Million VMT				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Bradford	13	8	14	7	7	2.1	1.3	2.3	1.2	1.2
Sullivan	0	1	2	1	4	0	1.1	2.2	1.3	5.4
Susquehanna	8	10	10	10	9	1.5	1.9	1.8	1.8	1.7
Tioga	11	10	5	12	11	1.9	1.8	0.9	2.4	2.1
Wyoming	5	7	4	2	7	1.8	2.4	1.4	0.7	2.6
Northern Tier	37	36	35	32	38	1.8	1.7	1.7	1.6	1.9
Pennsylvania	1,117	1,107	1,102	1,088	1,083	1.1	1.1	1.1	1.1	1.1

Source: Pennsylvania Crash Information Tool, 2013-2017

Figure 27: Traffic Fatalities by County, 2013 - 2017



Source: Pennsylvania Crash Information Tool, 2013-2017

Despite a significant decline in 2015, serious injuries as a result of vehicular crashes have risen in the region since 2013. All counties except Susquehanna have shown either the same or an increase in the number of serious injuries resulting from crashes between 2013 and 2017. Serious injuries statewide have also significantly risen. Rate of serious injuries per 100 million VMT has risen 0.8 during the five-year period. Again, Sullivan was the only county to experience a significant increase in serious injury rate during the five-year time period. Even so, the serious injury rate remains higher throughout the region than in Pennsylvania, except for in 2015. Tioga is the only county to have a lower or equal serious injury rate than Pennsylvania as a whole. See Table 41 and Figure 28.

Except for a dip in 2015, the serious injury rate has remained higher throughout the region than in Pennsylvania.

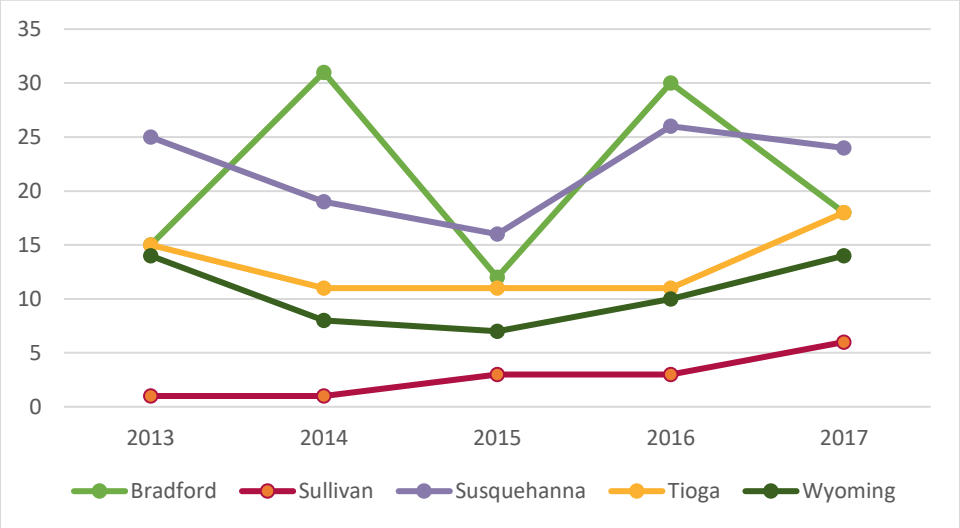
Table 41: Serious Injuries, 2013 - 2017

	Serious Injuries					Serious Injuries per 100 Million VMT				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Bradford	15	31	12	30	18	2.4	4.9	2.0	5.2	3.2
Sullivan	1	1	3	3	6	1.0	1.1	3.2	4.0	8.1
Susquehanna	25	19	16	26	24	4.8	3.6	2.8	4.7	4.4
Tioga	15	11	11	11	18	2.6	2.0	2.0	2.2	3.5
Wyoming	14	8	7	10	14	5.0	2.8	2.5	3.6	5.1
Northern Tier	70	70	49	80	80	3.3	3.4	2.3	4.0	4.1

Pennsylvania	2,715	2,575	2,579	3,691	3,512	2.8	2.6	2.6	3.7	3.5

Source: Pennsylvania Crash Information Tool, 2013-2017

Figure 28: Serious Injuries by County, 2013 – 2017



Source: Pennsylvania Crash Information Tool, 2013-2017

Non-motorized fatalities and "suspected serious injuries" were also calculated using PennDOT's Crash Information Tool. This was achieved by totaling crashes involving a bicycle or a pedestrian that resulted in either a fatality or serious injury. With so few such crashes in the region, no clear trend can be discerned. Crashes involving a horse and buggy were also examined, but none resulting in a fatality or serious injury were found from 2013 to 2017. See Table 42.

Table 42: Non-Motorized Fatalities and Suspected Serious Injuries

	Non-Motorized Fatalities & Serious Injuries				
	2013	**2014**	**2015**	**2016**	**2017**
Bradford	1	3	5	0	2
Sullivan	0	1	0	0	0
Susquehanna	2	3	2	0	0
Tioga	1	1	1	2	1
Wyoming	1	0	0	0	3
Northern Tier	5	8	8	2	6
Pennsylvania	547	494	552	701	710

Source: Pennsylvania Crash Information Tool, 2013-2017

Northern Tier Safety Performance Analysis

Table 43 compares baseline data and targets for Northern Tier's safety performance measures using five-year rolling averages, which are more reliable indicators of trends than single-year data. Baseline data is drawn from historical safety data; targets were established by PennDOT.

Comparing the 2013-2017 average to the 2014-2018 average shows that the number of fatalities has decreased. However, the decline in fatality rate was negligible due to declining total traffic volumes. Conversely, the number of serious injuries, the serious injury rate, and the number of non-motorized fatalities and serious injuries have increased.

Safety performance in the Northern Tier will need to improve to meet targets for number of fatalities and the fatality rate.

Comparing the 2014-2018 baseline data to the 2016-2020 target shows that safety performance in the Northern Tier will need to improve to meet targets for number of fatalities and the fatality rate. However, the Northern Tier is already meeting or exceeding the performance targets for number of serious injuries, serious injury rate, and number of non-motorized fatalities and serious injuries.

Table 43: Safety Performance Targets

Performance Measure (5-Year Rolling Averages)	as of August 2018	as of August 2019	
	NT 2013-2017 Baseline	NT 2014-2018 Baseline	NT 2016-2020 Target
PM1 Number of Fatalities	38.8	36.6	32.8
PM1 Fatality Rate per 100 Million VMT	1.89	1.80	1.65
PM1 Number of Serious Injuries	75.8	80.6	96.8
PM1 Serious Injury Rate per 100 Million VMT	3.68	3.98	4.87
PM1 Number of Non-Motorized Fatalities and Serious Injuries	5.6	6.2	6.3

Source: PennDOT

PM2: Pavement & Bridge Performance

Pavement

Measures

FHWA's pavement performance measures[2] are:

- Percentage of NHS Interstate pavements in good condition
- Percentage of NHS Interstate pavements in poor condition
- Percentage of NHS non-Interstate pavements in good condition
- Percentage of NHS non-Interstate pavements in poor condition

Pavement performance measures required for FHWA reporting are described in Table 44 and include the following four distress components:

- **International Roughness Index (IRI) –** Quantifies how rough pavement is by measuring the longitudinal profile of a traveled wheel track and generating a standardized roughness value in inches per mile
- **Cracking –** Measures the percentage of pavement surface that is cracked
- **Rutting –** Measures the depth of ruts (surface depression) in bituminous pavement in inches
- **Faulting –** Quantifies how bumpy concrete pavement is by measuring the difference in elevation across transverse concrete pavement joints in inches

Table 44: FHWA Pavement Performance Measure Thresholds

Rating	Good	Fair	Poor
IRI (inches/mile)	<95	95-170	>170
Cracking Percentage	<5	CRPC*: 5-10 Jointed: 5-15 Asphalt: 5-20	CRPC*: >10 Jointed: >15 Asphalt: >20
Rutting (inches)	<0.2	0.2-0.4	>0.4
Faulting (inches)	<0.1	0.1-0.15	>0.15

*CRCP – Continuously Reinforced Concrete Pavements

Source: 2018 Performance Measures Annual Report

2 The FHWA final rule for the National Performance Management Measures; Assessing Pavement Condition for the National Highway Performance Program and Bridge was published in the Federal Register (82 FR 5886) on January 18, 2017, and became effective on February 17, 2017. This final rule was the second in a series of three related rulemakings that together establishes a set of performance measures for State DOTs and MPOs to use as required by MAP–21 and the FAST Act.

Three of these distress components apply to each pavement type (bituminous or concrete). A pavement is considered to be in good condition if all three of its distress components are rated as good. A pavement segment is considered to be in poor condition of two or more of its distress components are rated as poor.

The condition of the highway network is important to the operating efficiency of the system. PennDOT maintains condition information on all state-owned roads, assessing certain highways every year and others by sample, and reports the data in annual performance reports, statewide and by planning region.

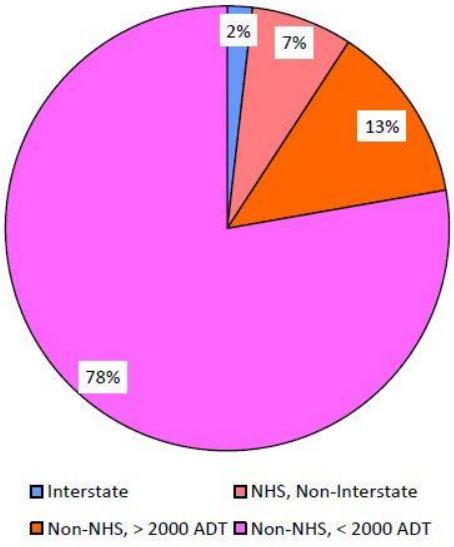
In addition to the individual distress components described above, roadway condition is assessed according to its Overall Pavement Index (OPI)—a more complete measure that reflects IRI as well as structural, surface distress, and safety factors.

Northern Tier roadways generally have poorer overall pavement condition ratings, not just issues with rough pavement surfaces.

Northern Tier Pavement Conditions

Figure 29 reviews the percentage of Northern Tier pavement miles by roadway classification. The large majority of roads in the region are non-NHS with Average Daily Traffic (ADT) less than 2,000 vehicles. Only 2 percent of roadway miles are Interstate.

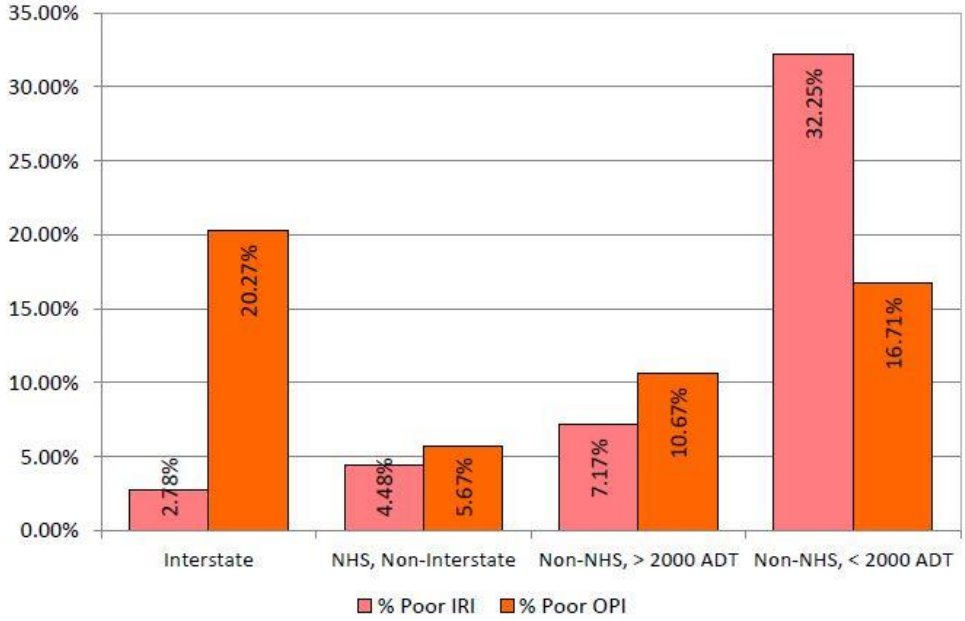
Figure 29: PennDOT Network Miles in Northern Tier



Source: 2018 Performance Measures Annual Report

Error! Not a valid bookmark self-reference. illustrates "poor" ratings by roadway classification. Poor IRI and OPI is highest among the Northern Tier's dominant roadway type—non-NHS roadways with less than 2,000 ADT. In all other roadway categories, percentage of poor OPI is higher than percentage poor IRI. This means that Northern Tier roadways generally have poorer overall pavement condition ratings, not just issues with rough pavements.

Figure 30: Percentage of Poor IRI and Poor OPI in the Northern Tier

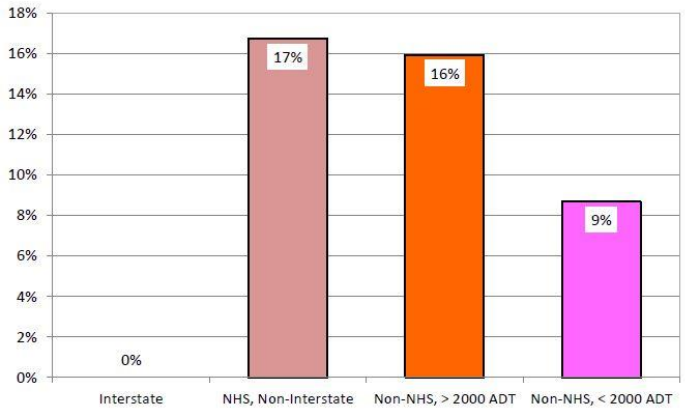


Source: 2018 Performance Measures Annual Report

There are many road segments where, due to insufficient funding, the pavement continues to be used without benefit of the rehabilitation treatments needed to maxmize the functional service life, or roadway life cycle. These are known as "out-of-cycle" segments. In many cases, Northern Tier roadways are getting by on less-than-ideal preventative maintenance due to low traffic volumes.

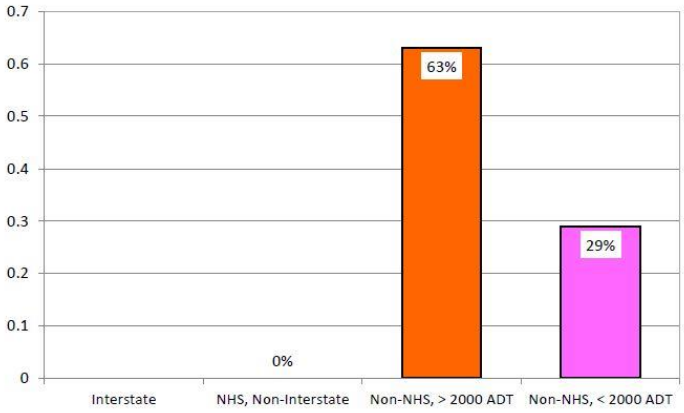
PennDOT programs preventative maintenance primarily based on traffic volumes. Low level bituminous routes are those routes that typically have an average dailiy traffic (ADT) volume of less than 3000 and an average dailiy truck traffic (ADTT) volume of less than 150. If either the ADT or ADTT is higher than the threshold then they are considered high level routes. Low level routes receive a seal coat at least every 7 years and are paved at most every 20 years. High level routes are typically paved in the range of 12 to 17 years range, longer with an interim microsurfacing. Figure 31 and Figure 32 illustrate high-level and low-level bituminous out-of-cycle miles.

Figure 31: Percentage of High-Level Bituminous Miles Out-of-Cycle in the Northern Tier



Source: 2018 Performance Measures Annual Report

Figure 32: Percentage of Low-Level Bituminous Miles Out-of-Cycle in the Northern Tier



Source: 2018 Performance Measures Annual Report

Targets

MAP-21 and the FAST Act require each state to develop and implement a Transportation Asset Management Plan (TAMP) in accordance with 23 U.S.C. 119. The intent is to encourage states to achieve and sustain a state of good repair over the life cycle of transportation assets and to preserve or improve the condition of the National Highway System (NHS).

Pennsylvania established a TAMP Steering Committee with representation from PennDOT's Executive staff, Engineering Districts, Asset Management Division, Center for Program Development and Management, Bureau of Planning and Research, Highway Safety and Traffic Operations Division, FHWA, the Pennsylvania Turnpike Commission (PTC), and

MPOs/RPOs. The workgroup's purpose is to manage and coordinate the development, submission, and implementation of the TAMP, and the pavement and bridge condition performance measures. PennDOT CPDM, BOMO, Engineering Districts, and the MPOs/RPOs will continue to utilize the committee to coordinate the State's pavement and bridge condition target-setting. Information discussed as part of the committee is shared at Statewide Planning Partner Meetings and conference calls.

The TAMP commits Pennsylvania to meeting federal asset condition targets; projects in each regional LRTP are prioritized to meet these targets.

