

Technical Memorandum 2: Needs Assessment

Warren County Transportation Plan

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JANUARY 2021

Technical Memorandum 2.1: Previous Studies

Warren County Transportation Plan

SEPTEMBER 2020

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Introduction

Warren County, in partnership with the NJTPA, is developing a long-range transportation plan to forge a vision for the future of the County’s transportation network through 2045. The Warren County Transportation Plan (Plan) will identify recommendations and a phased implementation plan to address transportation needs, overcome challenges, and leverage opportunities across a broad range of projects, policies, and strategies.

To build upon existing knowledge, the project team consulted numerous Master Plans and planning studies undertaken by municipal, county, and regional entities concerning Warren County in recent years. These resources provided valuable information and background for analysis. This synergy will produce a more comprehensive and expansive set of recommendations. The breadth and detail of previous studies speak to the communities’ desire to continue to operate an effective and efficient transportation system while directing growth to existing centers.

This Previous Study summary includes additional studies that have been conducted since the 2018 Transportation Technical Study (TTS). An associated Previous Study Matrix is included with this document. This matrix lists location-specific recommendations from the studies listed below plus those reviewed in the 2018 TTS that have not yet been implemented. The selected studies (Table 1) were chosen based on recommendation from the study team, the scope of their focus, and their relevance to transportation planning in Warren County. Where available, municipal master plans were reviewed and summarized. The corresponding recommendations from each study in the associated Previous Study Matrix are identified under the “Matrix Number” column.

Table 1 - Studies Reviewed

Title	Year	Lead Jurisdiction	Matrix Number
Warren County Transportation Plan	1982	County	24
Liberty Township Master Plan	2003	Municipality	25
Warren County Smart Growth Plan-Transportation Technical Study	2004	County	1
Knowlton Township Master Plan Reexamination Report	2009	Municipality	*
Washington Borough Downtown Redevelopment Plan	2009	Municipality	27
Phillipsburg Walkable Community Workshop Report	2010	MPO	18
Morris/Warren County Rail Corridor Study	2013	MPO	14
Phillipsburg Master Plan Reexamination Report	2013	Municipality	23
New Jersey Statewide Freight Plan	2017	NJDOT	29
Plan 2045: Connecting North Jersey	2017	MPO	30
Hackettstown Master Plan Reexamination Report	2018	Municipality	31
Mansfield Township Master Plan Reexamination Report	2018	Municipality	32
Morris Canal Greenway Corridor Study	2018	MPO	33
Warren County Transportation Technical Study Update	2018	County	28
Freight Rail Industrial Opportunities Corridors Program	2019	MPO	34
Oxford Township Active Transportation Plan	2019	Municipality	35
White Township Proposed Master Plan Amendment	2019	Municipality	36
Warren County Light Industrial Site Assessment	2020	County	37
2040 Freight Industry Level Forecasts	2020	MPO	*

*Studies with an asterisk under “Matrix #” do not have any unfinished location-specific recommendations to include in the associated matrix

Warren County Transportation Plan

The 1982 Warren County Transportation Plan provided an orderly and timely plan for coordinated development of different transportation modes and identified deficiencies in present modes. Through the plan, the County Planning Board adopted 11 high-level goals and objectives (each with several sub-goals) for maintaining existing infrastructure and expanding network opportunities where feasible.

- Promote and maintain a highway system which provides for efficient movement of people and goods within and through the County
- Upgrade and maintain the traffic safety characteristics of the County Road System
- Encourage the use of Federal and State funding for all major roadway improvements
- Coordinate improvements to existing facilities
- Include environmental concerns in the transportation planning process
- Monitor growth and development patterns and adjust the transportation plan as required to accommodate unanticipated changes
- Continue to update and add to the Warren County Highway Inventory
- Maintain present level of service
- Improve commuter rail and bus service
- Expand the availability and type of transportation systems for all residents
- Increase public participation in the overall transportation planning process for the County by creating a County Transportation Committee

Liberty Township Master Plan

The Liberty Township Master Plan, revised in 2003 aims to focus growth in already developed neighborhoods while promoting transportation options with objectives including:

- Encourage a development pattern emphasizing pedestrian, non-motorized transportation
- Investigate the potential for use of traffic calming devices
- Promote pedestrian and bicycle travel through designation of bicycle lanes and pedestrian accessways
- Consider all existing right-of-way for use as pedestrian paths

Warren County Strategic Growth Plan-Transportation Technical Study

The 2004 Warren County Transportation Technical Study provided a key step in the development of the Warren County Smart Growth Plan. This study developed a land use and transportation model to test the impacts of land use decisions on the roadway network and predict future traffic levels. Existing zoning was compared with a centers-based land use scenario in which development was focused in three regional centers, and 22 local centers. The model determined a 35 percent reduction in vehicle miles traveled in the centers-based approach compared to future no-build conditions. Recommendations to preserve the transportation network's capacity and efficiency include restoring or extending passenger rail service along three corridors in the County, assessing fees related to the burden of future development on the transportation system, and improving site design and access management.

Knowlton Township Master Plan Reexamination Report

The Knowlton Township Master Plan Reexamination Report, published in 2009, revised its 1984 Master Plan with the consistent aim of retaining the community's rural and agricultural qualities. Primarily focused on land use, the report includes the goal of minimizing the impact of development on the local

road network and the need to create trail linkages. Since the previous reexamination, traffic flow at Exit 4 on I-80 was altered to facilitate truck u-turns; thus, reducing safety conflicts discussed in several previous plans.

Washington Borough Downtown Redevelopment Plan

Washington Borough's Downtown Development Plan was adopted in 2009 and created a comprehensive vision for a vibrant downtown. Much of the plan's focus was on zoning, land use, and design, although several transportation goals were listed including maximizing pedestrian connections, diverting traffic from residential streets, and creating parking regulations capable of supporting mixed-use development.

Phillipsburg Walkable Community Workshop Report

A Walkable Community Workshop with an associated document was completed in 2010 for the intersection of Roseberry Street and U.S. 22 in Phillipsburg. This location was chosen in part due to its inclusion in NJTPA's 2008 Regional Priority Update Study listing of high crash locations, and the presence of pedestrian-friendly land uses. Walkable Community Workshops consist of an introduction to local stakeholders, presentation of best practices for walkable communities, a guided walking audit of the study area, and small group discussions of proposed improvements. Recommendations for the intersection and adjacent street segments include constructing, widening, and increasing the setback of sidewalks where appropriate, and replacing existing pedestrian signal heads with new countdown signal heads with push buttons. Incorporation of an educational component was also highly advised. Subsequent to the study, the intersection was milled and paved and short lengths of cracked sidewalk on Roseberry Street were removed and replaced. A traffic signal was installed to enhance pedestrian safety at the intersection.

Morris/Warren County Rail Corridor Study

The 2013 Morris/Warren County Rail Corridor Study detailed the existing conditions of the 52 mile Washington Secondary/Morristown Line Corridor between Phillipsburg (Warren County) and Morristown (Morris County). Across the county, state and nation, upgrades to rail have not kept pace with the evolving demands of rail-served industries. In 1995, the Association of American Railroads issued a new standard which increased the maximum gross-weight-on-rail allowed per train car to 286,000 lbs (known as 286k) whereas the previous maximum was 263,000 lbs (263k). Due to vertical and weight constraints, much of the corridor is unable to cater to 17-foot tall 286k railcars, the standard designated by the Association of American Railroads in 1995. Up to 90 percent of revenue travel on the corridor are adversely affected by these limitations. This results in higher costs for local freight users, and less desirable sites for businesses. One vertical clearance constraint and three weight-restricted bridges were identified in Warren County along the rail corridor. It is estimated that three clusters along the corridor in Warren County have the potential to provide 1.6 million square feet of industrial space to rail served industries. The three clusters are in Phillipsburg, Washington Borough, and Mansfield. Together, these sites could bring thousands of jobs, and more than \$100 million dollars to local tax rolls. Preliminary concepts and costs were identified for upgrading these facilities to 286k standards.

Phillipsburg Master Plan Reexamination Report

Phillipsburg's 2004 Master Plan was further reviewed in 2013 with the release of the Phillipsburg Master Plan Reexamination Report. Several circulation issues identified in previous plans and reexaminations were found to continue being present including congestion on South Main Street, poor regional circulation, and through truck traffic on local streets.

The Reexamination described several initiatives that have been undertaken to improve these and other circulation concerns including adopting a municipal Complete Streets policy, and the completion of studies concerning three corridors. The summary of each included in this report is as follows:

- A study of U.S. 22 by Warren County resulted in a call for additional efforts to develop a comprehensive bicycle plan for the region with appropriate linkages to key activity generators.
- A group of three studies of I-78 by NJTPA focused on bus and commuter alternatives with the goal of improving transit service along the U.S. 22 and I-78 corridors. Recommendations include expanding park-and-ride capacity in the short-term and extending Raritan Valley Line commuter rail service in the long-term.
- A 2012 25-Year Action Plan of the Morris Greenway aimed to provide safe bike and pedestrian access along the canal while promoting historic awareness. This study was complemented by the subsequently discussed 2018 Morris Canal Greenway Study.

New Jersey Statewide Freight Plan

The 2017 NJDOT Statewide Freight Plan presents a comprehensive framework to address freight's challenges and opportunities, improve New Jersey's freight transportation system, and strengthen the State's economic competitiveness. The plan provides a blueprint for NJDOT investment, identifying discrete projects that immediately address critical freight system improvements. The document is an update of the 2007 plan. Several potential projects in Warren County were identified including improvements to portions of U.S. 22, I-78 and I-80, and removing rail 286k height and rail constraints.

Plan 2045: Connecting North Jersey

NJTPA's Long Range Transportation Plan "Plan 2045: Connecting North Jersey," completed in 2017 aims to lay out a plan for transportation infrastructure improvements for the next 25+ years. Goals of the plan's initiatives include:

- Protect and improve natural ecosystems, the built environment and quality of life.
- Provide affordable, accessible and dynamic transportation systems responsive to all current and future travelers.
- Retain and increase economic activity and competitiveness.
- Enhance system coordination, efficiency, overall safety and connectivity for people and goods across all modes of travel.
- Maintain a safe, secure and reliable transportation system in a state of good repair.
- Create great places through select transportation investments that support the coordination of land use with transportation systems.
- Improve overall system safety, reducing serious injuries and fatalities for all travelers on all modes.

Demographic, transportation, and technology trends most impacting the NJTPA region were identified. Specific trends most affecting Warren County include an aging population, long commute times, and limited bus and rail service. After reviewing these trends, the plan details performance-based funding scenarios and a set of nine Regional Capital Investment Strategy (RCIS) principles to guide project funding going forward. These principles include moving freight more efficiently, supporting walking and biking, and managing incidents and applying transportation technology. Twenty-nine near and mid-term road, highway, and transit projects within Warren County are also provided.

Hackettstown Master Plan Reexamination Report

The Hackettstown Township Master Plan Reexamination Report, published in 2018, revised its 1978 Master Plan after several reexaminations in the intervening years. The plan encourages the preservation and revitalization of the historic center and older residential neighborhoods as well as the mending of downtown traffic circulation difficulties that coordinate with County and State initiatives, providing off-street parking, and limiting driveway access. Additional recommendations include providing a continuous trail along the Musconetcong River, developing wayfinding signage, encouraging filling in sidewalk gaps, and preparing a bike and pedestrian master plan.

Mansfield Township Master Plan Reexamination Report

The Mansfield Township Master Plan Reexamination Report, published in 2018, represented a revision of its 1999 Master Plan. The study found minimal changes in the land use characteristics and demographics of the Township from the previous reexamination. Concordant with the aim to focus any growth into areas with existing infrastructure, the study cited the goal of protecting the township's rural road system by restricting more intense development and regional traffic to County and collector roads.

Morris Canal Greenway Corridor Study

NJTPA's 2018 Morris Canal Greenway Corridor Study established an implementation-focused plan to develop the full 102-mile Morris Canal corridor as a greenway while preserving the area's historic, recreational and scenic resources, and leveraging the greenway to enhance local communities. Traveling through six New Jersey counties, the Canal terminates in Phillipsburg. The study developed both short and long-term trail alignments while aiming to develop as much off-road trail as possible. Several trail typologies were developed based on immediate surroundings and land uses. Warren County currently has 13.5 miles of the Morris Canal Greenway developed, all off-road; the most of any county. In Warren County, the plan calls for an additional 21.2 miles, only 5.7 miles of which would be on-road, primarily in the densely settled boroughs of Washington and Phillipsburg.

Warren County Transportation Technical Study Update

The 2018 Warren County Transportation Technical Study represents the first phase of updating the 2004 transportation plan element of Warren County's Master Plan. This phase involved gathering data, defining methodologies, evaluating existing conditions, and establishing goals and priorities. A review of transportation and demographic trends found a significant increase in the non-white, Hispanic, and foreign-born communities, and a need for more robust, accessible, and affordable mobility options. The study concludes with the recommendation of three alternative future scenarios for testing using NJTPA's travel demand model and comparing it to baseline conditions using a 2045 build year in a subsequent study phase (this study).

Freight Rail Industrial Opportunities Corridor Program

The 2019 Freight Rail Industrial Opportunities Corridor Program creates a program fostering collaboration among public and private entities to address physical barriers to freight access of industrial properties along select rail corridors. Seven corridors in New Jersey were selected based on the presence of physical restrictions and requests from businesses to eliminate such barriers. Six weight and two height restrictions were found along the Morris/Warren Corridor extending between Morris and Warren Counties. Eight hundred acres of industrial opportunity space are available along this corridor in Warren County. Between the two counties, upgrades to the rail corridor to allow 286k railcars could lead to more than 9,000 local jobs and \$650 million dollars in tax revenue.

Oxford Township Active Transportation Plan

Oxford Township completed an Active Transportation Plan in 2019. The plan assesses existing biking and walking conditions in Oxford Township and defines a vision for the future of active transportation in the township, providing a framework to guide investment decisions. Several conceptual intersection planning designs and off-road trail alignments are provided in the plan.

White Township Proposed Master Plan Amendment

White Township proposed amending its Master Plan in 2019, maintaining its circulation plan goal to provide a safe, efficient circulation system consistent with the character of the township. Supplementing the master plan amendment was an assessment of potential traffic impacts along Belvidere Rd (CR 519) spurred by residential uses in the Industrial and Light Industrial zoned areas. The traffic model determined the need for substantial infrastructure improvements in the Build Condition, including the addition of travel lanes and three signalized intersections.

Warren County Light Industrial Site Assessment

The Warren County Light Industrial Site Assessment was completed in 2020 to understand the potential long-term impact of warehousing and distribution development in the County. Based on the location of existing clusters of parcels zoned for industrial use, 15 sites were selected for analysis. 2045 no-build and build condition traffic volumes were extrapolated from existing volumes to determine the impact of industrial development on the roadway network. Under build conditions, nearly every intersection analyzed was projected to operate with a Level of Service F. Potential measures that would be necessary to mitigate the impacted intersections were identified, including restriping of lanes at intersections to facilitate turns, installing traffic signals, and pushing back stop bars. To maintain an acceptable level of service under the analyzed build-out condition, CR 519 would also need to be widened to two lanes in each direction. Several transportation demand management approaches were also identified to mitigate traffic impacts, including staggering worker shifts at the industrial sites and increasing the use of freight rail for goods movement where possible to reduce roadway freight volumes.

2050 Freight Industry Level Forecasts Study

The 2050 Freight Industry Level Forecasts, published in 2020 developed estimates of current and projected future freight demand in the NJTPA region to the year 2050. This data will help NJTPA and its member agencies identify the location and type of existing and future goods movements as well as inform which strategic investments should be considered to support economic development and resiliency. Estimates of freight traffic and site locations were gathered from several sources and used to forecast traffic and employment through a Freight Forecasting Tool. Across the region, e-commerce sales are expected to represent 47% of retail sales in 2050, up from 11% in 2019. Despite the increase in e-commerce sales, forecasted employment in freight generating industries is expected to slightly decline. E-commerce packages in Warren County is expected to increase more than 300% between now and 2050, consistent with regionwide trends.

Technical Memorandum 2.2: Equity Assessment

Warren County Transportation Plan

DECEMBER 2020

INTRODUCTION

The purpose of the Equity Assessment is to ensure that all people are treated fairly and are meaningfully involved in the development and implementation of a project regardless of race, color, origin, or income. Concern that a minority and/or low-income population might disproportionately bear potential adverse environmental and health impacts from a project led to the issuance of Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. EO 12898 makes environmental justice a core mission of projects funded by Federal agencies.

The Equity Assessment is focused on the following characteristics:

1. Poverty-measured at household level
2. Racial Minorities-measured at population level
3. Limited English Proficiency-measured at household level
4. National Origin-measured at population level
5. Auto Accessibility-measured at household level
6. Disabilities-measured at population level
7. Age-measured at population level

Several of the variables were also reviewed for Warren County's 2018 Transportation Technical Study. Where applicable, comparisons to the data are made. Data for the 2018 study was gathered from the Environmental Protection Agency's EJ Screening tool, whereas more recent data was gathered from the United States Census' website.

Identifying the location of vulnerable populations will assist with the public outreach process in assuring all communities are reached out to and heard. Additionally, locations with significant populations of vulnerable populations will be more greatly considered while developing recommendations.

Equity Assessment Methodology

Data for each of the variables was gathered from the United States Census' 2018 Five-Year American Community Survey, the most recent five-year dataset available at the census tract level. In addition to elaborating upon the results of the analysis and comparing data at the census tract, county, state and national levels, details of each variable's methodology is provided.

Assessment Summary

As per the Census data, Warren County has a significantly lower portion of the population living in poverty, being a racial minority, having limited English proficiency, having been born outside of the United States, and lacking automobile access than state and national figures and a similar rate of residents with disabilities. Despite lower comparative rates of vulnerable populations, higher proportions of vulnerable populations were mainly found in Hackettstown and Phillipsburg.

1. Poverty

The United States Census counts the number of households living below the federal poverty level. A smaller portion of Warren County households live in poverty compared to state and national figures. Additionally, the poverty rate across all three geographies did not change since the 2018 study was conducted. Several census tracts in the county have a poverty rate above the state or national rates, particularly in the County’s more densely populated communities of Phillipsburg and Hackettstown. Poverty figures are provided in Table 1, and Table 2 and mapped in Figure 1.

Table 1: Poverty Comparisons

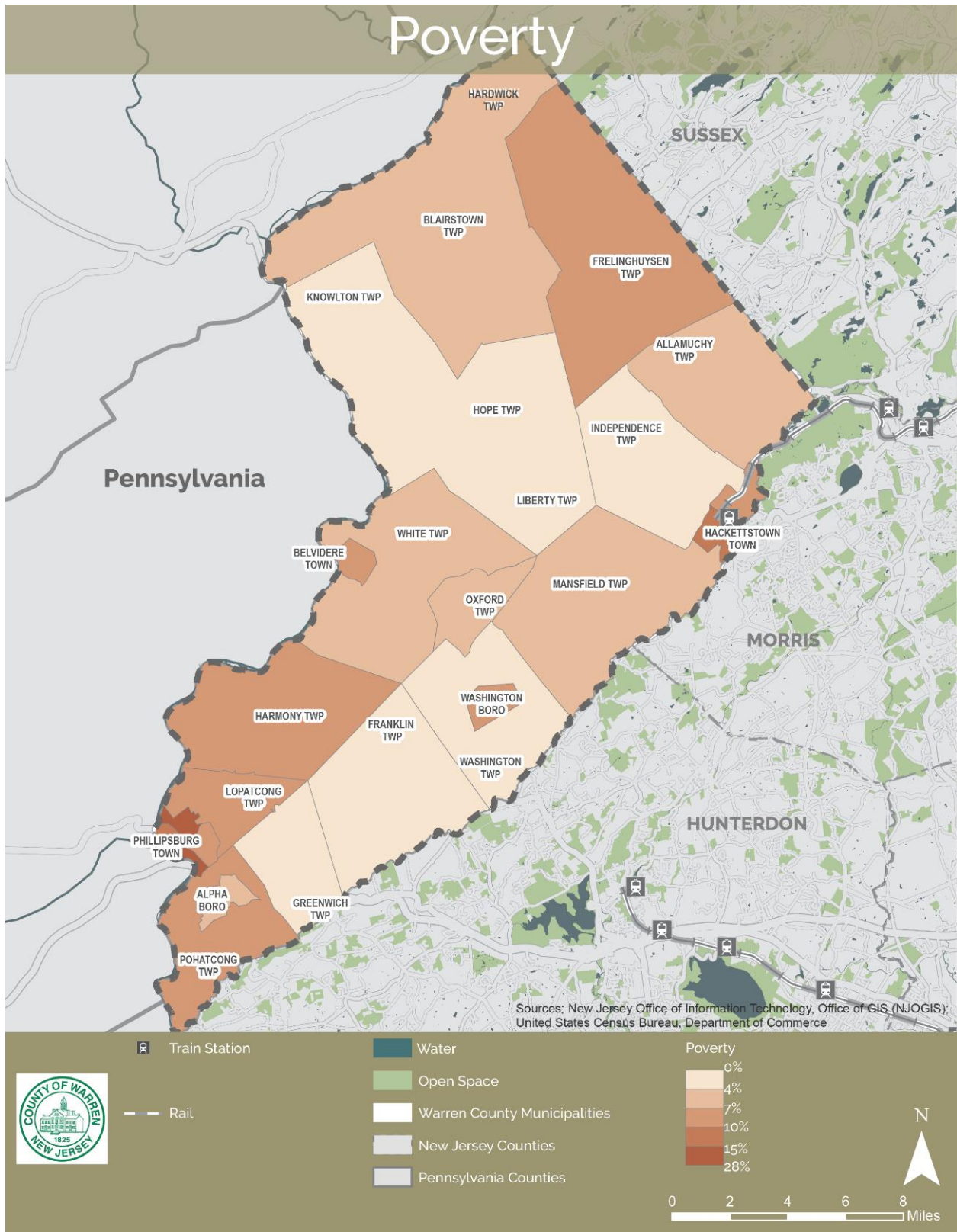
	Warren County	State	USA
2018 Report	8%	14%	10%
2020 Report	8%	14%	10%

Table 2: Poverty at the Census Tract Level

Municipality	Tract	Households Below Poverty Level*
Allamuchy	313.02	5.7%
Alpha	324	5.0%
Belvidere	317	7.9%
Blairstown	311.01	4.9%
Franklin	321.01	3.4%
Frelinghuysen	311.02	8.2%
Greenwich	321.02	2.6%
Hackettstown	314.01	9.8%
Hackettstown	314.02	14.7%
Harmony	318	7.3%
Independence	313.01	3.9%
Knowlton	312	2.8%
Lopatcong	322	9.9%
Mansfield	315	6.4%
Oxford	316.02	5.7%
Phillipsburg	306	20.3%
Phillipsburg	307	14.0%
Phillipsburg	308	8.6%
Phillipsburg	309	27.0%
Pohatcong	323	7.1%
Washington Boro	320	7.4%
Washington Township	319	3.6%
White	316.01	4.7%
Warren County		7.8%

**Values more than 10% greater than the county average are highlighted in red*

Figure 1



2. Racial Minority

Racial minority population is defined as any individual not identifying as “only white.” The percentage of racial minorities in Warren County increased from 2018 to 2020 and remained significantly lower than State and nationwide averages. Several census tracts have racial minority populations significantly greater than the County rate including the densely populated communities of Phillipsburg, Hackettstown and Washington Boro. Racial minority figures are provided in Table 3 and Table 4 and mapped in Figure 2.

