Warren County
transportation technical study update

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NJTPA wsp

Disclaimer

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Abstract

The Warren County Transportation Technical Study Update is the first phase of a process to prepare the Transportation Plan Element of the Warren County Master Plan. Phase one gathers together comprehensive data resources, defines applicable methodologies, evaluates existing conditions and context, and establishes study goals and priorities to create a decision-making framework that sets the stage for development of the Transportation Plan Element in a future phase two. The proposed Transportation Plan Element will drive the county's transportation planning and decision-making efforts, and guide the selection and advancement of priority capital improvements and policy measures.

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Executive Summary

Warren County's makeup - its geography, demographics, density, commuting characteristics, and economic base - places it in a decidedly unique position among New Jersey's 21 counties, functioning as the eastern boundary of Pennsylvania's Lehigh Valley and Poconos and the western limits of the New York-Newark metropolitan area. Warren County's reality is that it is part of both and its strength and potential lie in its role as the bridge between these vastly different regions linked by interstate highways, commerce, and proximity to the vast markets and trade zones of New Jersey, Pennsylvania, New York and New England.

This study is an update of the Warren County 2004 Transportation Technical Study that revisits and updates the goals, supporting data, technical resources, and methodologies to a time horizon of 2045, and incorporates the findings and recommendations from related transportation studies and plans.

Is Warren County Ready for The Future?

Among the ***purposes*** of the master plan is to evaluate whether the region is prepared for its future; the proposed Warren County Transportation Plan Element will address this question in the future.

But before examining ***whether*** or not it is prepared for the future, Warren County must first develop an ***understanding of its current conditions and context***: its needs, assets, deficiencies, goals, and priorities.

Study Findings

- The region's complex geography creates numerous mobility challenges, including the need to cross rivers and travel over and around steep hills and mountain chains
- Sensitive environmental and historic sites constrain the ability to maintain and expand the transportation network
- Local and state land use and environmental regulations including the Highlands Water Protection and Planning Act, further constrain both new development and some essential transportation improvement projects in sensitive environmental areas

- Growth of the logistics and supply chain industries is creating new economic opportunities, but straining many roadways with heavy truck traffic
- Benefits from trucking industry need to be balanced with local community impacts
- There is a County-wide need for traffic calming and gateways to preserve traditional villages, small town quality of life, and safety
- Despite a slowdown in County population growth, changing demographics and diversification of population translate into the need for more robust and accessible mobility options compared to previous generations
- Nearly all the population growth since the 2000 Census – a net increase of about 4,700 persons – appears to have come from the non-white, Hispanic and foreign-born communities
- Future NJTPA (North Jersey Transportation Planning Authority, the region's designated Metropolitan Planning Organization) population projections through 2045 are ¼ percent per year compared to historic growth rate of 1 percent, and just one-half of the region-wide NJTPA projected growth rate
- Warren County is also aging, with a median age that has advanced from 37.6 to 43.1 in just 16 years, and is doing so at a rate faster than New Jersey overall
- Demographic data reveal Warren County to be two places:
  - One that is getting older, with stagnant growth, and whose composition remains vastly white
  - And a second that is much younger, with a growing population, and rapidly becoming more diverse

Study Themes & Priorities

Together the study themes guide study recommendations, based on priority issues and needs gathered and assembled during the stakeholder outreach and technical assessment.

Demographics and Mobility

- Changing demographics and diversification of population
- Significant backlog of transportation improvement projects hampers local and regional mobility
- Need for more robust, accessible, and affordable mobility options

What Does the Future Look Like?

- How much future growth is likely and where it may take place?
- Investigate implications of anticipated logistics and supply chain industry growth

Preservation vs. Development

- The region's complex geography and many sensitive environmental and historic sites constrain new development and essential transportation improvements
- County-wide need for traffic calming to preserve quality of life and safety
- Balance need for growth and economic development with maintaining desirable Warren County quality of life

Three-Part Framework Plan

This study advances a Three-Part Framework Plan of proposed policies, programs, and projects, including recommendations from three categories:

1. Coordination and Outreach
2. Technical Assessment
3. Explore Scenario Alternatives

The Framework Plan proposes three potential alternative future scenarios for detailed study and assessment during the next phase of the planning process, development of the Warren County Transportation Plan Element.

- **Multimodal/Centers-Based** emphasizes basic smart growth principles, including walkability, transit, and innovative site design and access management techniques. The center-based scenario is derived from the 2004 Transportation Technical Study which recommended that measures be taken to preserve the capacity of the transportation network to accommodate existing and future development
- **Logistics Hub** is derived from the proposed I-78 Logistics Park in Phillipsburg and Lopatcong Township which is currently in the planning and early development stages. News reports indicate an addition of approximately 3,000 jobs and 3.8 million square feet of warehouse and distribution space at the 365-acre site; one of the largest development sites currently available in New Jersey
- **Warren County Blend** assumes a mix of multimodal, transit, policy, and land use elements from the Multimodal/ Centers-Based Scenario along with applicable elements of the Logistics Hub to achieve a better integration of transportation access, mobility enhancements, and economic development

Scenario Assessment & Future Analysis

The 2045 baseline scenario model projects that Warren County residents and workers will be driving more miles and more hours, taking longer trips at slightly lower speeds, and traveling more on local and county roads than they do today.

These data and findings represent the current assessment of what would happen to travel conditions in the region if no new plans, policies, programs, or projects are introduced beyond what has already been approved and adopted within the 2045 timeframe.

Development of the Transportation Plan Element of the Warren County Master Plan will compare and contrast these baseline conditions with the results from the three alternative future scenarios.

The proposed Transportation Plan Element will evaluate and advance an appropriate and feasible mix of planning, policy, and transportation improvements to meet the many and varied transportation demand and mobility needs outlined in this study.

Next Steps

Transportation and land use decision-making must be grounded in a firm understanding of local goals, context, need, and projected future conditions, as much has changed since the development of the Warren County 2005 Strategic Growth Plan.

The study team worked with the Warren County Planning Department, Study Advisory Committee, Transportation Advisory Council, NJTPA, and municipal and interagency partners to revise and refresh the study goals from the 2005 Strategic Growth Plan.

The Warren County Transportation Technical Study Update promotes a balanced smart growth approach with integrated land use and transportation planning and assessment methodologies. This study gathers together the comprehensive data resources and methodologies, evaluates existing conditions and context, and reexamines study goals and priorities to set the stage for future planning and decision-making.

The Warren County Transportation Technical Study Update is the first phase of a process that leads to the development of the Transportation Plan Element of the Warren County Master Plan in a future phase two. The transportation element will drive Warren's transportation planning and decision-making efforts, and the selection and advancement of priority capital improvements.

Revised Study Goals

Preserve and enhance the County's rural character and its agricultural, natural, historic, and tourism resources.

Focus growth in existing centers, using incentives such as improved public infrastructure to support new development and redevelopment.

Protect and enhance water quality and quantity.

Maintain and improve the existing transportation system to provide safe and efficient mobility and access.

Provide transportation choices that increase mobility, including improved public transportation, and bicycle and pedestrian options.

Increase the resiliency of the County's infrastructure to extreme weather events and flooding.

Provide a mix of housing types to accommodate the needs of current and future residents.

Increase educational opportunities and encourage desirable development that provides local employment opportunities.

Promote cooperation among municipalities and with other counties and the state to advance mutual interests.

Encourage state legislation to provide localities more control over growth.

Seek equitable outcomes for the plan's implementation, considering the diverse needs of Warren County residents, landowners, and businesses.

Monitor technological and economic trends to identify new opportunities for achieving the County's strategic goals.

00 | Introduction

Warren County's makeup - its geography, demographics, density, commuting characteristics, and economic base - places it in a decidedly unique position among New Jersey's 21 counties, functioning as the eastern boundary of Pennsylvania's Lehigh Valley and Poconos and the western limits of the New York-Newark metropolitan area, Warren County's reality is that it is part of both and its strength and potential lie in its role as the bridge between these vastly different regions linked by interstate highways, commerce, and proximity to the vast markets and trade zones of New Jersey, Pennsylvania, New York, and New England.

Warren County Transportation Technical Study Update

This study is an update of the Warren County 2004 Transportation Technical Study (2004 Technical Study) that revisits and updates the goals, supporting data, and technical resources and methodologies to a time horizon of 2045, and incorporates the findings and recommendations from various related transportation studies and plans. This Warren County Transportation Technical Study Update (Technical Study Update) is envisioned as the first phase of a two-part undertaking to update the Transportation Plan Element of the Warren County Master Plan. It is the intention of the Warren County Planning Department that the updated Transportation Plan Element will be undertaken shortly after this study is completed.

The proposed Transportation Plan Element will define and drive Warren's transportation planning and decision-making processes and guide the selection and advancement of capital improvements and policy measures.

Transportation and land use decision-making must be grounded in a firm understanding of local goals, context, needs, and projected future conditions. The Technical Study Update promotes a balanced smart growth planning approach with integrated land use and transportation assessment methodologies.

Quick Fact

Although its total population plateaued around the time of the 2010 U.S. Census, Warren County is becoming more diverse both in its demographic composition and in its mobility needs.