Northern Tier Pavement Performance Analysis

Table 45 and Table 46 summarize the IRI and OPI ratings across the region, as reported in the 2018 Performance Measures Annual Report for Pavements. Figure 33 and Figure 34 show good, fair, and poor condition percentages for all NHS Interstate and NHS non-Interstate miles in Pennsylvania. These pie charts were included to allow for comparison between statewide and regional performance. As shown in Table 45 and Table 46, 26.2 percent of the region's total roadways have poor IRI ratings, while 15.1 percent have poor OPI ratings. These tables also show that higher-order highways are better maintained than non-NHS highways with less than an average of 2,000 daily trips. Prioritizing funding for the maintenance of the NHS system is necessary to meet federal minimum condition thresholds for the NHS.

Table 45: Northern Tier Pavement Smoothness (IRI)

Business Plan	Excellent		Good		Fair		Poor		Median	Tested
Network	Seg-Mi	%	Seg-Mi	%	Seg-Mi	%	Seg-Mi	%	IRI	Seg-Mi
Interstate	29.4	54.41%	8.1	15.09%	15.0	27.72%	1.5	2.78%	68	54.0
NHS, Non-Interstate	114.4	52.58%	67.6	31.04%	25.9	11.90%	9.8	4.48%	74	217.7
Non-NHS, ≥ 2000 ADT	216.1	54.58%	112.6	28.44%	38.8	9.81%	28.4	7.17%	93	395.9
Non-NHS, < 2000 ADT	477.2	21.40%	575.9	25.82%	457.8	20.53%	719.3	32.25%	183	2,230.2
Total - Roadway	837.1	28.89%	764.2	26.37%	537.5	18.55%	758.9	26.19%	144	2,897.7

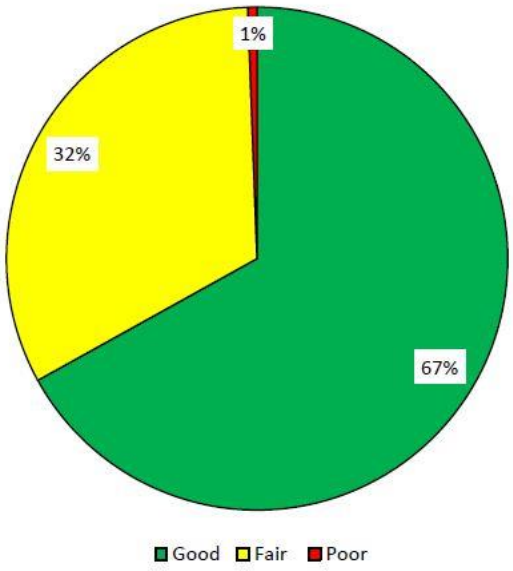
Source: 2018 Performance Measures Annual Report

Table 46: Northern Tier Overall Pavement Index (OPI)

Business Plan	Excellent		Good		Fair		Poor		Median
Network	Seg-Mi	%	Seg-Mi	%	Seg-Mi	%	Seg-Mi	%	OPI
Interstate	22.4	41.41%	14.2	26.26%	6.5	12.06%	10.9	20.27%	95
NHS, Non-Interstate	37.8	17.56%	136.0	63.15%	29.4	13.62%	12.2	5.67%	90
Non-NHS, ≥ 2000 ADT	153.6	39.09%	130.1	33.10%	67.4	17.15%	41.9	10.67%	89
Non-NHS, < 2000 ADT	687.6	30.94%	806.5	36.30%	356.6	16.05%	371.4	16.71%	78
Total - Roadway	901.4	31.25%	1,086.8	37.68%	459.8	15.94%	436.4	15.13%	83

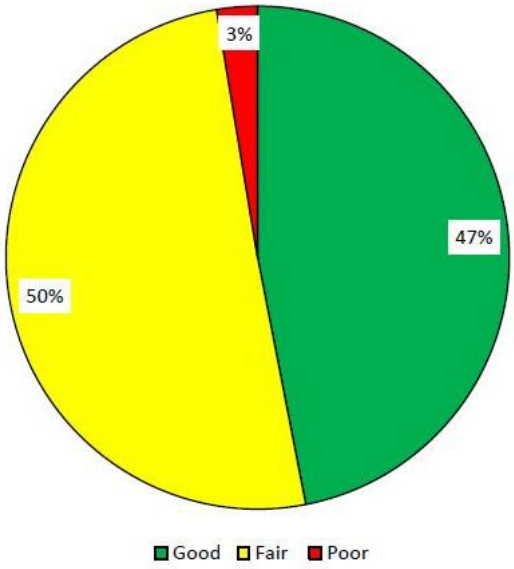
Source: 2018 Performance Measures Annual Report

Figure 33: PA NHS Interstate Performance



Source: 2018 Performance Measures Annual Report

Figure 34: PA NHS Non-Interstate Performance



Source: 2018 Performance Measures Annual Report

Table 47: Northern Tier Pavement Performance Measures

Business Plan Network	MAP-21 Pavement Performance Measure											
	Good				Fair		Poor				Missing (Max 5%)	
	Miles	%	2020 Target	2022 Target	Miles	%	Miles	%	2020 Target	2022 Target	Miles	%
Interstate	35.5	66.96%	-	50%	17.2	32.45%	0.3	0.59%	-	5%	0.1	0.18%
NHS, Non-Interstate	99.0	46.94%	46%	50%	106.4	50.45%	5.5	2.61%	4%	5%	4.0	1.84%

Source: 2018 Performance Measures Annual Report

Table 48 compares the Northern Tier's 2018 pavement conditions[3] with 2022 statewide target conditions set by PennDOT. Both NHS Interstate and NHS non-Interstate highway pavement in poor condition in the region currently meet (are lower than) the targets for 2022. The percentage of Interstate highway pavement in good condition meets (is higher than) the target well. However, the region has not yet met the 2022 target for NHS non-Interstate highway pavement in good condition. In order for the region to meet its target, the percentage of NHS non-Interstate pavement in good condition must increase by 3.1 percent by 2022.

The percentage of NHS non-Interstate pavement in good condition must increase by 3.1 percent by 2022 to meet the target.

Table 48: Pavement Performance Targets

Performance Measure	2018 NT Baseline	2022 PA Target
PM2 Percentage of highway pavement in poor condition (maximum)		
• **NHS Interstate**	0.6	5.0
• **NHS Non-Interstate**	2.6	5.0
PM2 Percentage of highway pavement in good condition		
• **NHS Interstate**	66.7	50.0
• **NHS Non-Interstate**	46.9	50.0

Source: PennDOT

[3] For the Interstate and NHS, Non-Interstate Business Plan Networks, the IRI and OPI data is for 2018. For the Non-NHS Business Plan Networks, the IRI and OPI data for recent year captured, either 2017 or 2018.

Bridges

Measures

The FHWA final rule for the National Performance Management Measures; Assessing Pavement and Bridge Condition for the National Highway Performance Program, was published in the Federal Register (82 FR 5886) on January 18, 2017, and became effective on February 17, 2017.

This final rule was the second in a series of three related rulemakings that together establish a set of performance measures for State DOTs and MPOs to use as required by MAP–21 and the FAST Act.

The bridge performance measures are:

- Percentage of NHS bridges by deck area classified in good condition
- Percentage of NHS bridges by deck area classified in poor condition

The FHWA final rulemaking also established performance measures for all mainline Interstate Highway System and NHS non-Interstate bridges regardless of ownership or maintenance responsibility, including bridges on ramps connecting to the NHS and NHS bridges that span a state border. FHWA's performance measures aim to assess bridge condition by deriving the percentage of NHS bridges rated in good and poor condition by deck area. FHWA requires that no more than 10 percent of a state's total NHS bridge deck area be in poor condition and that no more than 5 percent of a state's bridge data be unreported or missing.

Separate bridge structure condition ratings are collected for deck, superstructure, and substructure components during regular inspections using the National Bridge Inventory (NBI) standards. For culvert structures, only one condition rating is collected (the culvert rating). A rating of 9 to 0 on the FHWA condition scale is assigned to each component. Based on its score, a component is given a good, fair, or poor condition score rating. A structure's overall condition rating is determined by the lowest rating of its deck, superstructure, substructure, and/or culvert. If any of the components of a structure qualify as poor, the structure is rated as poor.

Table 49 summarizes the FHWA scoring system for bridge condition metrics for deck, superstructure, substructure, and culvert components.

Table 49: Bridge Performance Measures

Rating	Good	Fair	Poor
Deck	≥7	5 or 6	≤4
Superstructure	≥7	5 or 6	≤4
Substructure	≥7	5 or 6	≤4
Culvert	≥7	5 or 6	≤4

Source: 2018 Performance Measures Annual Report

Northern Tier Bridge Conditions

Table 50 shows that only one of 33 bridges on the Interstate system and four of 157 bridges on the NHS system in the Northern Tier region (roughly 3 percent of each) are in poor condition. These bridges represent a very small percentage of the deck area in each of their roadway classification categories. However, another 7 Interstate bridges and 21 NHS bridges are rated at the low end of the fair condition rating scale.

There are many more state bridges on the non-NHS system in poor condition: 23 on non-NHS roads with > 2000 ADT and 154 on non-NHS roads with < 2000 ADT. As seen by comparing Figure 35 and Figure Figure 36, the percentage of total deck area that these poor bridges represent is smaller than the percentage of total bridges in each of their roadway classification categories. Again, many more of these non-NHS bridges are nearing a poor condition rating.

Very few bridges on the NHS system in the Northern Tier are in poor condition. Many more state bridges on the non-NHS system are in poor condition.

Interstate Bridges rated as Poor:

- BRKEY: 32207; I-81, Segment 2261; over a tributary to Lick Creek at mile 225; New Milford Township Susquehanna, County

Non-Interstate NHS Bridges rated as Poor:

- BRKEY: 32203; I-81, Segment 2235; over Township Route 492; in New Milford Township, Susquehanna, County
- BRKEY: 32762; US 6, Segment 500; over Morris Branch; Borough of Wellsboro, Tioga County
- BRKEY: 32759; US 6, Segment 460; over a tributary to Charleston Cree; 0.75 miles north of Wellsboro, Tioga County
- BRKEY: 37084; US 6, Segment 570; over a tributary to the South Branch of Tunkhannock Creek 500' west of Township Route 107; in Clinton Township, Wyoming County

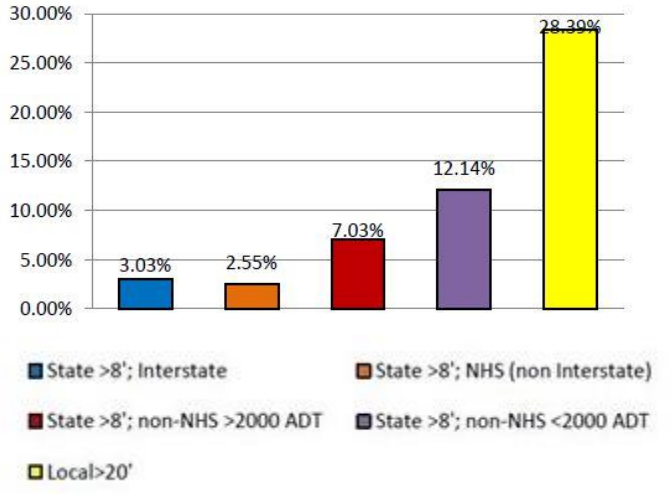
Local bridges have the highest number of bridges in poor condition (90) and the highest percentage of poor-condition deck area (19.5 percent) of all roadway classification categories. Ninety bridges or 28 percent of local bridges ≥ 20 feet are in poor condition. These facilities often carry very low traffic volumes, though even a few vehicles (e.g., logging trucks, agricultural wagons, etc.) can represent a significant contribution to the economy.

Table 50: Current Status of Northern Tier Bridges Greater than 8 Feet Long

Business Plan Network	Total Bridge Count	Total Deck Area (Msf)	Aver. Bridge DA (sf)	Closed Bridges	Posted Bridges	Poor Count	% Poor by Count	Poor-Deck Area (Msf)	% Poor by Deck Area	Non-Poor Bridges with a "5" Condition Rating
State ≥8'; Interstate/Ramps	33	0.2409	7,299	0	0	1	3.03%	0.0070	2.90%	7
State ≥8'; NHS (non-Interstate)	157	1.2631	8,045	0	0	4	2.55%	0.0025	0.20%	21
State ≥8'; non-NHS > 2000 ADT	327	1.2113	3,704	0	3	23	7.03%	0.0293	2.42%	93
State ≥8'; non-NHS < 2000 ADT	1,269	1.5752	1,241	9	28	154	12.14%	0.1477	9.38%	358
Total - State Bridges (≥8')	**1,786**	**4.2904**	**2,402**	**9**	**31**	**182**	**10.19%**	**0.1865**	**4.35%**	**479**
Local≥20'	317	0.4263	1,345	14	81	90	28.39%	0.0833	19.55%	90

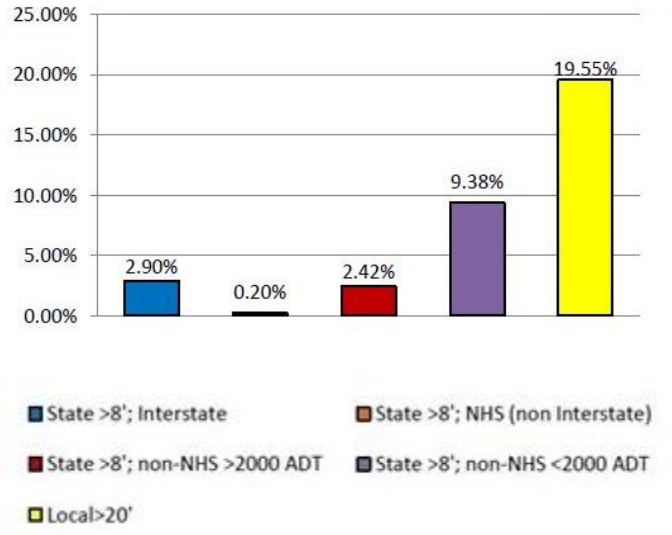
Source : 2018 Performance Measures Annual Report

Figure 35: Percentage of Poor Northern Tier Bridges by Roadway Classification (by Count)



Source: 2018 Performance Measures Annual Report

Figure 36: Percentage of Poor Northern Tier Bridges by Roadway Classification (by Deck Area)



Source: 2018 Performance Measures Annual Report

Targets

Pennsylvania's bridge condition targets are established by the TAMP Steering Committee as described under pavement targets.

The region currently meets targets for maximum percentage of NHS bridges in poor condition and minimum percentage of NHS bridges in good condition.

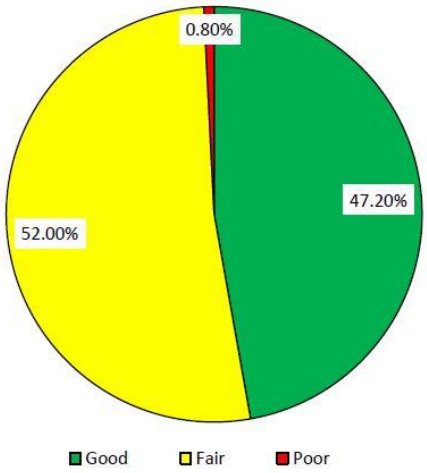
Northern Tier Bridge Performance Analysis

There are 125 NHS Interstate and NHS non-Interstate bridges in the region. Of the region's entire NHS > 20-foot bridge network, 59 are in good condition. Slightly more (65) are in fair condition, and one is rated in poor condition. Whether analyzing by number of bridges or by deck area, the majority of the region's NHS non-Interstate bridges are in good condition, but the majority of the region's NHS Interstate bridges are only in fair condition.

Other comparisons do yield considerable differences between data by bridge count and deck area. For example, based on deck area, 61 percent of the region's bridges are in good condition, which is 14 percent higher than the number (count) of bridges in good condition. This means that large bridges are better maintained than smaller bridges; note that all bridges in this analysis are still greater than 20 feet long. Figure 37 and

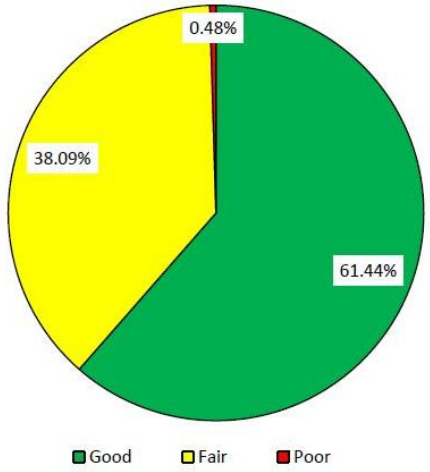
Figure 38 depict the data provided in Table 51, with the pie charts separated by count and deck area for easy comparison.