Table 3: Racial Minority Comparisons

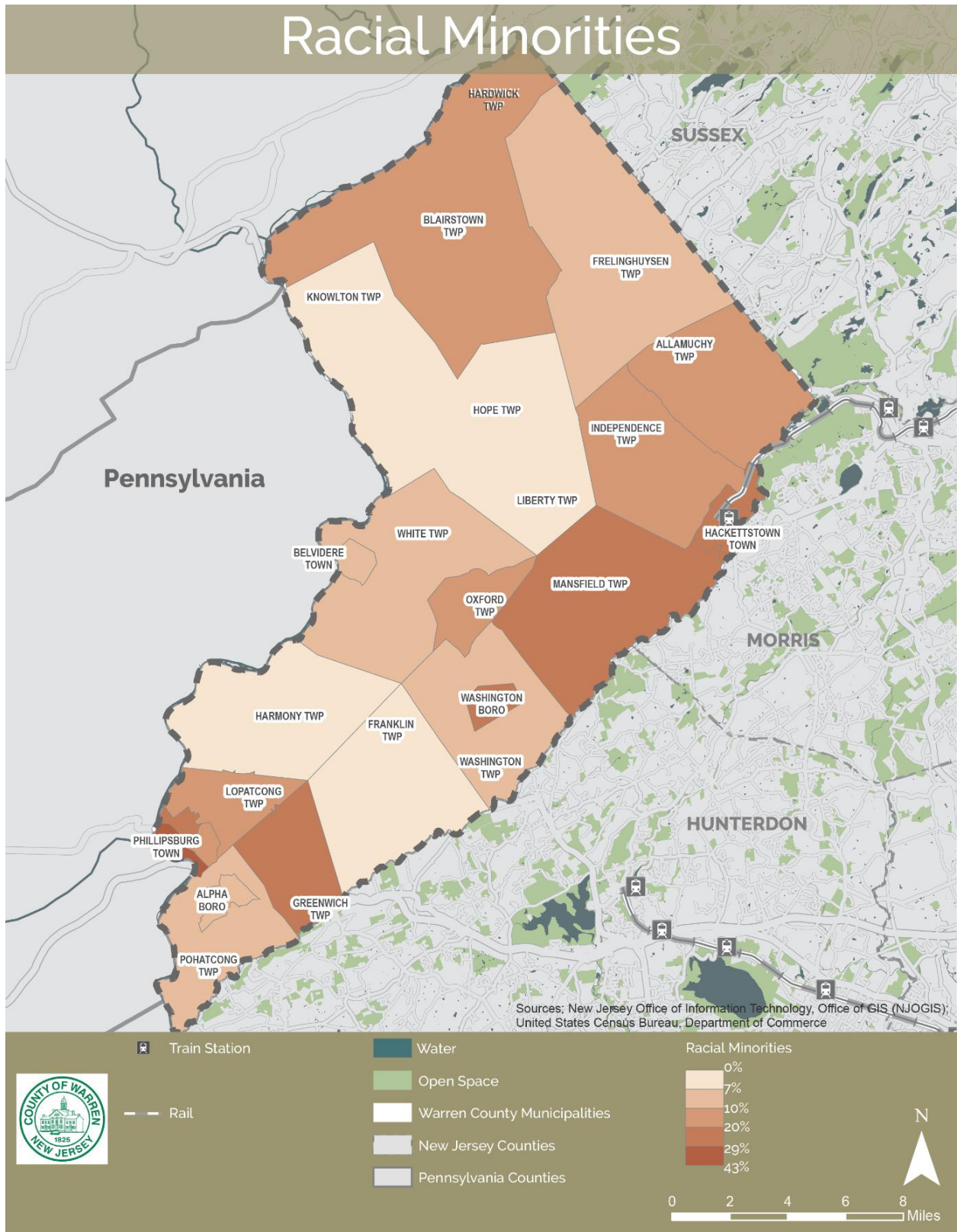
	Warren County	State	USA
2018 Report	16%	42%	37%
2020 Report	21%	44%	39%

Table 4: Racial Minorities at the Census Tract Level

Municipality	Tract	Racial Minorities*
Allamuchy	313.02	12.7%
Alpha	324	10.0%
Belvidere	317	8.1%
Blairstown	311.01	16.8%
Franklin	321.01	5.9%
Frelinghuysen	311.02	9.3%
Greenwich	321.02	21.9%
Hackettstown	314.01	28.6%
Hackettstown	314.02	24.3%
Harmony	318	5.5%
Independence	313.01	16.8%
Knowlton	312	6.6%
Lopatcong	322	19.0%
Mansfield	315	24.1%
Oxford	316.02	12.4%
Phillipsburg	306	27.8%
Phillipsburg	307	33.2%
Phillipsburg	308	20.0%
Phillipsburg	309	42.5%
Pohatcong	323	7.9%
Washington Boro	320	24.5%
Washington Township	319	7.5%
White	316.01	8.0%
Warren County		20.6%

**Values more than 10% greater than the county average are highlighted in red*

Figure 2



3. Limited English Proficiency

Households with limited English proficiency are defined as a household in which all members 14 years and over speak English less than “very well.” The percentage of limited English proficiency households in Warren County remained the same between 2018 and 2020 and is lower than rates across New Jersey and the country. Several census tracts have a rate of limited English proficiency households significantly higher than the County rate including the densely populated communities of Phillipsburg, Hackettstown and Washington Boro. Limited English proficiency figures are provided in Table 5 and Table 6 and mapped in Figure 3.

Table 5: Limited English Proficiency at the Census Tract Level

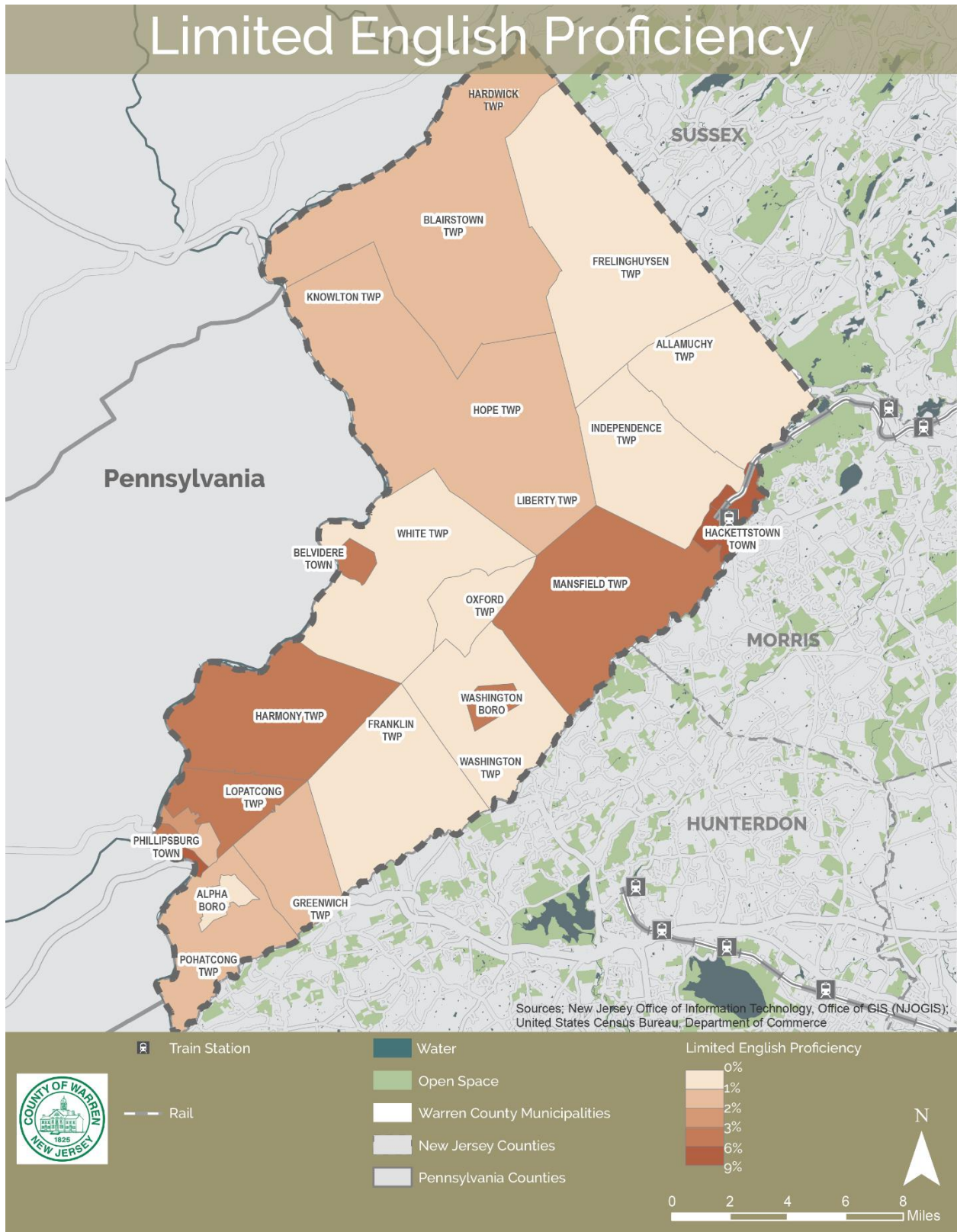
Municipality	Tract	Limited English Proficiency*
Allamuchy	313.02	0.2%
Alpha	324	0.5%
Belvidere	317	3.5%
Blairstown	311.01	1.1%
Franklin	321.01	0.5%
Frelinghuysen	311.02	0.0%
Greenwich	321.02	1.5%
Hackettstown	314.01	7.6%
Hackettstown	314.02	8.1%
Harmony	318	5.2%
Independence	313.01	0.8%
Knowlton	312	1.5%
Lopatcong	322	3.6%
Mansfield	315	4.6%
Oxford	316.02	0.3%
Phillipsburg	306	2.1%
Phillipsburg	307	5.6%
Phillipsburg	308	1.7%
Phillipsburg	309	6.9%
Pohatcong	323	1.3%
Washington Boro	320	3.5%
Washington Township	319	0.0%
White	316.01	0.7%
Warren County		2.6%

**Values more than 10% greater than the county average are highlighted in red*

Table 6: Limited English Proficiency at the Census Tract Level

	Warren County	State	USA
2018 Report	3%	7%	5%
2020 Report	3%	7%	4%

Figure 3



4. Non-Native Born Population

Significantly fewer Warren County residents were born outside of the United States than rates for New Jersey and the United States. Several census tracts have a significantly higher rate of people born outside of the United States than the county and national rates including the densely populated communities of Phillipsburg, and Hackettstown. Non-native born population figures are provided in Table 7 and Table 8 and mapped in Figure 4.

Table 7: Non-Native Born Population at the Census Tract Level

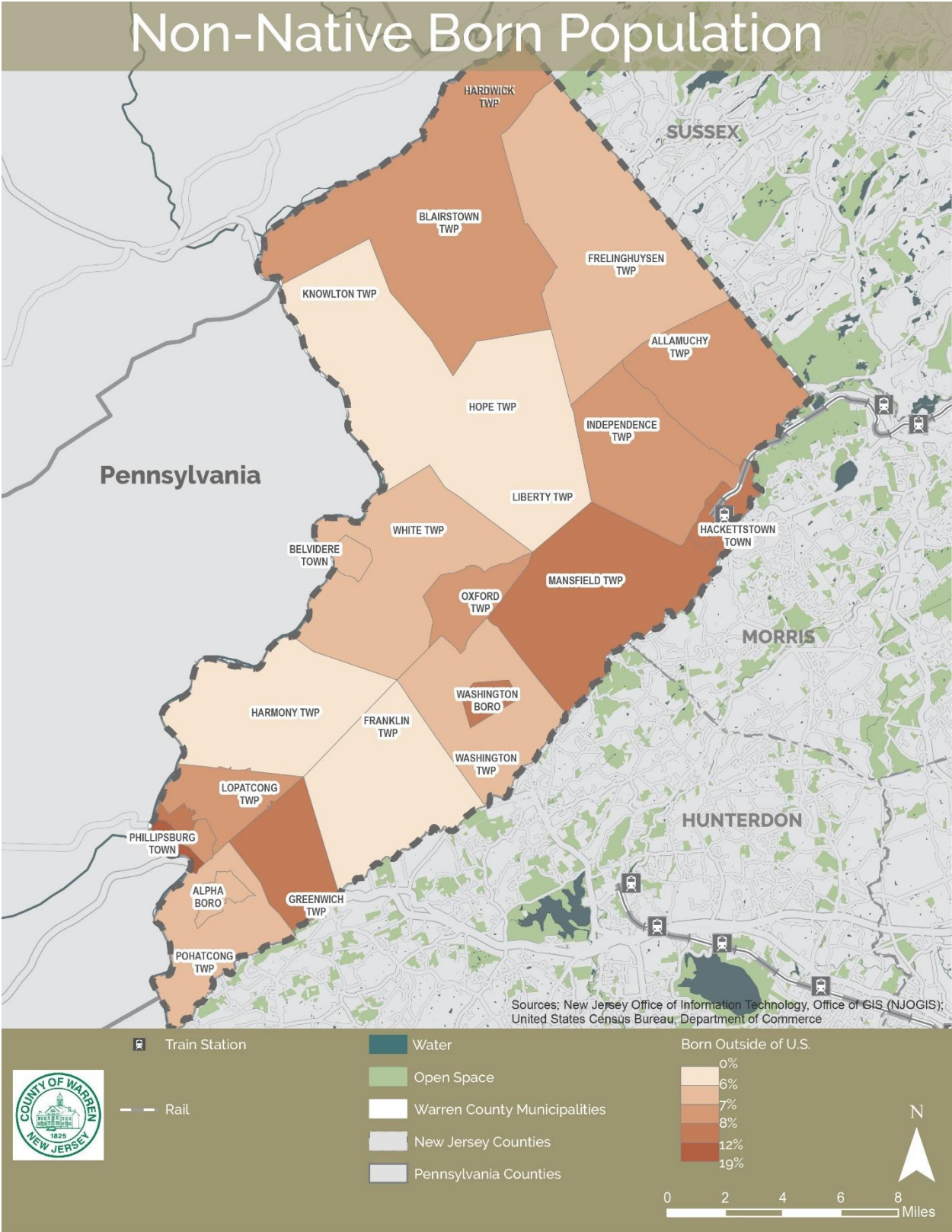
Municipality	Tract	Non-Native Born*
Allamuchy	313.02	5.7%
Alpha	324	5.0%
Belvidere	317	7.9%
Blairstown	311.01	4.9%
Franklin	321.01	3.4%
Frelinghuysen	311.02	8.2%
Greenwich	321.02	2.6%
Hackettstown	314.01	9.8%
Hackettstown	314.02	14.7%
Harmony	318	7.3%
Independence	313.01	3.9%
Knowlton	312	2.8%
Lopatcong	322	9.9%
Mansfield	315	6.4%
Oxford	316.02	5.7%
Phillipsburg	306	11.0%
Phillipsburg	307	7.9%
Phillipsburg	308	8.0%
Phillipsburg	309	27.0%
Pohatcong	323	7.1%
Washington Boro	320	7.4%
Washington Township	319	3.6%
White	316.01	4.7%
Warren County		9.6%

**Values more than 10% greater than the county average are highlighted in red*

Table 8: Non-Native Born Population Comparison

	Warren County	State	USA
2020 Report	10%	22%	14%

Figure 4



5. Automobile Access

The United States Census counts the number of households without access to an automobile. A smaller portion of Warren County households lack access to an automobile than the State and Country. Several census tracts have significantly higher rates of no automobile access than the County average including parts of Hackettstown and Phillipsburg. Automobile access figures are provided in Table 9 and Table 10 and mapped in Figure 5.

Table 9: Auto Accessibility at the Census Tract Level

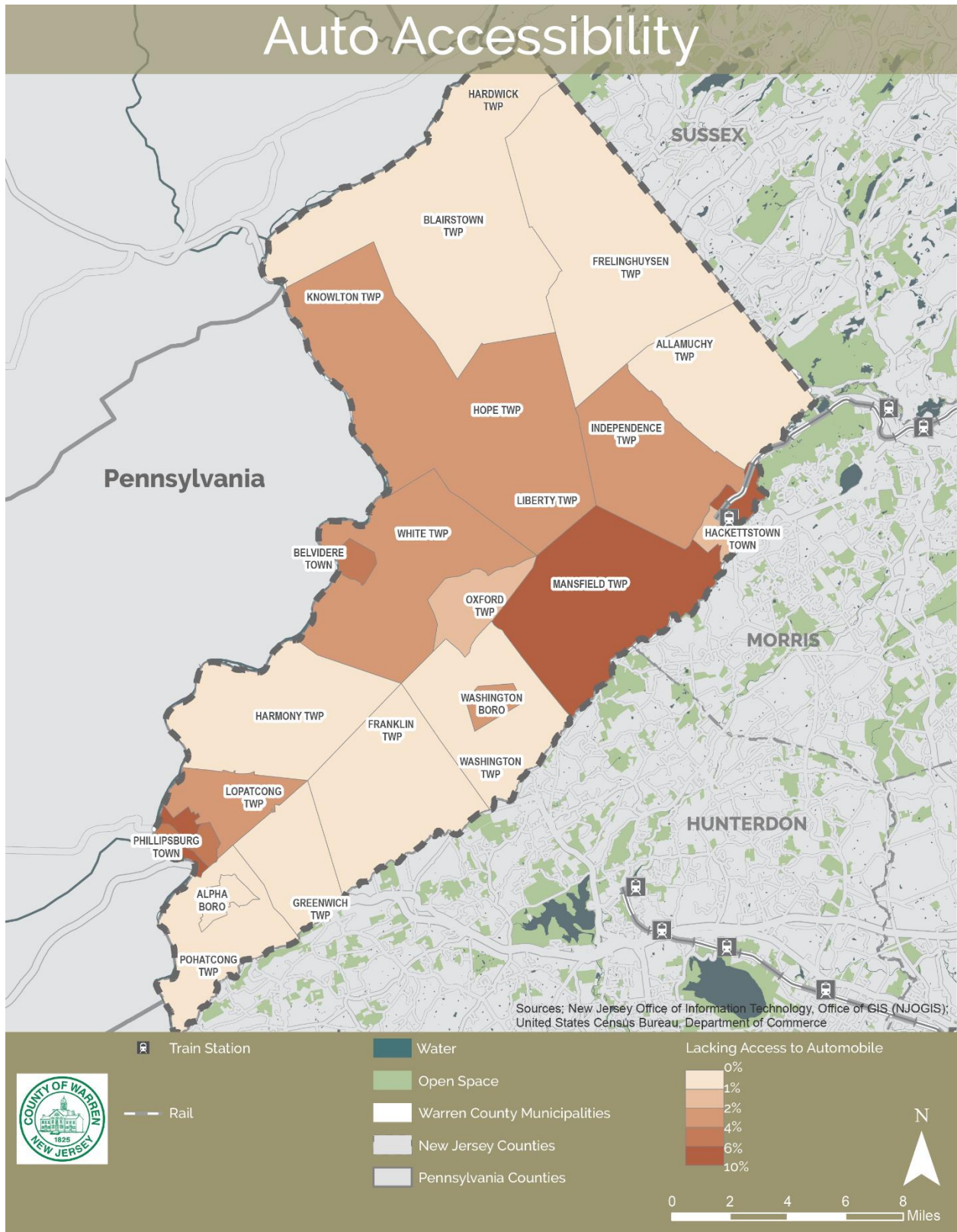
Municipality	Tract	Households without Automobile Access*
Allamuchy	313.02	1.0%
Alpha	324	0.6%
Belvidere	317	4.4%
Blairstown	311.01	0.8%
Franklin	321.01	0.0%
Frelinghuysen	311.02	0.2%
Greenwich	321.02	0.2%
Hackettstown	314.01	9.2%
Hackettstown	314.02	2.0%
Harmony	318	0.0%
Independence	313.01	3.4%
Knowlton	312	3.0%
Lopatcong	322	2.8%
Mansfield	315	6.3%
Oxford	316.02	1.8%
Phillipsburg	306	6.7%
Phillipsburg	307	4.6%
Phillipsburg	308	4.8%
Phillipsburg	309	8.4%
Pohatcong	323	0.0%
Washington Boro	320	3.4%
Washington Township	319	0.8%
White	316.01	4.0%
Warren County		3.1%

**Values more than 10% greater than the county average are highlighted in red*

Table 10: Households without Automobile Access Comparisons

	Warren County	State	USA
2020 Report	3%	6%	4%

Figure 5



6. Disabilities

The United States Census counts the number of individuals with a physical or cognitive disability. Warren County has a higher rate of disabled residents than the State and the same rate as the national average. Several census tracts have a higher rate of disabled residents than the County average including most of Phillipsburg, White, Oxford, Belvidere and Alpha. Disability figures are provided in Table 11 and Table 12 and mapped in Figure 6.

Table 11: Disabilities at the Census Tract Level

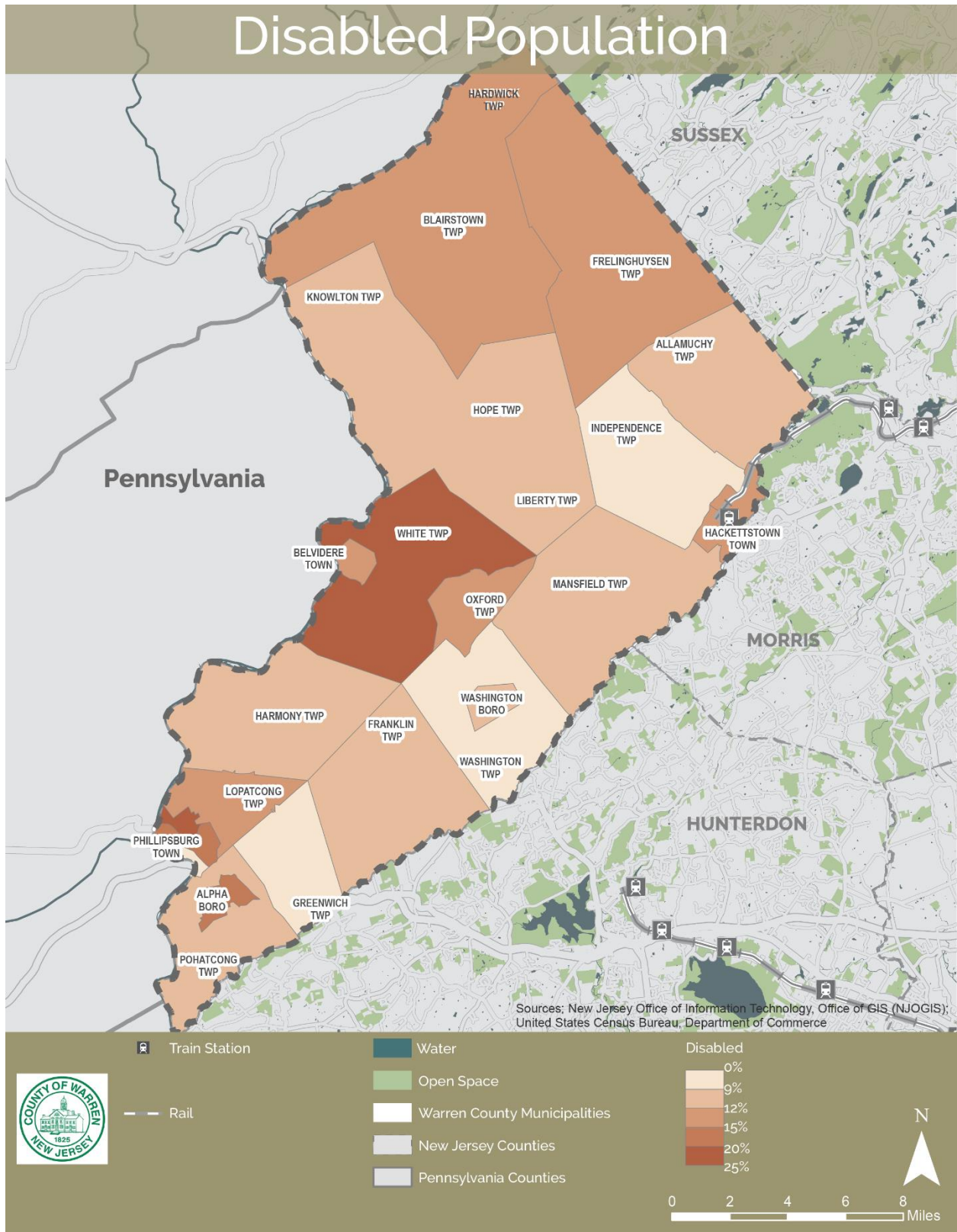
Municipality	Tract	Disabled*
Allamuchy	313.02	9.2%
Alpha	324	17.3%
Belvidere	317	15.0%
Blairstown	311.01	14.1%
Franklin	321.01	11.8%
Frelinghuysen	311.02	13.4%
Greenwich	321.02	7.6%
Hackettstown	314.01	13.1%
Hackettstown	314.02	13.0%
Harmony	318	9.9%
Independence	313.01	6.8%
Knowlton	312	10.5%
Lopatcong	322	14.4%
Mansfield	315	11.0%
Oxford	316.02	15.0%
Phillipsburg	306	21.5%
Phillipsburg	307	19.3%
Phillipsburg	308	17.2%
Phillipsburg	309	8.0%
Pohatcong	323	11.5%
Washington Boro	320	10.7%
Washington Township	319	8.4%
White	316.01	23.2%
Warren County		13.4%

**Values more than 10% greater than the county average are highlighted in red*

Table 12: Disabilities Comparisons

	Warren County	State	USA
2018 Census	13%	10%	13%

Figure 6



7. Age

The United States Census tabulates the age of each person and provides data points for several age ranges, including children and the elderly (defined as 65 years and older). Warren County has a similar rate of the population being under five, five to 17, and over 65 as the State and nationwide averages though there is a wide variation in these figures between census tracts in the County. The more densely populated communities of Belvidere and Phillipsburg have higher rates of the population being under five years old. These two municipalities, in addition to Greenwich, have high rates of the population being between five and 17 years old. Additionally, the less densely populated townships of Allamuchy, Blairstown, and White have high rates of senior residents. Age figures are provided in

Table 13 and Table 14, and each of the three age-related data points are mapped in Figure 7, Figure 8, and Figure 9.