More than a decade has now passed since the 2004 Technical Study with significant and measurable changes to Warren County's population, demographic composition, and economic outlook. There is a need to evaluate the projections and technical assessment, and determine whether there is continuing stakeholder and public support for its assumptions, objectives, and recommendations. The intervening years have seen much slower population growth than previously forecast and this update incorporates newer and much lower NJTPA demographic projections which bring significant implication for the region's future transportation and mobility needs.

Regional Context

Featuring a blend of rolling hills and small mountain ranges, expansive river valleys, and vast tracts of farmland and forest, Warren County is a collection of small and distinct communities spread across a complex and environmentally sensitive geography. The county includes as many as fifty unique localities, ranging from large municipalities such as Phillipsburg, Hackettstown, and Washington Borough, to smaller municipalities like Alpha Borough, Belvidere, and Oxford, to dozens of small and scattered unincorporated communities with place names like Port Murray, Brass Castle, Finesville, Mountain Lake, and Marksboro; many with just a few hundred residents.

Mostly rural and small town in composition and lifestyle, Warren's largest population center is Phillipsburg with about 15,000 residents. The county features an overall population density of about 300 persons per square mile, just one-quarter of the statewide average of 1,200. Only the municipalities of Alpha, Belvidere, Hackettstown, Phillipsburg, and Washington Borough exceed the statewide average.

Population growth in Warren County has weathered a succession of boom and bust cycles since its incorporation nearly two centuries ago in 1825 from portions of neighboring Sussex County. Total population has roughly doubled since 1950, but growth has slowed significantly since the 2000 Census and population actually decreased slightly since 2010. The 2016 U.S. Census estimate of population is still below the 2010 Census total.

The county's population is measurably less diverse than is typical of New Jersey as a whole, with a much higher percentage of white population (89.5 percent for Warren County vs 72.4 percent for New Jersey), and much lower percentages of Hispanic (8.2 percent vs 20.0 percent) and foreign-born 9.7 percent vs. 21.8 percent) residents.

Despite these findings, detailed examination reveals that Warren is becoming more diverse and increasingly a gateway community to new immigrants from many nations. The county's minority population is primarily of Hispanic origin, and nearly all the population growth since the 2000 Census – a net increase of about 4,700 persons – appears to have come from the non-white, Hispanic, and foreign-born categories.

Warren is also aging, with a median age that has advanced from 37.6 to 43.1 in just 16 years,

and is doing so at a rate faster than New Jersey overall.

Most of these demographic changes are limited to a small group of municipalities, including Phillipsburg, Washington Borough, and Hackettstown.

The Warren County workforce has New Jersey's second longest mean travel time to work at about 34.4 minutes, well above the statewide mean of 30.4 minutes and trailing only neighboring Sussex County at nearly 38 minutes.

Ultimately the demographic data reveal Warren County is becoming two places:

- One that is getting older, with stagnant growth, and whose composition remains vastly white
- And another that is much younger, with a growing population, and rapidly becoming more diverse

While this second vision of Warren County may be more in line with New Jersey's overall diversity, some of these findings set these new Warren County residents apart from their counterparts in other parts of the state, with the potential for significant mobility implications.

Each of these factors shape the future need for transportation networks, travel modes, and mobility services:

- The region's complex geography creates numerous mobility challenges including the need to cross rivers and travel over and around steep hills and mountain chains
- Sensitive environmental and historic sites constrain the ability to maintain and expand the transportation network and make necessary repairs and improvements to critical bridges and intersections
- The evolving regional economy and growth of the logistics and supply chain industries are creating new economic opportunities, but straining many local, county, state, and interstate roadways with heavy truck traffic
- Despite a slowdown in County population growth, changing demographics and diversification of population translate into the need for more robust and accessible mobility options compared to previous generations

For many of Warren County's newest residents and workers, the traditional focus on roads and bridges alone is simply not enough and this study represents the beginning of a new path forward as the region looks to the future

New Jersey Highlands Water Protection and Planning Act

The Highlands Region is a vital source of drinking water for more than half of New Jersey's families, yielding approximately 379 million gallons of water daily. In addition to water resources, the Highlands Region contains exceptional natural resources such as contiguous forest lands, wetlands, pristine watersheds and plant and wildlife species habitats. The region contains many sites of historic significance and provides abundant recreational opportunities. Approximately 110,000 acres of agricultural lands are in active production in the Highlands region.

The Highlands Water Protection and Planning Act was signed into law in August 2004 to advance conservation efforts, smart growth, regional planning, and water supply protections in the region.

The Highlands Act places significant restrictions on both new development and transportation improvement projects in the region, and thus severely constraints local land use and capital improvement decisions.

The Highlands Act documents the geographical boundary of the Highlands Region and establishes the Highlands Preservation and the Highlands Planning Areas. All "major Highlands development," as defined by the Highlands Act, in the Preservation Area is regulated and will require DEP approval, unless otherwise exempted by the Act.

Exemptions related to transportation projects are:

- Construction or extension of trails with non-impervious surfaces on publicly owned lands or on privately owned lands where a conservation or recreational use easement has been established and filed with the deed for the lots on which the easement exists
- Routine maintenance and operations, rehabilitation, preservation, reconstruction, or repair of transportation or infrastructure systems by a State entity or local government unit, provided that the activity is consistent with the goals and purposes of the Highlands Act and does not result in the construction of any new through-capacity travel lanes
- Construction of transportation safety projects and bicycle and pedestrian facilities by a State entity or local government unit, provided that the activity does not result in the construction of any new through-capacity travel lanes
- Routine maintenance and operations, rehabilitation, preservation, reconstruction, repair, or upgrade of public utility lines, rights of way, or systems, by a public utility, provided that the activity is consistent with the goals and purposes of the Act
- Reactivation of rail lines and rail beds existing on August 10, 2004
- All other projects will need to obtain Highlands Preservation Area approval from the NJDEP

Highlands Region

The New Jersey Highlands Region is an 800,000+ acre region covering over 1,250 square miles and 88 municipalities in seven counties (Bergen, Hunterdon, Morris, Passaic, Somerset, Sussex and Warren), including 171,236 acres in Warren County. Of this Warren County total, 104,085 acres (61 percent) are in the Highlands Planning Area and 67,150 acres (39 percent) are in the Highlands Preservation Area (Figure 1).

Highlands Preservation Area

The Act designates approximately 398,000 acres of exceptional natural resource value as the Highlands Preservation Area. Development in the Preservation Area is severely restricted. All the land in the Highlands Region that is not in the Highlands Preservation Area lies within the Highlands Planning Area.

Highlands Planning Area

The Highlands Planning Area is the portion of the Highlands Region that is not included in the Highlands Preservation Area. While the Act does not establish any new standards for the Highlands Planning Area, the Highlands regional master plan, which must be adopted by the Highlands Water Protection and Planning Council, will provide an avenue for enhanced standards, the transfer of development rights (TDR), and smart growth in this portion of the Highlands Region.