Figure 37: Northern Tier NHS > 20 ft Bridge Performance (by Count)



Source: 2018 Performance Measures Annual Report

Figure 38: Northern Tier NHS > 20 ft Bridge Performance (by Deck Area)



Source: 2018 Performance Measures Annual Report

Table 51: Northern Tier Bridge Performance Measures, NHS Bridges > 20 feet

	Good				Fair				Poor			
Business Plan Network	Count	Count %	Deck Area (Msf)	Deck Area %	Count	Count %	Deck Area (Msf)	Deck Area %	Count	Count %	Deck Area (Msf)	Deck Area %
Interstate	3	10.34%	0.013	5.56%	25	86.21%	0.217	91.50%	1	3.45%	0.007	2.95%
NHS, Non-Interstate	56	58.33%	0.890	72.19%	40	41.67%	0.343	27.81%	0	0.00%	0.000	0.00%
Total NHS	59	47.20%	0.903	61.44%	65	52.00%	0.560	38.09%	1	0.80%	0.007	0.48%

Source: 2018 Performance Measures Annual Report

Table 52 compares Northern Tier's 2018 bridge conditions with 2021 target conditions set by PennDOT. The region currently meets both targets for maximum percentage of NHS bridges in poor condition and the minimum percentage of NHS bridges in good condition.

Table 52: Bridge Performance Baseline and Targets

Performance Measure	2018 NT Baseline	2021 PA Target
PM2 Percentage of NHS bridges with Poor Condition (Deck Area)	0.5	3.0
PM2 Percentage of NHS bridges with Good Condition (Deck Area)	61.4	26.0

Source: PennDOT

PM3: System Performance

Measures

The FHWA final rule for the National Performance Management Measures; Assessing Performance of the National Highway System, Freight Movement on the Interstate System, and Congestion Mitigation and Air Quality Improvement Program was published in the Federal Register (82 FR 5970) on January 18, 2017, and became effective on May 20, 2017.

This final rule was the third in a series of three related rulemakings that together establish a set of performance measures for State DOTs and MPOs to use as required by MAP-21 and the FAST Act. The measures in this third and final rule will be used by State DOTs and MPOs to assess the performance of the NHS Interstate and NHS non-Interstate bridges and pavements for the purpose of carrying out the NHPP; to assess freight movement on the Interstate Highway System; and to assess traffic congestion and the on-road mobile source emissions for the purpose of carrying out the Congestion Mitigation and Air Quality Improvement (CMAQ) Program. These system performance measures are collectively referred to as the PM3 measures.

The PM3 measures are:

- Percentage of person-miles traveled on the Interstate System that are "reliable"
- Percentage of person-miles traveled on the NHS non-Interstate system that are reliable
- Interstate System Truck Travel Time Reliability Index
- Annual Hours of Peak-Hour Excessive Delay (PHED) per capita
- Percentage of non-single-occupant-vehicle (SOV) travel
- On-road mobile source emissions reduction for CMAQ-funded projects

Targets

Reliability is measured using the Regional Integrated Transportation Information Tool (RITIS) analysis platform and currently does not directly produce data for MAP-21 measures for RPO areas. Therefore, baseline conditions for the Northern Tier are not yet available. Additionally, the annual hours of excessive delay and non-SOV travel measures are only required for the Pittsburgh (SPC) and Philadelphia (DVRPC) urbanized areas. CMAQ emission targets are produced statewide and for MPO/RPOs that are in nonattainment or maintenance of the National Ambient Air Quality Standards. The Northern Tier is in attainment of these standards and therefore is not required to set regional targets. See

Table 53.

Baseline reliability conditions for the Northern Tier are not yet available.

Table 53: System Performance Targets

Performance Measure	2017 NT Baseline	2021 PA Target
PM3 Reliability		
1. Interstate	N/A	89.8%
2. Non-Interstate	N/A	87.4%
3. Truck	N/A	1.34%
PM3 Delay		
1. Percentage Peak Hour Excessive Delay (Hours per Capita)	N/A	N/A
PM3 Non-SOV Travel		
1. Percentage Non-Single-Occupant-Vehicle Travel	N/A	N/A
PM3 CMAQ Emissions (kg/day)		
1. VOC Emissions	N/A	201.7
2. NO_x Emissions	N/A	612.8
3. $PM_{2.5}$ Emissions	N/A	20.5
4. PM_{10} Emissions	N/A	17.5
5. CO Emissions	N/A	1135.4

Source: PennDOT

Performance Targets Summary

Table 54 summarizes the Safety (PM1) and Pavement & Bridge (PM2) performance measures and targets applicable to the Northern Tier. Only two performance targets have yet to be achieved: "Number of Non-Motorized Fatalities and Serious Injuries" and "Percentage of NHS Pavement with Good IRI."

Poor IRI is highest on non-NHS roads with < 2,000 ADT; excellent IRI is highest on non-NHS roadways with ≥ 2,000 ADT. Good IRI is highest on non-NHS and NHS non-Interstate roads, though all road types have similar ratings. Fair IRI is highest on non-NHS roadways with < 2,000 ADT. Approximately 56 percent of the region's roadways have excellent or good IRI ratings, while 44 percent have fair or poor IRI ratings. For OPI ratings, 67.5 percent of the region's roadways are rated excellent or good.

Non-NHS state bridges > 8 feet with < 2,000 ADT make up the majority of the region's bridges by both count (60 percent) and deck area (34 percent). Local bridges > 20 feet and non-NHS state bridges > 8 feet with < 2,000 ADT make up 76 percent of the region's bridges by count, but only 43 percent by deck area.

Table 54: Performance Measures and Targets Summary

Safety Measures and targets are based on 5-year rolling averages	NT Measure 2014-2018	NT Target 2016-2020
PM1 Number of Fatalities	36.6	32.8
PM1 Fatality Rate (per 100 Million VMT)	1.81	1.65
PM1 Number of Serious Injuries	80.6	96.8
PM1 Serious Injury Rate (per 100 Million VMT)	3.9	4.8
PM1 Number of Non-Motorized Fatalities and Serious Injuries	6.2	6.3
Pavement and Bridge Measures and targets are published annually	**NT Measure 2018**	**PA Target 2021**
PM2 Percentage of highway pavement with Poor IRI		
• **NHS Interstate**	0.6%	5.0%
• **NHS Non-Interstate**	2.6%	5.0%
PM2 Percentage of highway pavement with Good IRI		
• **NHS Interstate**	66.7%	50.0%
• **NHS Non-Interstate**	46.9%	50.0%
PM2 Percentage of NHS bridges with Poor Condition (Deck Area)	0.5%	3.0%
PM2 Percentage of NHS bridges with Good Condition (Deck Area)	61.4%	26.0%

Source: PennDOT

Local Performance Measures

In addition to the required performance measures, the Northern Tier may adopt local performance measures that reflect important milestones or factors in the region's transportation planning. NTRPDC staff has identified two local performance measures, listed in Table 55.

Table 55: Local Performance Measures

Local Performance Measures	2019 Baseline	2023 Target
1. **Rate of local bridge improvements (e.g., # completed in the last five years)**	#	9
2. **Percentage of municipalities participating in PennDOT service programs**		
A. **LTAP (average annual municipal attendance)**	80	80

Source: NTRPDC

Chapter 5: Regional Direction

The five counties of the Northern Tier have similar yet independent policies on community development, economic development, and environmental protection. These plans and policies are summarized below. Economic development is further planned and supported at the regional level as the Comprehensive Economic Development Strategy (or CEDS) for the Northern Tier. These plans and policies are consistent with a transportation system preservation and service expansion approach. The 2018 Bradford County Comprehensive Plan, 2011 Sullivan County Comprehensive Plan, 2018 Susquehanna County Comprehensive Plan, 2017 Tioga County Comprehensive Plan, and the 2019 Wyoming County Comprehensive Plan were referenced when developing these values.

Community Development

Communities of the Northern Tier generally welcome incremental expansion of established communities, improvement to housing conditions, and reinvestment in communities that have experienced decline. They discourage development that displaces their their historic building stock, and working farmland and woodlands on a large scale.

It is important to note that many Northern Tier communities were established when local transportation was by foot, wagon, or rail. Buildings at that time were constructed of wood, brick, or stone—materials available as or able to be cut into small units which could be assembled into intricate patterns on a building façade. Many residents and community leaders envision structures and public spaces that are compatiable with the historic scale and detailed design of buildings.

Community development values are expressed in county planning documents using language such as:

- Maintain and enhance rural and small-town community character.
- Conserve farmland and woodlands as large blocks of working open space.
- Provide facilities and services to protect the health, safety, and welfare of residents.
- Use, and encourage others to use, sound planning practices.
- Promote well-designed residential and commercial development.
- Enhance telecommunications and community infrastructure.
- Encourage volunteerism to serve needs among the population.

Communities of the Northern Tier generally welcome incremental expansion and reinvestment in their communities and discourage development and infrastructure that displaces their historic building stock, and working farmland and woodlands on a large scale.

Economic Development

Communities appreciate the rural landscape for its scenic qualities as well as for its economic value, e.g., agriculture and forestry. They view minimal regulation as key to the sustainability of these industries. Manufacturing retains a foothold in the region, particularly for industries that rely on raw materials derived from agriculture and forestry. Commercial and community services, however, provide the majority of employment opportunities in the region today. Due to the fact that communities are small and dispersed, businesses that provide these services are typically small with limited wage and career development opportunities. Thus, employment alone does little to attract new workers to the region. In addition, while the region's small towns and rural landscape are appealing to visitors, the area is not widely known as a tourist destination, lacking the national identity and name recognition (and supporting visitor infrastructure) of regions such as the Adirondacks, the Smoky Mountains, or the Rocky Mountains, for example.

Northern Tier communities appreciate their rural working and scenic landscape and support transportation improvements that serve agriculture, forestry, and tourism.

As a result of these values and conditions, county and regional planning documents have established economic development goals such as:

- Support continued use of rural landscapes for agriculture and forestry with minimal regulation.
- Retain and grow business and industry, including the shale gas industry.
- Increase local employment, career development opportunities, and wage rates.
- Attract and retain young professionals.
- Continue to promote potential development sites for businesses.
- Encourage the reclamation and reuse of vacant industrial sites/buildings.
- Revitalize older commercial centers in the boroughs and villages.
- Enhance tourism and recreation that features rural and small-town character.
- Develop a regional identity or brand.

Regional Economic Development Strategy

The Comprehensive Economic Development Strategy (or CEDS) for the Northern Tier (2018) shares a focus on broadband infrastructure and workforce development. Its goals for community revitaliztion and tourism are each supported by strategies to improve walkablity and to develop the regional trail network

Environmental Protection

Communities clearly express a desire to preserve the environment—primarily the natural environment. They outline sensitive natural resources such as floodplains, wetlands, steep slopes, and farmland soils to be protected from development and its impacts. They also value the longevity of buildings and structures, some which have historic significance. These values are expressed in goals and objectives such as:

Northern Tier communities desire to protect the natural and cultural environment from development and its impacts.

- Minimize pollution to air and water—both surface waters and groundwater.
- Minimize erosion of farmland-quality soils, preserve wetlands, and restore stream corridors.
- Minimize loss of forest.
- Implement stormwater and floodplain management, building codes, and zoning to manage impacts.
- Identify and protect historic features, sites, and structures.

Chapter 6: Transportation Goal & Objectives

Transportation Goal

NTRPDC's transportation goal is:

To manage the transportation system in support of communities, economies, and environmental priorities for the present and the future.

Each decision or action by NTRPDC or supported by NTRPDC should relate to this goal.

NTRPDC, serving as the region's Rural Planning Organization (RPO), guides the overall transportation planning and programming process in Bradford, Sullivan, Susquehanna, Tioga, and Wyoming counties. The RPO approves the development and implementation of highways, bridges, transit and other transportation facilities and services.

The Northern Tier RPO, in conjunction with the Pennsylvania Department of Transportation (PennDOT), county governments, local municipalities, regional transit agencies, economic development providers, and local citizens, works to fulfill the regional vision of an efficient and stable transportation network. This will benefit the region as whole by enabling growth in business and employment.

The Northern Tier's transportation objectives address infrastructure, operations, and services; community and economic development; community character; and environmental resources.

Transportation Objectives

The Northern Tier's transportation objectives outline potential means of measurable progress toward the region's overall goal. They address infrastructure, operations, and services; community and economic development; community character; and environmental resources.

Three objectives have been added to each of the sub-sections below in this LRTP update. Each is marked with **(New)**.

Infrastructure & Service Objectives

The infrastructure objectives identify the transportation system conditions of greatest importance to the region and characterize the nature of desired improvement.

1. Reduce risk/improve safety; assess crash data annually.
2. Manage repair and maintenance to prevent more costly rehabilitation or construction work.
3. Reduce congestion and increase efficiency through operational improvements; consider highway capacity improvements as a last alternative.

4. **(New)** Expand infrastructure for carpooling and vanpooling, i.e., park-n-ride lots.
5. Accelerate project delivery, especially local bridge improvements.
6. **(New)** Work with county maintenance managers to coordinate with the County 6 Year Plan and TIP program and discuss county maintenance needs for best use of available funds.
7. **(New)** Manage stormwater (floodwaters).
8. Improve connectivity between existing bicycle and pedestrian facilities.
9. Support the maintenance of rail infrastructure, including rail right-of-way.
10. Support the provision of public transportation services.
11. Consider relocating historic bridges or their adjoining highway facilities to accomplish historic bridge preservation and highway functionality.
12. Strengthen municipal governance and cooperation with regard to local transportation infrastructure.
13. Encourage the formation of formal and informal transportation partnerships to finance highway improvements in support of commercial and industrial development.

Objectives for Community & Economic Development

These objectives identify how the transportation projects and other actions should align with and serve community and economic priorities.

1. Increase accessibility through new or upgraded facilities in conjunction with planned development.
2. **(New)** Improve coordination with counties and municipalities in land development.
3. Maintain, enhance, and/or improve connectivity among and access to schools, parks, community centers ("downtowns" and other hubs), and health care centers.
4. Improve airports' capacity to serve local industry.
5. **(New)** Support railway infrastructure improvements to serve local industries.
6. Promote scenic byways designation as a tool for tourism; support conservation of scenic qualities with corridor management plans.
7. Support county/municipal planning activities with technical assistance and supplemental funding, when available.
8. Support redevelopment of brownfields and other underutilized sites with transportation improvements and enhancements.
9. Ensure emergency vehicle access for new development.

10. **(New)** Coordinate use and activity in the public right-of-way, such as public water, public sewer, utility distribution/transmission, telecommunications and data infrastructure.

11. Support natural gas, agriculture, manufacturing, health care, and travel and tourism with adequate transportation infrastructure; develop industry-specific transportation improvement plans, if appropriate.

Objectives for Sensitive Resources

These objectives identify how transportation studies, plans, and projects should acknowledge, avoid, and mitigate impacts, and enhance local character and sensitive resources.

For Community Character

1. Apply appropriate scale, mapping, design, and details to new construction in designated historic contexts and areas of defined community character.

2. Enhance community character as defined by planning studies.

3. Support the relocation of aboveground utilities to underground in community centers, if desired and documented by the local community.

4. Avoid and minimize impacts to community character as defined by planning studies.

5. **(New)** Protect existing residential neighborhoods.

6. **(New)** Coordinate development across municipal boundaries when appropriate.

For Resource Identification

7. Coordinate with resource agencies to verify the presence and condition of natural and historic/cultural resources at the project site and in its surrounding physical context prior to or during project scoping.

8. Coordinate with public and private conservation organizations to determine if a project site is among conservation priorities (i.e., identified and ranked; no action taken) or in the process of conservation action (i.e., application is complete).

9. Support the ongoing evaluation and designation of historic resources with significance and historical integrity that contribute to community character and heritage tourism.

For Impact Management

10. Avoid and minimize impacts to natural and historic resources.

11. When wetland impacts are unavoidable, mitigate through wetland banking programs.

12. When forest impacts are unavoidable, mitigate through reforestation, riparian buffer plantings, and/or community tree planting projects with priority given to the same watershed. Coordinate with agencies that provide conservation and restoration programs.

For Resource Enhancement

13. Recognize and interpret designated historic transportation structures and their significance to communities, where locally desired.
14. Interpret significant extant and lost resources at off-road facilities, consistent with conservation and tourism planning and in coordination with the resource owner/manager.
15. Enhance access and wayfinding (signage) to resources consistent with conservation and tourism planning and in coordination with the resource owner/manager.
16. Add/enhance water trail access consistent with conservation and tourism planning and in coordination with the resource owner/manager.

Chapter 7: Financial Analysis & Investment Strategy

By federal law, the long-range transportation plan must be "financially constrained" and contain a section outlining the amount of revenue expected over the life of the LRTP. For the LRTP to be financially constrained means that the LRTP (and the TIP, approved separately) must include sufficient financial information 1) to demonstrate that proposed projects can be implemented using committed, available, or reasonably available revenue sources and 2) to provide assurance that the federally supported transportation system is being adequately operated and maintained. For the LRTP, the planning horizon may be no less than 20 years.