Table 13: Age Comparisons

		Warren County	State	USA
2018 Census	Population Under 5	5%	6%	6%
	Population 5-17	16%	16%	17%
	Elderly Population	17%	16%	15%

Table 14: Age at the Census Tract Level

Municipality	Tract	Population Under 5	Population 5-17	Elderly Population
Allamuchy	313.02	3.7%	13.2%	22.7%
Alpha	324	5.3%	12.3%	20.6%
Belvidere	317	8.3%	18.8%	13.0%
Blairstown	311.01	3.5%	15.6%	23.4%
Franklin	321.01	6.1%	15.5%	15.5%
Frelinghuysen	311.02	5.2%	15.8%	19.4%
Greenwich	321.02	4.7%	20.3%	10.2%
Hackettstown	314.01	5.9%	15.5%	17.2%
Hackettstown	314.02	5.8%	13.6%	16.4%
Harmony	318	3.1%	13.9%	16.5%
Independence	313.01	3.5%	14.2%	13.9%
Knowlton	312	3.9%	15.2%	16.5%
Lopatcong	322	4.2%	16.3%	21.2%
Mansfield	315	6.3%	15.8%	15.5%
Oxford	316.02	2.2%	19.1%	15.0%
Phillipsburg	306	4.9%	13.2%	18.5%
Phillipsburg	307	4.2%	18.4%	11.5%
Phillipsburg	308	7.3%	17.9%	16.0%
Phillipsburg	309	3.9%	25.2%	8.6%

Municipality	Tract	Population Under 5	Population 5-17	Elderly Population
Pohatcong	323	6.1%	15.3%	15.3%
Washington Boro	320	5.5%	15.0%	11.1%
Washington Township	319	2.3%	18.5%	15.1%
White	316.01	2.3%	8.0%	38.2%
Warren County		4.6%	15.8%	17.2%

**Values more than 10% greater than the county average are highlighted in red*

Figure 7

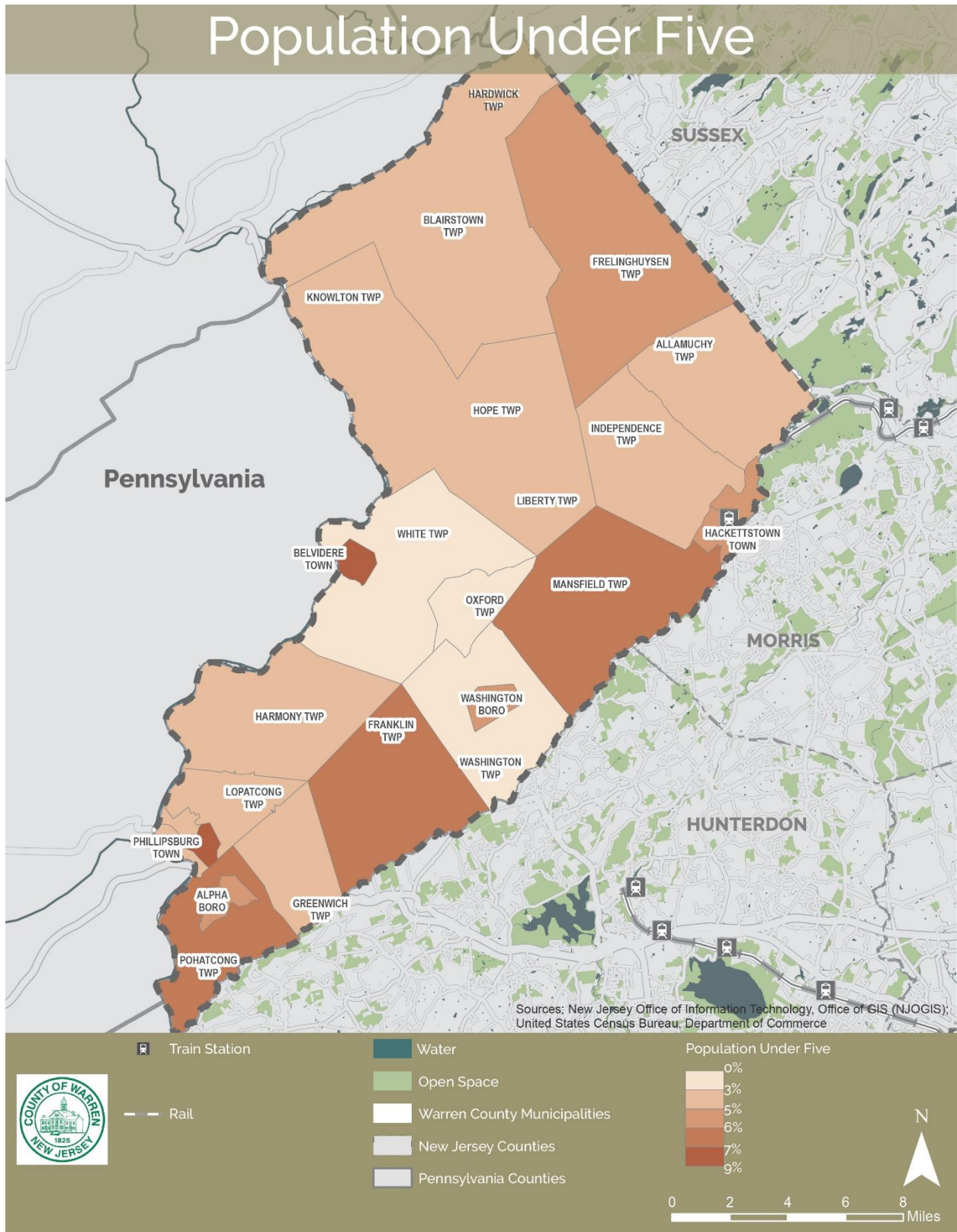


Figure 8

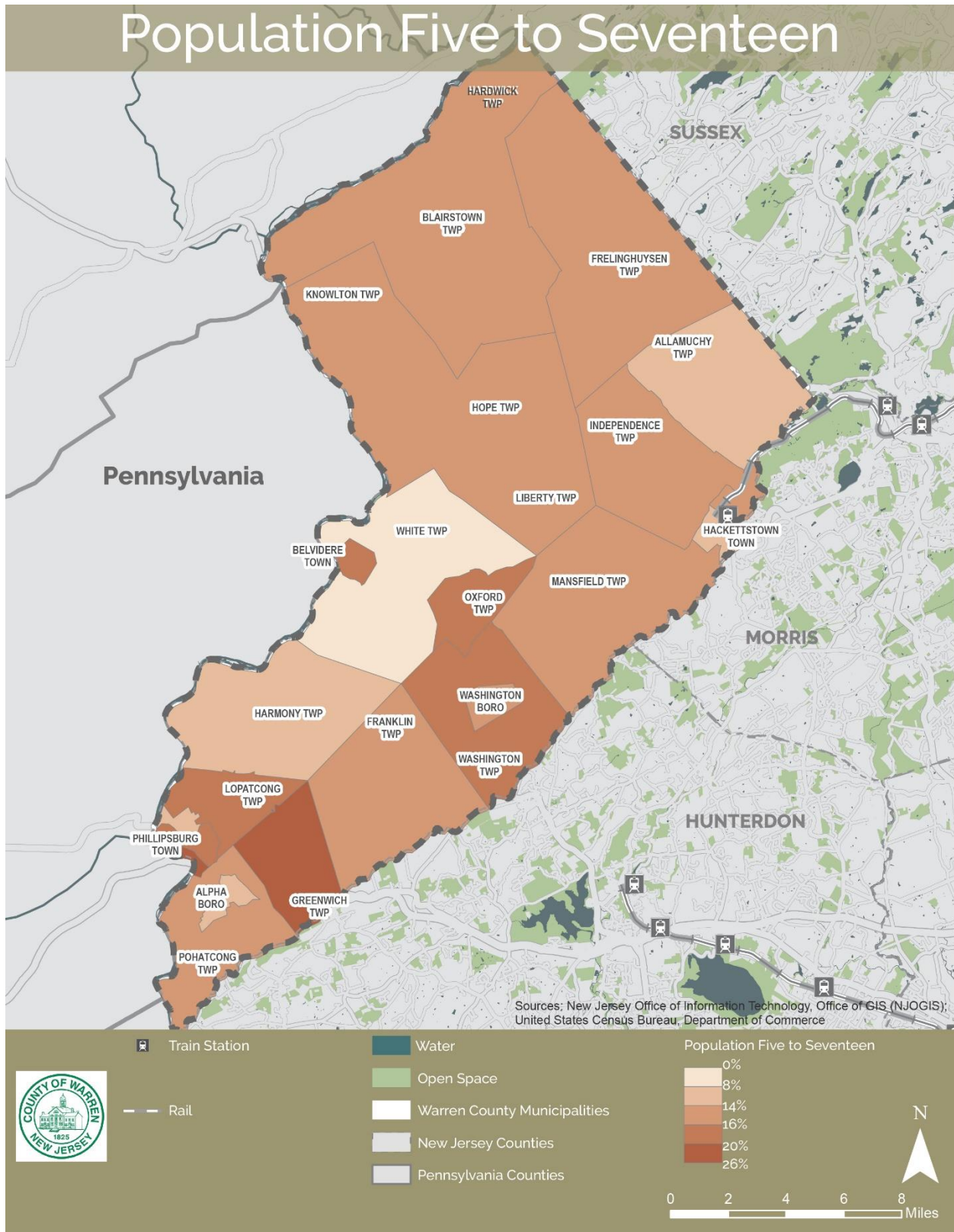
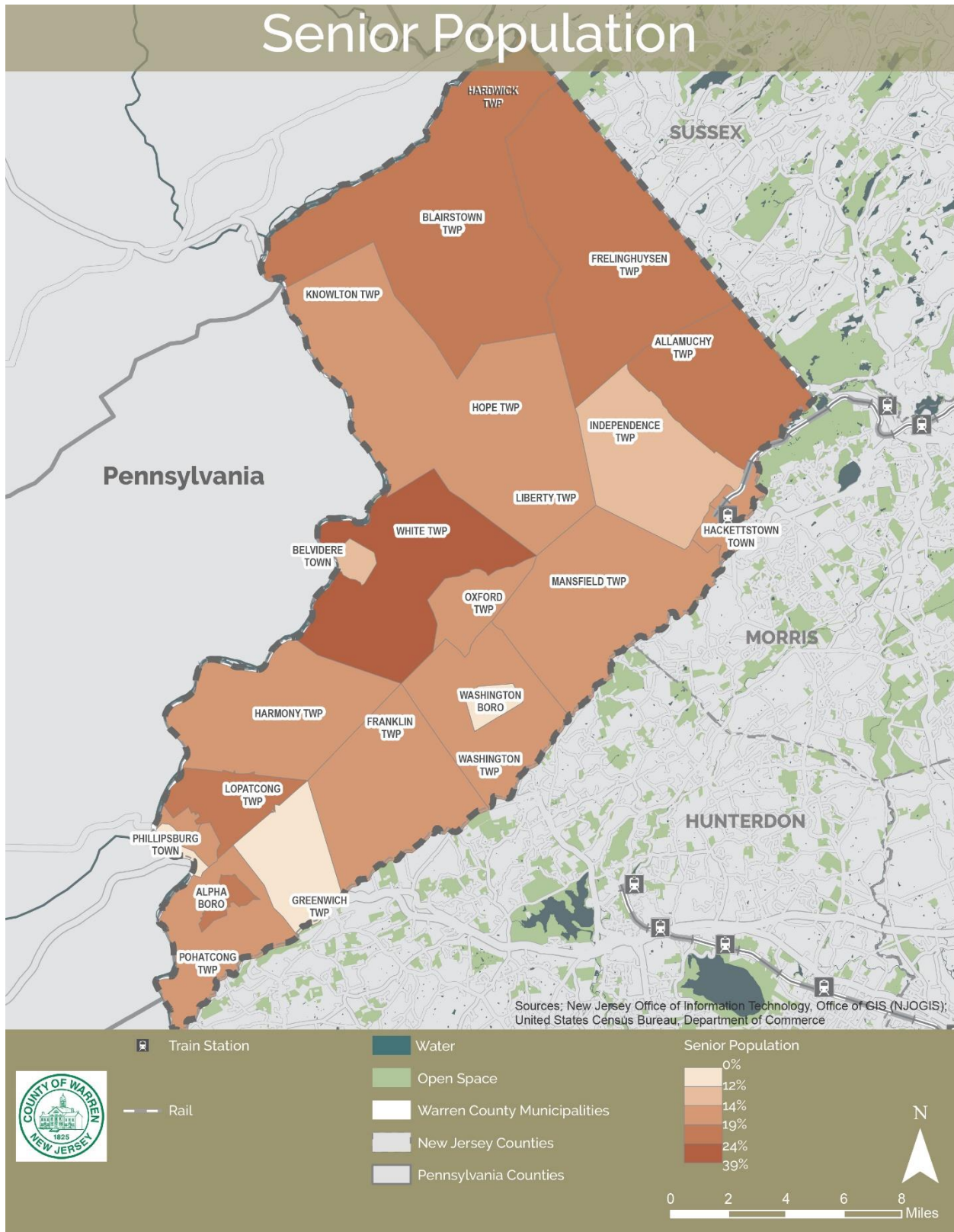


Figure 9



Technical Memorandum 2.3: Wikimap Assessment

Warren County Transportation Plan

DECEMBER 2020

INTRODUCTION

An online interactive map (i.e. Wikimap) was created for the Warren County Transportation Plan to collect place-based comments about transportation in Warren County. The web interface allowed users to mark-up a virtual map of the County by identifying corridors (lines) and spot locations (points) where transportation challenges or opportunities were present. The primary purpose of the mapping tool was to geographically locate and identify problem areas and opportunities based on local knowledge.

The Wikimap was open for public comment between June 22 and August 31, 2020. Users were able to add place-based comments onto the map as well as reply to already provided comments. A total of 192 interactions were recorded on the Wikimap; 164 interactions were “point” comments while 28 were “line” comments.

Categories

Comments were assigned to the following categories with example comments for each provided:

- *Bicycle or Pedestrian (Bike/ped)*-poor access to an existing trail
- *Congestion*-a congested segment of a corridor
- *Historic*-concern about the impact of construction of the structural integrity of nearby historic properties
- *Safety*-difficulty safely entering a roadway due to visibility concerns
- *Speed Concern (Speeding)*-a segment of a corridor with motorists traveling above the speed limit
- *Trucks*-concern about the number of trucks on a roadway
- *I-80 Rockwall project (Wall)*-concern about the proposal to build a retaining wall along the rockface adjacent to I-80
- *Warehouses*-concern about the impact increased truck traffic brought on by warehouse construction would have on roadways
- *Other*-comments concerning other topics such as cut-through traffic, public transit, or right-of-way concerns

Figure 1 below depicts the location of comments with each dot representing a categorized comment. Many comments fall into multiple categories and thus received several dots on the map below. Four hotspot locations with a high concentration of comments have a callout box next to them expressing the number of comments in each category. Nearly half of the 28 “line”, or corridor, comments provided by stakeholders were subsequently converted to “point” comments where applicable to simplify and clarify the visual representation. The width of the “line” comments are proportional to the number of interactions for that line. For example, the red line along County Route 519 is the thickest line because it received the most comments. The legend at the bottom of the map presents the number of “point” comments falling into each category. A total of 297 category assignments are present once multiple category assignments were accounted for.

Figure 1: Wikimap Comments

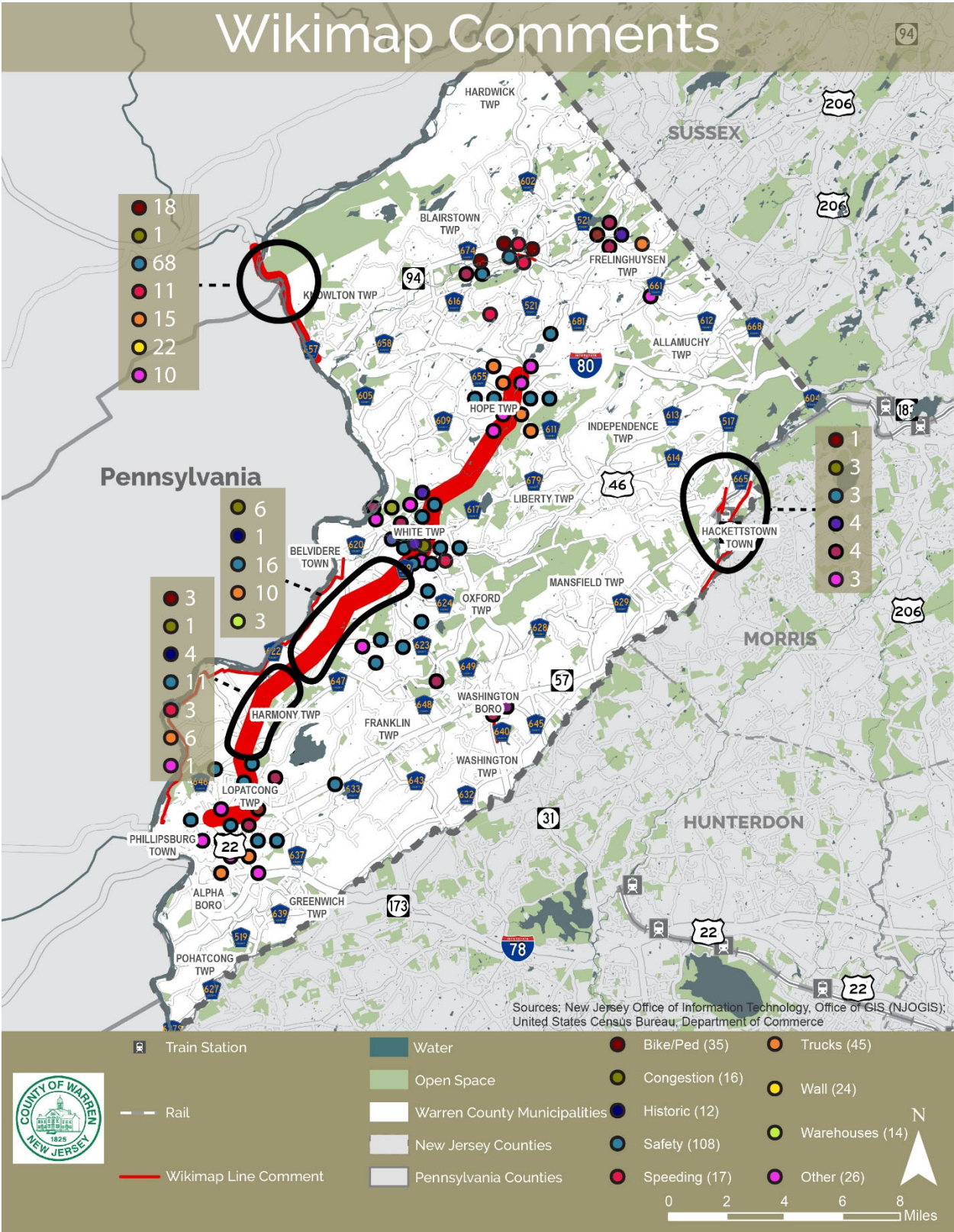


Table 1 below shows the breakdown in category interactions throughout the County:

Table 1: Warren County Wikimap Comments

Hotspot	Total	Bike/Ped	Congestion	Historic	Safety	Speeding	Trucks	Wall	Warehouse	Other
Number	297	35	16	12	108	17	45	24	14	26
Percentage	100%	12%	5%	4%	36%	6%	15%	8%	5%	9%

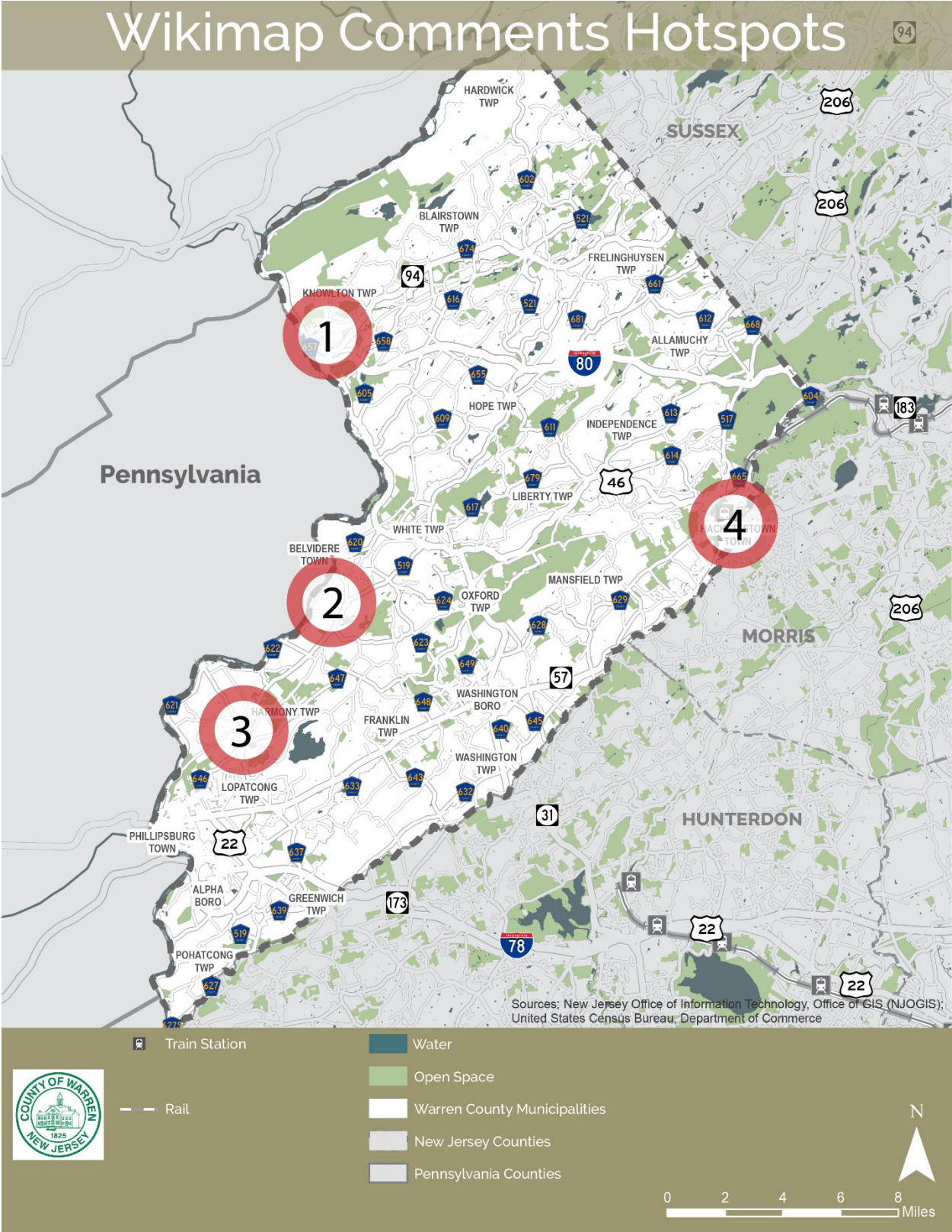
Hotspot Analysis

Four hotspots (locations with a high number of comments) were identified, as shown in **Error! Reference source not found.** These four hotspots correspond to the four locations in Figure 1 with callout boxes. The breakdown of comment categories for each hotspot is shown in Table 2. Several smaller comment areas are subsequently discussed.