Working farms and rural landscapes are frequent sights in Warren County

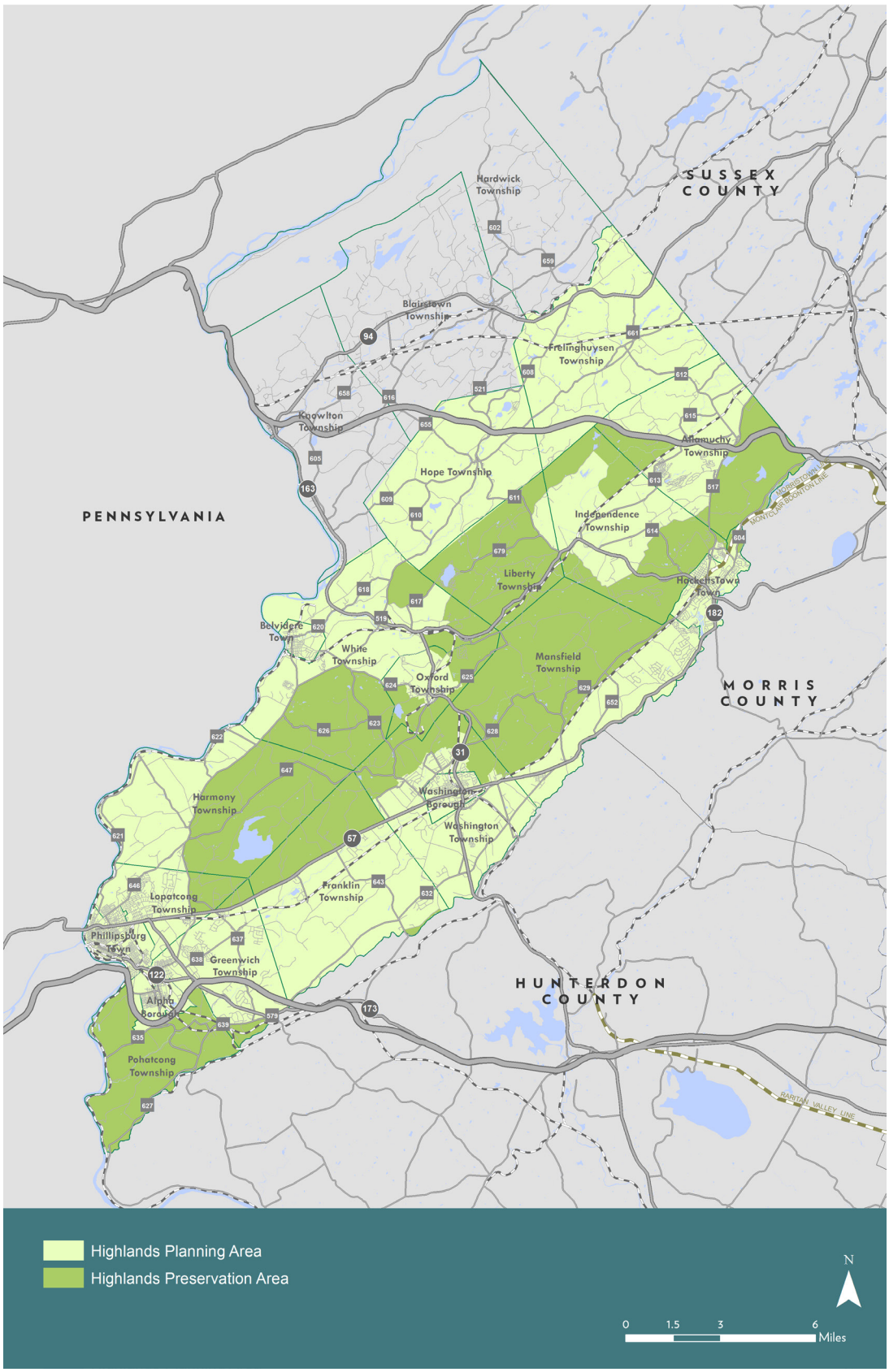


Figure 1: Designated NJ Highlands Planning and Preservation Areas in Warren County

Planning Context

Three previous studies completed about a dozen years ago provide the foundation for the Technical Study Update. These studies developed demographic projections and traffic forecasts for Warren County through 2030, and used these resources to conduct a development build out analysis and traffic assessment using current municipal zoning. Based on the traffic forecasts, these studies recommended a program of smart growth, center-based measures to mitigate forecasts of increasing traffic congestion.

The Technical Study Update is designed to revisit these studies with updated demographic projections and traffic forecasts, and confirm stakeholder and public support for the previous assumptions, objectives, and recommendations.

Warren County 2005 Strategic Growth Plan (2005 Strategic Growth Plan) provides the strategic framework for county and local decision-making, guides future investment in the transportation network, and identifies adequate public infrastructure improvements to accommodate projected growth.

The 2005 Strategic Growth Plan developed regional goals and indicators, documented existing conditions, and compared future conditions under existing zoning with conditions under the alternative land use scenarios. Recommendations were developed for land use, transportation, and water quality planning, with specific actions, including site access management strategies; restoring passenger service for the Lackawanna Cut-Off study, Washington Secondary and extension of the Raritan Valley Line; and creation of Transportation Development Districts and Transportation Enhancement Districts.

Warren County Transportation Technical Study (2004 Transportation Technical Study) was undertaken in tandem with the 2005 Strategic Growth Plan and included the development of a land use and transportation model to test the impacts of land use decisions on the roadway network.

The model was used to conduct a buildout analysis comparing existing zoning regulations with centers-based land use scenario alternatives. This analysis indicates that traffic congestion increases significantly in both scenarios, but is much worse under existing municipal zoning.

The 2004 Transportation Technical Study recommends measures be taken to preserve the capacity of the transportation network to accommodate existing and future development. Specific planning recommendations include smart growth land use strategies, targeted corridor planning and transit improvements, site design and access management tool, transportation control measures, and transportation financing districts to supplement existing funding streams.

Warren County 2015 Land Use Forecasting and Transportation Analysis Study (2006) made use of the Warren County Travel Demand Model to analyze the transportation and land use system in the year 2015. Future year forecasts for land use and demographics were developed with input from both county and municipal professional staff and Planning Board members.

The demographic projections developed in the 2005 Strategic Growth Plan anticipated an uninterrupted continuation of the county's historic population growth rate of roughly one percent per year since 1830, and forecast the county would maintain this robust growth rate through 2030. Consequently, the resulting land use and transportation forecasts anticipated significant levels of new development, increasing travel demand, and worsening congestion over the Plan's 30-year time frame.

As we now know what happened instead was a steep drop-off in growth between the 2000 and 2010 Census counts to almost one-half the historic annual growth rate, followed by a post 2010 decline in total county population in the most recent Census estimate for 2016. This is among the most significant drivers of the need for the Technical Study Update to re-examine the demographic projections, update the supporting data and study goals, and revise the transportation forecasts.

The Village of Hope was entered into the State and National Registers of Historic Places in 1973

Is Warren County Ready for The Future?

A ***purpose*** of the master plan is to evaluate whether the region is prepared for its future; the Warren County Transportation Plan Element will address this question in the future.

But before examining ***whether*** the region is prepared, Warren County must first develop an ***understanding of its current conditions and context***: its needs, assets, deficiencies, goals, and priorities.

To do so, this study must first ask: **How Does Warren County *Prepare* for the Future?**

The Technical Study Update considers this question using a three-part planning process:

1. Examine Existing Conditions

   Outreach and Coordination to engage stakeholders, gather feedback and comments, and build consensus on study recommendations. A combination of traditional and innovative outreach and coordination methodologies were employed, including a study advisory committee to guide and direct the planning process; meetings and a survey to engage Warren County's 22 municipalities; targeted outreach to under-represented and environmental justice communities; social media and crowdsourcing applications; and pop-up events held at public gatherings and community events.

   Study Goals, Themes, and Priorities emerge from the community-based planning process and support the formulation of goal statements that articulate study purpose and intent in a clear and concise manner. The revised study goals will be used to evaluate and prioritize the various recommendations and implementation actions in the Transportation Plan Element.

   Data-driven Technical Assessment includes review of previous studies; implementation status of projects, plans, and recommendations; and assessment of system performance, including using crash data and NJDOT management systems.

2. Understand How Warren County is Changing

   The Technical Study Update builds upon these previous efforts with a comprehensive assessment of the latest demographic forecasts and traffic projections to establish a baseline of comparison with future scenario alternatives and outcomes.

   Demographic Resources provide a reliable and consistent dataset to help understand conditions and needs, evaluate the demand for goods and services, and inform decisions about priorities for investments in infrastructures and utilities.

   Environmental Justice is a core mission of projects funded by Federal agencies and an essential part of many planning studies, including all Subregional Studies funded by the NJTPA. The purpose of the Environmental Justice Assessment is to identify and engage disadvantaged communities and ensure they are not

disproportionately affected by any study recommendation, action, or project.

Scenario Planning and Travel Demand Modeling methodologies provide a platform for exploring a range of alternative future outcomes and investment scenarios by testing a mix of infrastructure, demographic, land use, and policy changes, and comparing each potential alternative to the 2045 baseline travel projections and performance measures.

Baseline Travel Model Projections establish the baseline reference point for the scenario planning process and exploration of potential future outcomes. The demographic data resources comprise the principal inputs to both the scenario planning process and travel demand modeling methodologies.

3. Explore Potential Future Outcomes

Consistent with Warren County's historic, environmental, and preservation priorities, the Technical Study Update explores innovative, lower-cost, and context sensitive design alternatives to meet its current and projected future transportation needs. These projects, policies, and services are designed to better reflect and enhance local character, context, and sensitive natural resources and assets, and address mobility and safety needs and considerations in a lower-cost, lower-impact manner.

Study Themes and Priorities guide development of the Framework Plan based on comments and priority issues gathered and assembled during the comprehensive stakeholder outreach and coordination process.

The Technical Study Update advances a **Three-Part Framework Plan,** including proposed policies, programs, and projects from the following categories:

1. **Planning and Outreach -** recommendations derived from stakeholder comments and priority issues identified during the many and varied outreach events and methodologies.
2. **Technical Assessment -** recommendations derived from the data collection, assessment, NJDOT management systems, scenario planning, and travel demand modeling tasks.
3. **Alternative Future Outcomes -**three alternative future outcomes scenarios are proposed for detailed study and assessment during the next phase of the study process; development of the Warren County Transportation Plan Element.

01 | Examine Existing Conditions and Context

Transportation and land use decision-making must be grounded in a firm understanding of existing conditions and context: including the region's needs, assets, deficiencies, goals, and priorities.

The Transportation Technical Study Update begins with a comprehensive outreach and coordination process to help guide the study effort and build consensus on a program of achievable goals and recommendations; summary of previous studies and plans; implementation status of projects and plans; and technical assessment of system performance measures and metrics.

Stakeholder Outreach and Coordination

The Technical Study Update used a community-based planning process to support the technical elements of the study by engaging stakeholders, seeking feedback and comment on study tasks and deliverables, and building consensus on study recommendations and implementation elements.

Collaboration and coordination with local, county, regional, and state partners are essential to understanding and assessing local goals, needs, and context, and support and advance proposed policies, programs, and projects.

The outreach and coordination efforts is a continuous and collaborative process with a variety of opportunities for discussion, engagement, and assessment, including:

- Study Advisory Committee
- Transportation Advisory Council
- Municipal Partners
- Focus Groups
- Public Engagement
- Social Media and Crowdsourcing

Many of the preliminary study findings were derived directly from these initial engagement activities and used to refine and prioritize recommendations for the Three-Part Framework Plan.