Revenue and Cost Estimation Methodology

This LRTP's financial time horizon spans 25 years, from 2021 to 2045. The plan estimates the level of funding that can reasonably be expected over that period, and it shows how the plan's projects can be accommodated within the financial constraint. The following paragraphs outline the sources of revenue expected and the process used to calculate the projected transportation revenue and the estimated project costs.

Inflation and Year of Expenditure

Statewide transportation planning and metropolitan transportation planning regulations require that revenue and cost estimates for the TIP and LRTP use inflation rates to better reflect costs in each "Year of Expenditure." Regulations governing Year of Expenditure require that TIPs and LRTPs account for revenue growth and inflation, and that projects be slotted in the years in which Vby 6he expenditure is expected to occur. Rural planning organizations in Pennsylvania also comply with these regulations.

Highway/Bridge Revenue

Highway and bridge revenue projections are developed based on the most recent federal and state transportation legislation. Fixing America's Surface Transportation (FAST) Act is the most recent federal authorizing legislation and was signed into law on December 4, 2015. Therefore, FAST Act authorization is the best source for developing options for future year federal funding. At the state level, Act 89 of 2013 is providing substantial increases in transportation funding. The state highway/bridge capital revenue was developed using Pennsylvania's 2021 Transportation Financial Guidance as a base for fiscal years 2021–2024. Baseline revenues were then projected through 2045.

The following summarizes the revenue estimation process:

- PennDOT 2021 Financial Guidance includes a baseline of federal highway funds through the FAST Act and estimates future years based on a zero percent annual increase due to the expiration of the FAST Act and uncertainty regarding the Highway Trust Fund. State funds are based on the most recent estimated revenues to the Motor License Fund.

- Revenue figures for the years 2021–2045 were based on PennDOT 2021 Transportation Program Financial Guidance which requires a zero percent increase in anticipated federal funding, and a 2 percent decrease in anticipated state funding after 2032.
- Discretionary funding can include special federal funds or state discretionary funds. Special and discretionay federal funds are usually for specific projects or programs contained in federal reauthorization acts or annual federal appropriations. State discretionary dollars represent 20 percent of total federal Surface Transportation Block Grant Program (STP) funding as well as 15 percent of highway funding, which is reserved for distribution by the Secretary of Transportation to offset the impact of high-cost projects that are beyond a region's allocation. For this plan, there was no discretionary funding assumed.
- Local and private project funding shares are difficult to estimate going forward. Recent TIPs have included minimal amounts of local funds, generally for local bridges. Since these dollars were minimal, no local funding was assumed beyond the projects in the TIP years.

Transit Revenue

The transit revenue baseline was developed using Pennsylvania's 2021 Transportation Financial Guidance as a base for the TIP years 2021–2024. Federal transit funds coming to the region are generally Section 5311, non-urbanized and rural apportionments, which come through PennDOT. Since there is no guaranteed funding to this region for future years, no assumptions were made beyond 2024.

Revenue Projections

The resulting revenue estimates for highway, bridge and transit project funding are summarized in Table 56 and detailed in Table 57 for PennDOT's Twelve-Year Program (TYP) (three four-year TIP periods) plus the long-range or "out years" of the plan.

Table 56: Summary Highway/Bridge/Transit Revenue Estimates, Northern Tier (in thousands)

Period	Federal Highway/Bridge	State Highway/Bridge	State Transit	Total
Short-Term (Actual) 1st Four Yrs of 2021 TYP (FY 2021-2024)	$70,991	$89,781	$11,684	**$172,456**
Mid-Term 2nd & 3rd Four Yrs of 2021 TYP (FY 2025-2032)	$131,909	$196,132	-	**$328,041**
Long-Range (FY 2033-2045)	$206,817	$277,187	-	**$484,004**
Total	**$409,717**	**$563,100**	**$11,684**	**$984,501**

Table 57: Funding Allocation Projection for Highway, Bridge and Transit Programs Through 2045 (in thousands)

		FEDERAL				STATE			TOTAL
	Funding Type / Fiscal Yr	NHPP	STP	OFF SYSTEM BRIDGES	HSIP	State Highway	State Bridge	Transit	
Short-Term 1st 4-Yrs of 2021 TYP (FY)	2021	$3,947	$7,758	$2,696	$1,232	$13,662	$6,966	$2,921	**$36,261**
	2022	$3,488	$7,726	$2,696	$1,232	$14,813	$6,963	$2,921	**$36,918**
	2023	$7,033	$8,355	$4,055	$1,232	$12,795	$10,037	$2,921	**$43,507**
	2024	$5,953	$8,301	$4,055	$1,232	$14,511	$10,034	$2,921	**$44,086**
	Subtotal	**$20,421**	**$32,140**	**$13,502**	**$4,928**	**$55,781**	**$34,000**	**$11,684**	**$172,456**
Mid-Term 2nd & 3rd 4-Yrs of 2021 TYP (FY)	2025	$4,910	$8,301	$4,055	$1,232	$14,509	$10,032		**$43,039**
	2026	$3,867	$8,301	$4,055	$1,232	$14,505	$10,028		**$41,988**
	2027	$2,823	$8,301	$4,055	$1,232	$14,502	$10,025		**$40,938**
	2028	$2,321	$8,301	$4,055	$1,232	$14,498	$10,021		**$40,428**
	2029	$2,321	$8,301	$4,055	$1,232	$14,496	$10,019		**$40,424**
	2030	$2,321	$8,301	$4,055	$1,232	$14,492	$10,015		**$40,416**
	2031	$2,321	$8,301	$4,055	$1,232	$14,488	$10,011		**$40,408**
	2032	$2,321	$8,301	$4,055	$1,232	$14,484	$10,007		**$40,400**
	Subtotal	**$23,205**	**$66,408**	**$32,440**	**$9,856**	**$115,974**	**$80,158**	**$0**	**$328,041**
Long-Range (FY)	2033	$2,321	$8,301	$4,055	$1,232	$14,194	$9,807		**$39,910**
	2034	$2,321	$8,301	$4,055	$1,232	$13,910	$9,611		**$39,430**
	2035	$2,321	$8,301	$4,055	$1,232	$13,632	$9,419		**$38,960**
	2036	$2,321	$8,301	$4,055	$1,232	$13,360	$9,230		**$38,499**
	2037	$2,321	$8,301	$4,055	$1,232	$13,092	$9,046		**$38,047**
	2038	$2,321	$8,301	$4,055	$1,232	$12,831	$8,865		**$37,604**
	2039	$2,321	$8,301	$4,055	$1,232	$12,574	$8,687		**$37,170**
	2040	$2,321	$8,301	$4,055	$1,232	$12,322	$8,514		**$36,745**
	2041	$2,321	$8,301	$4,055	$1,232	$12,076	$8,343		**$36,328**
	2042	$2,321	$8,301	$4,055	$1,232	$11,834	$8,176		**$35,920**
	2043	$2,321	$8,301	$4,055	$1,232	$11,598	$8,013		**$35,520**
	2044	$2,321	$8,301	$4,055	$1,232	$11,366	$7,853		**$35,127**
	2045	$2,321	$8,301	$4,055	$1,232	$11,139	$7,696		**$34,743**
	Subtotal	**$30,173**	**$107,913**	**$52,715**	**$16,016**	**$163,929**	**$113,258**	**$0**	**$484,004**
	TOTAL	**$73,799**	**$206,461**	**$98,657**	**$30,800**	**$335,684**	**$227,416**	**$11,684**	**$984,501**

Revenue Projection Assumptions

Short-Term Federal and State Highway/Bridge funds based on FY2021-24 Financial Guidance over four years.
Mid-Term Federal and State Highway/Bridge funds based on FY2021-24 Financial Guidance over eight years.
Long-Term Federal Highway/Bridge funds based on 0 percent increase for FY2033-45.
Long-Term State Highway/Bridge funds based on 2 percent decrease for FY2033-45.
No assumptions were made for transit funds beyond 2024 due to no guaranteed of future funding.

Investment Strategy

NTRPDC prepared its project list in two parts because needs in the short term are more defined and certain than needs over the long term. Part 1 covers years 2020-2032 (the first 12 years); Part 2 covers years 2033-2045.

Highway and Bridge Part 1, Years 2021-2032

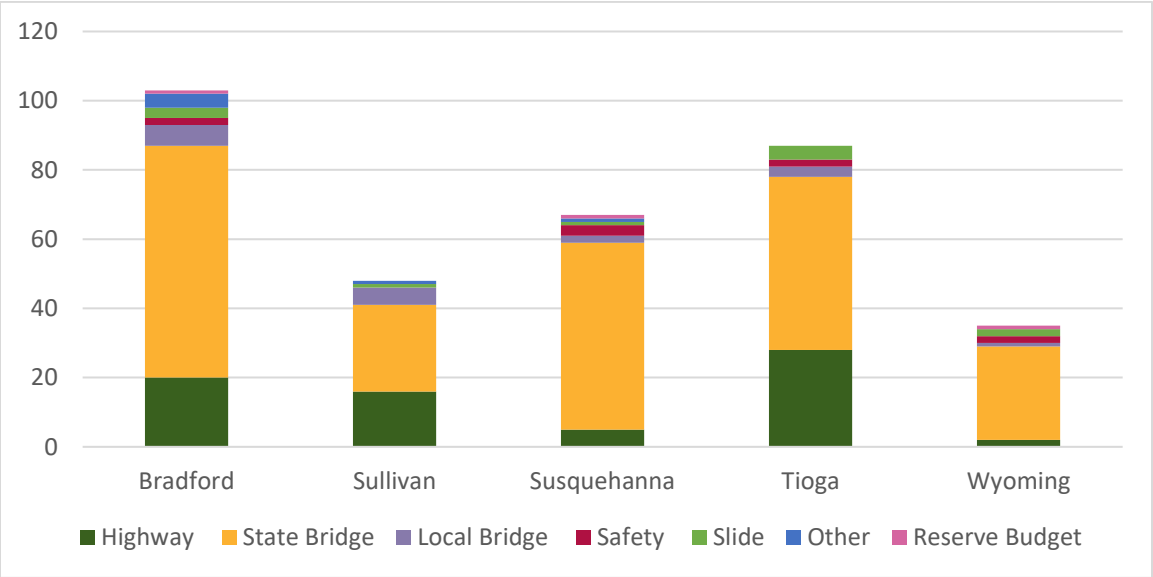
Figure 39 and Figure 40 show that system preservation with an emphasis on bridges remains a priority for NTRPDC through 2032. In fact, the 212 bridge projects comprise 68 percent of the projects and 47 percent of the program costs over the 2021-2032 period. At the county level, bridges comprise between 52 percent (Sullivan) and 93 percent (Susquehanna) of all highway and bridge projects and between 28 percent (Tioga) and 71 percent (Wyoming) of program costs.

Highway restoration projects account for 22 percent of all projects and 41 percent of program costs, plus 11 soil slide repair projects.

Nine safety projects, addressing guide rail, intersections, and shoulders, consume approximately 3 percent of the Twelve-Year Program costs.

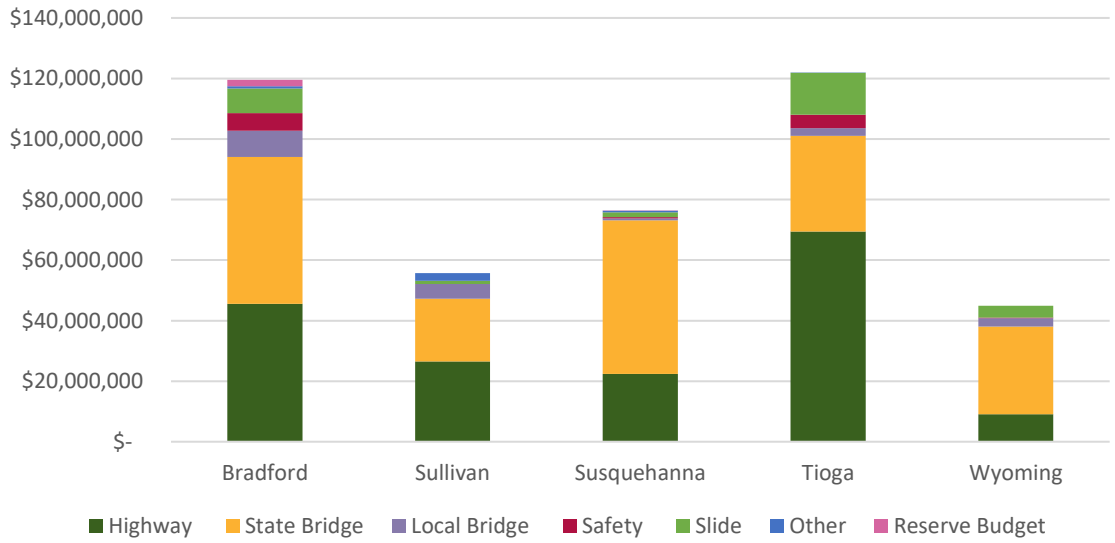
Six "other" projects are programmed for inspections, signage, etc.

Figure 39: Distribution of Highway and Bridge Projects by Type, 2021-2032



Source: PennDOT District 3 and District 4

Figure 40: Distribution of Highway and Bridge Projects and Project Costs by County, 2021-2032



Source: PennDOT District 3 and District 4

Highway and Bridge Part 2, Years 2033-2045

Beyond 2020 and the Twelve-Year Plan, the specific needs of the transportation system across the Northern Tier are not known. However, general asset mangement needs can be assumed and aligned with anticipated revenue.

For example, based on current asset conditions and historical traffic volumes, PennDOT Districts 3 and 4 anticipate that certain major highway segments will need major pavement restoration efforts, possibly between 2033 and 2045. Also, a review of recent TIPs has shown that the need for slide repair is constant, though the specific facility cannot be predicted.

Likewise, certain major bridges will require rehabilitation in order to maintain a state of good repair. In addition, certain "poor" bridges will require replacement to avoid posting or closure. Where long-range needs for indivdual facilities are known, they are listed in Table 58 or Appendix A.

It was assumed that bicycle and pedestrian facilities, as part of complete streets or as off-road facilities, will largely be supported by transportation and recreation grants. Some projects may have one or more elements, e.g., a trail crossing a highway, that are eligible for highway funds.

Table 58: Highway and Bridge Funding Allocation, 2033-2045

Reserve Budgets by Project Type	Funding Sources	Budget Allocation* ($000)	Known Needs**
Major Pavement Projects Reserve	Federal: NHPP, STP State: Highway Funds	$ 242,003	• Highway Corridors of Regional Significance – listed by county in Appendix A • Slide repairs, which have been persistent in Northern Tier's TIPs.
Major Bridge Projects Reserve	Federal: Bridge Funds (as eligible) State: Bridge Funds	$179,081	• Wyalusing River Bridge Replacement • All poor state bridges within projected revenue – See Appendix A
Local Poor Condition Bridges Reserve	Federal: Bridge Funds (as eligible) State: Bridge Funds	$ 48,400	• All poor local bridges within projected revenue – See Appendix A
Safety Projects Reserve	Federal: HSIP, other highway/bridge as applicable	$14,520	

* Based on projected remaining revenue for 2033-2045 ($484,004,000), calculated as projected revenue for 2021-2045 ($984,501,000) minus 2021-2032 TYP budget ($500,497,000).

**Known Needs are listed by name, if known, or generically. They include incomplete projects from the 2015-2040 LRTP, i.e., projects listed but not completed, not let for design/construction, and not programmed in the 2021-2032 TYP.

Transit and Transportation Services

While some transit needs are predictable, such as the ongoing replacement of transit vehicles, the projected revenue for transit is unknown. BeST's known needs for 2021-2032 and 2033-2038 are listed in Table 59 and Table 60 only for general awareness.

Table 59: BeST Capital Program, 2020 and 2021-2032

Capital Expense	Cost Estimate (plus inflation)	2020	2021-24	2025-28	2029-32
Support Vehicles	$50,000 / 3 yrs	$50,000	$52,000	$54,000	$114,000
Garage & Office/CNG Facility Improvements	$500,000 / 4 yrs	$2,000,000	$1,000,000	$500,000	$500,000
Replacement Vehicles:					
Bus (27 passengers)	5 vehicles @ $150K / 5 yrs	-	$772,500	-	$795,675
Bus (20 passengers)	7 vehicles @ $100K / 5 yrs	-	$721,000	$742,630	-
ADA Mini Van (10 passengers)	4-5 vehicles @ $75K / yr	-	$1,158,750	$1,095,405	$1,362,196
Non-ADA Mini Van (6 passengers)	4-5 vehicles @ $50K / yr	$400,000	$309,000	$936,270	$980,272
Support Equipment	$25,000 / yr	$25,000	$110,000	$130,000	$150,000
Spare Components	$25,000 / yr	$25,000	$110,000	$130,000	$150,000
Towanda Transit Center	$100,000 / 4 yrs	-	$100,000	$100,000	$100,000
Total Capital Expenses		**$2,500,000**	**$4,333,250**	**$3,688,305**	**$3,688,305**

Source: BeST (operated by River Valley Transit)

Table 60: BeST Capital Program, 2033-2038

Capital Expense	Cost Estimate (plus inflation)	2033-36	2037-38
Support Vehicles	$50,000 / 3 yrs	$60,000	$62,000
Garage & Office/CNG Facility Improvements	$500,000 / 4 yrs	$500,000	$0
Replacement Vehicles:			
Bus (27 passengers)	5 vehicles @ $150K / 5 yrs	$819,545	$0
Bus (20 passengers)	7 vehicles @ $100K / 5 yrs	$764,909	$787,856
ADA Mini Van (10 passengers)	4-5 vehicles @ $75K / yr	$1,894,789	$844,132
Non-ADA Mini Van (6 passengers)	4-5 vehicles @ $50K / yr	$1,012,958	$0
Support Equipment	$25,000 / yr	$170,000	$90,000
Spare Components	$25,000 / yr	$170,000	$90,000
Towanda Transit Center	$100,000 / 4 yrs	$100,000	$100,000
Total Capital Expenses		**$5,492,201**	**$1,973,988**

Source: BeST (operated by River Valley Transit)

In addition, the 2019 Coordinated Public Transit–Human Services Transportation Plan (Local Coordinated Plan) recommends that BeST: Install transit amenities such as bus stop signage and shelters in more densely populated areas serviced by fixed routes (Goal D - Improve Infrastructure, Strategy 4).