Table 2: Wikimap Comments at Hotspots

Hotspot	Total	Bike/Ped	Congestion	Historic	Safety	Speeding	Trucks	Wall	Warehouse	Other
1	145	18	1	-	68	11	15	22	-	10
2	36	-	6	1	16	-	10	-	3	-
3	29	3	1	4	11	3	6	-	-	1
4	18	1	3	4	3	4	-	-	-	3

Figure 2: Wikimap Comment Hotspots



[Hotspot 1 \(Interstate 80 Curve at Dunnfield Creek/Appalachian Trail in Knowlton/Hardwick Twps\)](#)
The most prominent hotspot for Wikimap comments is near the curve of Interstate 80 in Knowlton and Hardwick Townships near the exit for Dunnfield Creek, the Appalachian Trail, and Kittatinny Point Visitor Center. The location is approximately 1.2 miles southeast of the Delaware River and Pennsylvania border. This location is the site of 145 category comments, nearly half of which concern safety. A substantial number of comments also relate to bicycle/pedestrian conditions, trucks, and the proposal to install a retaining wall. The comments generally concern the high traffic volumes and speeds, particularly of trucks, navigating around this “s-curve.” 22 commenters objected to the proposal to install a retaining wall against the adjacent rockface, citing that existing safety concerns are due to the roadway geometry rather than the presence of the rock wall. Bicycle/pedestrian comments relate to the need to preserve local trail access for cyclists and hikers near the curve. Another hotspot appears in Figure 1 to the southeast of Hotspot 1; however, these comments are also regarding the “S-curve” along Interstate 80 therefore these Wikimap interactions were incorporated into Hotspot 1.

[Hotspot 2 \(County Route 519 in White Township\)](#)

Hotspot 2 includes a corridor of CR 519 in White Township roughly bounded by the border with Harmony Township to the south US 46 to the north. This nearly five-mile segment received 36 Wikimap category comments. Congestion-related comments mainly centered on the lack of multiple access points to CR 519 from establishments along the corridor. With high traffic volumes, and sometimes speeds, motorists find it difficult to safely enter the roadway. Truck/warehouse-related comments focused on concern about the possibility of additional warehouses being constructed in the area that would exacerbate existing congestion and safety issues.

[Hotspot 3 \(County Route 519 in Harmony Township\)](#)

Hotspot 3 includes the five-mile segment of CR 519 in Harmony Township. Comments in this hotspot include the potential impact of warehouse construction on nearby historic properties, unsafe biking and walking conditions to nearby schools, as well as visibility issues along the curve of the road exacerbated by high speeds and truck volumes.

[Hotspot 4 \(Hackettstown\)](#)

Comments in Hackettstown included the prevalence of cut-through traffic, the need for new pedestrian infrastructure, and the desire for a bypass. Cut-through traffic was identified traveling along Mitchell Road to reach NJ 57, as well as East Prospect Street and East Baldwin Street to bypass congestion along U.S. 46 and CR 517. Stakeholders commented on the desire for a bypass to combat cut-through traffic and congestion at U.S. 46 and CR 517. The need for marked pedestrian crossings was identified at along CR 604 at Maple Avenue, and Seber Road, the latter of which provides access to Hackettstown Riverfront Park. The need for sidewalk constructions and extensions were identified for CR 517, CR 604, NJ 57, and westbound U.S. 46 west of Canal Road.

[Other Clusters](#)

In addition to the hotspots identified as being the locations of the most comments, several smaller comment clusters were identified by the project team for further analysis, summarized below.

Hope

Comments in Hope Township centered around safety and truck issues along CR 519. The corridor was identified as a problem corridor due to existing truck volumes, expectation for higher truck volumes from warehouse construction, and the difficulty entering/exiting the roadway from adjacent land uses.

Phillipsburg Area

Comments in Phillipsburg and nearby areas include safety concerns involving trucks, prevalent congestion, and improving conditions along existing bicycle facilities. The intersection of NJ 57 and CR 519 in Lopatcong was identified as having safety issues due to the difficulty for trucks to turn left from northbound NJ 57 to CR 519. The signal timing along U.S. 22 was identified as not providing sufficient time for vehicles along the intersecting roads and plazas, specifically at Stryker Road in Lopatcong and the Hillcrest Mall in Phillipsburg. Comments concerning bike facilities included the need for “Trail Crossing Ahead” signs along CR 519 near the Greenwich/Lopatcong border for the Morris Canal Greenway.

NJ 94 (Blairstown/Frelinghuysen)

Comments along and near NJ 94 in Blairstown and Frelinghuysen include the need for passing lanes and the desire for a walking trail. Several hills along NJ 94 in Frelinghuysen were identified as being locations where trucks drastically slow down, causing congestion, potentially unsafe driving conditions, and loud noises for nearby residents. A stakeholder suggested that more segments of widened roadway would allow vehicles to pass these trucks. The prevalence of fast-moving vehicles traveling along the shoulder to pass left-turning vehicles was identified as an issue along the corridor in Blairstown, as well as the need to slow traffic in the commercial area of Blairstown. Lambert Road in Blairstown was identified as catering to significant pedestrian volumes. Multiple stakeholders suggested a pedestrian trail be constructed along Lambert Road between North Warren Regional High School at Noe Road to the commercial plaza and library at NJ 94.

Conclusion

Overall, Wikimap comments received from local stakeholders covered a variety of topics and geographies, but generally concerned the following topics:

- The “s-curve” in Interstate 80 poses a safety hazard
- Stakeholders do not support the retaining wall proposal for I-80
- Bicycle and pedestrian access should be enhanced, particularly along high-speed, high-volume corridors
- Several county corridors cater to high speeds and high volumes, particularly of trucks
- New light industrial warehouses and facilities present the possibility to worsening existing congestion and traffic volumes
- Existing and anticipated truck volumes should be routed away from residential neighborhoods and walkable commercial districts

Technical Memorandum 2.4: Data Assessment

Warren County Transportation Plan

JANUARY 2021

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Introduction

A variety of data sources were gathered, reviewed and analyzed for inclusion into the Warren County Transportation Plan. These sources provide an understanding of the overall transportation and demographic conditions of the County as well as important distinctions between communities. These data sources will be vital and when linked with the public outreach process will result in the identification of key focus sites for which recommendations will be developed.

A description of each data source is provided below. Each section is concluded with a brief summary of takeaways from the data source. The document concludes with two trending issues that impact considerations of the larger circulation system.

The development of this Circulation Plan update was undertaken during the COVID-19 pandemic. As a result, public outreach was conducted mainly via electronic means such as online focus groups. Additionally, while much of the data analysis was conducted prior to the pandemic, some data was gathered during the pandemic when travel demand and patterns were atypical. Where appropriate, the unusual nature of the data is pointed out.

Roadways and Structures

Functional Class

The Federal Highway Administration categorizes all roadways by functional classification. Functional classification is the systematic organization of highways and roadways into separate classes or groups, based upon their intended service function. Efficient and safe operation of the system requires that facilities be designed to serve a specific purpose within the street hierarchy. Municipalities can advocate to change the functional class of a roadway if travel patterns or a community’s needs have changed. Roadway functional classifications applicable to Warren County are defined in Table 1 below.

Table 2 provides a list County and State routes assigned to each functional classification. In addition to these routes, many roadways under local jurisdiction fall into the groups. Several County routes fall under multiple functional classifications, based on the nature and use of the roadway portion.

Table 1: FHWA Functional Classifications¹

Arterials	Interstates	Limited or no access to abutting land uses. Access only from major streets at interchanges. Freeways supplement the capacity of the arterial street system and provide high speed mobility.
	Other Freeways and Expressways	Similar in nature to Interstates, but not operating as an interstate highway.
	Other Principal Arterials	Serving major centers of metropolitan areas and providing a high degree of mobility, these roads can also provide mobility through rural areas. Often provide direct access (via driveways) to land uses.
	Minor Arterials	Interconnects and augments the principal arterial system. Operating speeds and service levels are lower than major

		arterials. Should be excluded from identifiable residential neighborhoods.
Collectors	Major Collectors	Provides service to traffic generators, connecting cities and large towns, serving the most important intra-county travel corridors.
	Minor Collectors	Provide service to developed areas and smaller communities linking locally important traffic generators.
Local	Local Access	Provides land access and can exist in any land use setting. Movement is incidental and involves travel to and from a collector facility.

¹ Summarized from FHWA descriptions

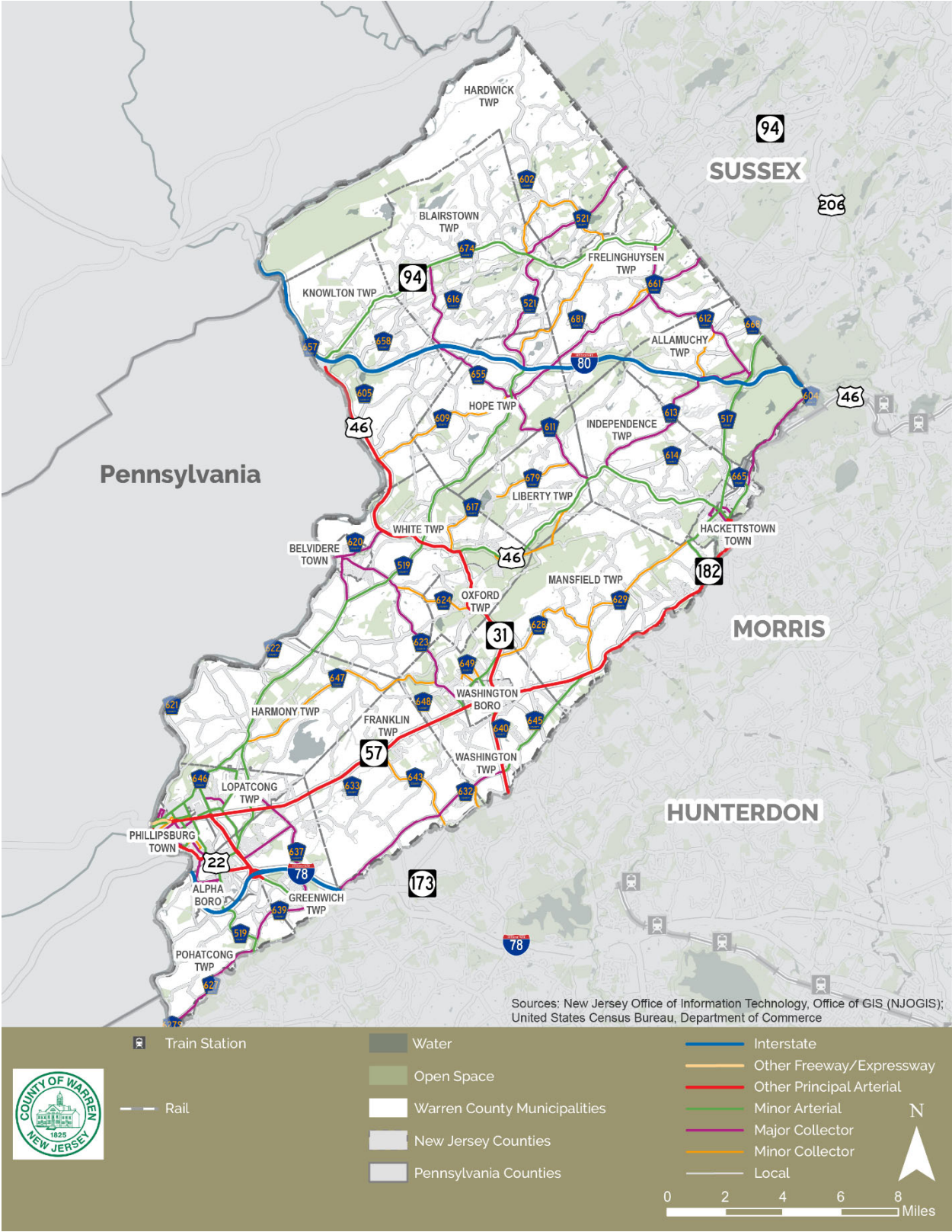
Key Points

A variety of roadway functional classifications are located in Warren County. Interstates 78 and 80 allow high-speed, high-volume thru movement as an easy means of traversing the mainly rural country to reach higher density metropolitan destinations. Principal arterials such as NJ 57 and NJ 31 provide access between distant townships within the County while connecting local retail and commercial centers. Minor arterials such as CR 519 and U.S. 46 east of NJ 31 also provide access to regional centers such as Hackettstown and Phillipsburg, connecting to principal arterials and interstates. Major and minor collectors constituting most of the County roadway system provide additional access between the higher functional classification roadways as well as smaller residential neighborhoods.

Table 2: Functional Classification Designations

Interstates			
Interstate 78		Interstate 80	
Other Freeways/Expressways			
U.S. 22 (west of North Hillcrest Boulevard westbound, west of Morris Street eastbound)			
Other Principal Arterials			
U.S. 22 (east of Warren Street in Phillipsburg to I-78)	U.S. 46 (west of NJ 31)	NJ 31	NJ 57
NJ 122	NJ 182		
Minor Arterial			
U.S. 173 (east of I-78)	U.S. 46 (east of NJ 31)	NJ 94	CR 517
CR 519 (south of CR 521)	CR 521 (south of I-80)	CR 604 (south of CR 665)	CR 623 (small portion north of NJ 57)
CR 628 (west of NJ 31)	CR 632 (east of NJ 31)	CR 646	CR 665
Major Collector			
CR 519 (north of 521)	CR 521 (north of I-80)	CR 601	CR 604 (north of CR 665)
CR 609 (small portion)	CR 611	CR 612 (most)	CR 613
CR 620	CR 621 (only in Phillipsburg)	CR 623 (most)	CR 627
CR 632 (west of NJ 31)	CR 637	CR 638	CR 639
CR 641	CR 642	CR 655	CR 661
CR 667			
Minor Collector			
CR 602	CR 608	CR 609 (most)	CR 612 (small portion in Johnsonburg)
ICR 615	CR 617	CR 624	CR 625 (portion)
CR 628 (east of NJ 31)	CR 629	CR 643	CR 647
CR 649	CR 659	CR 679	
Local Access			
All other roads			

Figure 1: Functional Classifications



Speed Limits

An efficient and effective roadway network provides a variety of road types with varying speed limits to assure the safe movement of vehicles through and within the County. Based on the environment and surrounding land uses of a roadway segment, the speed limit may vary.

Table 3 and Table 4 list the range of speed limits on State and County roadways in Warren County. Figure 2 shows a map of speed limits in the County for State and County-maintained routes. Where applicable, the range of existing speed limits is provided where speed limits along a route varies.

Key Points

Similar to Functional Classification, a variety of speed limits regulate roadways in Warren County. Interstates and roadways with minimal curves cater to higher speed (>50 mph) traffic while much of the County roadways (designated with CR) allow travel speeds of 35-50 mph, traveling through curvy and hilly terrain and connecting to higher speed roadways. Local roadways that provide direct access to residential uses tend to have lower (<35 mph) speed limits.

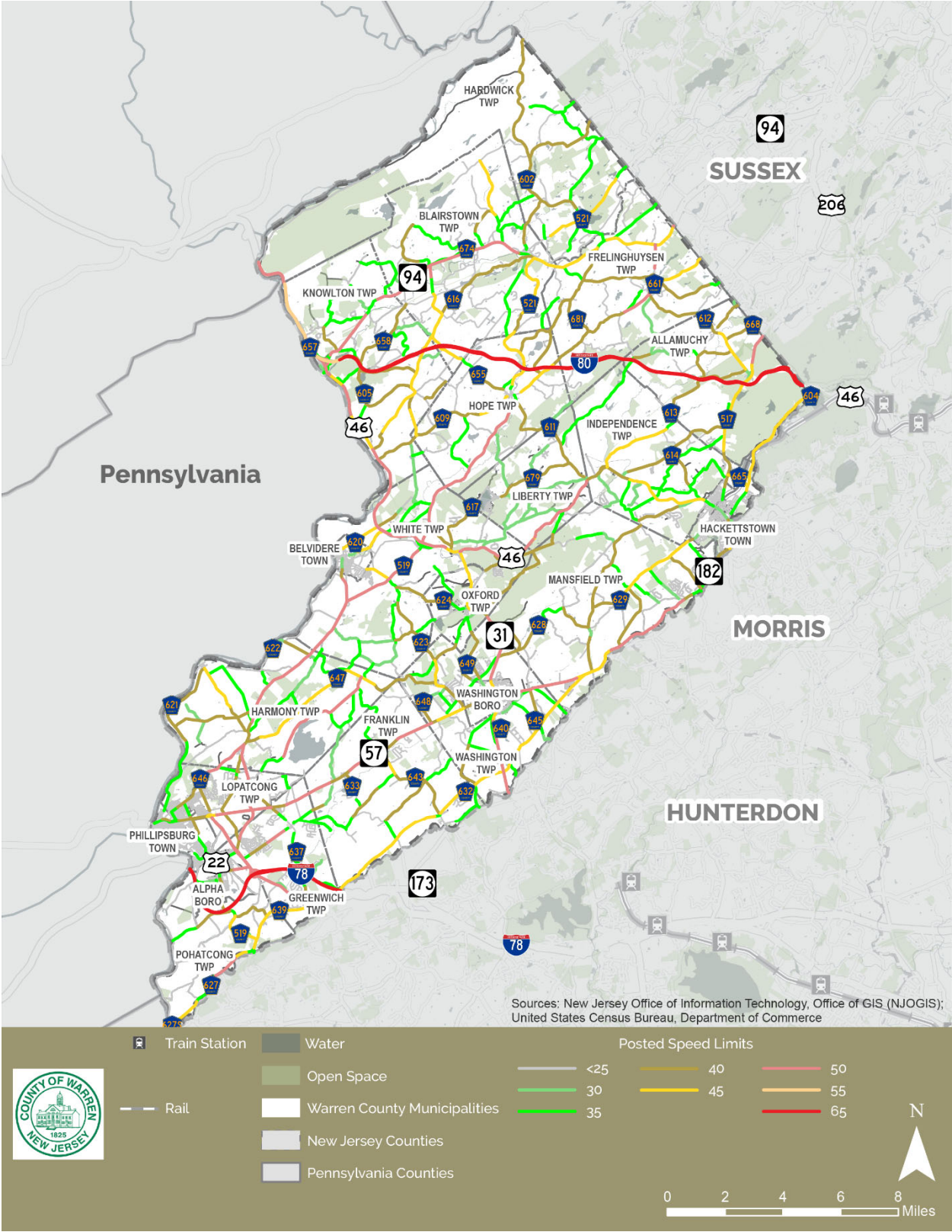
Table 3: Speed Limits

Interstate Routes	U.S. Routes	State Routes
I-78: 65 mph	U.S. 22: 25-50 mph	NJ 31: 35-50 mph
I-80: 50-65 mph	U.S. 46: 35-50 mph	NJ 57: 25-50 mph
	NJ 94: 35-50 mph	
	NJ 122: 25-50 mph	
	NJ 163: 25 mph	
	NJ 173: 40-50 mph	
	NJ 182: 40 mph	

Table 4: Speed Limits on County Routes

<i>CR 517:</i> 25-50 mph	<i>CR 614:</i> 30-40 mph	<i>CR 628:</i> 35-40 mph	<i>CR 643:</i> 25-45 mph	<i>CR 658:</i> 40 mph
<i>CR 519:</i> 25-50 mph	<i>CR 615:</i> 40 mph	<i>CR 629:</i> 30-45 mph	<i>CR 644:</i> 30 mph	<i>CR 659:</i> 35-40 mph
<i>CR 521:</i> 25-45 mph	<i>CR 616:</i> 40-45 mph	<i>CR 630:</i> 30-35 mph	<i>CR 645:</i> 30-35 mph	<i>CR 661:</i> 25-50 mph
<i>CR 601:</i> 20 mph	<i>CR 617:</i> 40 mph	<i>CR 631:</i> 25 mph	<i>CR 646:</i> 40-50 mph	<i>CR 665:</i> 45 mph
<i>CR 602:</i> 25-40 mph	<i>CR 618:</i> 35 mph	<i>CR 632:</i> 35-45 mph	<i>CR 647:</i> 40-45 mph	<i>CR 667:</i> 30 mph
<i>CR 604:</i> 25-45 mph	<i>CR 619:</i> 35 mph	<i>CR 633:</i> 40-45 mph	<i>CR 648:</i> 30-40 mph	<i>CR 668:</i> 40 mph
<i>CR 605:</i> 25-40 mph	<i>CR 620:</i> 25-50 mph	<i>CR 635:</i> 35-40 mph	<i>CR 649:</i> 30-40 mph	<i>CR 669:</i> 40 mph
<i>CR 607:</i> 30 mph	<i>CR 621:</i> 25-45 mph	<i>CR 636:</i> 40 mph	<i>CR 650:</i> 40 mph	<i>CR 671:</i> 35 mph
<i>CR 608:</i> 40 mph	<i>CR 622:</i> 25-40 mph	<i>CR 637:</i> 25-40 mph	<i>CR 651:</i> 40 mph	<i>CR 672:</i> 35 mph
<i>CR 609:</i> 25-45 mph	<i>CR 623:</i> 35-45 mph	<i>CR 638:</i> 25-40 mph	<i>CR 652:</i> 40 mph	<i>CR 673:</i> 35 mph
<i>CR 610:</i> 35 mph	<i>CR 624:</i> 30-40 mph	<i>CR 639:</i> 45 mph	<i>CR 653:</i> 35 mph	<i>CR 674:</i> 35 mph
<i>CR 611:</i> 25-40 mph	<i>CR 625:</i> 30-40 mph	<i>CR 640:</i> 35 mph	<i>CR 654:</i> 25 mph	<i>CR 676:</i> 25 mph
<i>CR 612:</i> 25-45 mph	<i>CR 626:</i> 30-40 mph	<i>CR 641:</i> 35 mph	<i>CR 655:</i> 35-50 mph	<i>CR 678:</i> 25 mph
<i>CR 613:</i> 35-45 mph	<i>CR 627:</i> 35-50 mph	<i>CR 642:</i> 30-35 mph	<i>CR 656:</i> 25-30 mph	<i>CR 679:</i> 40 mph

Figure 2: Speed Limits



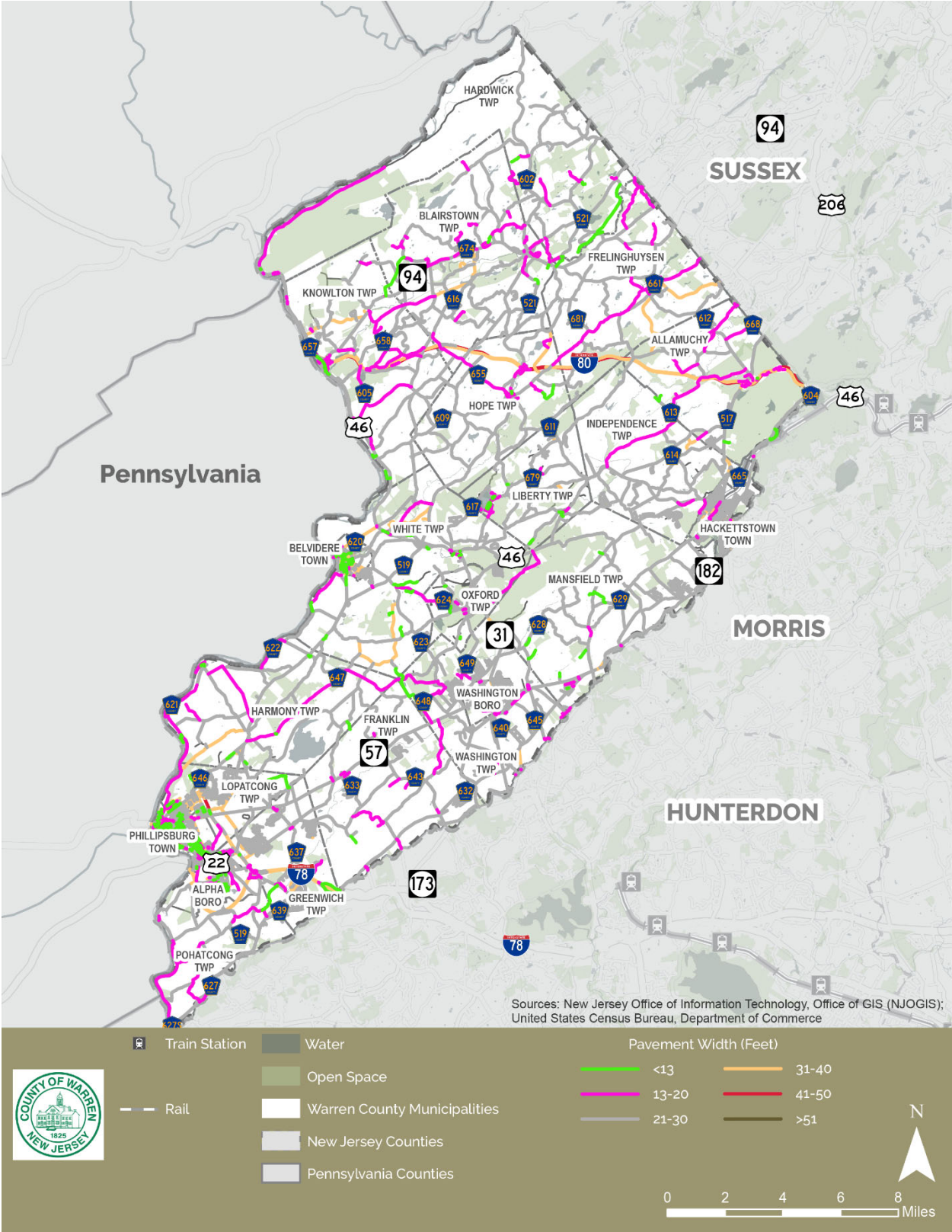
Pavement Width

Most roadways in the County, including the majority of County roadways have a pavement width of 21-30 feet, sufficient for one travel lane in each direction with no on-street parking. Roadways with a pavement width above 40 feet include U.S. 46, NJ 31, NJ 57, and short segments of several municipal roadways. Additionally, many municipal roadways have a pavement width of less than 20 feet. A map of pavement widths throughout the County is shown in Figure 3 and was obtained from NJDOT Straight Line Diagram data.