Quick Fact

Warren County's total population has roughly doubled since 1950 but growth has slowed significantly since the 2000 Census.

Study Advisory Committee

Effective Study Advisory Committee (SAC) engagement is the foundation of the community-based planning process and ensures the study is driven by local priorities and the study team adequately understands and addresses local goals, needs, and issues.

Members of the SAC included professionals and staff from various local, county, regional, and statewide agencies, along with advocates and stakeholder group representatives. SAC members provided input and guidance throughout the study. Please see the listing of SAC members and their affiliations at the end of this document.

Three SAC meetings were held to guide the Transportation Technical Study from goal setting and assessment of existing conditions, to review and vetting of the study findings, to formulation of implementation strategies and future scenario alternatives.

Engagement of the SAC members included a facilitated discussion of the study goals and objectives, review of study findings, NJTPA travel demand model data, and baseline scenario metrics and performance measures.

Comments from committee members ranged across a broad spectrum of planning, mobility, safety, and quality-of-life issues:

- Concern about impacts of heavy truck traffic on historic properties
- Need for accessory housing zoning to accommodate changing housing needs of aging county residents and families
- Spillover effect of interstate highway congestion to county and local roadways
- Continued low ridership of 31Ride Shuttle requires rethinking of strategy to meet mobility needs while addressing regional congestion on State highways, including Routes 31 and 57
- Work with TransOptions TMA to evaluate potential for subsidized ridesharing to meet senior mobility needs
- Need to understand biking and walking as essential travel modes for some residents and workers
- Work with trucking advocates to understand and mitigate lack of truck rest stops and service areas

Transportation Advisory Council

The Warren County Transportation Advisory Council (TAC) meets bi-monthly as an extension of the Department of Human Services to discuss needs, performance, and administration of the Warren County Transportation (WCT) system, including transit, shuttle, demand response, and paratransit services for Warren County residents.

The study team attended the April 12, 2018 TAC meeting in Washington Township and provided an overview of the study goals and findings. TAC members offered a number of comments and suggestion for transportation and mobility issues:

- The U.S. Route 22 at NJ 57 intersection has signal timing, alignment and right turn deficiencies. This intersection is a priority intersection identified by Warren County and NJDOT

- CR 519 and CR 620 were also discussed because of traffic congestion issues TAC members suggested realigning and restriping the intersection for better sight lines
- Other traffic issues include turning movement and congestion issues near the Department of Human Services building in Belvidere
- Truck and bus traffic traveling on smaller roads and bridges in the county was cited as an issue especially on roads in Blairstown. Some TAC members suggested GPS navigation systems may be contributing to this problem
- Transit issues discussed include extending the Hackettstown shuttle to Centenary College and Hackettstown Medical Center
- There is a need to increase the frequency of county shuttles serving the County Court House in Belvidere
- TAC members anticipate shuttle service will be needed when the proposed freight facility opens at the old Ingersoll Rand site

Municipal Partners

Local participation, support, and buy-in are essential elements to successful implementation of the study recommendations and Framework Plan. Municipal elected officials, professionals, and planning board members were consulted at key stages of the study to ensure that each of Warren County's 22 municipalities has an equal voice in the needs assessment, problem identification, and study recommendation elements of this study.

The municipal partners were provided with a digital survey to begin the coordination process. The survey was organized around Warren County's key challenges and mobility needs:

- Priority transportation issues
- Local roadway conditions
- Pedestrian and bicycle mobility
- Public transportation
- Priority improvement projects and strategies
- Local projects, plans, and initiatives
- Traffic impacts of new development

An initial meeting was held with the municipal partners in November 2017 to review the survey responses and provide each municipality the opportunity to discuss local goals and concerns in-depth. Comments and observations on region-wide needs and issues included:

- Improve pedestrian mobility
- Extend hours of shuttle service
- Opportunities for seniors to stay in their communities & maintain mobility
- Job access for residents without cars
- Traffic and mobility issues associated with residential developments, such as Hawk Pointe in Washington Township and Panther Valley in Allamuchy
- Lighting on rural roads
- GPS misdirection of truck traffic ("stuck truck" syndrome)
- Quality of life impacts of long-haul trash trains, including noise and smell
- Identify opportunities for rails-to-trails

Specific local and municipal concerns included:

- Truck turnaround issue at Old Route 22 in Phillipsburg
- Truck traffic impacts on CR 519 in downtown Hope
- School traffic impacts at NJ 31 & CR 625 in Oxford Township
- Congestion on Allen Road Bridge in Mansfield
- Crosswalk needed at CR 519 & 612 in Frelinghuysen
- Congestion and speed enforcement issues on I-80
- Need for additional I-80 vehicle cross-over areas

The team met with municipal partners again in May 2018 to review the study recommendations, scenarios, and implementation strategies. A variety of comments and concerns were offered:

- Frustration with the lengthy delays for critical transportation projects to receive approval for design and construction
- How can Warren County receive its fair share of transportation funding?
- The impact of the Highlands Act may be a factor in the slowdown of population and employment growth in the region
- What can be done to increase ridership on the Route 31 Shuttle?

Focus Groups

Small focus groups empower stakeholders, advocates, social service providers, and business community representatives to take a meaningful role in the overall study and provide a wider range and diversity of input and comment than traditional outreach methods.

Small groups provide opportunities for personal input and perspective not always apparent to professionals, decision makers, and SAC members by bringing together people with a direct investment in the community, people who understand and appreciate its assets, and live everyday with its shortcomings. Warren County Planning staff and the study team worked together to organize and conduct two focus groups discussion meetings.

Trucking, Goods Movement, and Business: This focus group brought together a group representing a variety of interests centering on freight and goods movement issues, truck access, warehousing, and local and regional business development. Comments included:

- The proximity of Warren County to the Lehigh Valley is a significant opportunity for the logistics industry
- The need to mitigate the impact of trucking operations on rural roads and small communities is an ongoing concern
- Increasing regulation of many aspects of trucking and goods movement is a significant burden to trucking firms, vendors, and drivers, making it increasingly difficult to conduct business even as demand for their services is growing

- More truck rest stops and service areas are needed – for convenience, safety, and viability of business operations

Multimodal Mobility: This focus group brought together a group representing a diversity of multimodal and mobility needs including pedestrian and bicycle mobility, seniors, transit, safety, the disabled, and access to work and education. Comments included:

- Recognize that for some residents biking, walking, and transit are the primary mode of travel
- Integrate access and mobility considerations when making location decision for facilities, services, and new development
- Warren County's disabled residents need access to affordable transportation options bringing employment, health care, education, housing, and community life within reach
- Construction and maintenance of sidewalks is a local responsibility
- Funding for county transit services is stable, but limited and therefore constrains expansion of services and service areas

Public Engagement

Public meetings provide a forum for engaging residents, stakeholders, and advocates to ensure they are kept informed and engaged throughout the study, and afforded ample opportunity to provide feedback and comments.

Recognizing today's busy, fast-paced lifestyles, and the need to engage hard-to-reach, and underrepresented communities; a series of innovative "pop-up" meetings was held. Designed to 'take the meeting to the community' pop-up events and mobile outreach activities engage citizens as they go about their daily routines, gathering useful feedback and comments in an efficient, cost-effective, and conversational manner.

Team members interacted with numerous private citizens, social service providers, business owners, and municipal and agency representatives throughout the duration of the study, including:

- Three days at the Warren County Farmers Fair, July and August 2017
- Pop-up meeting at Hackettstown area bike shop, November 2017
- Roundtable discussion "pop-up" meeting with students at English as a Second Language (ESL) class, December 2017
- Follow-up discussion with ESL class to review and gather comment on study recommendations, April 2017
- County-wide Public Meeting May 2018

At the Warren County Farmers Fair, the team collected over 120 comments covering a wide range of topics, including:

- Transit needs
- Senior mobility
- State-of-good-repair
- Capacity at Clinton Park & Ride
- Targeted intersection improvements
- Congestion on I-80 and I-78, NJ Routes 22 and 31

- Maintain rural character ("don't overbuild")
- Sidewalk, bicycle, and trails improvements
- Trucking issues

Many issues were raised at the May 16 public meeting, including

- Is there a mechanism for regional land use recommendations to influence planning and zoning at the municipal level?
- Will currently planned and proposed apartment and multifamily residential units be included in the future traffic projections and how will these new projects impact regional traffic and congestion hotspots?
- Warren County needs to work with local and regional partners to advance critical transportation improvements to design and construction phases
- Decision makers need to understand and address the mobility needs of Warren County's aging residents, those with limited access to a personal automobile, and those who are unable to drive
- Both Warren County shuttle operators and private regional bus service providers have been experiencing labor shortages and wage rate competition due to the tightening labor market, constraining the ability to staff and operate bus service; even as many see expanded shuttles and buses as a priority for the region

English as a Second Language (ESL) Pop-up Events

Direct engagement of Environmental Justice (EJ) communities at ESL classes is recognized as a best practice approach for communicating with disadvantaged, under-represented, and potentially impacted groups. The team met twice with students at Hackettstown area ESL classes.