The majority of the recommendations made in the 2019 Local Coordinated Plan are non-capital actions for BeST, Susquehanna-Wyoming County Transportation (SWCT), and NTRPDC to implement to improve awareness for and coordination of transportation services. Some recommendations are made to BeST, some to SWCT, and some to both. NTRPDC is identified for those recommendations that relate to stakeholder engagement and public information.

The plan also includes planning activities for BeST and SWCT under Goal D – Improve Infrastructure, such as:

- Strategy 1: Explore updated fixed route technology, such as real-time bus tracking and automated passenger counts.
- Strategy 2: Investigate real-time tracking for shared-ride services.
- Strategy 3: Work with Ecolane software vendor to alter parameters to boost shared-ride efficiency.

The plan includes planning activities for NTRPDC, with BeST and SWCT as key stakeholders, under the same goal, such as:

- Strategy 5: Identify prioritization criteria (medical, transit, etc.) for general and winter roadway maintenance.
- Strategy 6: Evaluate sidewalks and curb cuts in high-density areas.
- Strategy 7: Evaluate the feasibility of connecting transit service to trails and bike paths.
- Strategy 8: Install wayfinding signage to key fixed route bus stops/shelters and to trails and bike paths in more densely populated areas.
- Strategy 9: Develop policies that address transportation access at the onset of development.

These activities could result in future projects or capital expenses.

Bicycle and Pedestrian

Off-Road Bicycle and Pedestrian Facilities

The 2019 Bicycle and Pedestrian Plan lists five planned trails in the region. Local sponsors anticipate grant funding to complete them. Anticipated projects are described in Table 61.

Table 61: Anticipated Bike-Ped Projects

Trail Sponsor Project Description	Project Cost	Status
Existing Trails		
D&H Rail Trail, Susquehanna County – This 38-mile trail from Carbondale, Lackawanna County, to the New York State line is being rehabilitated and improved. The portion from Carbondale to Ararat has recently been resurfaced. Rail-Trail Council of Northeastern Pennsylvania		The 6.5-mile segment from Stevens Point to the New York State line is expected to be improved in 2020 with drainage improvements, a new pedestrian bridge over Starrucca Creek, resurfacing, and gates. Design and engineering are underway for similar improvements from Ararat to Stevens Point; construction is expected 2021-2025, pending grant application and award.
Diahoga Trail, Bradford County – This multi-municipal trail will connect downtown Athens and Sayre to recreation and river access points in Bradford County. Futurescapes	$472,566 for Phases 1-2 Phase 3 Cost - TBD	Phases 1 and 2 of the trail Susquehanna Street in Athens Borough (at the river bridge) through Riverfront Park to a trailhead at South Higgins Avenue and East Hayden Street. Phase 3 (aka Segment D) will extend the trail north from the trailhead along the Borough's levee to a new trailhead at the Guthrie employee parking lot (750 spaces) on North Thomas Avenue, improving access to the Carantuan Trail that extends into New York State. This extension will require the crossing of County Bridge #25 on East Lockhart Street in Athens Township. Grant applications are in the early stages of preparation.
Endless Mountains Trail, Susquehanna County – This 10-mile trail from Montrose to Alford is being rehabilitated. Rail-Trail Council of Northeastern Pennsylvania		Grading and drainage projects were recently completed. Resurfacing is planned in 2-mile segments for the entire corridor. New signage and a brochure are grant-funded.
Iroquois Trail, Wyoming County – This trail is being extended from the Little League fields on the east side of Tunkhannock to the Tunkhannock High School on the west side of town following a sewer easement. Wyoming County		The county is currently working to secure multiple easements for the trail extension. Engineering and surfacing with crushed stone are next steps. There is also growing support for a pedestrian bridge over the Route 6 bypass for more efficient access to Riverside Park.
Trolley Trail, Lackawanna-Wyoming Counties – This two-segment trail is closing its gap from Dalton to La Plume. Countryside Conservancy		Phase 3 of the Trolley Trail is a 0.6 mi-mile extension from the east side of Keystone College along Route 6 into La Plume, Lackawanna County. This phase will include signage. The Conservancy also plans to update the trailhead on Riverside Drive in Factoryville. Future phases will address:

Trail Sponsor Project Description	Project Cost	Status
		• Gap Closure from Dalton Borough to La Plume to complete about 7 miles of continuous trail from Clarks Summit to Factoryville. This phase may include a crossing of Route 6. • Extension to Davis Cross Preserve and Lake Winola. Extension to Nicholson remains in the long-range vision.
New/Planned Trails		
Marsh Creek Greenway, Tioga County – This 3.2-mile bicycle and pedestrian facility will connect the Pine Creek Rail Trail, one of Pennsylvania's premier destination rail-trails, to Wellsboro, closing a state-identified trail gap. Tioga County and Tioga County Partnership for Community Health	$10-11 million	Construction to begin by Summer 2020 or 2021, pending grant funding.
Northern Central Rail to Trail, Canton area, Bradford County – This is a rail-trail opportunity along a former branch of the Pennsylvania Railroad from Williamsport, PA, to Elmira, NY. The initial stage of the project is to develop 10 miles of rail-trail between Troy and Canton, PA. **Northern Central Rail to Trail**	N/A	Northern Central Rail to Trail is pursuing grant funding for trail development through PA DCNR and beginning to coordinate with PennDOT for 2 miles in Troy and 3 miles in Canton.
Central Bradford County Trail Network – This trail will connect the Towanda Riverwalk with a loop through Towanda Borough, and spur trails into Wysox and Monroeton. Towanda Borough		Feasibility study completed in 2018/19
Endless Mountains Trail, Sullivan County – This trail will connect the east end of the Loyalsock Trail (and Worlds End State Park) to Ricketts Glen State Park, primarily through State Game Lands 13.		A feasibility study was underway as of January 2019.

Source: NTRPDC

On-Road Bicycle and Pedestrian Facilities

With a regional economic and transportation goal of improved walkablity, sidewalks, crosswalks, and other pedestrian infrastructure should be maintained in locations where they exist and installed where there are gaps in existing systems. These issues should be identified and prioritized in local planning efforts and shared through PennDOT Connects, when appropriate.

The 2019 Northern Tier Bicycle and Pedestrian Plan outlines further assessment, planning, and prioritization activities. The purpose of the Bicycle and Pedestrian (Bike-Ped) Plan is to assist NTRPDC in its efforts to develop an effective multimodal transportation network, primarily through its transportation program but also as it supports local initiatives for off-road trails.

Aviation

The Grand Canyon Airport Authority's 2017 Master Plan for the Wellsboro Johnston Airport includes projects totaling an estimated $10 million in three development phases: Phase I (0-5 years), Phase II (6-10 years), and Phase III (11-20 years).

In the next five years, Skyhaven Airport plans to add between 10 and 20 more hangers and pave the newly added taxiways and ramps, and intends to buy the land to the north of the airport to clear obstructions long term.

Airport operators and NTRPDC should continue to evaluate needs in line with the state's priorities for airports and their relationship to all modes of the transportation system:

- Maximize drive time accessibility of population and economic centers, and reduce identified gaps.
- Implement, along with system preservation and economic development needs, feasible upgrades and expansions justified through the master planning process or documented operational need.
- Ensure that operational capacity will accommodate future demand.

Rail Freight

Table 62 lists proposed rail freight projects (2015-2040) as shown in the 2015 Pennsylvania State Rail Plan. As noted in the plan, this potential investment in rail freight infrastructure conveys good stewardship of the rail freight system and "a commitment to investing in that system to make it function more efficiently and safely."

No specific year of project implementation is listed in the 2015 Pennsylvania State Rail Plan, and some projects (submitted after the response deadline) were not captured in the plan's analysis of short- and long-term projects, therefore all projects are included here in Part 1. Rail freight projects are funded privately or through state and federal programs, where eligible, and have no bearing on the projected highway, bridge, or transit funding discussed above. However, if possible, these projects should be coordinated with highway/bridge system programming, including construction schedules that may temporarily close routes for travelers and emergency responders.

Table 62: Proposed Freight Rail Projects (2015-2040)

Project	Project Description; County	Estimated Cost (in millions of 2015 dollars)
Class I Projects		
	NS Crescent Corridor	
D&H Improvements	NS acquired 283 miles of D & H rail lines and facilities in Pennsylvania and New York, including 127 miles between Sunbury and the NY/ PA state line through Scranton. Track and signal upgrades will be required; Susquehanna	$50.0
Class III Shortline Projects		
	Reading Blue Mountain and Northern	
Bridge Deck Replacement	Replace a full timber deck on a 100- foot-long bridge on the Susquehanna Branch; Bradford	$0.1
	Central New York Railroad	
Tie Installation/Ballast & Surface	Tie Installation - 15.20 miles @ 900 ties/ mile = 13,680 ties @ $100/ tie. Ballast & Surface M P 186.70 to M P 201.90; Susquehanna	$1.4
Structure Repairs & Waterproof	Structure Repairs & Waterproof the Deck Beneath the Track at the Starrucca Viaduct #189.42; Susquehanna	$0.4
Ties, Ballast & Surface	Tie Installation/Ballast & Surface M P 186.70 to M P 201.90: 15.20 miles @ $13,000/mile; Susquehanna	$0.2
Crossings	Rehabilitation of Crossings; Susquehanna	$0.1
Renew Bridge	Renew Bridge Timber & Walkway Bridge #191.99; Susquehanna	<$0.1
Bridge Repair	Concrete Repairs to Bridge #190.13 SP 96; Susquehanna	TBD
Welded Rail	Welded Rail to Replace Jointed Rail; Susquehanna	TBD
Tie Installation/ Ballast & Surface	Tie Installation/ Ballast & Surface, M P 186.70 to M P 201.90, 15.20 Miles; Susquehanna	$2.2
Ditching	Ditching M P 186.70 to M P 117.90; Susquehanna	$0.2
Bridge Timbers	Renew Bridge Timbers at Bridge #199.34; Susquehanna	$0.1
Bridge Repairs	Masonry Repairs to Bridge #197.16; Susquehanna	$0.1
Bridge Repairs	Various Steel Repairs & Paint to Bridge #192.22 over Susquehanna River	$0.6
Bridge Timbers	Renew Bridge Timber, Bridge #191.99: Install 560 Bridge Timbers, replace wooden walkway with steel grating; Susquehanna	$0.5
Tie Installation/ Ballast & Surface	Install Ties, Ballast/Surface on Siding between MP 193.90 (CPSR) and MP 189.80 (CP Lanesboro), 4.1 Miles. Install 4,200 Ties, Ballast/Surface, Renew Bolts; Susquehanna	$0.6
Bridge & Viaduct Repairs	Repairs to Starrucca Viaduct #189.46 & Bridge #190.13 in Lanesboro: • Starucca Viaduct – Masonry Repairs, waterproof concrete decks, renew track • Bridge #190.13 – Masonry Repairs; Susquehanna	$4.3

Project	Project Description; County	Estimated Cost (in millions of 2015 dollars)
Bridge Repairs	Repair various bridges - Remove rust, steel repairs, paint critical steel members, MP 186.70 to MP 201.90; Bridge #'s 201.52, 200.70, 199.34, 198.52, 195.42, 191.99; Susquehanna	$2.0
Continuous Welded Rail	Replace Jointed Rail with Continuous Welded Rail ncludes new rail, ties, ballast/surface: 14.0 Miles of Track - Pike County and 8.4 Miles of Track; Susquehanna	$9.8

Source: 2015 Pennsylvania State Rail Plan

Chapter 8: Project Selection and Prioritization

Continuous investment is needed to maintain the region's transportation system in a state of good repair. Maintaining a safe and efficient transportation system requires that projects address safety issues and concerns and reduce congestion. These needs are primarily identified by PennDOT Central Office and its Engineering Districts using asset data collected through inspections, crash data, and other performance data. NTRPDC affirms these needs and their prioritization by selecting these projects into the Northern Tier LRTP.

Selection Criteria

Projects included in the LRTP meet at least one of the following transportation and related community and economic development objectives, which serve as project selection criteria:

Transportation Infrastructure

1. Reduce risk/improve safety, i.e., reduce fatalities and serious injuries.
2. Manage repair and maintenance to prevent more costly rehabilitation or construction work.
3. Reduce congestion and increase efficiency through operational improvements.
4. Improve connectivity, especially between existing bicycle and pedestrian facilities.
5. Support the maintenance of rail infrastructure, including rail right-of-way for rail-to-trail conversion.
6. Support the provision of public transportation services.

In Support of Community and Economic Development

7. Increase accessibility through new or upgraded facilities in conjunction with planned development.
8. Maintain, enhance, and/or improve connectivity among and access to schools, parks, community centers ("downtowns" and other hubs), and health care centers.
9. Support key industries—natural gas, agriculture, manufacturing, health care, and travel and tourism—with adequate transportation infrastructure.
10. Improve airports' capacity to serve local industry.
11. Support redevelopment of brownfields and other underutilized sites with transportation improvements and enhancements.
12. Support railway infrastructure improvements to serve local industries.

Projects for which Project Selection Criteria can be quantifiably estimated and for which cost estimates have been prepared will be prioritized for the projected funding. Projects without cost

estimates will only be listed on the Illustrative List of Transportation Needs and will only be programmed with Bridge Reserve line items after cost estimates are prepared.

Selected Highway and Bridge Projects

NTRPDC selects PennDOT Central Office and District programmed highway and bridge projects, including:

- 2021-2032 TYP
- Carryover projects from the 2015 - 2040 LRTP
- All state bridges currently rated poor
- All local bridges ≥ 20 feet currently rated as poor

Table 63: Selected Transportation Projects from State and District Programs

	MAINTAIN Resurface Rehabilitate Replace	ENHANCE Safety Service	EXPAND Add Extend	Total
Streets & Highways				
PennDOT and Other State & Federal	146, includes 11 slide repairs	9 safety, 6 service	-	161
Local (Municipal)	-	-	-	-
Bridges				
State	505	-	-	505
County/Local ≥20	141	-	-	141

Source: PennDOT

See Appendix A for the 2021–2045 Highway and Bridge Projects by program period and Map 5 for 2021-2032 Project Locations.

Projection Prioritization

...of Highway Projects

NTRPDC will rely on the prioritization of state highway preservation needs prepared by each PennDOT Engineering District.

...of State Bridge Projects

NTRPDC will rely on the prioritization of state bridges prepared by each PennDOT Engineering District.

...of Local Bridges

NTRPDC will prioritize local bridges 20 feet or longer using the PennDOT BMS2 Risk Analysis tool supplemented by information on other factors of condition, function, and performance, such as ADT/ADTT, length of detour, vehicle weight, etc. It will select the 10 highest-risk bridges and contact local bridge owners for local input on need. If the local owner is interested, discussions of programming and local contribution will begin. If not interested, consideration will proceed to next-highest-risk local bridge.

For local bridges less than 20 feet long, NTRPDC will finalize and follow this process to develop a Northern Tier Local Bridge Management Database and to identify and prioritize projects in the off years of the TIP update cycle:

- Coordinating with the Northern Tier Local Bridge Subcommittee to develop a prioritization process for local bridges. The prioritization process is in preliminary develop and will be utilized for the next LRTP update.
- Prepare and send a letter to counties and municipalities in the region soliciting local bridge projects (less than 20 feet);
    - provide table of recipient's local bridges as identified in the Northern Tier Local Bridge Management Database (NTRPDC's local bridge version of PennDOT's Bridge Management System—much smaller but contains at minimum a listing of bridge name, location, type, size, status, last inspection date, and condition);
    - request that any new bridges be added and that any candidates for removal be identified;
    - notify counties and municipalities that inspection data will be used in NTRPDC's prioritization of local bridge projects;
    - request inspection data, where available; and
    - request readiness to make a local funding commitment with (maximum 12) months or by a specified date in advance of the TIP update.
- Compile the response of potential local bridge projects and inspection data into the Northern Tier Local Bridge Management Database; follow up with local bridge owners to request any missing data.
- Rank local bridge projects based on risk.
- Meet with county officials, local officials of high-ranking bridges, county/local bridge inspectors, and PennDOT District bridge units to discuss ranked bridges and select the two highest-risk local bridge projects in each county; each pair could include one county bridge and one local bridge, two county bridges, or two local bridges.
- Begin discussions of project programming and local contribution.