Key Points

The vast majority of roadways, including most County roadways present a pavement width of 21-30 feet, sufficient for one lane of travel in either direction with no on-street parking. Several roadways in the more densely developed communities of Phillipsburg, Alpha, Washington Boro and Hackettstown present roadway widths ranging from 31-50 feet.

Figure 3: Pavement Width



Roadway Jurisdiction

Public roadways are under the jurisdiction of either the State, County or municipality which determines the entity required to lead any changes to the roadway. Table 6 presents the mileage of roadways falling under each jurisdiction, and Figure 4 presents a map of the existing jurisdiction of each roadway in the County, highlighting all changes to roadway's jurisdiction since Warren County's previous circulation plan was published in 1982. The 1982 Warren County Transportation Plan provided an orderly and timely plan for coordinated development of different transportation modes and identified deficiencies in present modes. Through the plan, the County Planning Board adopted 11 high-level goals and objectives (each with several sub-goals) for maintaining existing infrastructure and expanding network opportunities where feasible. These goals are elaborated upon in Technical Memo 2.1 focusing on previous studies. Roadway jurisdiction changes highlighted in Figure 4 shows the existing roadway jurisdiction while Figure 5 shows changes to the roadway jurisdiction since the County's 1982 Transportation Plan. In that figure, additions and deletions that were recommended in the 1982 Plan are indicated as being FROM the 1982 Plan, and the additions and deletions that were not recommendation from the 1982 Plan are indicated as being SINCE the 1982 plan. Data concerning existing roadway jurisdiction was obtained from NJDOT Straight Line Diagrams.

Additions to the County roadway network from the 1982 plan include the following:

- CR 665 (Bilby Road): CR 517 to CR 604 in Hackettstown
- CR 679: Lakeside Drive North to CR 611 in Liberty
- CR 659: CR 602 to CR 521 in Hardwick
- CR 521: NJ 94 in Blairstown to Hardwick border
- CR 661 (Dark Moon Road): CR 661 in Frelinghuysen to Sussex County border
- CR 519 (Johnsonburg Bypass): CR 661 to CR 661 in Frelinghuysen
- CR 602 (Franklin Grove Road): from Millbrook Flatbrook Road to Newman Road in Hardwick
- CR 632: NJ 57 in Mansfield to CR 651 in Washington Township
- CR 629: CR 652 to CR 628 in Mansfield
- CR 621: North Main Street in Phillipsburg to Lopatcong border
- CR 628: CR 649 to CR 649 in Washington Township

Roadways removed from the County roadway network from the 1982 plan include the following:

- CR 606 (River Road): Old Mine Road from I-80 to Delaware River National Recreation Area, formerly Pahaquarry Township merged into Hardwick Township
- CR 621 Spur: Railroad Avenue to CR 621 in Harmony
- Roaring Rock Road: west of CR 623 in Washington
- Old Belvidere Road: from CR 646 to CR 646 in Harmony
- Belview Road: CR 519 in Lopatcong to Strykers Road in Harmony
- Penwell Road : NJ 57 in Mansfield to Hunterdon County border
- Mellicks Woods Road: CR 519 to CR 519 in Pohatcong
- CR 677 (Morris Street): Raymond Street to U.S. 22 in Phillipsburg
- Bridge Street: CR 660 to NJ 94 in Blairstown
- CR 661: CR 519 to CR 519 in Frelinghuysen

Additions to the County roadway network not recommended in the 1982 Transportation Plan include the following:

- CR 658 (Polkville Road): CR 658 Vail Road in Knowlton to CR 655 (Mount Hermon Road) in Blairstown
- CR 683 (Ryan Road and Cat Swamp Road): CR 614 Petersburg Road in Independence to Allamuchy Township border
- CR 680 (Mt. Pisgah Road): Jensen Drive to the County landfill

Roadways removed from the County roadway network not recommended in the 1982 Transportation Plan include the following:

- CR 601 (Blair Place): CR 660 (Main Street) to CR 602 (Bridge Street)
- CR 665 (Bilby Road): CR 517 to Independence/Hackettstown border

All roadways added to the County roadway network were previously under municipal jurisdiction, and all roadways removed from the County roadway network moved to the jurisdiction of the municipality. Additions and deletions from the County roadway network not recommended in the 1982 Transportation Plan are detailed in Table 5.

Table 5: Roadway Jurisdiction Changes Not Recommended in 1982 Plan

Municipality	Road Name	Cross Street A	Cross Street B	Mileage	
				Added	Deleted
Knowlton/ Blairstown	CR 658 (Polkville Road)	CR 658 (Vail Road)	CR 655 (Mount Hermon Road)	1.07	
Independence/ Allamuchy	CR 683 (Ryan Road and Cat Swamp Road)	CR 614 (Petersburg Road)	Allamuchy Township border	1.14	
White/ Oxford	CR 680 (Mt. Pisgah Road)	Jensen Drive	County Landfill	0.6	
Blairstown	CR 601 (Blair Place)	CR 660 (Main Street)	CR 602 (Bridge Street)		<0.1
Independence/ Hackettstown	CR 665 (Bilby Road)	CR 517	Independence/Hackettstown border		0.5

Key Points

Most (63 percent) of the roadway mileage in the County falls under municipal jurisdiction. Smaller percentages of the overall roadway network fall under County, State and Interstate jurisdiction though these roadways cater to far higher traffic volumes than the municipal roads. Interstate roadways include Interstate 78, Interstate 80, and U.S. 22. Except for small pockets of the County with little to no development and large open areas including Hardwick, Blairstown, and Franklin, the County is well-served by County roadways.

Table 6: Roadway Jurisdiction

Jurisdiction	Distance	Percent
Interstate*	67 miles	6%
State	84 miles	7%
County	259 miles	23%
Municipal	716 miles	63%
Private	13 miles	1%

**Includes "Interstate" and "U.S." routes
Source – NJ Office of Technology, Office of GIS*

Figure 4: Roadway Jurisdiction

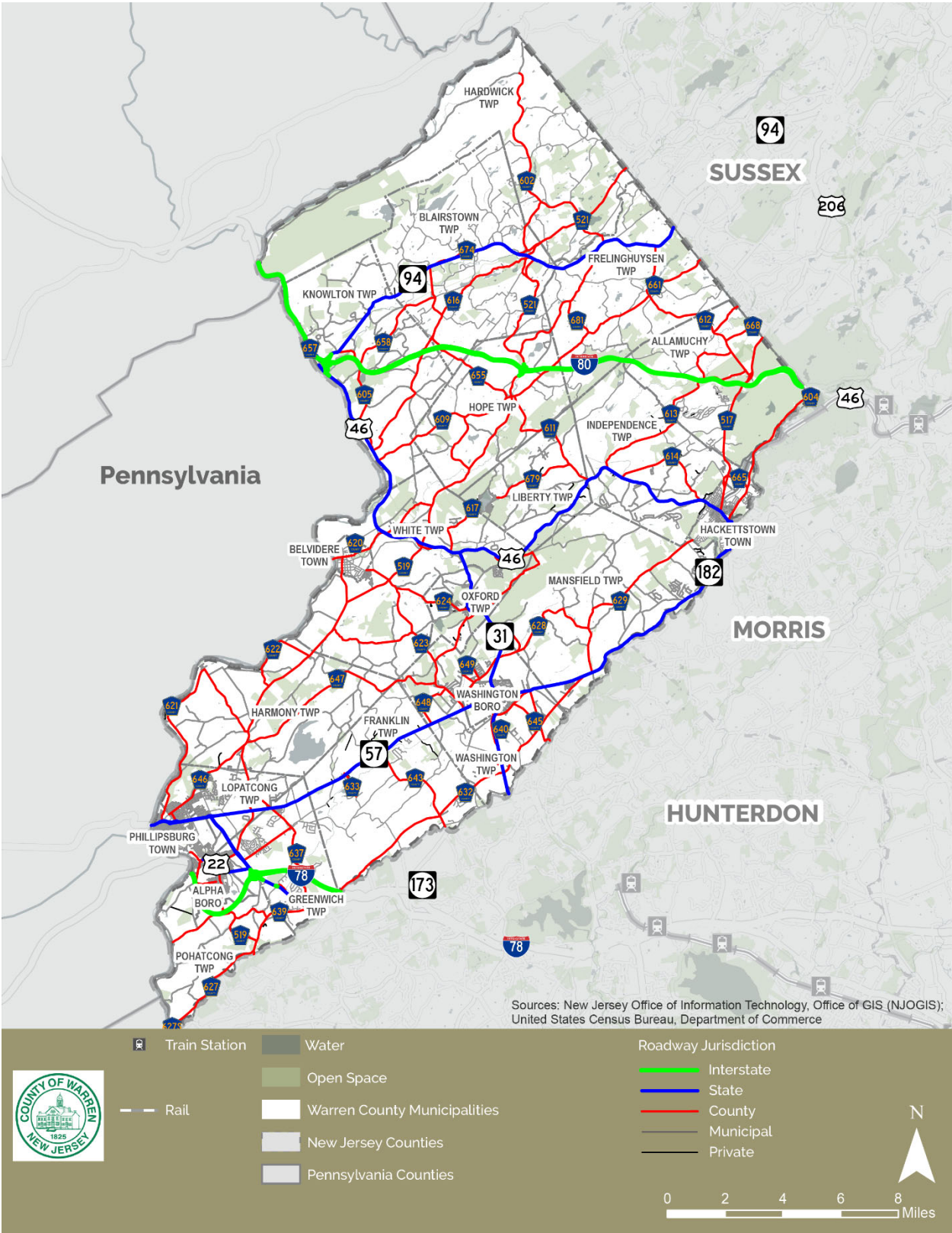
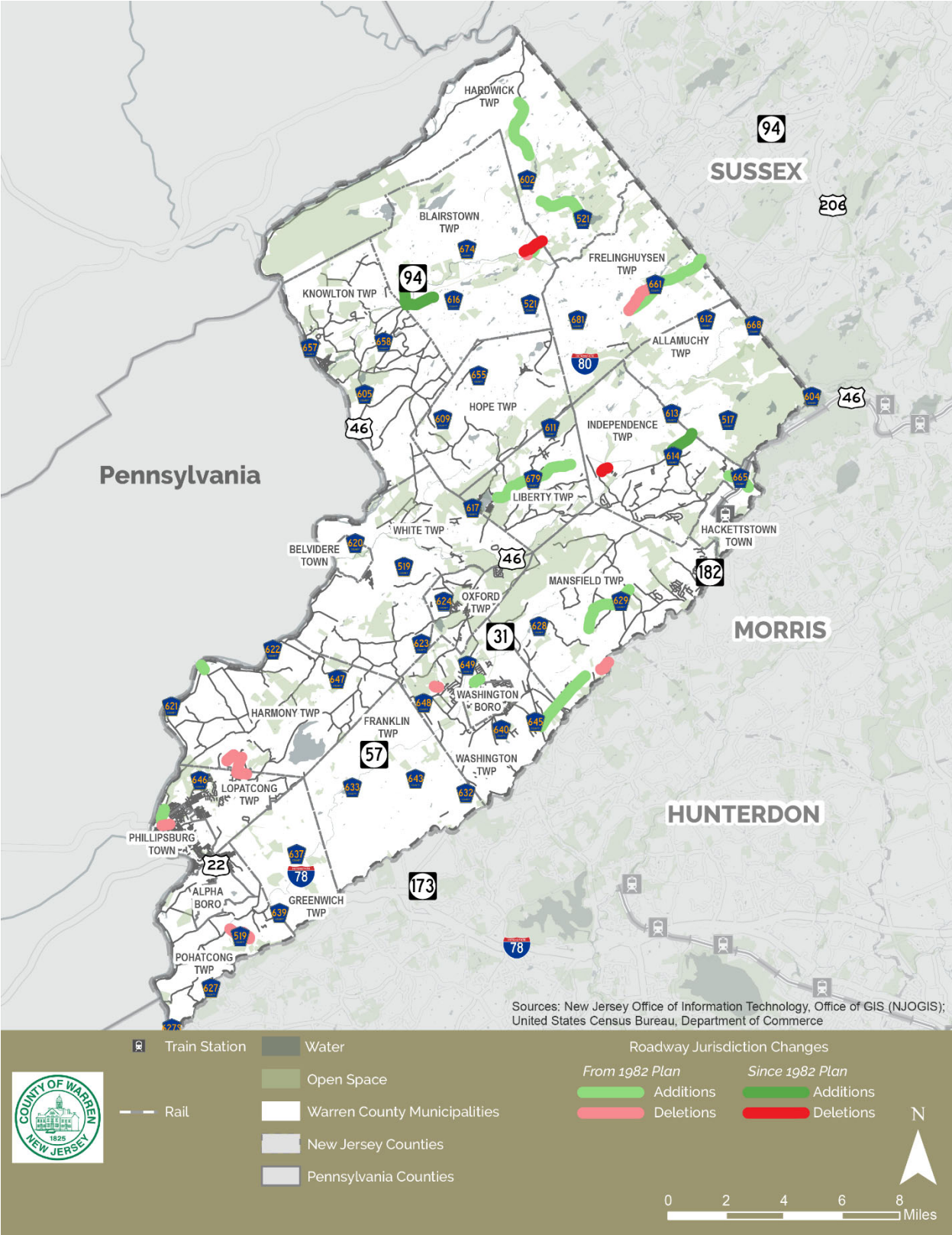


Figure 5: Roadway Jurisdiction Changes



Roadway Volumes

Traffic counts from the New Jersey Department of Transportation (NJDOT) were obtained from NJDOT’s Traffic Monitoring System.

Traffic counts on Warren County roadways conducted between 2016 and 2020 were downloaded, and data within each report transcribed into a database which was joined with an existing GIS file of traffic monitoring stations throughout the state. The data includes station ID, data, and volumes. Multiple types of traffic counts were collected including simple volume counts utilizing automatic traffic recorders and more complex classification counts with breakdowns of vehicle types. Summary data points include average annual daily traffic volume, the number of trucks, and the number of single and combination trucks traveling on each direction of a roadway.

Traffic count data will be used throughout the further development of the Circulation Plan to determine traffic patterns and identify specific locations for potential improvements.

Table 7 presents a list of corridors where average annual daily traffic (AADT) is greater than 10,000. Where volumes along a corridor vary, the upper and lower limits are shown. Ranges can vary highly due to the differing context of the corridor throughout the County. Traffic volumes are mapped in Figure 6.

Key Points

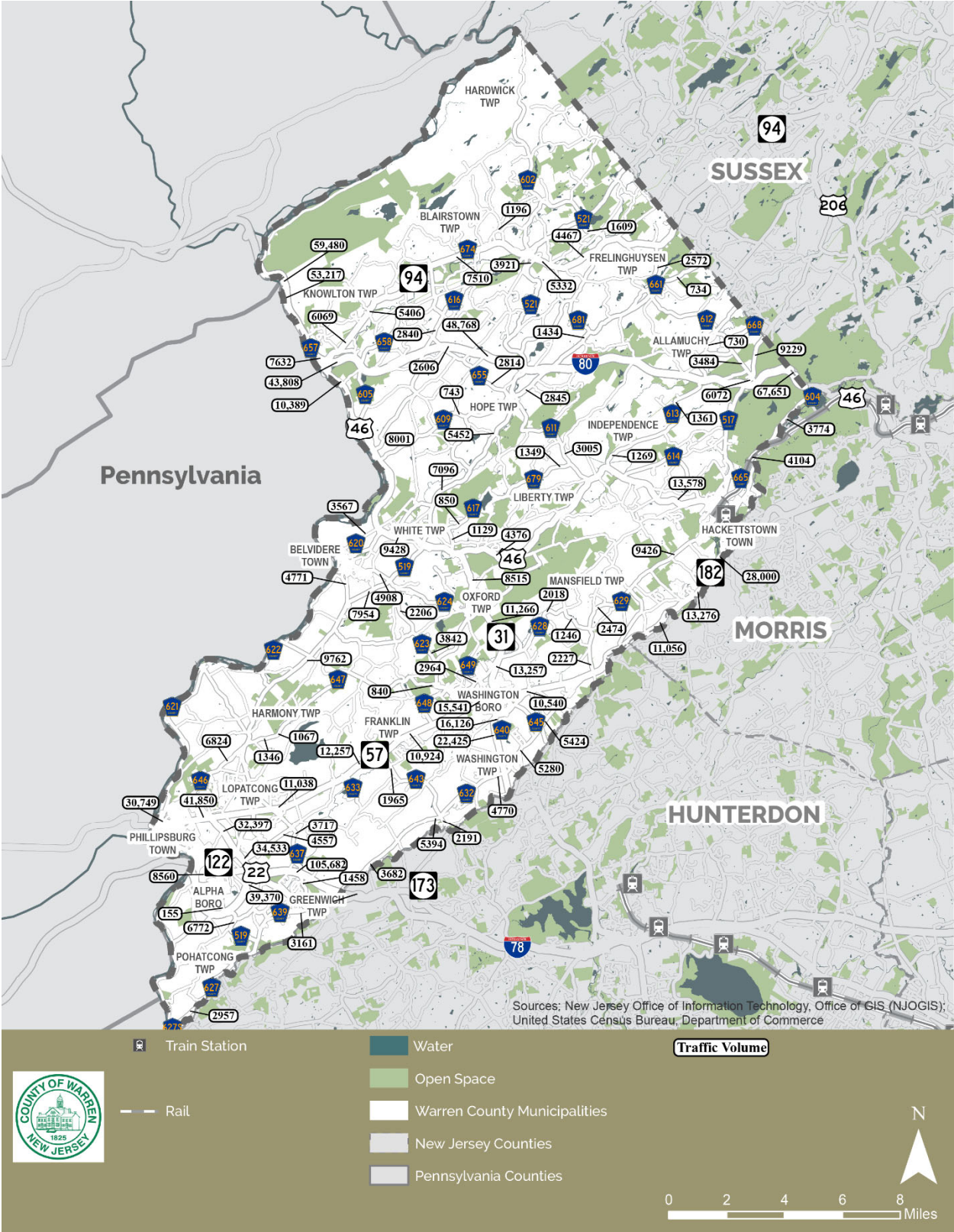
Traffic counts are highest on interstate roadways, with the highest being 105,000 AADT on Interstate 78, followed by 60,000 on Interstate 80. U.S. 22 and NJ 31 each have an AADT above 30,000. Several County roadways have an AADT above 10,000. Most traffic counts were conducted on high-volume roadways including the two-interstates as well as in the more developed areas of Hackettstown, Washington Boro, Phillipsburg, and Alpha.

Table 7: Roadway Traffic Volumes Over 10,000 (AADT)

Roadway	AADT
I-78	106,000
I-80	40,000-60,000
U.S. 22	30,000-43,000
NJ 182	16,000-28,000
CR 517	13,000-18,000
NJ 173	13,000
NJ 31	11,000-24,000
NJ 57	10,000-16,000
U.S. 46	10,000-14,000
CR 519	11,000-13,000
CR 638	11,000-13,000
NJ 122	11,000-12,000

*Traffic counts were conducted between 2016 and 2020. Corridors with a volume range include counts taken at multiple locations along the corridor

Figure 6: Traffic Volumes



Height/Weight Restrictions

Numerous bridges and roadways in Warren County have weight or height restrictions that preclude the use of a roadway by trucks exceeding those limits, making travel through the County and between major roadways more difficult. The design or condition of these bridges and roadways do not permit usage by certain vehicles. Height is measured from the roadbed to the highest point on the vehicle or load it is carrying. Weight includes the weight of the vehicle plus the weight of the load that is being carried.

While necessary for physical and safety reasons, height and weight restrictions can create secondary impacts. Restrictions can limit transportation accessibility for local businesses, impact local economic viability, increase vehicle miles traveled, and divert traffic through residential neighborhoods. Eleven County routes have height restrictions and seven County routes have weight restrictions.