The first ESL meeting was used to provide a brief overview of the study, promote a discussion of transportation mobility issues in Warren County, and identify specific mobility needs and limitations. Following the first meeting, a program of multimodal transportation recommendations was developed by the study team, specifically designed to address the concerns, needs, and mobility limitations identified by the ESL students. At the second ESL meeting, the team reported back to the participants and asked for their feedback and assessment of the proposed recommendations. This information was used to refine and prioritize recommendations for the Three-Part Framework Plan.

Overall, the group placed the highest priority on transit improvements, followed by walking and biking improvements, with the lowest priority placed on driving.

Social Media and Crowdsourcing

In addition to formal meetings, the study team used several social media and crowdsourcing applications to engage and encourage the public to contribute to the study. These tools provide a means to both gather and disseminate study information, and help to reach those unable to attend formal public meetings in person, enabling the study team to interact with a broader and more diverse audience.

WikiMapping

An interactive online WikiMap web page was launched in July 2017 to collect comments about walking, biking, transit, and general transportation-related issues in Warren County. A screen capture of the WikiMap page and comments is displayed on the following page.

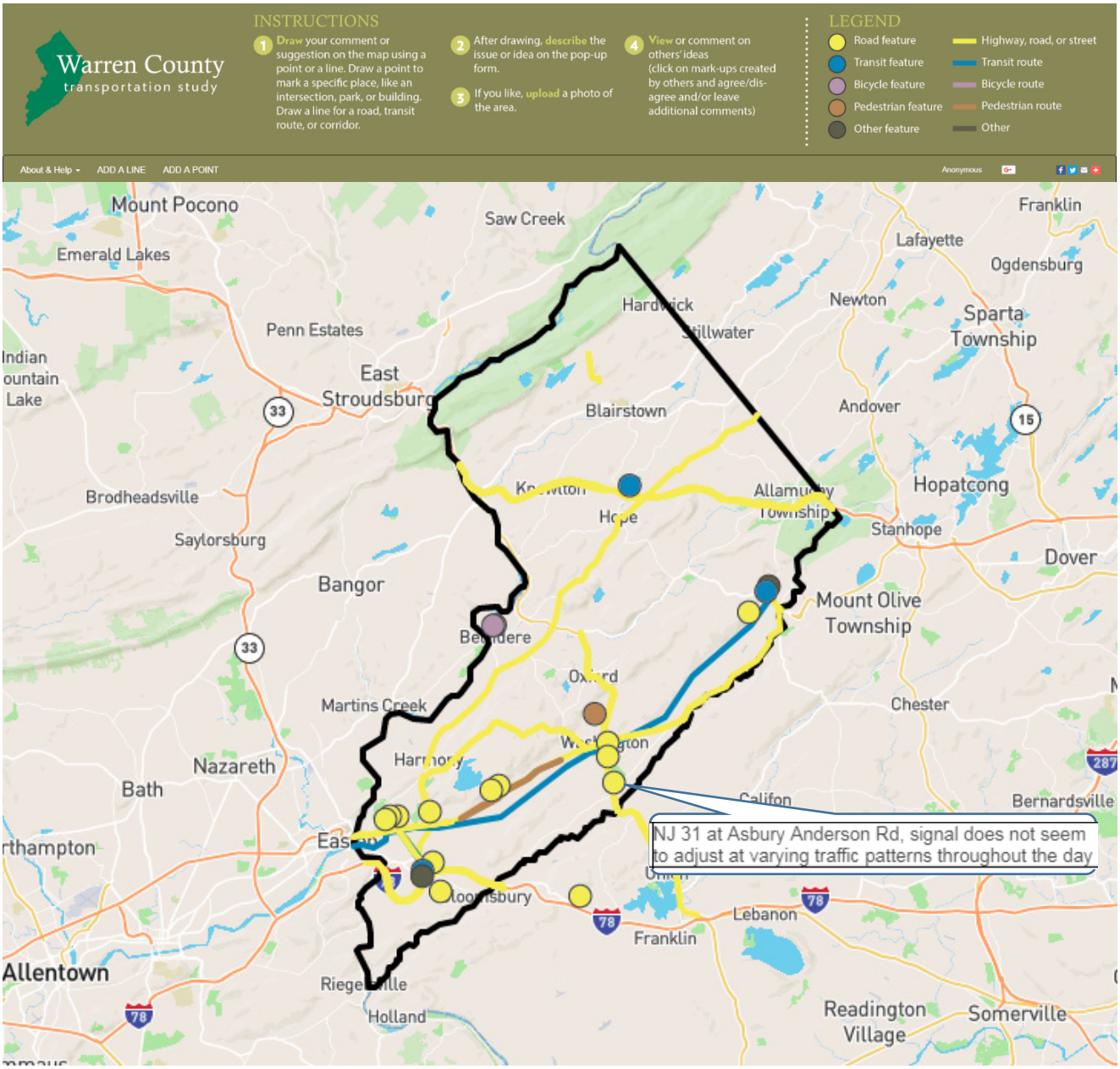
Open to all members of the public, users were asked to identify corridors and spot locations for challenging and problematic routes and conditions. Participants could also identify specific locations as examples of good design which could be used and replicated elsewhere in Warren County to improve safety and mobility. WikiMap also provides the capability to upload a photo or image. The team utilized the WikiMap to gather comments at the November pop-up event in Hackettstown.

More than 70 comments were received; major themes included:

- Need for transit service to and from New York City
- Transit access to key destinations like colleges and grocery stores
- Congestions issues reported on I-80, I-78, NJ 22, and NJ 31
- Maintaining and preserving rural character of the county
- Bicycle and pedestrian connectivity in Hackettstown, Phillipsburg and Washington Borough
- Safety and crash issues on NJ 31, NJ 57, intersection of NJ 57 and CR 519
- Better commuter rail connections to other parts of New Jersey and New York City.

Facebook Page

The study team established and maintained a Warren County Transportation Technical Study Facebook page. The page was launched in August 2017. Study information and updates were posted to keep community members informed on study activities and products. The Facebook page included information on upcoming meetings and events, a study factsheet PDF available for download, and a link to the study's WikiMap page.



Online Interactive WikiMap webpage

Study Goals, Themes, and Priorities

The community-based planning process supports the formulation of goal statements that articulate study purpose and intent in a clear and concise manner. The revised study goals will be used to evaluate and prioritize the study recommendations.

Revise and Refresh Study Goals

The study team worked with the Warren County Planning Department, Study Advisory Committee, Transportation Advisory Council, NJTPA, and municipal and interagency partners to revise and refresh the study goals from the 2005 Strategic Growth Plan which states:

> The role of the Strategic Plan is to provide policy guidance for local plans, guide future investment in the transportation network, ensure that adequate public facilities exist, and to accommodate growth where it can be best coordinated.

In addition to overview of current conditions and context, planning documents and zoning, and anticipated future needs, the team facilitated an interactive discussion and assessment of the study goals at the first Study Advisory Committee Meeting, held at the Warren County offices on June 27, 2017.

The following priorities emerged to guide revision of the study goals:

- Recognize the commitment Warren County and municipalities have made to preserving historical and cultural resources
- Prioritize infrastructure resiliency
- Use planning and infrastructure incentives to focus growth in existing centers
- Promote improved transportation mode choices, rather than just access to the various travel modes, as a means of enhancing both mobility and opportunity
- Promote a mix of housing types to accommodate the growing diversity of households and residents
- Provide appropriate educational and training opportunities to meet the changing needs of the job market
- Monitor technological and economic trends which may affect transportation needs over the life of the plan

Questions were posed by some committee members as to why non-transportation related topics and concepts would be included in the goals for a transportation study. As noted, the initial goals were derived from the 2005 Strategic Growth Plan which applies to a broad range of county-wide services, needs, and disciplines, including transportation safety, access, and mobility. Therefore, a common set of goals should be used across all Warren County planning documents, plans, projects, and initiatives, and the 2005 Strategic Growth Plan was deemed the most appropriate venue for developing and hosting a single, consistent, and universally applicable program of goals.

Transportation and mobility are closely related to a broad range of planning issues and factors, including housing affordability, job access, economic development, and even health and quality of life, so it is appropriate that the study goals should also reference these issues.

Revised Study Goals

Preserve and enhance the County's rural character and its agricultural, natural, historic, and tourism resources.

Focus growth in existing centers, using incentives such as improved public infrastructure to support new development and redevelopment.

Protect and enhance water quality and quantity.

Maintain and improve the existing transportation system to provide safe and efficient mobility and access.

Provide transportation choices that increase mobility, including improved public transportation, and bicycle and pedestrian options.

Increase the resiliency of the County's infrastructure to extreme weather events and flooding.

Provide a mix of housing types to accommodate the needs of current and future residents.

Increase educational opportunities and encourage desirable development that provides local employment opportunities.

Promote cooperation among municipalities and with other counties and the state to advance mutual interests.

Encourage state legislation to provide localities more control over growth.

Seek equitable outcomes for the plan's implementation, considering the diverse needs of Warren County residents, landowners, and businesses.

Monitor technological and economic trends to identify new opportunities for achieving the County's strategic goals.

Study Themes and Priorities

Comments, concerns, trends, and needs were gathered and assembled from the various study tasks to establish the priorities and challenges that will guide future study, action, and collaboration and development of the Transportation Plan Element in the proposed phase two.