PAMS, BAMS, and LLCC

Pavement and bridge condition forecasts through the next 12 years are generated by PennDOT's Asset Management Divisionusing its enterprise Pavement Asset Management System (PAMS) and Bridge Asset Management System (BAMS). The projections are based on current condition data housed in PennDOT databases and the improved conditions expected as a result of future projects. Planned transportation system investments are derived from financial information provided in PennDOT's General Procedural Guidance document and lists of programmed projects from the Multi-modal Project Management System (MPMS). Using BAMS and PAMS, these projects can be selected based on priority.

Lowest Life Cycle Cost (LLCC) is a process designed to maximize the life of an asset at the lowest cost through a risk-based prioritization of preservation, rehabilitation, and reconstruction. This process will focus on treating the structure with the right process at the right time rather than treating structures in poor condition.

These are future processes in which bridge and highway projects would be prioritized.

Known, Unfunded Needs

NTRPDC will explore funding for eligible study and project programming to advance these concepts; some may require local contributions to qualify for state or federal programs. Programs that have been utilized in the Northern Tier are Multimodal projects, ARLE, Green Light Go, and TAP.

The Multimodal Transportation Fund stabilizes funding for ports and rail freight, increases aviation investments, establishes dedicated funding for bicycle and pedestrian improvements, and allows targeted funding for priority investments in any mode. Multimodal projects are often local projects that would have a difficult time moving forward with the support of a large funding source. A current Multimodal project in the Northern Tier region is the Marsh Creek Greenway located in Tioga County. The goal of the Automated Red Light Enforcement (ARLE) System in Pennsylvania is to improve safety at signalized intersections by providing automated enforcement at locations where red light running has been an issue. The Green Light-Go Program provides state funds for the operation and maintenance of traffic signals along critical and designated corridors on state highways.

Transportation Alternatives Program (TAP) provides funding for programs and projects defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation, trails that serve a transportation purpose, and safe routes to school projects.

These listed programs are available for use by the county and local municipalities.

Chapter 9: Environmental Screening

NTRPDC recognizes that any project or action will have desired effects on the transportation system as well as other impacts to the community and the environment during and after construction. It also recognizes that inadequate environmental coordination slows project delivery and fails to serve current and future travel needs, discourages desired economic development, and ultimately costs more in time and dollars.

Toward better environmental outcomes from transportation improvement projects, NTRPDC commits to the following coordination activities:

- **Update mapping and field view new project sites** to be programmed on each TIP; share data/GIS updates with PennDOT Districts and Central Office.
- **Participate in the PennDOT Connects process** in support of projects that help to advance municipal goals and priorities.
- **Participate in project-level scoping field views** with PennDOT District personnel, and invite environmental agencies to field view project sites with complex environmental considerations.
- **Consult with appropriate parties** to identify early opportunities to avoid, minimize, and mitigate environmental impacts during project development, and to consider advanced environmental mitigation opportunities toward enhancement and restoration.
- **Continue to learn more about the NEPA process** through training and resource-specific workshops.

Based on years of project development and construction, NTRPDC recognizes that many impacts are predictable and manageable. To better anticipate needed environmental coordination, NTRPDC conducted an environmental screening to forecast the potential impacts on 325 representative projects (731 phases in the 2021-2032 TYP).[4] The analysis used GIS to compare locations of projects to locations of 23 known resources or resource types using statewide datasets. It determined there was a potential direct impact if the project was located within 200 feet of a known resource and a potential indirect impact if the project was located within 1,000 feet of a known resource. Where data was available, locally important resources were characterized but proximity was not analyzed.

[4] Representative projects include projects from the draft 2021 TYP. Projects carried over from the 2015 LRTP and projects representing state bridges greater than eight feet and local bridges greater than 20 feet rated poor will be screened at project scoping.

Northern Tier presented their environmental screening results to in the Agency Coordination Meeting (ACM) via conference call on March 25, 2020. The ACM involves multiple federal and state agencies.

The results of the environmental screening are shown in Figure 41. The 325 resources are grouped in six categories by topic. Potential impacts in each category may require coordination with one or more agencies.

Figure 41: Potential Direct and Indirect Impacts of 325 Representative LRTP Projects (Project Phases)

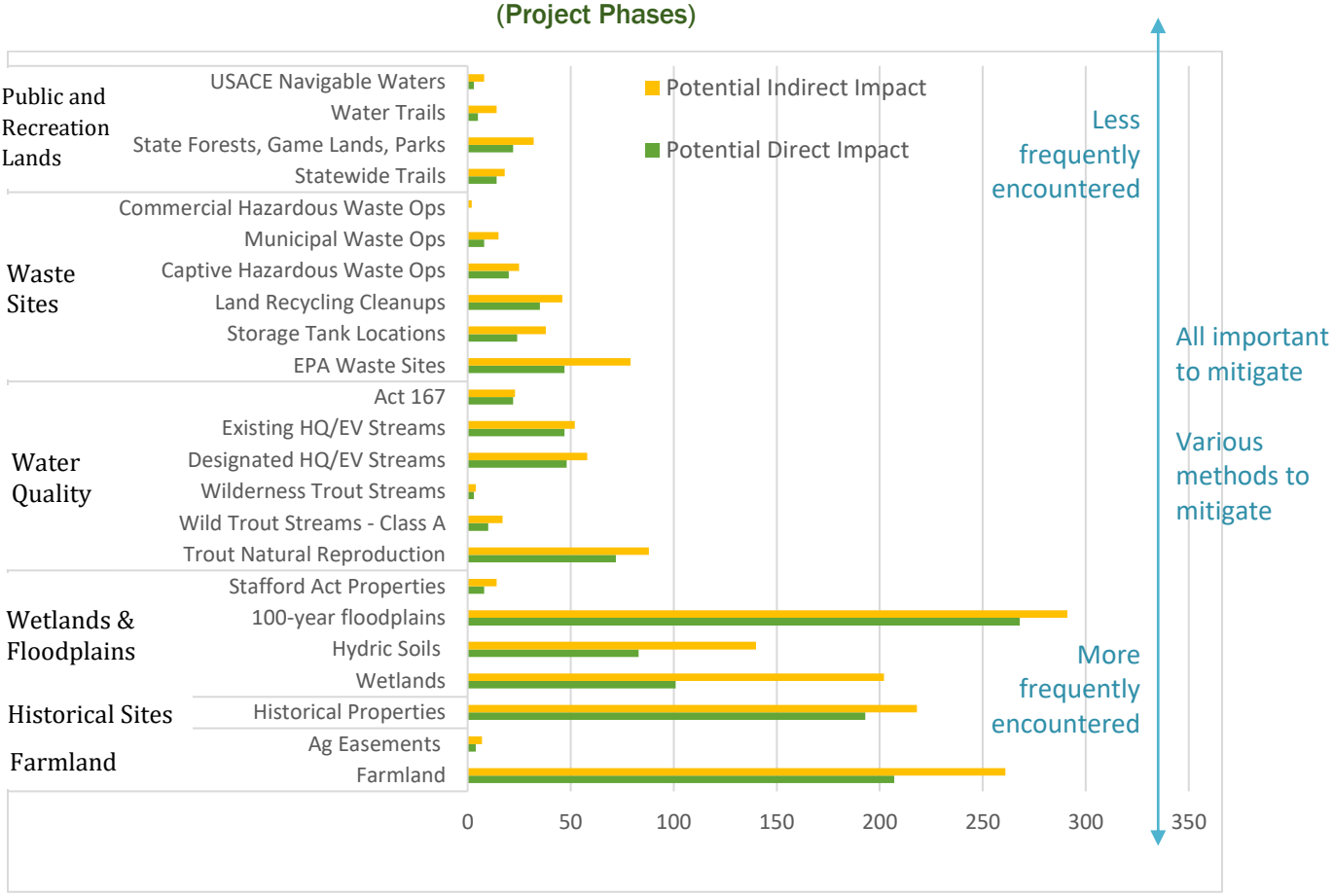


Figure 41 demonstrates that most of the 325 projects could affect at least one resource category—farmland, wetlands and floodplains, and/or historic resources. This can be expected given that transportation systems develop along the same patterns as early settlements, which are typically on the flat and fertile valley floors and along streams and rivers. However, the LRTP project list comprises system preservation projects almost exclusively—not new facilities or capacity additions (i.e., roadway widening)—and therefore most impacts would be temporary, occurring only during construction, and within the right-of-way.

Analysis of these environmental resource categories is characterized in the following sections. The number of projects with potential impacts is shown by the charts, and mitigation opportunities are presented in the text.

Farmland

Three conditions contribute to the sensitivity of farmland to transportation projects: soils, use, and land preservation.

Fertile soils conducive to agriculture are abundant in the region. Prime farmland soils and soils of statewide importance lie in the valleys and across some hillsides. They total over one million acres of the region. Bradford County has the highest share of each. Some of these soils are cultivated while others lie under forest cover or man-made development. The likelihood of converting either of these surface conditions to active agriculture is very low in the current economy.

The agricultural industry is active across the region. About one-third of the land is engaged by farms in livestock, dairy, and crop production. Farms of all sizes are present here, however farm size is trending smaller.

Farmland preservation is available through the sale of development rights or easement. Fifty-eight farms representing 16,250 acres of farmland have been protected.

Table 64: Farmland Resources

Farmland Resources					
Prime Farmland Soils			217,356 acres		• Not all in use for agriculture; some wooded, some developed
Soils of Statewide Importance			924,155 acres		
Land Use & Planning	Acres, Percent of Region				**Trends**
	2002	2007	2012	2017	
LAND USE					•
Land in farms	784,745 33.88%	714,739 30.41%	785,777 31.05%	775,534 30.64%	• Land in farms has fluctuated, recently declined • More, smaller farms
PRESERVATION					
Acres of Preserved Farmland (Ag easements)			58 farms 16,250 acres		• Steady numbers, increasing acreage

Potential Impacts

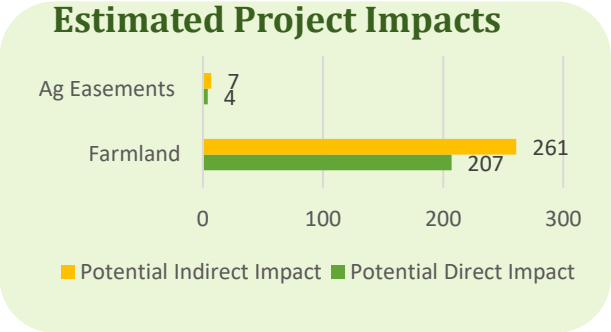
Of the 325, 207 lie within 200 feet of farmland soils and another another 261 lie within 1,000 feet of farmland soils. The construction or ultimate footprint of these projects could affect the availability and quality of these soils for future production.

A much smaller number of projects lie in close proximity to agricultural easements. These projects could affect lands that have already been protected from development with public funds.

Given the focus on system preservation projects in the LRTP, potential permanent impacts to farmland soils and agricultural easements are few; temporary impacts during construction are more likely.

See Map 6, Farmland v. 2021-2032 Project Locations, for locations of farmland soils, use, and protected lands and project sites.

Figure 42: Projects with Potential Farmland Impacts



Total Projects = 325

Avoidance and Mitigation

To minimize impacts to farmland soils, NTRPDC will conduct the following:

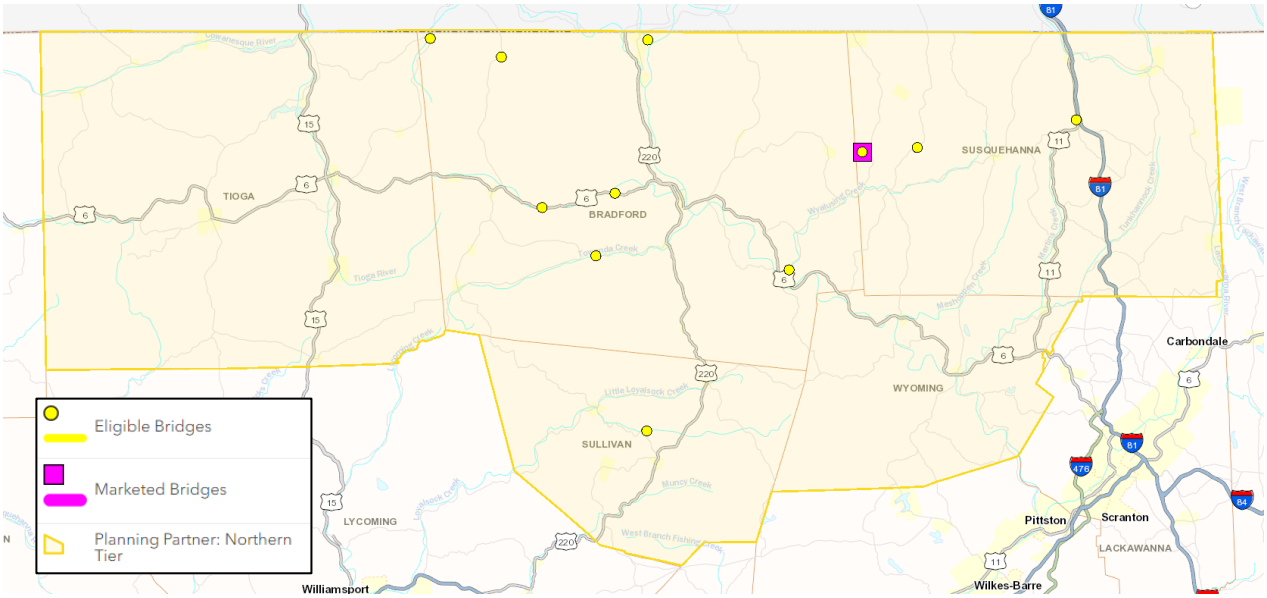
1. Field view upcoming project sites with available GIS mapping to verify actual use in proximity to the project site. Field views will provide the most accurate assessment of current conditions and limitations to future use of soils for agriculture.
2. If there is real potential for impact to farmland soils engaged in active agricultural use, liaise with municipal and county planning offices to determine if the property is moving toward development and with the respective County Conservation District to assess if the property is moving toward agricultural easement.
3. Update findings in narrative and/or GIS formats and share with the respective PennDOT District and Central Office; report findings to coordinating environmental agencies, including County Conservation Districts.
4. If permanent impacts to agricultural easements are unavoidable, explore project funding for a "replacement" agricultural easement at another location.

Historic Resources

Because this region is rural and has not experienced extreme development pressure or significant redevelopment, many of its communities still reflect the eras of their growth in their architecture. Among older structures, some are significant for their architecture or for the people and events they hosted. These include steel truss bridges, which have been eliminated in many other regions of Pennsylvania by replacement, and sites and structures have been listed on the National Park Service's National Register of Historic Places. Other sites and structures have been evaluated and await further application toward listing on the National Register, and still others have been surveyed but not evaluated.

Due in part to the region's abundant waterways, which were used by early people as transportation corridors, and also thanks to careful excavations, at least 771 archeological sites have been documented in the region, accordingly to previous inquiries with the Pennsylvania Historical and Museum Commission. Additional sites may lie undisturbed, particularly along the river and stream banks. Historic local bridges are 89 and counting—there are many more local bridges whose historic significance has not been determined.

There are 11 eligible historic metal truss bridges and 1 marketed historic metal truss bridge as seen in the graphic below:



Locally, historic preservation has been limited; only one local historic district, Wellsboro, has been designated and is regulated.

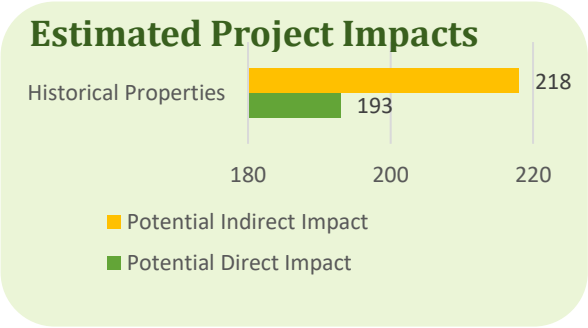
Table 65: Historic & Archeological Resources

Resource	Total Sites
Statewide Data	
Historic Sites in PennDOT OneMap	2,516
Listed on the National Register	43; 7 districts, 8 bridges, 4 covered bridges; 2 viaducts
SHPO-Eligible for National Register Listing	156; 22 districts, 12 bridges
Regional Data	
Local Historic Districts	1, Wellsboro
Century Farms	230
Surveyed Sites, no SHPO-eligibility determination	236
Historic Local Bridges	>89

Potential Impacts

Of the 325 representative projects, 193 projects are located within 200 feet of known historic sites and another 218 lie within 1,000 feet of such sites.