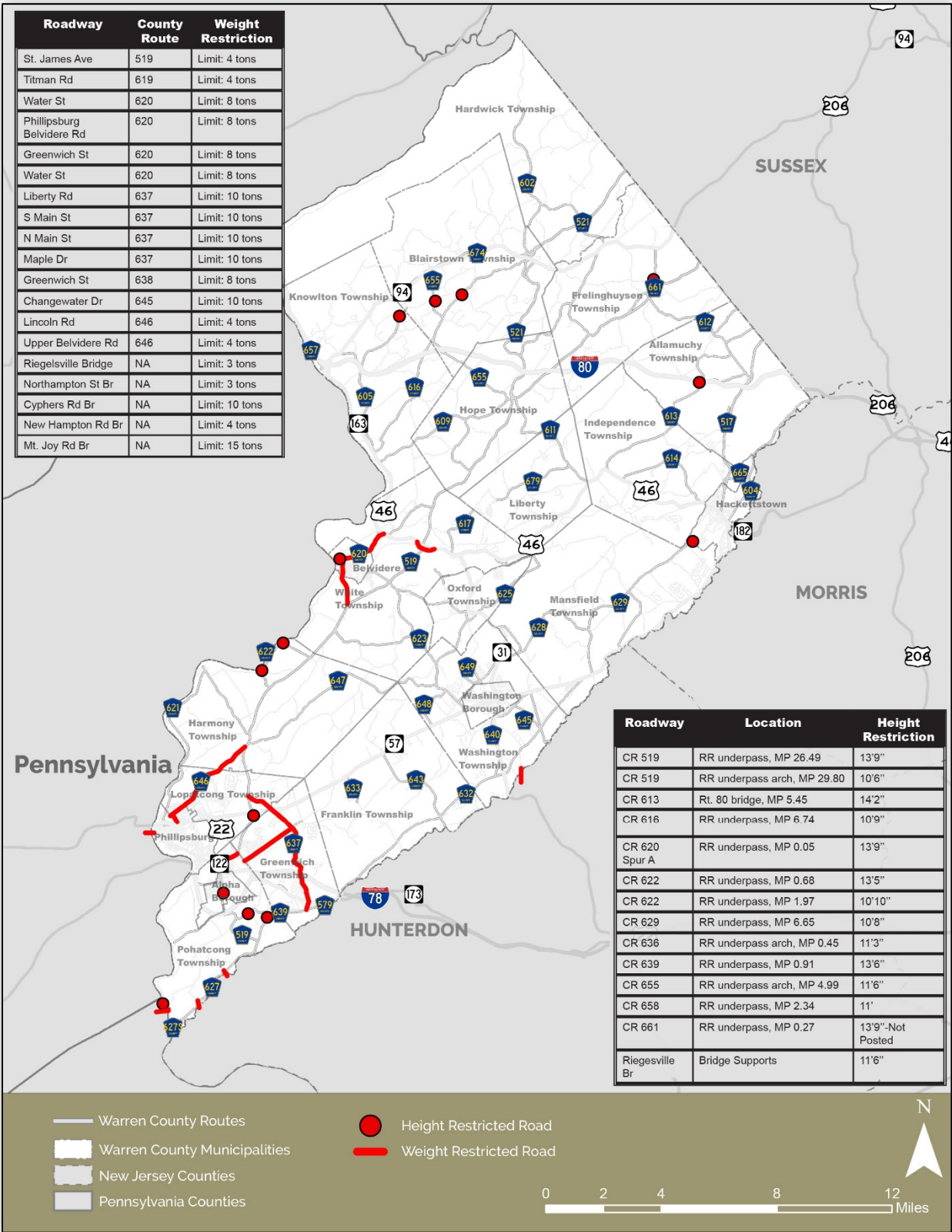
Key Points

County roads with height and weight restrictions tend to be around the border of Warren County, with few restrictions in the County's interior. In Pohatcong, both CR 636 and CR 639 have height restrictions of 11'3", and 13'6", respectively. Additionally, CR 519 in Alpha has a 13'9" height restriction and a 10'6" height restriction in Lopatcong. These restrictions present fewer opportunities for trucks entering from the southeast. In the north, height restrictions are present along CR 658 in Knowlton, and CR 616 and CR 655 in Blairstown. Near the Delaware River, two height restrictions are present on CR 622 in Harmony, west of CR 519. To the north of this, CR 620 Spur A in Belvidere has a 13'9" height restriction.

Seven County roads have weight restrictions, mostly in the southern portion of the County. CR 519 in Pohatcong has a four-ton limit and in Greenwich it has an eight-ton limit. CR 637 in Lopatcong and Greenwich has a 10-ton limit. CR 646 in Philipsburg, Lopatcong, and Harmony has a four-ton limit. CR 620 has an eight-ton limit in White and Belvidere, and the short extent of CR 519 in Pohatcong has a four-ton limit.

The location of height and weight restricted County routes are presented in Figure 7.

Figure 7: Height and Weight Restrictions



Truck Network

Warren County provides access to high volumes of truck traffic on its network of County, State and Interstate routes. The plethora of County routes provide connections to major roadways and local access to industrial, warehousing, and manufacturing establishments located throughout the County. Routes under state jurisdiction including NJ 31, NJ 57, U.S. 46, and U.S. 22 provide freight access across the region. Annual truck ton flows along Interstates 80 and 78 are among the highest of any corridor in the state. These corridors serve truck traffic both stopping in and passing through Warren County to reach transportation assets and distribution centers in north Jersey and eastern Pennsylvania. Together, this network of roadways is essential to the continuation of efficiently providing goods throughout the region.

Truck Routes

Truck routes are identified as “New Jersey Access Network” or “National Highway System” or “Trucks Not Permitted.” These routes are consistent with NJDOT’s Truck Network Map, which identifies the New Jersey Access Network (N.J. Admin Code § 16:32-1.1), a series of routes where double-trailer truck combinations or 102-inch wide trucks are permitted, the National Highway System (23 U.S. Code § 103), the Federally designated system of major intra- and interstate roadways, and New Jersey’s “Blue Routes,” a series of roadways where trucks are permitted only when making local deliveries (defined in N.J. Admin Code § 16:32).

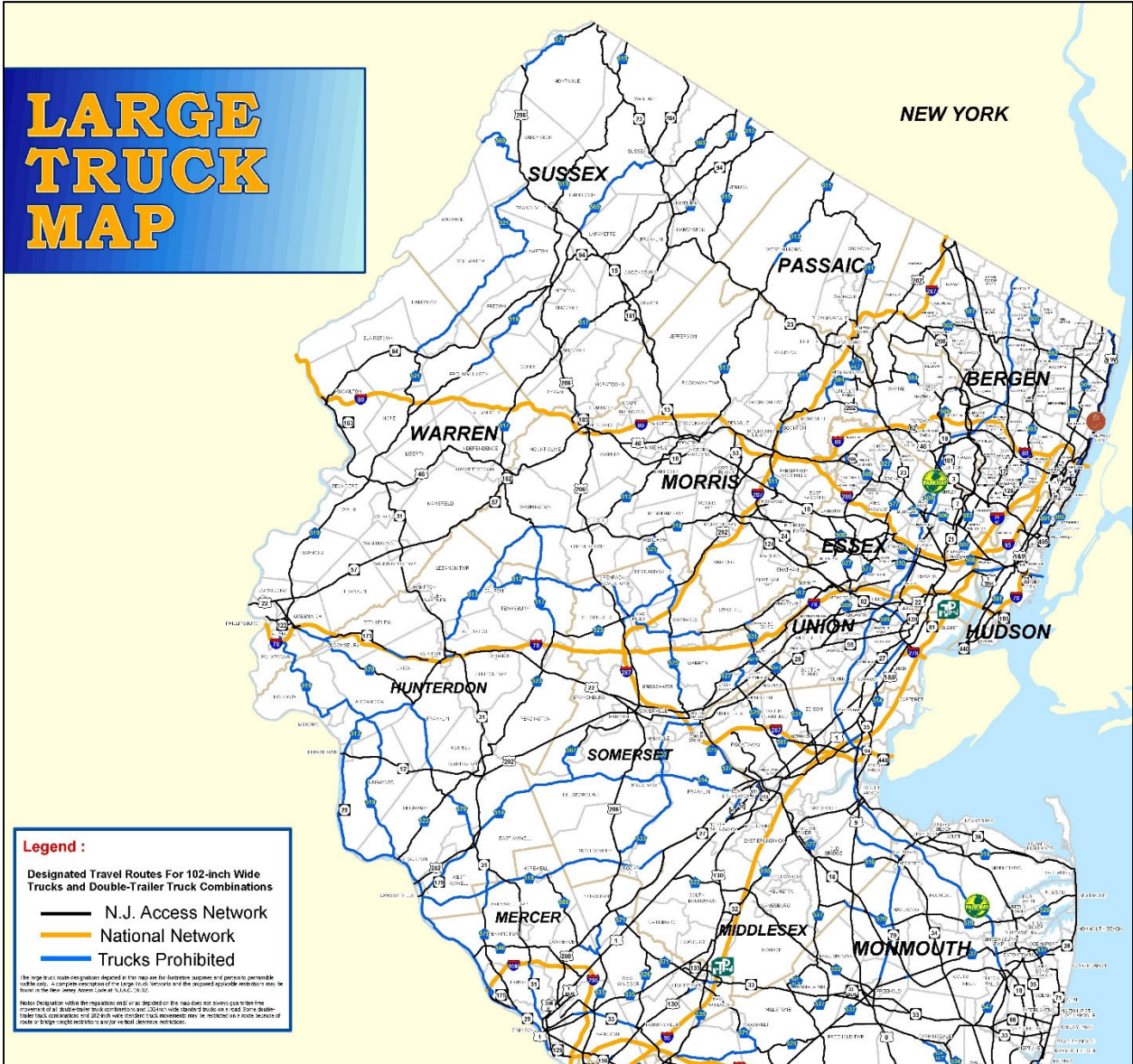
Roads within Warren County that are part of the National Highway System include Interstate 78 and Interstate 80, as well as NJ 31, NJ 57 and NJ 173. Additionally, U.S. 22, U.S. 46, NJ 94, and NJ 122 are part of the New Jersey Access Network. Roadways within the County on which trucks are prohibited include CR 521 (north of NJ 94), CR 519 (north of central Frelinghuysen), CR 579, and CR 519 (south of Alpha Borough).

Truck routes in Warren County and surrounding counties are shown in Figure 8.

Key Points

Freight is an important means of transport throughout the Country, State and County. Several state-funded projects are proposed or underway to continue improving the ability for safe and efficient freight movement within the County and between non-adjacent parts of the State and region. Freight will continue to be an important issue within Warren County due to the prevalence of truck routes located within.

Figure 8: Truck Routes



Maintenance

As per the 1982 Plan, the County reconstructs surface treated pavements (such as oil and chip roads) every 3 to 4 years, and resurfaces bituminous concrete surfaced roadways every 12 to 15 years.

Capital Improvement Plan

County Roadway Right-of-Way Standards

The Warren County Engineering Department has designed standard cross-sections for each roadway classification category. These standards are used in implementing the County subdivision and site plan regulations as well as the general implementation of the Circulation Plan. Warren County’s 1982 Transportation Plan presented the following two cross-sections:

Figure 9: Minor Arterial Cross-Section (1982 Plan)

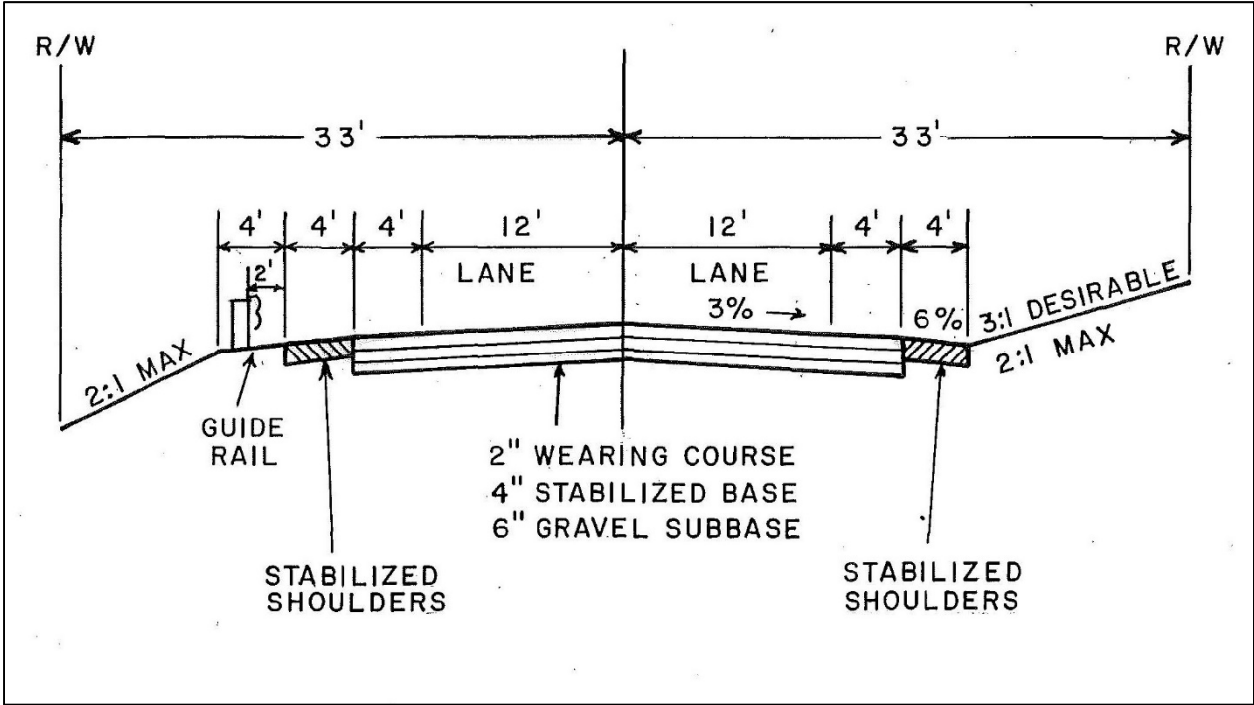
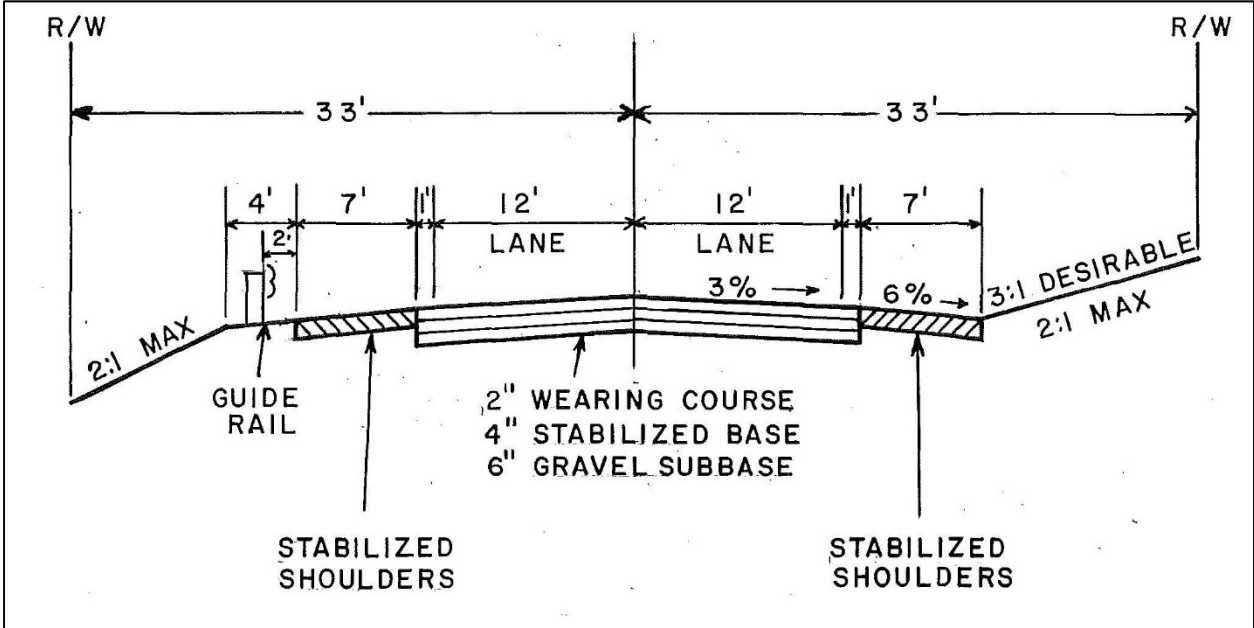


Figure 10: Major and Minor Collector Cross-Section (1982 Plan)



The following drawings present updated minimal desirable typical cross-sections.

Figure 11: Minor Arterial Cross-Section (Updated)

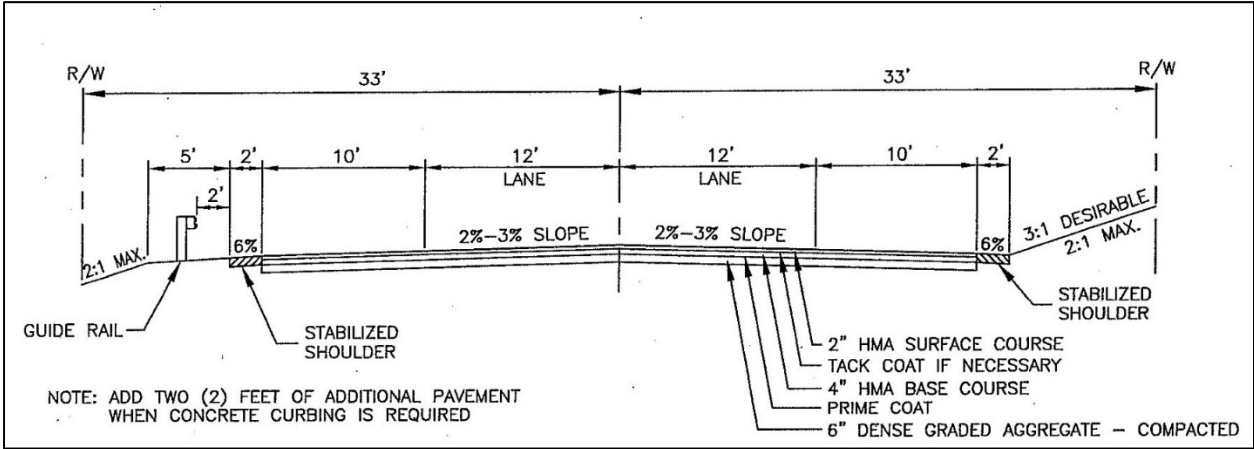


Figure 12: Major Collector Cross-Section (Updated)

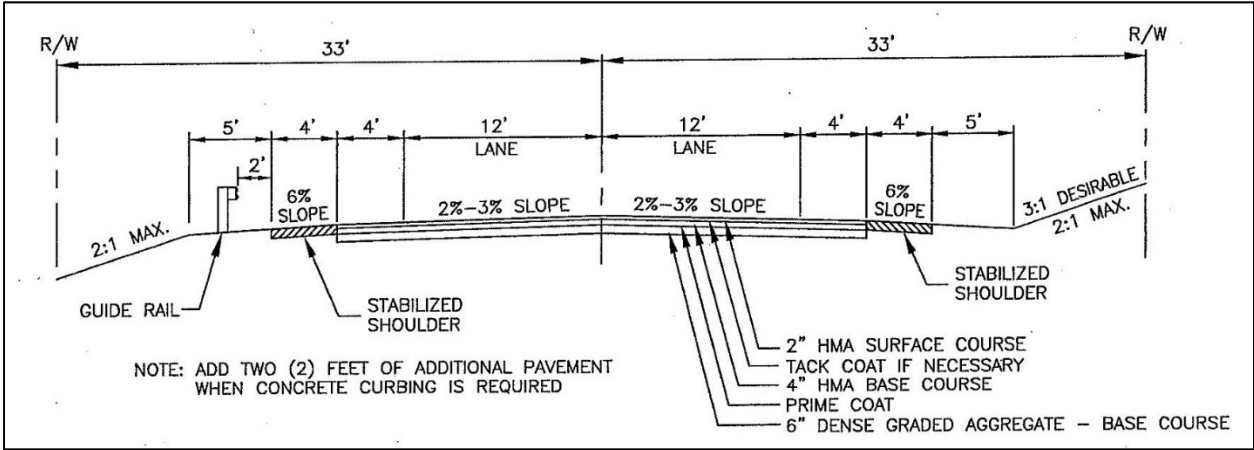
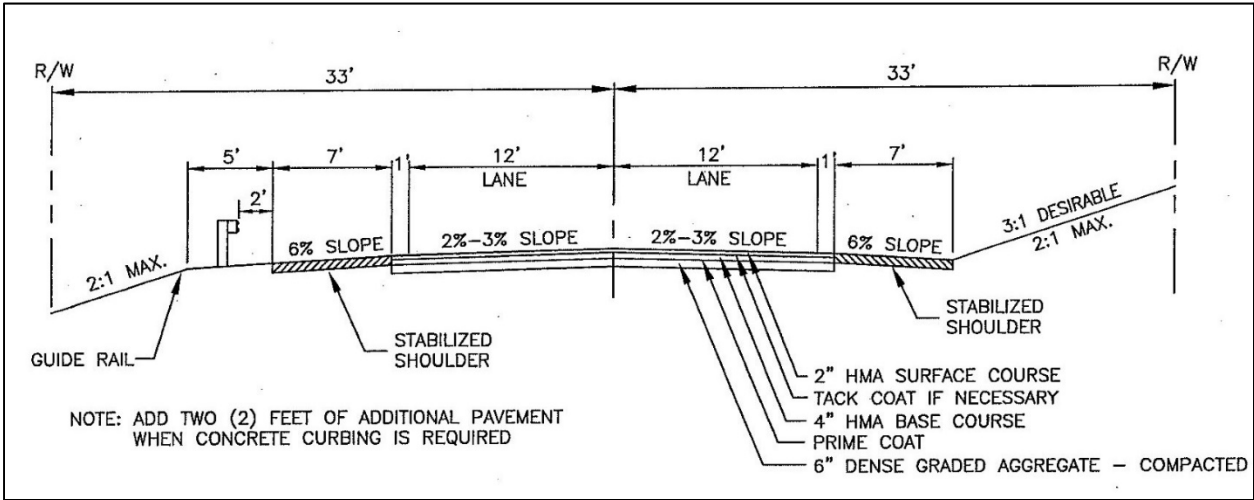


Figure 13: Minor Collector Cross-Section (Updated)



Key Points

The following changes were made between cross-sections in the 1982 plan and current County guidance:

Minor Arterial

- 2' stabilized shoulders instead of 4'
- 10' separation between travel lane and stabilized shoulder instead of 4'
- 3' provided to the outside of the guide rail instead of 2'
- 2-3% slope of roadway instead of 3%

Major Collector

- 4' stabilized shoulders instead of 7'
- 4' separation between travel lane and stabilized shoulder instead of 1'
- 3' provided to the outside of the guide rail instead of 2'
- 2-3% slope of roadway instead of 3%

Minor Collector

- 3' provided to the outside of the guide rail instead of 2'
- 2-3% slope of roadway instead of 3%

Crash Analysis

Crash records for 2016-2018 were collected and mapped for all roads in Warren County from the New Jersey Department of Transportation's (NJDOT) Safety Voyager system (Figure 14). This analysis was performed for two different crash subsets. The first subset included all crashes within the database (10,041 records). This analysis aimed to identify the overarching crash clusters in the County. The second subset analyzed only crash incidents along County roadways and within a 50-foot radius. The purpose of this second analysis was to identify crash clusters at the intersection/corridor level along County roadways.

Figure 15 and Figure 16 provide more detailed inset maps of the two hotspots with the most crashes, accompanied by brief summary tables.

The following descriptions of identified crash clusters indicate which types of crashes were prevalent at the location and an overview of surrounding land uses.

Crash Clusters

All Roadways

Four hotspots were identified, as shown in Figure 14.

- U.S. 22 (Phillipsburg): 1,208 crashes
- U.S. 46 at NJ 182/CR 517/CR 604 (Hackettstown): 599 crashes
- U.S. 22 at CR 638/CR 519 (Greenwich Township and Pohatcong Township): 400 crashes
- NJ 31 at NJ 57 (Washington Boro): 217 crashes

For all roads in Warren County, the identified hotspots and their overrepresented crash types are:

- US 22 in Phillipsburg – Crashes occurring at rates significantly higher than the statewide average include right angle (17% hotspot vs 10% statewide), fixed object (12% vs 9%), struck parked vehicle (16% vs 1%), and backing (4% vs 1%). This cluster has a high density of commercial destinations in a suburban setting including stores and restaurants with frequent intersections into residential neighborhoods.
- US 46 at NJ 182/CR 517/CR 604 - Crashes occurring at rates significantly higher than the statewide average include right angle (24% hotspot vs 10% statewide), struck parked vehicle (11% vs 1%), and backing (3% vs 1%). This cluster includes downtown Hackettstown and its high density of walkable retail locations, as well as frequent intersections into residential neighborhoods.
- U.S. 22 at CR 638/CR 519 – Crashes occurring at rates significantly higher than the statewide average include same direction rear-ends (60% hotspot vs 25% statewide), and same direction sideswipes (20% vs 12%). This clusters includes large shopping centers along U.S. 22 and vehicles entering/exiting Interstate 78 at high speeds.
- NJ 31 at NJ 57 – Crashes occurring at rates significantly higher than the statewide average include same direction rear-ends (34% hotspot vs. 25% statewide), and same direction sideswipes (20% vs 12%). This cluster includes downtown Washington Boro and its high density of retail locations and residential neighborhoods.