These observations and assessments were assembled and reorganized into three overarching study themes representative of Warren County's past, present, and desired future vision. An assemblage of these goals, trends, priorities, and themes is depicted in the *Word Cloud* image on the following page.

Understand the region's ongoing demographic changes and the resulting mobility challenges

- Changing demographics and diversification of population
- Significant backlog of transportation improvement projects hamper local and regional mobility
- Need for more robust, accessible, affordable mobility options

Use travel forecasting and scenario planning methodologies to understand what the future might look like

- How much growth is likely over the long term and where it may take place?
- Investigate employment and development implications of anticipated logistics and supply chain industry growth

Balance the strongly-expressed interest in preservation vs. the need for, and impact of, future growth and development

- The region's complex geography and many sensitive environmental and historic sites constrain new development and essential transportation improvements
- County-wide need for traffic calming and gateways to preserve traditional villages, small town quality of life, and safety
- Balance the need for economic and housing development with maintaining the desirable lifestyle that continues to draw new residents and businesses to Warren County


Mobility
History
Centers-based
Multimodal
Stakeholders
Goals
Funding
Logistics
Congestion
State-of-good-repair
Complete Streets
Context
Safety
Future
Community
Connectivity
Equity
Density
Scenarios
Crashes
Transit
Alternatives
Rail Trail
Baseline Projections
Pilot Projects
Truck Stops
Access Control
Park&ride
Shuttle
Bridges
Environmental Justice
Zero-car Households
Topography
Bicycle
Pop-up
Njrtm-e
Goods Movement
Ride-sharing
Management Systems
Implementation
Mitigate

Data-Driven Technical Assessment

The Technical Assessment is a data-driven process, including regional demographic forecasts and projections; review of previous studies and implementation status of recommended programs, projects, and policies; analysis of crash data and NJDOT management systems; and summary of baseline travel demand model forecasts.

The Transportation Technical Study Update begins with a comprehensive multimodal assessment of baseline existing conditions and mobility needs, including:

- Summary of Previous Studies
- Implementation Status Assessment
- System Performance Data
- Traffic Data Collection

Summary of Previous Studies

The following summaries provide an overview of the previously completed studies relevant to the Technical Study Update. Additional details, documentation, and implementation status are provided in Technical Memorandum 3.1.

More than 500 individual improvement and policy recommendations were proposed, only a small percentage – 13 percent – have been completed through 2018.

The various studies summarized in this section include the following:

- **Strategic Plans** – consists of the three studies completed about a dozen year ago that provide the foundation for the Technical Study Update – the Warren County 2005 Strategic Growth Plan, 2004 Transportation Technical Study, and 2015 Land Use Forecasting and Transportation Analysis Study
- **Multimodal studies –** studies of multimodal mobility and safety needs, including the Morris Canal, regional transit enhancements, and pedestrian safety in Phillipsburg
- **Corridor and Intersection Studies –** many of the region's principal arterial highways have been studied, ranging from NJ Routes 31, 46, and 57, to U.S. 22 and I-78
- **Freight and Goods Movement Studies** – assessment of industry needs and infrastructure constraints

Morris Canal Action Plan (2012)

The Warren County Morris Canal 25 Year Action Plan continues efforts to establish a greenway and multi-use trail linking major parts of Warren County; preserving a valuable historic resource, and fostering public interest in the Morris Canal. It will provide recreational opportunities for a large audience and guidance for land-use decisions.

The final plan describes specific strategies, recommendations and projects intended to guide the next 25 years of development for the Morris Canal Greenway. It prioritizes specific items based on the feasibility, costs and public support. The plan will be a living document for the County to revisit during the next 25 years as the canal greenway is implemented.

Route 57/46 Connector Study (2003)

This study was undertaken as a component of the Warren County Strategic Growth Plan and completed in 2003. The proposed Route 57/46 connector would fill a significant missing link in the region's arterial system. Route 57 terminates at a traffic signal approximately 1 mile west of U.S. Route 46 in Hackettstown. The Route 57/46 connector would provide a direct through movement to traffic which currently must travel on Mountain Avenue (NJ 182) through two additional traffic lights and make three turning movements utilizing East Avenue.

The connector would support local economic development in Hackettstown, which is a goal of the County Strategic Growth Plan, support the "smart growth" redevelopment of the Mountain Avenue section of Hackettstown, and provide the opportunity to retrofit the strip commercial development pattern to one that is more pedestrian and bicycle compatible and is designed in form to a Main Street context.

Route 57 Corridor Plan (2006)

The Route 57 Corridor Plan was undertaken to examine alternatives that would preserve the rural character and scenic viewsheds of Route 57 from Phillipsburg to Hackettstown, one of the last remaining state highways with its rural character intact. The 18-month planning effort examined future development and transportation alternatives for the twenty-mile, two-lane rural roadway through Warren County.

The Route 57 Corridor Plan was developed through a collaborative planning process engaging key stakeholders, technical experts and community residents. The Plan identified innovative implementation measures such as municipal zoning to support smart growth development, integrated land use and transportation planning, improved street connectivity, calming of excessive traffic speeds and targeted spot transportation improvements to mitigate future traffic congestion. In addition, four conceptual prototypes were designed to provide the study communities with a better understanding of potential issues common to the corridor:: village/farm preservation, borough/township, transitional areas, small villages, with the unique challenges for each example outlined in further detail.

The Route 57 Implementation Toolkit was developed as a companion document to advance strategies outlined in the Corridor Plan.

Route 31 Corridor Study (2000)

The N.J Route 31/U.S. Route 46 Corridor is a heavily traveled road of vital importance to northwestern New Jersey. The objective of the Route 31 corridor study is to recommend improvements for the Route 31/46 Corridor between I-78 and I-80 to mitigate safety problems and ensure traffic can operate at acceptable levels. This study was completed in November 2000 and developed in collaboration with the Warren County Planning Department and Hunterdon County Planning Board.

This study includes a detailed traffic analysis, and recommendations for 11 intersections.

U.S. 22 Corridor Improvement Plan (2009)

The U.S. Route 22 Corridor Improvement Plan is a comprehensive examination, assessment and analysis of the existing and future transportation conditions in the municipalities of Phillipsburg, Pohatcong, Lopatcong, Alpha and Greenwich. Existing data collection and future land use build-out data were utilized to analyze the future traffic conditions within the corridor. The results of the traffic analysis revealed that the existing roadway conditions within the study area are not sufficient to maintain current and future traffic flow. The U.S. Route 22 Corridor Improvement Plan was developed to alleviate the expected increase in traffic congestion, as corridor traffic volumes increase over time.

Recommendations include pedestrian, bicycle, and transit improvements.

I-78 Corridor Study (2007)

This Corridor Study assessed the need, impact, and feasibility of various transit strategies along the I-78 corridor between Lehigh County, Pennsylvania and Somerset County, New Jersey. The study is proceeded by an extensive and detailed environmental and planning assessment of the possible extension of rail service west towards Phillipsburg, New Jersey, which will constitute a separate Phase II effort called the Central New Jersey/Raritan Valley Transit Study.

The I-78 corridor has experienced significant growth in population and employment and this trend is expected to continue. Recognizing the mobility and accessibility needs of this growing population, the study sought to enhance transit options for current and future residents. The study developed recommendations, including strategies such as new and restructured bus routes, bus preferential treatments, and new and expanded park and ride facilities.

Morris-Warren Freight Rail Study (2013)

The Morris-Warren Freight Rail Study examines the infrastructure and operational improvements necessary to accommodate taller and heavier (263K to 286K) railcars. This is in line with NJTPA's Regional Transportation Plan 2035 which called for investments in rail infrastructure that increase weight capacity from 263K to 286K cars and eliminate overhead height restrictions throughout the NJTPA region.

The study identified a total of eight locations where infrastructure improvements are needed to accommodate 286K Plate "F" railcars, including the South Main Street Bridge in Phillipsburg which is currently under study. Two of these eight locations represent vertical constraints and the remaining six were structurally insufficient to accommodate today's heavier railcars. Each location was investigated to identify improvement alternatives for elimination of the constraint. These alternative improvements were developed at a conceptual level, with further investigation required to support identification of a preferred alternative.

Raritan Valley Line Extension (2011)

This study is a feasibility analysis for a wide range of potential transit improvements along the Interstate Route 78 (I-78) Corridor in portions of central and western New Jersey. The study area spans portions of Hunterdon,

Warren, and Somerset counties, with its western limit along the Delaware River at the border with Pennsylvania and the eastern limit along the Raritan Valley Line (RVL) in Bridgewater, New Jersey in Somerset County.

Making transit more attractive would allow residents more travel choices and help reduce peak period traffic volumes on I-78. The purpose of this study was to produce basic information on a range of alternatives in order to make this information available to decision-makers in the region to keep them better informed of the relative value of a range of transit improvements and their benefits in this corridor. The study was completed in 2011 and funded by NJ TRANSIT.

The list of alternatives focuses on a phased approach of providing added bus park-and-ride capacity along I-78 in the short-term or medium-term, followed by the possibility of extending RVL commuter rail service over a period of years into the future. Included with the RVL extension is a storage yard and maintenance facility sized for all trainsets planned to start and end west of Raritan Yard, thereby eliminating the current practice of deadheading trainsets between Raritan and High Bridge.