Figure 43: Projects with Potential Historic Resources Impacts



Total Projects = 325

Avoidance and Mitigation

To minimize impacts on historic and archeological resources, NTRPDC will conduct the following:

1. Field view upcoming project sites with available GIS mapping for existing resources and potential impacts.
2. Where potential impacts are known, seek the municipality's perspective on the project and potential positive and negative impacts to the historic site and verify any local historic evaluation or designation.

3. Update findings in narrative and/or GIS formats and share with the respective PennDOT District and Central Office; report findings to coordinating environmental agencies, including the Pennsylvania Historical and Museum Commission (PHMC).

4. If impacts to sites are unavoidable, seek context-sensitive design solutions at facility and feature scales, consider relocation of movable features following required protocols, and notify PHMC of any archeological findings.

To expedite local bridge projects, NTRPDC will explore a means to determine the historic significance of local bridges, especially those under 20 feet, in advance of TIP updates. If successful in making early determinations, NTRPDC will update the Districts with findings.

Wetlands & Floodplains

Glaciers and waters have sculpted the valleys and bowls of the region's landscape. In these low-lying areas, waters collect and infiltrate the surface, creating wet soils during wet weather conditions. These hydrologic conditions provide unique and often fleeting habitat for wildlife but play a more important role in the recharge of aquifers that supply water to private and community wells.

Wetlands are characterized by hydric soils, hydrophytic ("water-loving") vegetation such as cattails, and visible surface water for at least some portion of the year. They are generally found along watercourses or in flat or bowled topographies. The National Wetlands Inventory (NWI) screens various data sets to produce an inventory of likely wetland locations. Field verification is necessary to confirm wetland locations and boundaries. Exceptional natural communities that feature wetlands include the Bradford County's Southern Glaciated High Plateau and the peat-forming wetlands and glacial lakes in Bradford and Susquehanna counties.

Floodplains are lands adjacent to watercourses that are covered by water during times of flooding. Land is considered to be in the 100-year floodplain if it has a least a 1 percent chance of being flooded during any one year—a designation typically used for regulatory purposes. More than 128,000 acres of land lie within a floodplain across the region. The largest percentage (33 percent) is in Bradford County. The Northern Tier region is prone to flooding due to a combination of heavy precipation and steep slopes. These flooding issues can lead to problems for roadways and bridges that lie within floodplains, requiring temporary closure and emergency repairs. These repairs cause funding to be redirected from the TIP, ultimately defering previously planned projects.

Floodplains should not be developed for human habitation or capital-intensive facilities, though not all communities restrict development. Development in the floodplain not only puts people and property at risk but also limits water infiltration and displaces storage capacity, resulting in increased flows downstream. Properties that have been developed prior to local regulation can be acquired by counties for conversion back to open space through the Stafford Act. Of the 220 properties in the Stafford Act dataset, 187 properties have been acquired (closed) to date through the Stafford Act, 25 are proposed, and 8 have no listed status. The Stafford Act Properties are shown on Map 7, Wetlands and Floodplains v. 2021-2032 Project Locations.

Table 66: Wetlands and Floodplains

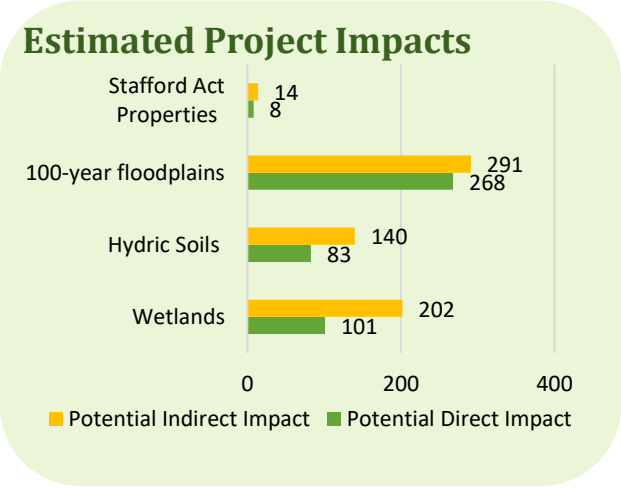
Wetland and Floodplain Features	Total	% of Region
Statewide Data		
NWI Wetlands	113 sq mi	2.9%
Hydric Soils	98,989 acres 155 sq mi	3.9%
100-yr Floodplain	128, 158 acres	5.1%
Stafford Act Properties	220 total 187 acquired 25 proposed 8 no status	n/a
Regional Data		
Municipalities with Regulated Floodplains	145 of 166	86.3%

Potential Impacts

Of the 325 LRTP projects:

- 101 projects could have direct impacts to wetlands (within 200 feet) and 202 could have indirect impacts (within 1,000 feet).
- 83 projects could have direct impacts to hydric soils (within 200 feet) and 140 could have indirect impacts (within 1,000 feet).
- 268 projects—essentially all bridge projects and low elevation highway preservation projects—could have direct impacts to floodplains (within 200 feet).
- Fewer projects could have direct impacts to municipally regulated floodplains (within 200 feet), since only 145 municipalities regulate their floodplains.
- 8 projects could have direct impacts on Stafford Act properties (within 200 feet); 14 could have indirect impacts (within 1,000 feet).

Figure 44: Projects with Potential Wetland Impacts



Total Projects = 325

See Map 7, Wetland and Floodplains v. 2021-2032 Project Locations, for locations of wetland and floodplain sites and project sites.

Avoidance and Mitigation

To minimize impacts to wetlands and floodplains, NTRPDC will conduct the following:

1. Field view upcoming project sites with available GIS mapping for existing resources and potential impacts.
2. Where potential impacts are known, verify any locally regulated floodplain and any Stafford Act properties. Reach out to municipalities that may have reported recently adding Stafford Act properties.
3. Update findings in narrative and/or GIS formats and share with the respective PennDOT District and Central Office; report findings to coordinating environmental agencies, including PADEP.
4. If impacts to sites are unavoidable, mitigate through wetland banking sites.

To prepare for necessary mitigation, NTRPDC will work with PennDOT Districts and Central Office to identify potential wetland banking sites.

Water Quality

Extensive forest cover and limited development protect water quality across the region. They limit the amount of sediment and nutrients reaching waterways and minimize solar radiation that heats the water. Clean, cool waterways provide quality habitat for aquatic wildlife—including native trout, a cost-effective water supply for community water system withdrawals, and clean water for outdoor recreation.

Stormwater management for water quantity and water quality are the purpose of Act 167 plans. Only one Act 167 plan has been completed in the region: a plan for the Wysox Creek watershed which drains all or portions of nine municipalities in central and northeastern Bradford County.

Table 67: Water Quality Resources

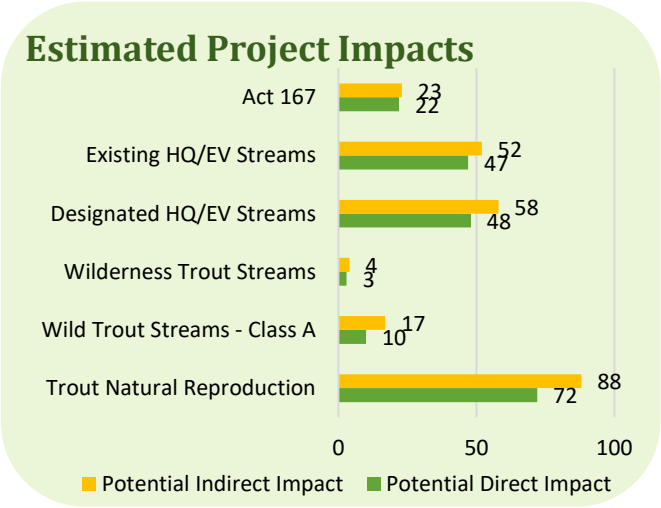
Water Quality Features	Number	Total Length or Area
Wild Trout Streams	476	1,235 miles
Wild Trout Streams, Class A	67	171 miles
Wilderness Trout Streams	12	43 miles
Existing Use High Quality (HQ)/Exceptional Value (EV) Streams	19 HQ/41 EV	1,043 miles
Designated Use HQ/EV Streams	14 HQ/1 EV	350 miles
Watersheds with Act 167 Plans	1: Wysox Creek 9 municipalities	832 acres

Potential Impacts

Of the 325 LRTP projects:

- 72 projects could have direct impacts to wild trout streams (within 200 feet) and 88 could have indirect impacts (within 1,000 feet).
- 10 projects could have direct impacts to Class A wild trout streams (within 200 feet) and 17 could have indirect impacts (within 1,000 feet).
- 3 projects could have direct impacts to wilderness trout streams (within 200 feet) and 4 could have indirect impacts (within 1,000 feet).
- 48 projects could have direct impacts on designated High Quality (HQ) or Exceptional Value (EV) streams (within 200 feet); 58 could have indirect impacts (within 1,000 feet). Similar impacts are possible on existing HQ and EV streams.
- 22 projects could have direct impacts (within 200 feet) and 23 prjoects could have indirect impacts (within 1,000 feet) on the Wysox Creek watershed.

Figure 45: Projects with Potential Water Quality Impacts



Total Projects = 325

See Map 8, Water Quality v. 2021-2032 Project Locations, for locations of water quality resources and project sites.

Avoidance and Mitigation

To minimize impacts on water quality, NTRPDC will conduct the following:

1. Field view upcoming project sites with available GIS mapping to identify existing resources and potential impacts.
2. Where potential impacts are known, verify Act 167 watersheds and offer to liaise with the county and municipality(s), as needed, especially regarding seasonal limits to in-stream activity.
3. Update findings in narrative and/or GIS formats and share with the respective PennDOT District and Central Office; report findings to coordinating agencies, namely PA DEP and the Pennsylvania Fish and Boat Commission (PFBC).
4. If impacts to sites are unavoidable, explore enhancements with PA DEP and/or PFBC to improve water quality elsewhere in the watershed.

Endangered, Threatened, and Special Concern Species

Direct and indirect impacts to endangered, threatened, and species of special concern were considered in addition to the analysis of sensitive natural areas. NTRPDC used the Pennsylvania Natural Heritage Inventory Program's Environmetnal Review List (serchable by county) as a working reference. Potential impact analysis has been deferred until project-level scoping.

Table 68: Sensitive Species/Biological Features

Biological Features	Number and/or Area
Natural Area/Heritage Sites	307
Interior Forest Blocks >1 square mile	441; 1291 sq mi, 32.6% of region
PNDI search hits	Deferred to project-level scoping
Species with frequent PNDI search hits	23

Previsous coordination with environmental agencies indicated that project locations should avoid permanent impacts to these species and their habitats and that temporary (construction-phase) impacts be managed through seasonal limits to work, i.e., construction scheduled to avoid mating and breeding seasons of these species. Time-of-year guidance for most of the species can be found in PennDOT's Threatened and Endangered Species Desk Reference (Publication 546).

Threatened and endangered species require greater sensitivity than species of special concern; habitat impacts to threatened and endangered species may require mitigation. Resource agencies noted that additional species may be identified in project-level PNDI searches and that the status of any species could change at any time. For example, the Northern Long-Eared Bat, currently a threatened species, was listed as an endangered species in Spring 2015 due to declines caused by white-nose syndrome.

Table 69: Pennsylvania Threatened and Endangered Species

Endangered Species	Threatened Species	Species of Special Concern
Mammals, Fish, Birds, Reptiles & Amphibians		
American Bittern	Allegheny Woodrat	Bald Eagle
Blackpoll Warbler	Eastern Small-Footed Bat	Barn Owl
Little Brown Bat	Long-eared Owl	Great Blue Heron
Northern Flying Squirrel	Northern Harrier	Marsh Wren
Northern Long-eared Bat	Peregrine Falcon	Mussels
Yellow-bellied Flycatcher		Northern Goshawk
		Pie-Billed Grebe
		Silver-Haired Bat
		Swainson's Thrush
		Timber Rattlesnake
		Wilson's Snip
Plants		
Backward Sedge	Appalachian Gametophyte Fern	A Sedge
Balsam Poplar	Bebb's Sedge	Bog Goldenrod
Bayard's Malaxis	Bog Bluegrass	Bog-rosemary
Bayonet Rush	Bog Sedge	Broad-leaved Willow
Bearberry Manzanita	Dwarf Mistletoe	Brome Grass
Beck's Water-marigold	Fall Dropseed Muhly	Bur-reed
Blunt-leaved Pondweed	Few-seeded Sedge	Button-bush Dodder
Bog Aster	Flat-leaved Bladderwort	Canadian Milkvetch
Branching Bur-reed	Floating-heart	Clinton's Wood Fern
Braun's Holly Fern	Larger Canadian St. John's-wort	Colic-root
Canada Buffalo-berry	Lesser Panicled Sedge	Common Labrador-tea
Case's Ladies'-tresses	Northeastern Bulrush	Crawford's Sedge
Checkered Rattlesnake-plantain	Prairie Sedge	Creeping Snowberry
Cooper's Milk-vetch	Red Currant	Downy Willow-herb
Cranesbill	Red-head Pondweed	Drooping Bluegrass
Dragon's Mouth	Robbins' Spike-rush	Dwarf Juniper
Ebony Sedge	Slender Water-milfoil	Evening-primrose
Few-flowered Sedge	Small-headed Rush	Giant Poison-ivy
Grassy Pondweed	Stalked Bulrush	Great-spurred Violet
Heart-leaved Twayblade	Sweet-gale	Hairy Honeysuckle
Hemlock-parsley	Tuckerman's Pondweed	Hooker's Orchid
Jacob's-ladder	Water Lobelia	Horned Bladderwort
Long-bracted Green Orchid	Wild-pea	Kidney-leaved White Violet
Mountain Wood Fern		Lupine
Northeastern Sedge		Marsh Bedstraw
Northern Pondweed		Mead's Sedge
Northern Water-plantain		Mountain Starwort
Oblong-fruited Serviceberry		Mud Sedge
Pod-grass		Oakes' Pondweed
Rough Cotton-grass		Purple Clematis
Showy Mountain-ash		Red Baneberry
Slender Rock-brake		Roundleaf Serviceberry
Swamp Fly Honeysuckle		Screw-stem
Torrey's Bulrush		Sedge
Twig Rush		Slender Sedge

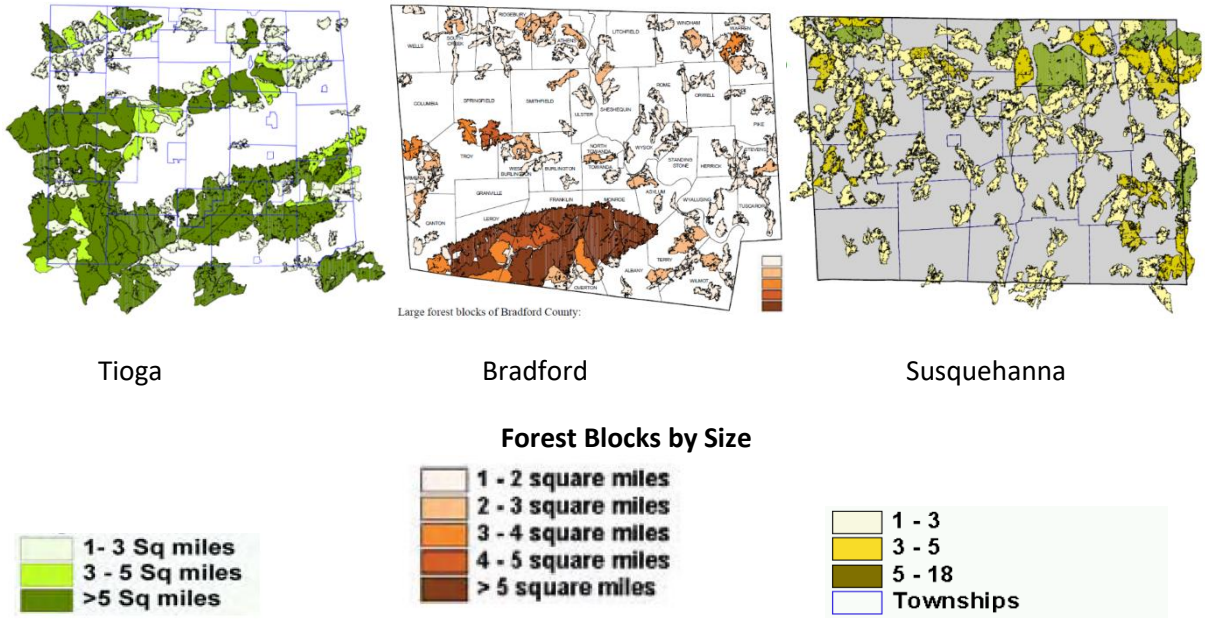
Twinflower	Slender Wheatgrass
Variegated Horsetail	Small Beggar-ticks
White Twisted-stalk	Soft-leaved Sedge
	Southern Wood-rush
	Stiff Cowbane
	Strawberry Goosefoot
	Swamp Currant
	Tufted Hairgrass
	Vetchling
	Water Bulrush
	Western Hairy Rock-cress
	White Adder's-mouth
	White Fringed-orchid
	White Trout-lily
	White Water-crowfoot
	Yellow Cowlily

Source: PA Natural Heritage Inventory Program Environmental Review List

Forest Blocks

Since 2005, the county natural heritage inventories have assessed the number and size of forest blocks as an indicator of forest and habitat health (vs. fragmentation). Three of the five county inventories includes these analyses as shown in Figure 46.