Figure 14: Crash Clusters (All Roadways)

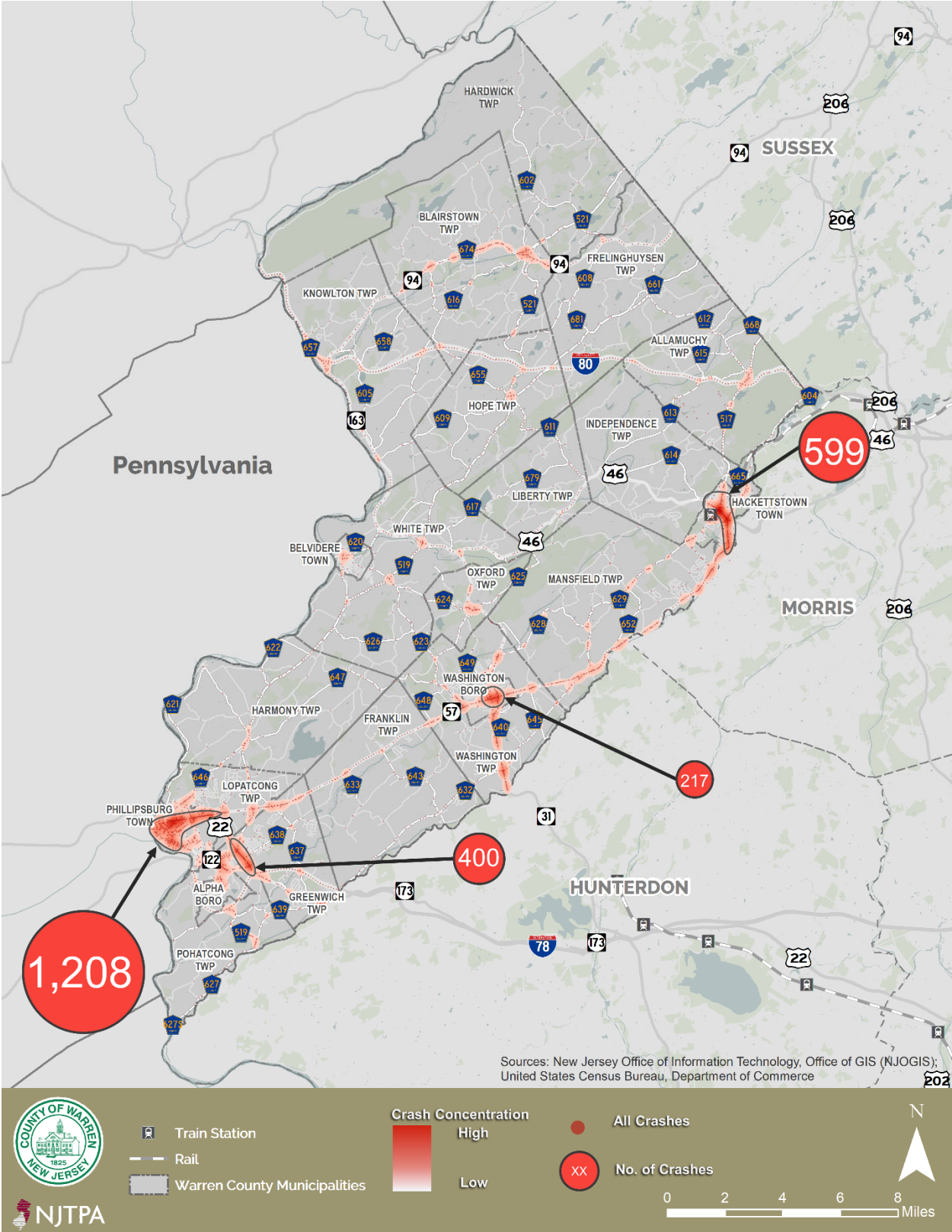
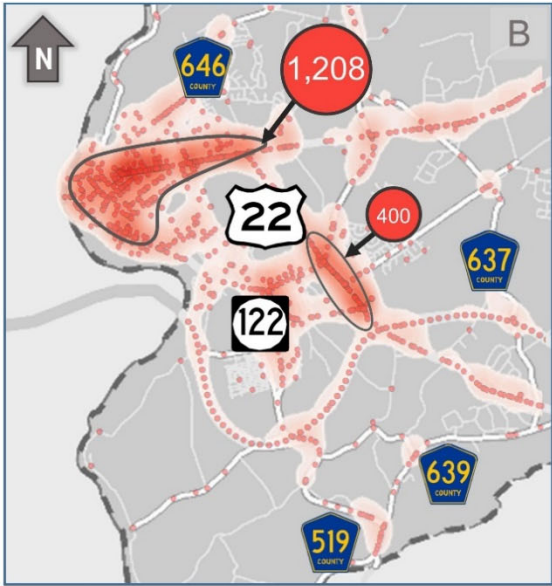
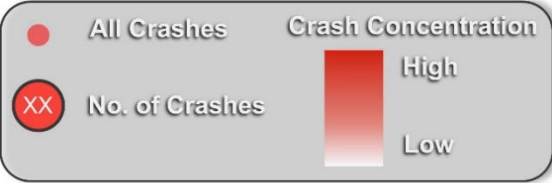


Figure 15: U.S. 22/Phillipsburg

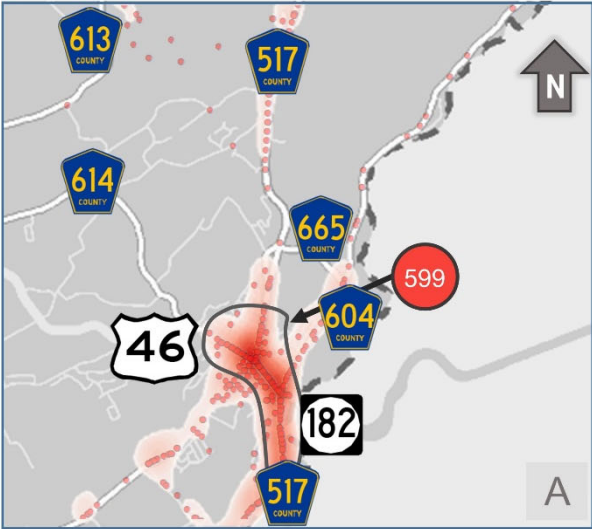


US 22, Phillipsburg		Statewide	
	Right Angle	17%	10%
	Struck Parked Vehicle	16%	1%
	Wet Surface	20%	18%
	Daylight	74%	70%
	Heavy Vehicles	9%	N/A
Crashes		1,208	

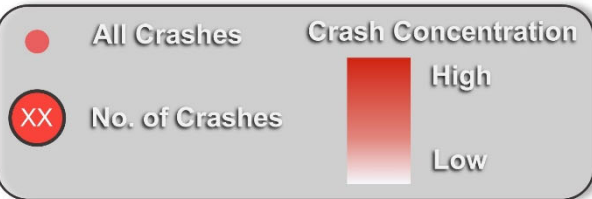


Source: 2016-2018 NJDOT Safety Voyager / Warren County

Figure 16: US 46, NJ 182, CR 517 & CR 604



US 46, NJ 182, CR 517, & CR 604		Statewide	
	Right Angle	24%	10%
	Struck Parked Vehicle	11%	1%
	Dry Surface	80%	80%
	Daylight	78%	72%
	Heavy Vehicles	8%	N/A
Crashes		599	



Source: 2016-2018 NJDOT Safety Voyager / Warren County

Crash Clusters on County Roads

The second hotspot analysis was completed to determine hotspots from crashes that occurred on County Routes (Figure 17). Figure 18: US 22 at CR 519 and Figure 19 provide more detailed inset maps of the two hotspots with the most crashes occurring on County Routes, accompanied by brief summary tables.

The following descriptions of identified crash clusters indicate which types of crashes were prevalent at the location and an overview of surrounding land uses.

Eight hotspots were identified, as shown in Figure 17.

- U.S. 22 at CR 519 (Pohatcong Township and Greenwich Township): 92 crashes
- U.S. 46 at CR 517 (Hackettstown): 61 crashes
- I-80 at CR 517 (Allamuchy Township): 48 crashes
- U.S. 46 and CR 519 (White Township): 44 crashes
- U.S. 22 at CR 646/Morris Street (Phillipsburg): 39 crashes
- CR 630 at CR 640 (Washington Township): 39 crashes
- NJ 94 at CR 521/CR 602/CR 616/CR 607 (Blairstown Township): 27 crashes
- NJ 57 and CR 519 (Lopatcong Township): 21 crashes

For all County Roads in Warren County, the identified hotspots and their overrepresented crash types are:

- US 22 at CR 519/CR 646 (Figure 18) – Crash types occurring at rates significantly higher than the statewide average include rear end (55% hotspot vs 48% statewide), backing (4% vs 1%), and other (6% vs 2%). Three percent involved heavy vehicles. Land use along this part of the CR 519 corridor include a more rural setting to the north near NJ 57, large retail centers along U.S. 22, and higher density residential land uses in Alpha Borough.
- US 46 at CR 517 (Figure 19)– Crash types occurring at rates significantly higher than the statewide average include right angle (16% hotspot vs 10% statewide), fixed object (23% vs 19%), backing (4% vs 1%), pedestrian (3% vs 1%) and other (8% vs 2%). Seven percent involved heavy vehicles. Land use along this segment of CR 517 is primarily medium density residential with small retail locations closer to US 46 and downtown Hackettstown.
- I-80 at CR 517 – Crash types occurring at rates significantly higher than the statewide average include left turn/U-turn (8% hotspot vs 2% statewide), head on (4% vs 2%), overturned (2% vs 1%), backing (6% vs 1%), animal (6% vs 4%), pedestrian (4% vs 1%) and other (4% vs 2%). Ten percent involved heavy vehicles. CR 517 north of I-80 presents a rural land use context with several auto-related businesses and a small residential neighborhood.
- U.S. 46 and CR 519 – Crash types occurring at rates significantly higher than the statewide average include right angle crashes (34% hotspot vs. 10% statewide). 11 percent involved heavy vehicles. Small commercial establishments are located at the intersection with low density commercial development along either corridor.
- US 22 at CR 646/Morris Street- Crash types occurring at rates significantly higher than the statewide average include rear end (59% hotspot vs 48% statewide), fixed object (13% vs 9%),

parked vehicle (10% vs 1%), and backing (3% vs 1%). Five percent involved heavy vehicles. The area around this intersection is highly developed with higher density single-family residential units south of US 22 and retail establishments along US 22.

- CR 630 at CR 640 – Crash types occurring at rates significantly higher than the statewide average include rear end (59% hotspot vs 48% statewide), fixed object (13% vs 9%), head on (5% vs 2%), and overturned (3% vs 1%). Three percent involved heavy vehicles. Land use in this area includes low density residential uses to the north and a more rural context to the south. Several higher speed roads meet near this intersection, including NJ 57.
- NJ 94 at CR 521/CR 602/CR 616/CR 607 – Crash types occurring at rates significantly higher than the statewide average include fixed object (11% hotspot vs 9% statewide), struck parked vehicle (26% vs 1%), left turn/U-turn (4% vs 2%), head on (4% vs 2%), and backing (19% vs 1%). Seven percent involved heavy vehicles. This cluster is within Blairstown’s business district. North of NJ 94 lies several retail establishments and a small residential neighborhood. A more rural, low density context is present along either direction of NJ 94.
- NJ 57 and CR 519 - Crash types occurring at rates significantly higher than the statewide average include left turn/U-turn (14% vs. 2%), and right angle (14% vs. 10%) crashes. Ten percent involved heavy vehicles. Each corridor provides a mainly rural context with higher density residential developments to the west in Phillipsburg.

Key Points

Crashes mainly occur on higher-speed and higher-volume State and County roadways within Warren County. Corridor studies and spot improvements should be investigated to further analyze the reasons for higher concentrations of crashes along specific corridors and improve visibility along hilly and windy roadways. This will be particularly important in areas experiencing increased traffic volumes due to development.

Figure 17: Crash Hotspots, County Roadways

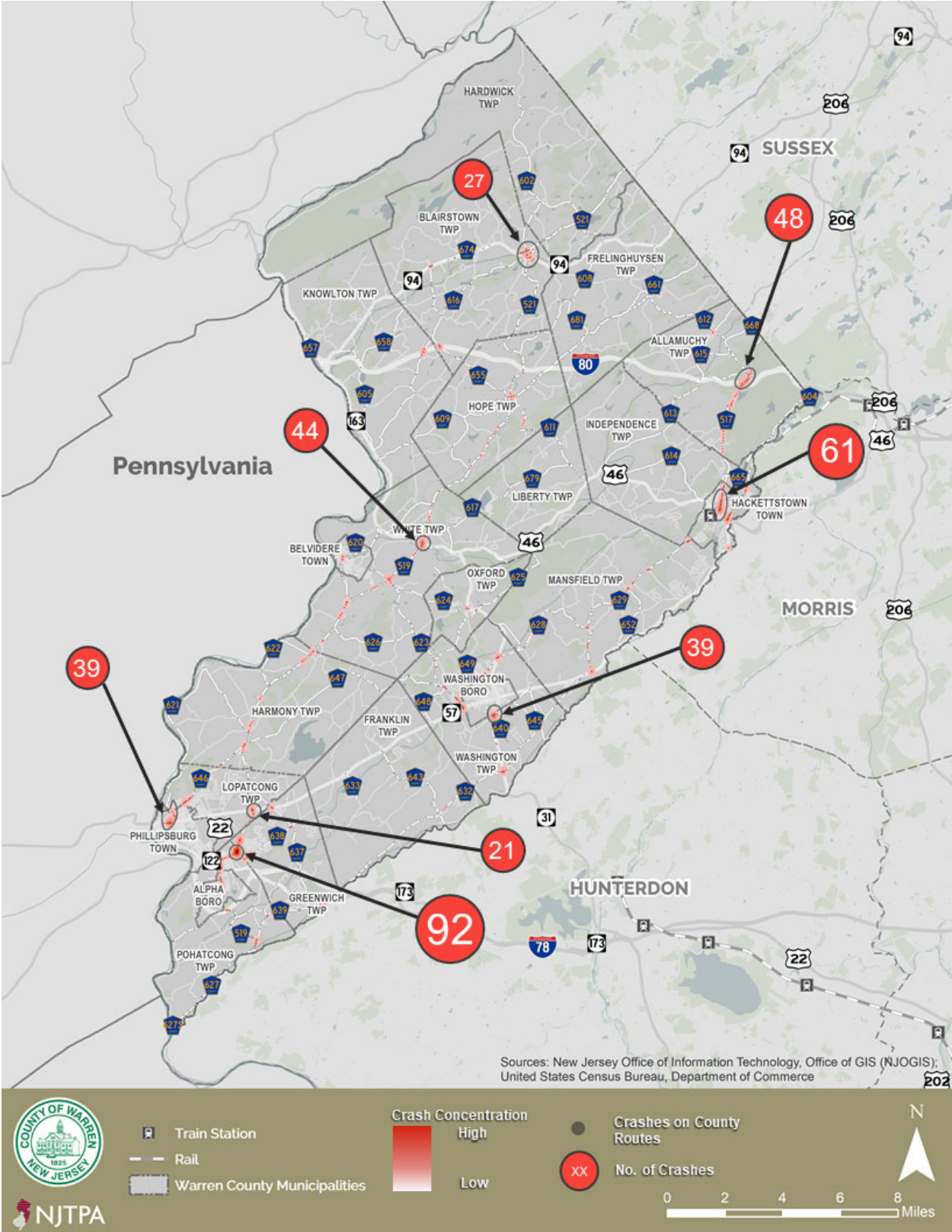
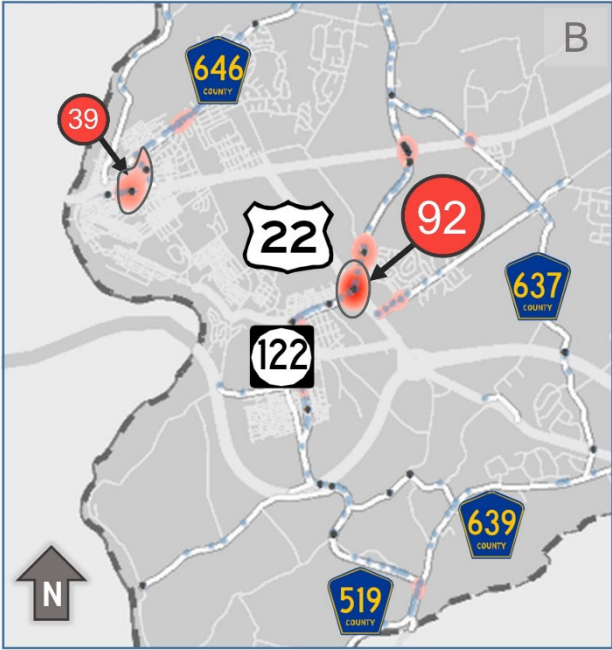


Figure 18: US 22 at CR 519/CR 646 Crashes



US 22 @ CR 519		Statewide
	Right Angle	14%
	Same Direction Sideswipe	23%
	Backing	4%
	Daylight	78%
	Heavy Vehicles	3%
Crashes		92

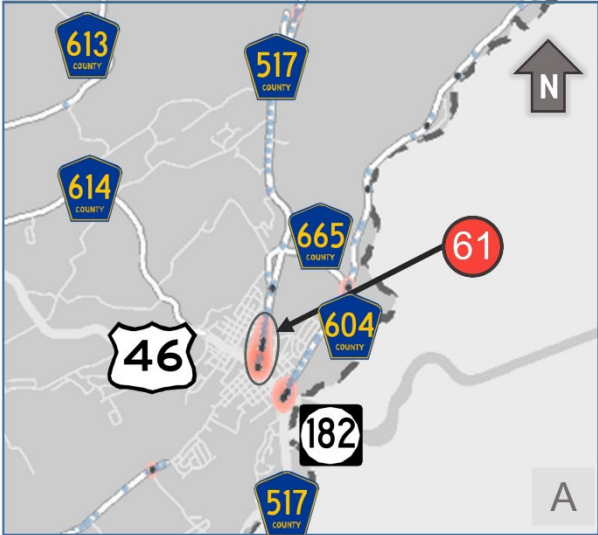
- Truck Crashes
- Crashes on County Routes
- No. of Crashes

Crash Concentration

High
Low

Source: 2016-2018 NJDOT Safety Voyager / Warren County

Figure 19: US 46 at NJ 182/CR 517 Crashes



US 46 @ NJ 182 & CR 517		Statewide
	Right Angle	16%
	Pedestrian	3%
	Wet Surface	22%
	Dusk	5%
	Heavy Vehicles	7%
Crashes		61

- Truck Crashes
- Crashes on County Routes
- No. of Crashes

Crash Concentration

High
Low

Source: 2016-2018 NJDOT Safety Voyager / Warren County

Biking and Walking

Biking and walking are integral parts of Warren County's transportation network, providing an alternative means to single-occupant motor vehicle use. Existing biking and walking conditions and facilities are detailed below.

Bicycle Compatibility Analysis

Warren County completed bicycle compatibility analysis based on the bicycle level of traffic stress (LTS). LTS measures a cyclist's expected comfort of a given roadway based on roadway conditions. Each bicyclist has different tolerances for stress created by the volume, speed, and proximity of automobile traffic. In general, lower stress facilities have increased horizontal and/or vertical separation between cyclists and motor vehicles and/or lower speeds and traffic volumes. Higher stress environments generally involve cyclists riding in close proximity to traffic, multi-lane roadways, and higher speeds or traffic volumes, a condition undesirable for most cyclists. Based on an analysis of the criteria, the LTS for a given roadway segment is classified into one of four categories. The four categories build upon another, so all LTS 4 cyclists would tolerate LTS 1-4 roadways, LTS 3 cyclists would tolerate LTS 1-3 roadways, etc.

The four levels of traffic stress are:

LTS 1: comfortable for most users

LTS 2: comfortable for most adults

LTS 3: comfortable for experienced and confident riders who might still prefer dedicated space

LTS 4: uncomfortable for most cyclists, tolerated by only the most experienced riders

A map of LTS designations within the County is shown on Figure 20.

Key Points

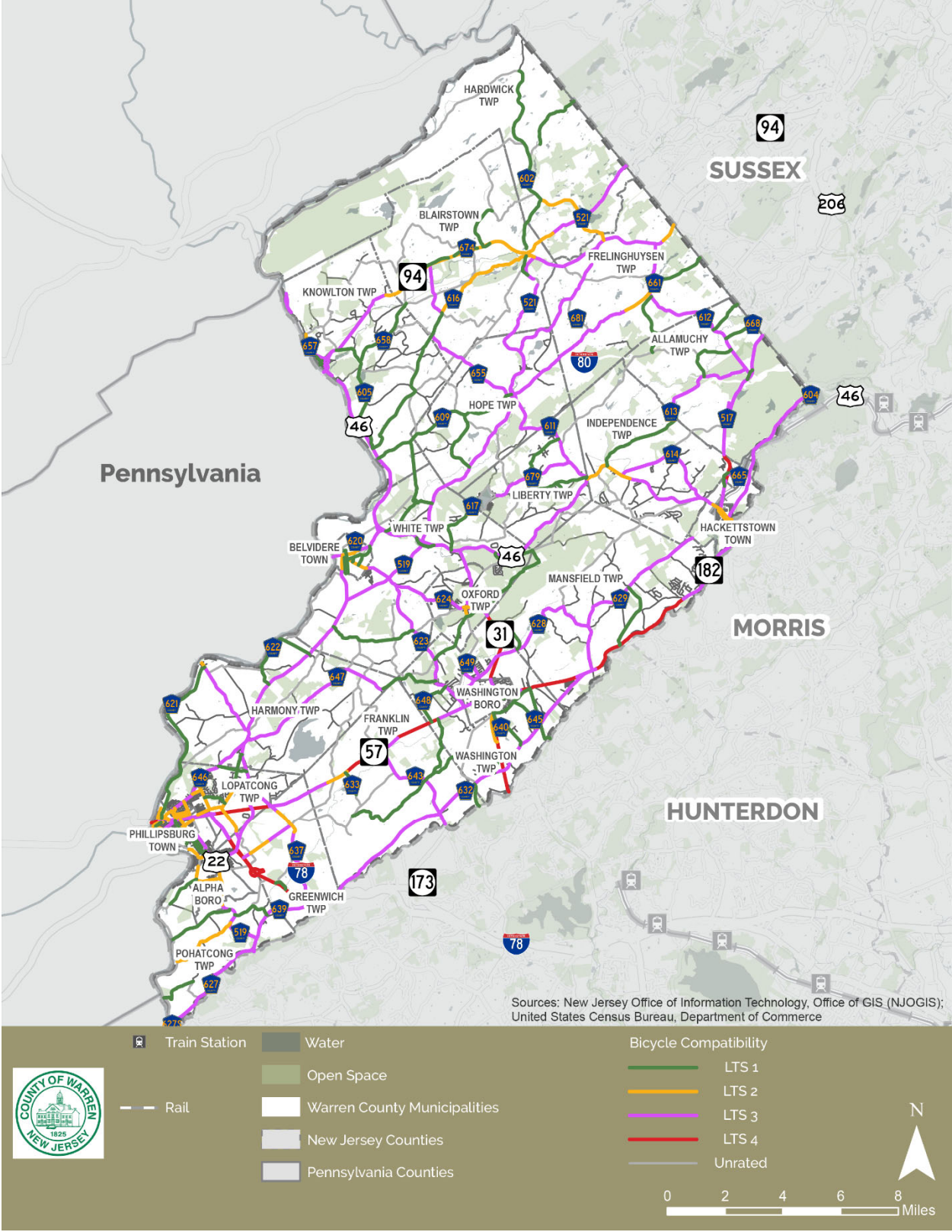
Of the 62 municipal roadways included in the LTS assessment, the majority were designated LTS 1 or 2.