NJDOT Statewide Freight Plan (2017)

The Statewide Freight Plan includes recommendation to mitigate rail freight constraints. Specific to Warren County, a series of projects are proposed to clear the entire Morristown Line/Washington Secondary for 286K access. The Morristown Line/ Washington Secondary connects Morris County with the Delaware River crossings in Warren County, providing access to the western freight rail network. The line is an historic facility and passes through several older industrial and mining towns between Phillipsburg and East Hanover. Much of the alignment is grade separated which is positive for surface transportation; however, many of the crossings and bridges cannot accommodate Plate F vehicles or 286K rail cars. There are no alternate routes aside from the Lehigh Line which is presently overburdened. Improved height clearances and 286K access along the Morristown Line/Washington Secondary needs to occur sequentially; either starting from the east or west to provide a continuous run of industry standard clearance and 286K capacity. The improvements would also support economic development and job growth while helping to retain existing rail freight customers.

Warren Heritage Scenic Byway Corridor Management Plan (2011)

This plan describes the special qualities of the Route 57 Scenic Byway, a 19-mile two-lane roadway in Warren County. The byway runs through Greenwich Township, Franklin Township, Washington Borough, Washington Township and Mansfield Township to Hackettstown. Lopatcong Township was included in the study, but the township declined to include its section of the highway in official scenic byway designation. This plan outlines strategies for preservation, enhancement, and interpretation of the corridor's unique resources, and sets forth a vision for the future of the byway along with practical steps to better publicize its special features to visitors. The Corridor Management

Plan was developed through a collaborative working group representing local officials, County agencies, civic groups, non-profit organizations with an interest in the area's heritage, and NJDOT.

This plan identified goals and strategies for preserving and enhancing the corridor's unique qualities, improving access and transportation, developing a sign program, interpreting byway resources, and encouraging tourism. These actions will require coordination among a variety of organizations over a period of several years. An institutional survey was conducted for the plan which identified initiatives and resources for implementation.

Walkable Community Workshop (Phillipsburg-2010)

NJTPA conducts half-day walkable community workshops in municipalities throughout the NJTPA region designed to educate stakeholders and identify barriers to walking and improve pedestrian safety in each of the identified communities. On March 25th, 2010, a Walkable Community Workshop was held in the Town of Phillipsburg.

Participants in the Phillipsburg Walkable Community Workshop investigated the walking condition of the Roseberry Street and Route 22 intersection and the blocks leading up to this congested intersection. During the workshop, participants paid close attention to the safety, comfort, convenience, and accessibility of Roseberry Street, Route 22, and the intersection of the two. The decision to select the workshop area was aided by the NJTPA's 2008 Regional Priority Update Study's listing of aggregate high crash segments. Roseberry Street is listed as a high crash segment within the study.

Five areas were identified for improvements. The overall recommendations from the audit include; adding pedestrian signal heads with countdown timers, push buttons, continental crosswalks, ADA compatible ramps and relocation of utility poles near curb ramps at intersections. Corridor improvements include completing sidewalk networks, resurfacing sidewalks, improving street lighting, and installation of traffic calming devices to reduce vehicle speeds along Route 22.

In addition to the design recommendations, an education component was also proposed to emphasize pedestrian safety for crossing the Roseberry Street at Route 22 intersection..

Northwest New Jersey Bus Study (2010)

The Northwest New Jersey Bus Study was initiated to address traffic congestion concerns and respond to requests for bus and shuttle service and facility improvements in a fast-growing area of northern New Jersey. The study area consists of portions of four counties in the northwestern portion of New Jersey: Sussex County, northern Morris County, western Passaic County (west of the I-287 corridor, including Wayne Township/Willowbrook Mall area) and northern Warren County (along and north of I-80 & U.S. 46). The study fills a need identified in NJTPA's Regional Transportation Plan, the NJ Highlands Regional Master Plan, and Report of Governor Christie's Subcommittee on Transportation for short and medium-term proposals to improve mobility

and access to jobs, education, tourism and other area destinations.

The main goal of this study was to evaluate the current public transit system and look for opportunities for new or improved transit service in this rapidly changing area. A broad range of solutions was considered beyond traditional bus routes. Facilities that support the new services were examined, as well as improvements in customer information. This work was supported by a significant data collection effort, including counts and passenger surveys.

NJTPA Truck Rest Stop Study (2008, 2011)

The North Jersey Truck Rest Stop Study was completed in early 2008 and updated in early 2010, motivated by the lack of adequate truck rest and service stops—especially near the port—currently available to truck drivers who are subject to new federal rules reducing drivers' hours of service. As a result, truckers are often forced to pull over on streets or highway shoulders to rest. Few, if any of these locations offer truck drivers legal parking space or amenities such as food, showers, and repair services. This raises safety and environmental concerns throughout the region and creates a potentially dangerous situation for the drivers themselves.

The primary study focus is potential sites for development or expansion to accommodate the region's growing demand for truck parking. No parking or rest stops are proposed in this study for Warren County. Truck parking also entails some policy issues and the need for paradigm shifts, including addressing these issues through state and regional policies.

Route 57 / 182 / 46 Hackettstown Mobility Improvements Concept Development Study

The purpose of the concept development study is to develop intersection improvement concepts that help relieve congestion and improve traffic operations at intersections in the Town of Hackettstown in Warren County, and Mount Olive and Washington Townships in Morris County. Improvements will provide the Hackettstown area with enhanced local and regional mobility. Four intersections were selected for development of improvements concepts.

- Intersection of U.S. 46 (MP 22.18) and East Avenue (Mount Olive Township and Washington Township, Morris County)
- Intersection of U.S. 46 (MP 21.68) and NJ 182 (Mountain Avenue)/Willow Grove Street/Warren Street (Town of Hackettstown, Warren County)
- Intersection of U.S. 46 (MP 21.26) and High Street/Grand Avenue (Town of Hackettstown, Warren County)
- Intersection of NJ 57 (MP 21.10) and NJ 182 (MP 0.00) (Town of Hackettstown, Warren County)

Implementation Status

A total of 535 individual improvements and policy recommendations were proposed by the previous studies, including actions of a variety of types and travel modes:

- Intersections & corridors
- Traffic signal projects
- Multimodal mobility
- Goods movement and rail freight

Working with the Warren County Planning Department and Engineer's Office, the team established the current implementation status as summarized in Table 1 below. The following paragraphs summarize some of the recommendations that have been completed, are currently ongoing, or have been partially completed. For additional information and details on the 535 recommendations and their implementation status, refer to Technical Memorandum 3.1.

Table 1: Current Implementation Status

Status	Recommendations	Percent of Total
Completed	70	13.1%
Funding Requested	4	0.7%
Status Unknown	71	13.3%
Not Completed	219	40.9%
Ongoing	57	10.7%
Partially Completed	12	2.2%
Planned	9	1.7%
Planned - Long Term	56	10.5%
Problem Statement Submitted	31	5.8%
Project Cancelled	6	1.1%
TOTAL	535	100.0%

Completed Recommendations

The team identified a total of 70 individual recommendations that have been completed to date; notable examples include the following.

Route 31 Corridor Study (2000)

- Intersection of Route 31 and Route 57
  - Traffic signal timings optimized
  - Various improvements made to reduce left turn crash frequency
- Intersection of Route 31 and Route 46
  - Traffic signal timing optimized
- Intersection of Route 46 and Bridgeville Road (County Route 519)
  - Adjusted clearance time (yellow and all red phase) at the Bridgeville Road approaches
  - Traffic signal timing optimized

U.S. 22 Corridor Studies (2009)

- U.S. Route 22 and Roseberry Street
  - Provide actuation and coordination as part of Signal Coordination Zone 1 and changed cycle length to 150 seconds
  - Installed pedestrian countdown signal heads, pedestrian push-buttons, and textured ADA accessible ramps
  - Restored existing sidewalk along the northeast approach of the intersection
  - Revised signal phasing to provide for concurrent northbound and southbound movements
  - Installed pavement markings to identify turning lanes
  - Realigned curb ramp with crosswalk at southeast intersection corner
- U.S. Route 22 and Shopping Center Drive
  - Installed new pedestrian push-buttons, signs and signal heads

Route 57 / 182 / 46 Hackettstown Mobility Improvements Concept Development Study

- U.S. 46 and NJ 182 (Mountain Avenue) / Willow Grove Street / Warren Street
  - Traffic signal timing optimized

Warren Heritage Scenic Byway Corridor Management Plan (2011) (Route 57)

- Worked with NJDOT to create scenic byway logo and branding, and coordinated tourism promotion with wayfinding efforts
- Developed and implemented a process for monitoring compliance with outdoor advertising strategies

NJTPA Walkable Communities Phillipsburg

- Corliss Avenue to Route 22 along Roseberry Street
  - Restriped Elder Avenue and Roseberry Street intersection crosswalks and provided ADA compliance
  - Installed pedestrian count-down signal heads and curb ramps at the Roseberry Street and Elder Avenue intersection
- Intersection of Route 22 and Roseberry St.
  - Eliminated right-on-red option from westbound Roseberry Street to Route 22, and from southbound Route 22 to Roseberry Street
  - Improved street lighting and crosswalk lighting

Ongoing Recommendations

The team identified 57 improvements and policy recommendations that are currently ongoing (implementation is underway but not fully completed). Many are policy and strategy actions for the Morris Canal Greenway and Warren Heritage Scenic Byway studies requiring ongoing coordination and collaboration with strategic partners. Notable examples include the following.