Figure 46: Forest Blocks by County



Avoidance and Mitigation

To minimize impacts to endangered, threatened and special concern species, NTRPDC will conduct the following:

1. Coordinate with PennDOT Districts to request PNDI searches for upcoming projects prior to each TIP update.
2. Based on hits, coordinate with Districts to invite the Pennsylvania Game Commission (PGC) and/or the U.S. Fish and Wildlife Service (USFWS) to the project-scoping field view.
3. If impacts to habitat are unavoidable, explore enhancements with PFBC, PGC, and/or USFWS to enhance local habitat elsewhere.

Waste Sites

Waste sites are varied sites that may contain potential pollutants. They include contaminated sites such as Superfund sites overseen by the US EPA; sites with storage tanks used to store large quantities of chemicals; sites that produce, handle, or dispose of hazardous waste; and municipal waste facilities. In the Northern Tier region, these sites include manufacturing facilities, hospitals, gas stations, and landfills, among others.

Table 70: Waste Sites

Sites by Type	# of Sites
Waste Sites, e.g., Superfund, etc.	1,079
Storage Tank Locations	1,651
Land Recycling Cleanups	763
Captive Hazardous Waste Operations	129
Municipal Waste Operations	132
Commercial Hazardous Waste Operations	3

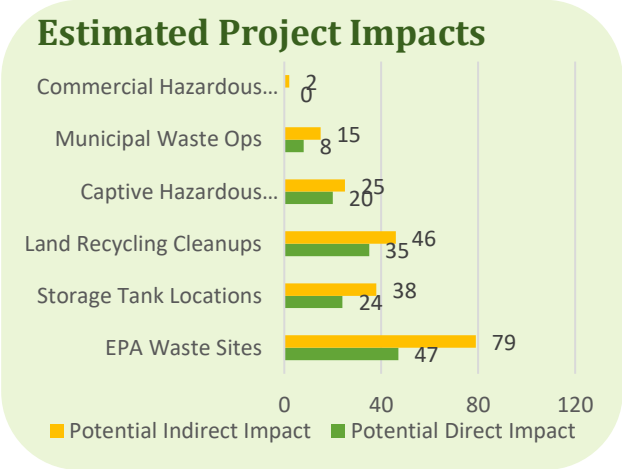
Potential Impacts

Of the 325 LRTP projects:

- 47 projects could have direct impacts to waste sites (within 200 feet) and 79 could have indirect impacts (within 1,000 feet).
- 24 projects could have direct impacts to storage tank locations (within 200 feet) and 38 could have indirect impacts (within 1,000 feet).
- 35 projects could have direct impacts to land recycling cleanups (within 200 feet) and 46 could have indirect impacts (within 1,000 feet).

- 20 projects could have direct impacts on captive hazardous waste operations within 200 feet), and 25 could have indirect impacts (within 1,000 feet).
- 8 projects could have direct impacts on municipal waste operations (within 200 feet) and 15 indirect impacts (within 1,000 feet).
- 2 projects could have indirect impacts on commercial hazardous waste ops (within 1,000 feet).

Figure 47: Projects with Potential Impacts to Waste Sites



Total Projects = 325

See Map 9, Waste Sites v. 2021-2032 Project Locations, for locations of waste sites and project sites.

Avoidance and Mitigation

To minimize impacts to waste sites, NTRPDC will:

1. Field view upcoming project sites with available GIS mapping to verify the status of the waste site as active or other, and to assess potential impacts.
2. Update findings in narrative and/or GIS formats and share with the PennDOT District and Central Office; report findings to PA DEP.
3. Where potential impacts are known, offer to liaise with waste site operator, as needed, regarding actual location of waste storage, construction schedule, and limits to access.

Public & Recreation Lands and Waters

The Northern Tier's scenic topography, water features, heritage sites, and abundant wildlife provide outstanding opportunities for outdoor recreation. For these reasons, numerous sites and waterways have been designated as public and developed as recreation lands or destinations.

Table 71: Public and Recreation Features

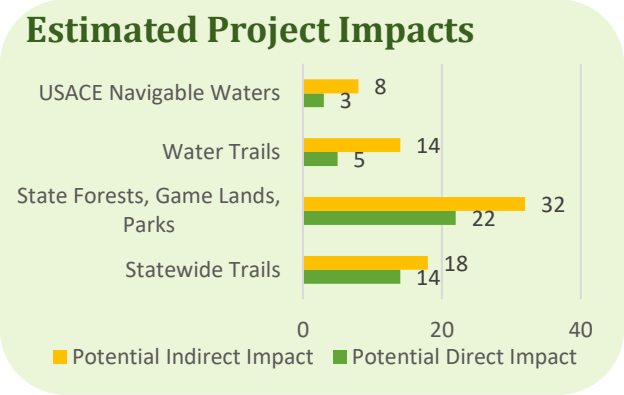
Public & Recreation Features	Number	Size
In Region		
Statewide Trails	3	145 miles
State Parks	7	6,832 acres
State Game Lands	22	205,774 acres
State Forests/Wild Areas	2	204,461 acres
USACE Flood Control Dams & Reservoirs	2	8,542 acres
Water Trails	1, Susquehanna	105 miles
USACE Navigable Waters	1, Susquehanna	105 miles
Local		
County/Local Parks	124	~120 acres
Other Recreation Resources		
Pine Creek Scenic River		23 miles
Viaduct Valley Way Scenic Byway		37 miles

Potential Impacts

Of the 325 LRTP projects:

- 14 projects could have direct impacts to statewide trails (within 200 feet) and 18 could have indirect impacts (within 1,000 feet).
- 22 projects could have direct impacts to state forests, parks, or game lands (within 200 feet) and 32 could have indirect impacts (within 1,000 feet).
- 5 projects could have direct impacts (within 200 feet) and 14 projects culd have indirect impacts (within 1,000 feet) to the Susquehanna Water Trail.
- 3 projects could have direct impacts (within 200 feet) and 8 projects could have indirect impacts (within 1,000 feet) to the Susquehanna River as a USACE navigable waterway.

Figure 48: Projects with Potential Impacts to Public Recreational Lands and Waters



Total Projects = 325

See Map 10, Public Lands v. 2021-2032 Project Locations, for locations of public and recreation lands and project sites.

Avoidance and Mitigation

To minimize impacts to public and recreation lands, NTRPDC will:

1. Field view upcoming project sites with available GIS mapping for existing resources and potential impacts.
2. Where potential impacts are known, liaison with county/local park management, county tourism offices, and PFBC, PGC, and DCNR regarding project schedule, parks access and events, etc.
3. Update findings in narrative and/or GIS formats and share with the PennDOT District and Central Office; report findings to DCNR.
4. If impacts to sites are unavoidable, use the State Game Land (SGL) bank (under development in District 4-0) and SGL bank (Hoffman bank) in District 3-0 and consider context-sensitive design solutions and enhancements along scenic rivers and byways.

Chapter 10: Air Quality Conformity

Note: The following is the Executive Summary from the "Transportation Conformity Determination: Tioga County, PA and Wyoming County Portion of the Scranton-Wilkes-Barre, PA Maintenance Areas" prepared by Michael Baker International for this Northern Tier 2045 LRTP update. The full report is provided as Appendix D.

As part of its transportation planning process, the Northern Tier Regional Planning and Development Commission (NTRPDC) completed the transportation conformity process for the Tioga and Wyoming County portion of the 2021-2024 Transportation Improvement Program (TIP) and 2045 Long Range Transportation Plan (LRTP). The report documents that the current TIP and LRTP meet the federal transportation conformity requirements in 40 CFR Part 93.

Clean Air Act (CAA) section 176(c) (42 U.S.C. 7506(c)) requires that federally funded or approved highway and transit activities are consistent with ("conform to") the purpose of the State Implementation Plan (SIP). Conformity to the purpose of the SIP means that transportation activities will not cause or contribute to new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS or any interim milestones. EPA's transportation conformity rules establish the criteria and procedures for determining whether metropolitan transportation plans, transportation improvement programs (TIPs), and federally supported highway and transit projects conform to the SIP.

On February 16, 2018, the United States Court of Appeals for the District of Columbia Circuit in South Coast Air Quality Mgmt. District v. EPA ("South Coast II," 882 F.3d 1138) held that transportation conformity determinations must be made in areas that were either nonattainment or maintenance for the 1997 ozone national ambient air quality standard (NAAQS) and attainment for the 2008 ozone NAAQS when the 1997 ozone NAAQS was revoked. These conformity determinations are required in these areas after February 16, 2019. The Tioga and Wyoming County portion of the NTRPDC was maintenance at the time of the 1997 ozone NAAQS revocation on April 6, 2015, and was also designated attainment for the 2008 ozone NAAQS on May 21, 2012. Therefore, per the South Coast II decision, this conformity determination is being made for the 1997 ozone NAAQS.

This conformity determination was completed consistent with CAA requirements, existing associated regulations at 40 CFR Parts 51.390 and 93, and the South Coast II decision, according to EPA's Transportation Conformity Guidance for the South Coast II Court Decision issued on November 29, 2018.

Chapter 11: Implementation

Adoption of the long-range transportation plan is a milestone in the transportation planning process, aligning projected funding for a specified period of time with the prioritized needs of the region. The process continues with the programming of LRTP projects in the four-year cycle of Transportation Improvement Programs (updated biennially) and a variety of activities that help to prepare future projects for programming and identify emerging transportation needs.

Project Programming

The long-range transportation plan provides a queue for transportation projects ready to be programmed as funds are available. NTRPDC should:

1. Advance highway and bridge projects from the LRTP project list to the 2021 TIP and 2023 TIP. Projects listed in the 2020-2032 portion should be programmed before projects listed in the 2033-2045 portion, unless conditions warrant urgent action.
2. Support the final improvements to US 15 necessary for Interstate designation. Although the only remaining deficiencies are located in Lycoming County, completion of these projects will make the corridor eligible for designation as Interstate 99 and improve Tioga County's economic visibility.

Activities for the Planning Work Program

In addition to the capital improvement projects identified in this plan, NTRPDC's transportation planners can support the region's development and environmental directions through planning activities, highlighted below. Some of these activities are related to the transportation infrastructure itself, while others are cooperative and coordinating activities that will help to identify and develop candidate transportation projects or that will advance community and economic development initiatives. NTRPDC should review and incorporate these activities into its Unified Planning Work Progam (UPWP) as appropriate.

Transportation Infrastructure & Services

Improve Safety Performance

1. Analyze crash cluster locations and evaluate safety improvements with each PennDOT District Office.
2. Request, coordinate, and participate in Road Safety Audits (RSAs) with each PennDOT District.
3. Review and update the Safety Study at minimum to maintain a list of current priority candidate projects.

Reduce Congestion

4. Work with PennDOT Districts 3-0 and 4-0 to implement the recommendations of the respective Regional Operations Plans (for traffic management).
5. Identify areas with bottlenecks that create congestion and seek funding to study causes and potential capital and non-capital solutions.
6. Identify areas where there is demonstrable need for park-and-ride facilities and seek funding to study site and construction feasibility.

Refine Project Selection & Prioritization

7. **(New)** Utilize the BAMS and PAMS (Bridge and Pavement Asset Management Program) for future project selection.
8. **(New)** Work with county maintenance managers to coordinate with the County 6 Year Plan and TIP program and discuss county maintenance needs for best use of available funds.
9. **(New)** Integrate PennDOT Connects into the LRTP Implementation.
10. Develop project selection criteria that support agriculture, manufacturing, health care, and travel and tourism.
11. Explore RPO-designation of a secondary highway network—secondary in importance to the NHS but vital for Northern Tier mobility—and use this designation as part of the project selection criteria.

Advance Study Findings to Project Needs

12. Seek funding to advance study concepts into defined project needs with cost estimates. Educate municipalities on funding sources that require local contributions and how to leverage funding from multiple sources.

Support Aviation & Rail Freight System Improvements

13. Support improvements and improved multimodal access to the region's airports.
14. Monitor the region's rail freight network.
15. Evaluate goods movement patterns and trends, particularly as they relate to corridors of regional significance and major shippers.

Increase Multimodal Travel Options

16. Continue to work with BeST (operated by River Valley Transit), Susquehanna-Wyoming County Transportation, and PennDOT to enhance public transportation services, including strategies identified in the Local Coordinated Plan.
17. Identify projects appropriate for bicycle- and pedestrian-related improvements, as recommended in the Northern Tier Bicycle and Pedestrian Plan, Northern Tier Open Space Plan; the Bradford County Open Space, Greenways, and Recreation Plan; and other planning documents.

18. Work with municipalities to identify bicycle and pedestrian projects, including new connections to schools, parks, and greenways, and places where the public can access healthy foods.

Strengthen Local Road Maintenance and Improvement

19. Develop and implement a Local Bridge Management Program.
20. Promote awareness of the availability of PennDOT's services for local government, including:
    - LTAP training (Local Transportation Assistance Program) for municipal officials
    - Agility Program
21. Share publications and best practices on assessing local transportation infrastructure and operations with county and municipal public works departments.
22. Encourage municipal cooperation through the development of joint maintenance agreements, sharing of equipment and services, and bid lettings; provide examples and best practices; explore councils of government as an additional means of communication with municipalities.
23. Develop or identify a model program for designating a functional classification for locally owned streets and roads; share with counties and municipalities and provide education on the practical application with land use planning.

In the Context of NT Communities and Economy

Collect Transportation Needs from Business & Industry

24. Develop contacts and maintain relationships with representatives of the key industry clusters of agriculture, manufacturing, lumber and wood products, construction, health care, and travel and tourism. Consult with them annually on the transportation needs of their business and their industry. Develop industry-specific transportation improvement plans, if appropriate.
25. Develop contacts and maintain relationships with representatives of educational institutions and workforce development agencies. Consult with them annually on the transportation needs of their business and their institutions.

Scenic Byways & Tourism

26. Enhance gateways into the region, particularly on National Highway System (NHS) routes such as US 6, US 15, US 220, and I-81 in conjunction with county and local planning.
27. Continue scenic corridors planning.
28. Provide technical support to counties and municipalities nominating roadways as scenic byways; participate in corridor management planning for designated byways.

Strengthen County & Municipal Transportation Planning

29. Seek supplemental funding for transportation elements of county and municipal planning activities upon request.

30. Upon request, assemble and analyze transportation data for local plans and studies; offer an informed regional perspective on transportation needs and planned projects; provide input on transportation implications of land use planning; suggest funding sources and partnerships related to transportation improvements.

31. Assist in defining community character—whether existing or desired/future, urban or rural, historic or contemporary—through planning studies. Such studies would include, at minimum, inventory and analysis, and may include goals and action planning.

32. Explore the need for transportation improvements to support the region's Keystone Opportunity Zones.

In the Context of the NT Environment

Collect Transportation Needs from Business & Industry

33. Develop contacts and maintain relationships with large land management agencies, such as the PA DCNR Bureau of Forestry, PA DCNR Bureau of State Parks, the PA Game Commission, and the PA Fish and Boat Commission. Inquire with each agency about perceptions and concerns with regard to nearby traffic volumes, access (year-round and seasonal), signage, etc. Coordinate information-sharing with municipalities and Engineering Districts, as needed.

Collaborate on Resource Avoidance and Impact Mitigation

34. Develop contacts and maintain relationships with representatives of the environmental agencies. Consult with them regularly on the potential impacts and best practices for project planning, including resource avoidance and mitigation.

35. Host an orientation for counties, municipalities, and resource and conservation organizations on NTRPDC's environmental policies, including guidance for using the PennDOT Connects process to request coordination with local goals and projects.

Appendices

Appendix A: 2021-2045 Highway and Bridge Projects

Appendix B: Maps

- Map 1, Major Communities
- Map 2, County Subdivisions
- Map 3, Topographic Features
- Map 4, Environmental Features
- Map 5, 2021-2032 Project Locations
- Map 6, Farmland v. 2021-2032 Project Locations
- Map 7, Wetlands and Floodplains v. 2021-2032 Project Locations
- Map 8, Water Quality v. 2021-2032 Project Locations
- Map 9, Waste Sites v. 2021-2032 Project Locations
- Map 10, Public Lands v. 2021-2032 Project Locations

Appendix C: Air Quality Conformity Determination

Appendix D: Public Involvement

Appendix E: Public Participation Plan