Data provided by the County was separated by roadway jurisdiction into State, County, and Municipal roadways. No State roadways were designated LTS 1. LTS 2 roadways include segments of U.S. 46 and NJ 94. LTS 3 roadways include significant segments of NJ 31, NJ 57, NJ 94, and U.S. 46. LTS 4 roadways include significant segments of several roadways, mainly in the southern part of the County, including NJ 31, NJ 57, and U.S. 22.

County roadways designated LTS 1 include several mile portions of CR 602, CR 609, CR 616, CR 621, and CR 625. County roadways designated LTS 2 include several mile portions of CR 616 and CR 659. LTS 3, the most common designation for County roadways, include several mile portions of CR 519, CR 611, CR 632, and CR 647. The only LTS 4 County roadways is a one-mile portion of CR 517 in Independence and Allamuchy.

Overall, only a limited number of roadways, mainly catering to low-speed traffic in residential areas provide biking facilities comfortable for all road users. High-volume, high-speed roads create barriers to biking between residential areas and commercial centers.

Figure 20: Bicycle Compatibility Analysis



Trails

Warren County possesses a network of hiking and biking trails on municipal, county, state, federal, and private land, many of which provide linkages to the regional system of trails that are already complete or in the process of being completed. These independent trails tend to traverse mountaintops and mountainsides, abandoned railroad and river corridors, lakesides, and the historic Morris Canal.

Table 8 shows that there are just over 180 miles of trails in Warren County under Federal, State, County, municipal and private/non-profit jurisdiction. The table also indicates if any segment of a site's trail system is part of a regional trail system as discussed below and in more detail in the County's Open Space Plan. Figure 21 shows the location of the major regional trails and major open space parks and wildlife management areas.

Table 8: Trails

Trail Name	Part of Regional Trail	Length Miles
Allamuchy Mountain State Park Trails	Warren-Highlands/Morris Canal	23.02
Appalachian Trail	Appalachian Trail	14.56
Bread Lock Park Trails	Morris Canal	2.10
Florence Kuipers Park Trails	Morris Canal	2.43
Jenny Jump Trails	Warren Highlands	13.64
Lehigh Hudson Trail	LH Trail/Pequest Valley	10.80
Merrill Creek Trails	Warren Highlands	12.60
Marble Hill Trails	Warren Highlands	4.86
Mt. Rascal Trail	Morris Canal	1.04
Delaware Water Gap National Recreation Area and Worthington State Forest Trails	Appalachian Trail	40.29
Paulinskill Valley Trail	Liberty Water Gap/911 Trail	12.70
Phillipsburg Riverfront Heritage Trail	Morris Canal	6.91
Port Murray Preserve Trail	Morris Canal	1.75
Port Warren Trail	Morris Canal	1.06
Ridge and Valley Trails	Ridge and Valley Trails	18.37
Washington Township Park Trails	Morris Canal	6.95
East Oxford Mountain Trail	Warren Highlands	0.56
West Oxford Trails	Warren Highlands	2.77
White Lake Trail	Ridge and Valley Trails	4.06
Total Trail System		180.56

Regional Trail Systems

Appalachian Trail

The Appalachian Trail is a more than 2,180 mile long public footpath traversing the scenic, wooded, pastoral, wild, and culturally resonant lands of the Appalachian Mountains from Maine to Georgia.

Morris Canal Greenway

The Morris Canal Greenway is envisioned as a 111-mile continuous west-east pedestrian and bicycle trail connecting six counties in northern New Jersey. Once completed it will extend from the Delaware River in Phillipsburg to the Hudson River in Jersey City.

The acquisition of the historic Morris Canal has been a high priority of the county for years. The Morris Canal was listed on the National and State Registers of Historic Places in 1974. The Morris Canal Greenway Trail uses a mix of public open spaces/parks and public roadways as the route in several areas as the roadways provide the needed connection between one Morris Canal site to another. The total existing walking length of the Morris Canal Greenway in Warren County is approximately 36 miles.

The Morris Canal Greenway is comprised of the following local trail systems

- Bread Lock Park Trails, Franklin Township (2.10 miles)
- Florence Kuipers Park Trails, Hackettstown (2.43 miles)
- Mt. Rascal Trail, Independence (1.04 miles)
- Riverfront Heritage Trail, Phillipsburg (6.91 miles)
- Port Murray Preserve Trail, Mansfield (1.75 miles)
- Port Warren Trail, Greenwich, Lopatcong (1.06 miles)
- Meadowbreeze Park, Washington Township (6.95 miles)

Warren - Highlands Trail/Greenway

The Warren Highlands Trail is a spur of the main Highlands Trail extending over 150 miles from Storm King Mountain on the Hudson River in New York south to Riegelsville, New Jersey, on the Delaware River. One section of the main trail is in Warren County and traverses Allamuchy Mountain and Stephens State Parks. The Warren Highlands trail spur travels 52.4 miles from the Delaware River in Phillipsburg to the Morris Canal Greenway Trail in Allamuchy. The trail travels through the municipalities of Phillipsburg, Lopatcong, Harmony, Washington Township, Oxford, White, Hope, Liberty, Frelinghuysen, Independence, and Allamuchy. The trail passes through 22,700 acres of preserved natural area including Merrill Creek Reservoir, Jenny Jump Mountain, Pequest River Wildlife Management Area, Allamuchy Mountain State Park and travels near several historic sites including Shippen Manor, Van Nest Hoff Vannatta Farmstead, and Rutherford Hall. The Warren-Highlands Trail connects with the main trail in Allamuchy Mountain State Park.

Local trail systems along the Warren Highlands Trail include:

- Allamuchy Mountain State Park Trails (23.02 miles)
- Jenny Jump Trails (13.64 miles)
- Merrill Creek Trails (12.60 miles)
- Marble Hill Trails (4.86 miles)
- East and West Oxford Mountain Trails (3.33 miles)

Paulinskill Valley Trail

The Paulinskill trail travels 12 miles in Warren County from Brugler Road in Knowlton paralleling the Paulinskill, to Frelinghuysen Township and into Sussex County where it then connects with the Sussex Branch Trail.

The Paulinskill Trail traverses over what was once the route of the New York Susquehanna and Western Railroad. The trail is a link in the larger Liberty-Water Gap Trail, and the 911 Memorial Trail. The trail is

conducive to multiple uses including hiking, horseback riding, cross-country skiing, and bicycling. It also provides access for fishing, canoeing, and individuals in wheelchairs.

Ridge and Valley Trail

Portions of the trail have been completed near White Lake in Hardwick Township, and offers a unique opportunity for the weekend hikers. This trail will connect the Paulinskill Trail with the Appalachian Trail, traversing the White Lake Natural Resource Area, various Ridge and Valley Conservancy properties and finally connecting near the Appalachian Trail at the Ralph Mason YMCA camp. Heading south the trail is planned to connect with the Warren-Highlands Trail.

Railroad Corridors

Abandoned or inactive railroad corridors offer trail users an excellent way of enjoying open space without having to purchase large blocks of land. Several railroads in Warren County are inactive and cross some of the county's most scenic regions. Since railroad corridors are flat, they are ideal for many uses, such as bicycling, walking, jogging, horseback riding, cross-country skiing, and wheelchair recreation. Preserving these corridors also creates agricultural and wildlife habitat buffers.

Warren Railroad Trail

This abandoned railroad enters Warren County by crossing the Musconetcong River at Changewater and travels in a northwesterly direction through Washington Township, Washington Borough, Oxford, White and Knowlton Townships for 20.13 miles. It could continue by crossing the Delaware River to Pennsylvania at the Village of Delaware in Knowlton Township. Portions of the right of way are in public ownership, most are in private ownership and a portion of the track is still used in Washington Borough. A portion of the Warren Railroad right-of-way is paved and is now the Oxford Bike Trail. Completion of the Warren Railroad trail would complement the other greenway trails because the Warren Railroad trail will intersect with the Morris Canal Trail, the Warren-Highlands Trail, and the Lehigh Hudson Trail.

Lehigh Hudson Trail/Pequest Valley Trail

The proposed Pequest Valley Trail would be a 30-mile trail across Warren and part of Sussex County and would follow the historic route of the former Lehigh and Hudson River Railroad as closely as possible. It would make connections with other area trails such as the Warren Highlands Trail and the Warren Railroad Trail, and the Sussex Branch Trail in Sussex County. Some sections can be walked now through the Pequest River Wildlife Management Area and other miscellaneous acquisitions by the State and municipalities through Independence and Allamuchy Townships. When completed the trail would pass through Belvidere, White, Liberty, Mansfield, Independence and Allamuchy.

Major Parks and Natural Areas

Worthington State Forest is in Hardwick, Blairstown and Knowlton Townships. The forest covers 6,584 acres and is within the Delaware Water Gap National Recreation Area. It has 26 miles of trails including 7 miles of the Appalachian Trail. It contains picnic areas, playgrounds, overlook/viewing points, boating/boat launch, fishing, hiking, camping.

Allamuchy Mountain State Park in Allamuchy includes 14 miles of marked trails and 20 miles of unmarked trails for hiking, mountain biking, and horseback riding, 3,390 acres are located in Allamuchy Township. Allowable activities include boating, hunting, fishing, hiking, biking, mountain biking, horseback riding trails, nature trails, birding, cross-country skiing, rock climbing area. The park includes the historic Waterloo Village and Saxton Falls, with remnants of the Morris Canal.

Stephens State Park in Hackettstown contains 327 acres and extends into Morris County. The total size of the park is 805 acres. Allowable activities and features include picnicking, playgrounds, fishing, boating/kayaking, hiking, biking, mountain biking, horseback riding, nature trails, birding, camping, cross-country skiing, and seasonal nature programs. The wild and scenic Musconetcong River flows through the park.

Jenny Jump State Forest has 4,343 acres in Frelinghuysen, Independence, Hope, Liberty, and White. Allowable activities and features include picnic areas, playgrounds, overlook/viewing points, fishing, boating, hiking, mountain biking, nature trails, and camping.

Pequest Wildlife Management Area is 4,609 acres in Liberty, Mansfield and White Townships. The Pequest Fish Hatchery is located within the WMA and offers programs about raising trout and the importance of natural resources.

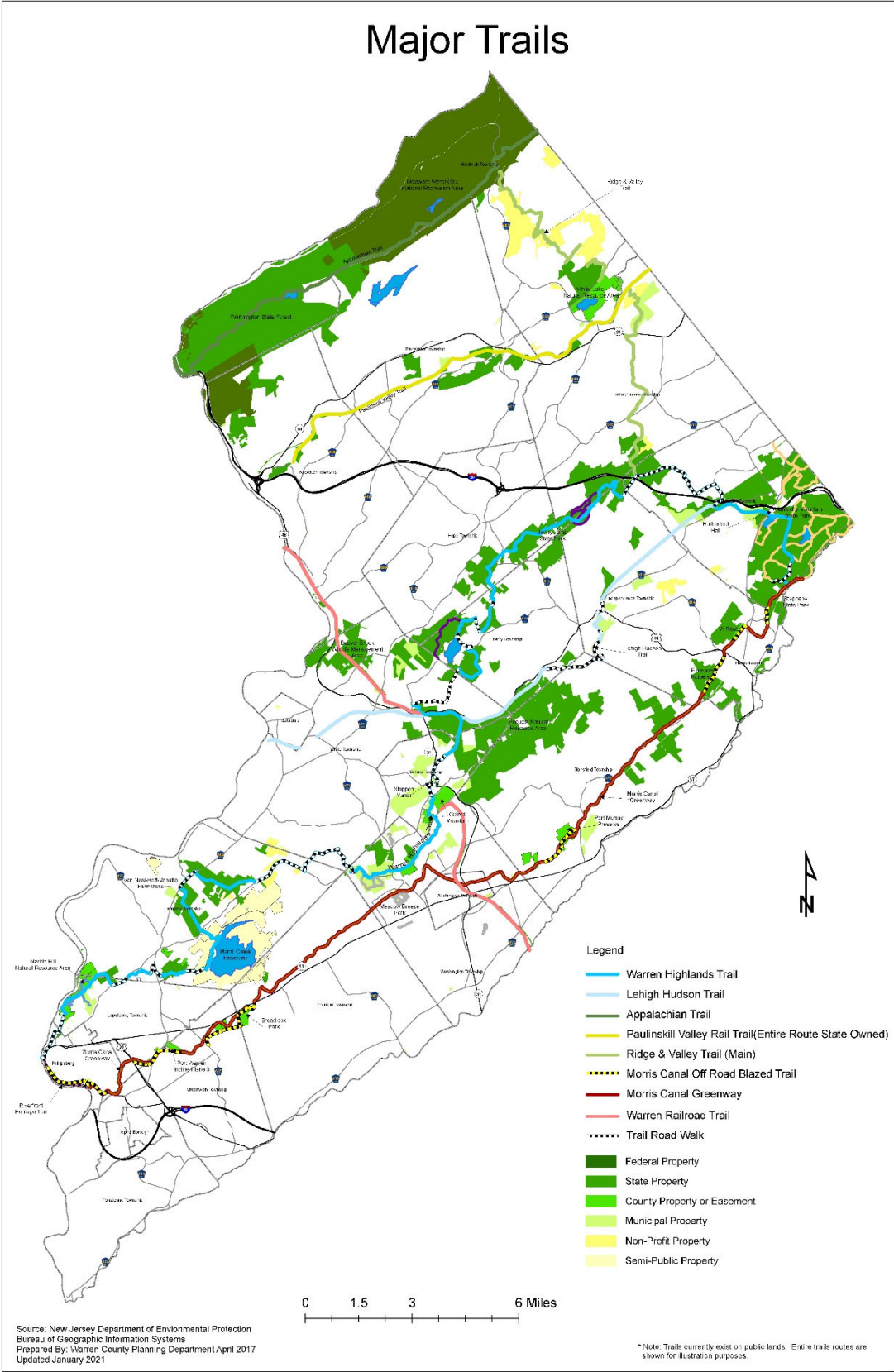
The Merrill Creek Reservoir encompasses 2,600 acres in Harmony and Franklin, including a 650-acre reservoir located atop Scotts Mountain in Harmony Township. Boating, fishing, nature study, and hiking are permitted on the 290-acre wildlife preserve. The visitors' center includes displays on area history, mammals, birds and fish found in the area, and offers educational programs. The Warren-Highlands Trail will use a portion of the perimeter trail and the Merrill Creek properties.

Historic Properties and District and Points of Interest

Major trails are shown in Figure 21. Twenty-nine properties in Warren County are listed as an individual historic property, in addition to 1,601 properties as part of 22 historic districts. Notable points of interest and historic districts in the County include:

- Morris Canal, includes Port Warren (Inclined Plane 9 west) Bread Lock Park (Lock 7) Saxton Falls, Allamuchy Mountain State Park
- Oxford Industrial Historic District includes Shippen Manor and Oxford Furnace
- Old Mine Road Historic District
- Blair Presbyterian Academy
- Asbury Historic District
- Delaware River Water Gap/Mount Tammany, Delaware River Water Gap National Recreation Area
- White Lake, Hardwick Township
- Centenary University, Hackettstown
- Merrill Creek Reservoir
- Van Nest Farmstead
- Belvidere Historic District
- Great Meadows
- Hackettstown Business District
- Warren County Farmers Fair and Fairgrounds

Figure 21:Major Trails



Public Transit

Multiple public transit providers present mobility options within Warren County including a County shuttle system and one New Jersey Transit (NJT) train station. This section elaborates upon transit proposals made in the 1982 County transportation plan as well as present conditions of existing public transit.

Passenger Rail

The County's only New Jersey Transit rail station is in Hackettstown, south of US 46. This station is the western termini of NJT's Morristown Line (part of the Morris & Essex Line) and Montclair-Boonton Line. Under the existing timetable during COVID, weekend service is not provided at Hackettstown. The nearest station with weekend rail service is Dover. The existing schedule operates seven trains to/from Hackettstown each weekday. Passengers traveling to/from Penn Station in New York City must transfer at either Dover or Newark Broad Street (depending on the connecting service). Depending on which train is taken, travel between Hackettstown and New York City takes between two hours and two hours and thirty minutes.

Shuttle Service

Existing Transit

The 1982 Warren County Transportation Plan proposed a series of transit service initiatives to address inter- and intra-county travel needs and offer modal opportunities other than single occupant vehicles. The intra-county system envisioned a series of five bus loops, each operating on two days of the week to provide coverage to a broad area of the County. At the time of the plan's development, much of the service was expected to remain a long-term initiative, with immediate implementation infeasible due to low population density and available funding.

The purpose of this assessment is to understand trends and potential opportunities related to bus services, focused on the intra-county loop concepts. Demand response paratransit and human services transportation are not included in this discussion.

Current Transit Operations

Operated by Easton Coach Company, the Route 57 Shuttle operates two routes in the County.

The Phillipsburg-Washington service operates between St. Luke's Warren Campus to Abilities in Washington. Service is provided each hour from 6:00 AM to 6:00 PM Monday to Friday. Saturday service operates on Saturdays between 9:00 AM and 4:00 PM with four runs to Washington and three to Phillipsburg. Service operates mainly along NJ 57 with stops including Warren County Community College in Washington Township, Shop Rite near CR 519 and US 22 in Phillipsburg, and along South Main Street at US 22 in Phillipsburg.

The Hackettstown-Washington service operates between Abilities in Washington and Lowe's in Hackettstown. Service is provided each hour from 8:00 AM to 4:30 PM. Service operates mainly along NJ 57 with stops including Shop Rite and Warren Hills Family Clinic along NJ 31 in Washington Township, and Shop Rite and Weis' near Allen Road and Newburgh Road in Hackettstown.

The suggested fare for each route is \$1.00 with no change able to be returned.

2019 ridership for the Route 57 Shuttle totaled 94,263 trips, a decline from peak ridership of 121,638 trips in 2017. Service in 2020 operated with much lower usage due to the COVID-19 pandemic which results in the mandated closing of many non-essential businesses and social distancing by residents. Shuttle service continued to operate for essential trips.

A 31Ride Shuttle operated from the Oxford Municipal Building to the Clinton Park & Ride from June 2016 to December 2018. The service was funded through the Section 5311 Innovation Grant.

Table 9: Fixed Route Bus Operating Costs: 2016-2020

Year	Route 57 Shuttle	31Ride Shuttle*	Operating Cost/Hour
2016	\$386,560.08	\$91,263.60	\$45.18
2017	\$391,828.91	\$160,556.77	\$46.31
2018	\$395,804.86	\$161,777.76	\$47.47
2019	\$423,551.20	\$0	\$49.90
2020 (Jan-Mar) pre-COVID	\$109,935.20	\$0	\$52.40
2020 (Apr-Sept) COVID	\$148,030.00	\$0	\$52.40

*Innovation Grant funding terminated at the end of December 2018
Source: Warren County

Table 10: Fixed Route Annual Bus Ridership: 2016-2020

Year	Route 57 Shuttle	31Ride Shuttle*
2016	115,800	1,102
2017	121,638	1,833
2018	107,446	1,948
2019	94,263	No service
2020 (Jan-Mar) pre-COVID	18,989	No service
2020 (Apr-Sept) COVID	11,643	No service

Source: Warren County

Intra-County Bus Loop Concept

In addition to the present Route 57 Shuttle service, several other proposed and terminated shuttle services have operated in the County

The 1982 intra-county loop system plan outlined five potential routes in an effort to provide service coverage throughout the County:

- System 1-A along the Route 57 corridor, connecting Phillipsburg, Washington Boro, and Hackettstown, with out-of-county connections to Netcong (Morris County) and Easton, PA
- System 1-B in northern Warren County, connecting Knowlton Township, Blairstown Township, Hardwick Township, and Frelinghuysen Township with Newton (Sussex County) and Stroudsburg, PA

These two routes were envisioned as the starting point, with additional intra-county services to be added as system expansion:

- System 2 in southern Warren County, connecting Phillipsburg, Washington Boro, Oxford Township, and Belvidere
- System 3 in east central Warren County, connecting Hackettstown, Oxford Township, and Washington Township

- System 4 in northwestern Warren County, connecting Blirstown Township, Columbia, and Hope Township
- System 5 in northeastern Warren County, Hackettstown, Panther Valley, Blirstown Township, and Hope Township

These loops included various interchange points, theoretically allowing for transfers on days when service availability aligned. System 1-A was emphasized for near-term implementation, and it formed the basis for the existing Route 57 corridor shuttles.

Key Points

Due to low population density spread throughout the County, a limited number of transit options are provided for Warren County residents.

Airports

The two public-use airports in the County are Hackettstown Airport and Blirstown Airport, both of which are primarily used for recreational purposes. The 1982 Transportation Plan stresses the need to keep these airports operational and functioning.

The New Jersey Department of Transportation's 2007 State Airport System Plan identified Hackettstown Airport as a Core Candidate Airport. Core airports house approximately 90 percent of the system's based aircraft and are essential to the future aviation system in New Jersey. Approximately ten percent of system aircraft are based at core candidate airports. If improved, core candidate airports could provide needed landside storage capacity and reduce capacity constraints at core airports. Hackettstown Airport provides aviation services such as fuel, hangars, tie downs and flight instruction.

The New Jersey Department of Transportation's 2007 State Airport System Plan identified Blirstown Airport as a Core General Service Airport. General Service airports are intended to support smaller corporate aircraft, such as twin-engine aircraft, and the operation of general aviation aircraft for business and pleasure. General Service airports provide the majority of the system's operational and storage capacity for single and multi-engine piston aircraft. Blirstown Airport provides flight trainings and, rental and scenic air tours.

Figure 22: Hackettstown Airport



Figure 23: Blairstown Airport



Freight Rail

Three freight railroads operate in Warren County.

Norfolk Southern operates two lines entering the County in Phillipsburg. Norfolk Southern's principal line from Allentown to North Jersey and New York City is the Lehigh Line. 30 trains per day use this line which passes through Alpha before crossing into Hunterdon County. This line does not serve any local Warren County customers. Norfolk Southern's Portland secondary line passes through Phillipsburg and runs north along the Delaware River to Brainards where it crosses to Martin's Creek, PA. The Belvidere Industrial Track continues along the east bank of the Delaware River to Belvidere, with a second branch crossing the river to Martin's Creek Power Plant.

The Dover and Delaware River Railroad is a short line railroad operating between Phillipsburg and Hackettstown over the former Norfolk Southern Washington Secondary. The line connects to Norfolk Southern's Lehigh Line and runs northeast past the Bridgepoint 78 Industrial park to Washington, Port Murray, Rockport and Hackettstown. This railroad has trackage rights beyond Hackettstown over New Jersey Transit as far as Newark. The route serves local customers in Morris and Warren Counties.

The Belvidere & Delaware River Railway is a short line railroad affiliated with the Dover and Delaware River Railroad. The railway connects with Norfolk Southern's Lehigh Line in Phillipsburg and runs south along the Delaware River passing into Hunterdon County at Riegelsville. The railway serves Builder's First Source and Baer Aggregates in Warren County. In addition to freight use, the railway is a partner with the New York Susquehanna and Western Railway Technical and Historic Society in providing tourist passenger train service to 75,000 visitors in Phillipsburg annually.

All rail lines in Warren County are cleared for Plate F railcars and can handle railcars up to 286,000 lbs. The Norfolk Southern Lehigh Line is cleared for double-stack intermodal trains. To improve the suitability of rail service in Warren County, the Hackettstown drainage bridge is being studied for possible improvements to its structure or replacement as the bridge cannot withstand the weight of Plate F rail cars. The drain runs under the railroad track at Third Avenue and Moore Street in Hackettstown and is essential to allow stormwater to flow underneath the track. The preferred alternative is for full replacement of the slab with precast slab panels.

Remaining projects to make Warren County railroads suitable for larger rail service:

The Hackettstown drainage bridge is being studied as it currently is in need of structural repair or replacement it cannot withstand the weight of the larger Plate F rail car. The drain runs under the railroad track at 3rd avenue and Moore street in Hackettstown and is essential to allow storm water to flow underneath the railroad track. The Preferred alternative is a full replacement of the slab with precast slab panels.

Key Points

Several freight railways are provided in Warren County. This infrastructure is essential to the continued efficient movement of goods throughout the County and beyond. Several projects are underway to improve freight rail movement within the County.