Warren Heritage Scenic Byway (Route 57) Corridor Management Plan (2011)

- Historic and Archaeological Strategies
  - Support efforts to preserve, protect, and link Morris Canal sites
  - Support preservation efforts by local historical societies
- Scenic Resource Strategies
  - Support local farming and farmland/open space preservation
- Natural and Recreation Strategies
  - Support initiatives to protect environmental quality
  - Implement Musconetcong River Management Plan

Warren County Morris Canal 25-year action plan (2012)

- Greenway Segment 2 - Lock Street to Route 22
  - Establish pedestrian friendly on/off road trail connection from Lock St Park to Sycamore Landing
  - Connect towpath to Phillipsburg Mall via proposed sidewalks in Sycamore Landing development

Partially Completed Recommendations

The team identified 12 improvements and policy recommendations that were partially completed (meaning that some but not all items from a recommendation for a specific intersection or corridor have been completed), notable examples include the following.

Warren County recommendations for redesign of the U.S. 22 and CR 519 intersection (2005), U.S. 22 and Route 122

- New Brunswick Avenue (Route 122) and Hawk Avenue (CR 519)
  - Partial completion of pedestrian crossing recommendations including: pedestrian countdown traffic signal heads, removal of exclusive pedestrian phase, and added pedestrian push button operation to westbound approach of Route 122

Warren County Morris Canal 25-year Action Plan (2012)

- Greenway Segment 11 - Florence Kuipers Park to Saxton Falls
  - Partial completion of existing sidewalk system and Route 46 crossing at Prospect Street to extend trail network east of Florence Kuipers Park

U.S. 22 Corridor Studies (2009)

- Spot Transportation Improvements completed at some locations, including
  - Intersection improvements and traffic calming measures
  - Context sensitive design elements
  - Pedestrian countdown signal heads, pedestrian push-buttons and ADA curb ramps

System Performance Data

The study team obtained NJDOT crash data summaries and management systems data for congestion, pavement, and bridge conditions along state highways in Warren County. The data was mapped and tabulated to identify known issues and problem areas. The team also obtained data for existing transit service to summarize public transportation services within the County.

This section provides an overview of the system performance data and findings. Additional details and documentation are available in Technical Memorandum 3.2

Crash Data

Crash data was obtained from NJDOT's Safety Voyager program (2014-2016) and Warren County's road safety assessments. Crash locations were mapped to identify crash clusters, and a hotspot analysis was conducted to identify intersections and corridors with safety issues. Warren County crash data was compared with statewide crash data to identify trends, patterns, and significant outliers.

The highest crash corridors are Interstate 78, Interstate 80, NJ 57 in Hackettstown, and portions of Washington Borough and Phillipsburg. The hotspot analysis also highlights U.S. Route 22, NJ 31 in Washington Borough, and downtown areas of Hackettstown, Washington Borough, and Phillipsburg.

Several notable outliers were identified by the crash data assessment, including the following:

- From 2014 to 2016 there were 9,787 crashes in Warren County; 80.2 percent of the total crashes in Warren County occurred away from the intersection and 19.8 percent occurred at the intersection. This is higher than statewide percentages where 72.4 percent of crashes occurred away from the intersection and 27.6 percent occurred at the intersection. These data indicate that improvements beyond spot intersection improvements are needed to mitigate crash hot spots and reduce crash occurrence. Other contributing factors will need to be investigated to adequately address the issue.
- Approximately 13 percent of crashes occurred in "dark" conditions with no street lights, which is more than three times higher than the statewide percentage (3.85 percent) which is likely consistent with the rural nature of the county
- 65.4 percent of the pedestrians involved in crashes in Warren County were males which is higher than the statewide percentage (51.8 percent); 16.7 percent of the pedestrians involved in crashes were between the ages of 20-29, also higher than the statewide percentage (13.8 percent).

Warren County staff conducted supplemental crash data and road safety assessments for 2011 to 2015 to identify the county road locations with the highest number of crashes. The vast majority of these crashes occurred at the top three locations: CR 519 at U.S. 22, CR 638 at U.S. 22, and CR 519 at NJ 57.

In the analysis period from 2014-2016, 92 bicycle and pedestrian crashes occurred in Warren County. Of this total, 29 crashes involved bicyclists. A majority of the bicycle and pedestrian crashes occurred on state and county highways and in Hackettstown, Washington Borough, and Phillipsburg.

Crash hotspots in Warren County are depicted in Figure 2.

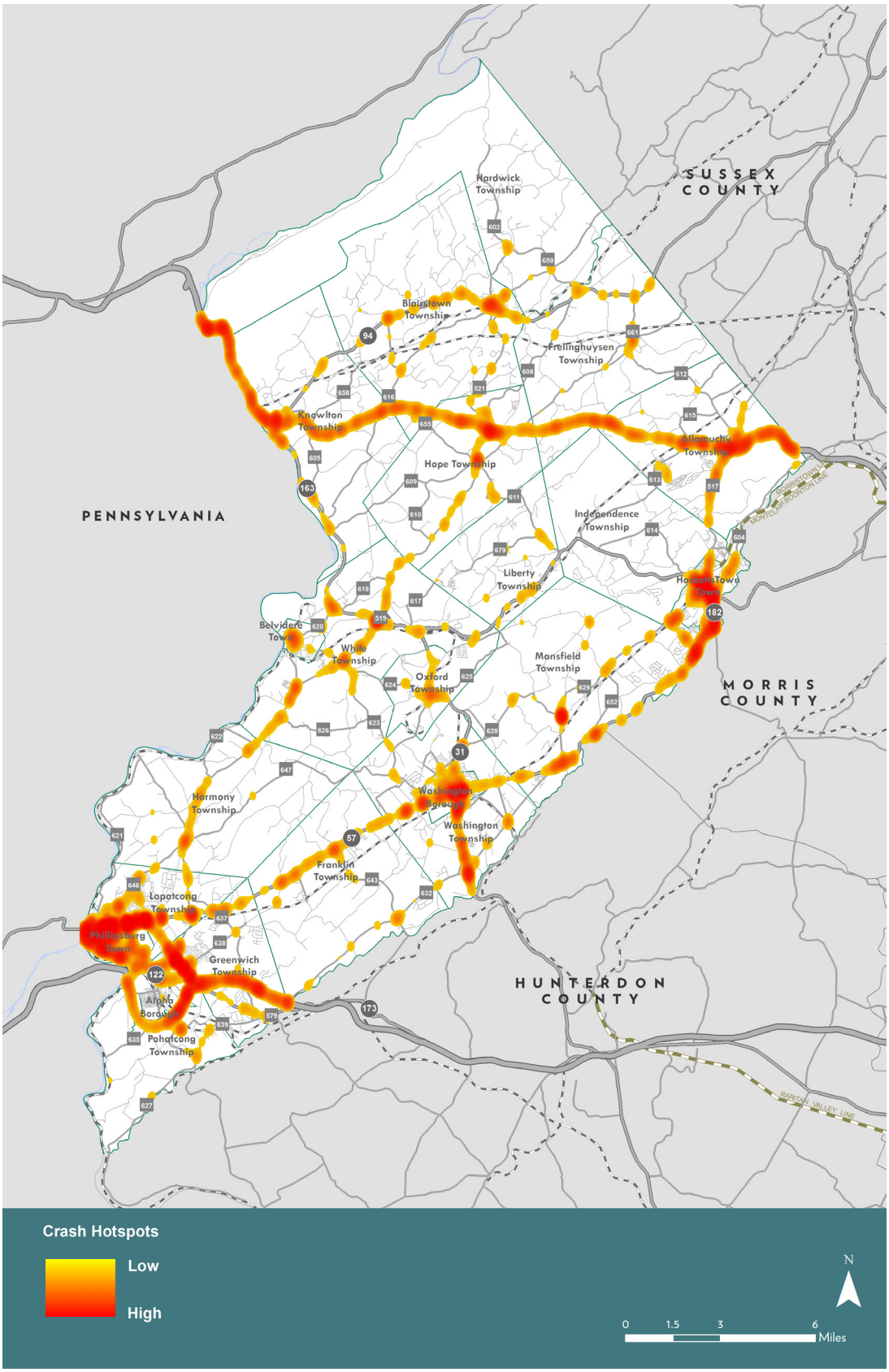


Figure 2: Crash Hotspots in Warren County (2014-2016)

Congestion Management System

The assessment of traffic congestion is based on NJDOT's Congestion Management System (CMS) data which uses Volume to Capacity (V/C) ratio, an index measuring the congestion level of the roadway network. Low V/C indicates a capacity surplus, and high V/C indicates congestion. The most recent CMS data assessment was completed in 2012.

For the assessment of congestion in Warren County, V/C >0.75 is considered "heavily" congested and V/C ratio between 0.51>VC>0.75 is considered "moderately" congested.

The review of NJDOT CMS data indicates that about 24 miles of U.S. and State roadways in Warren County are heavily congested, out of a total of about 222 total roadway miles in the CMS database. Some of the most heavily congested roadway segments in Warren County are on Interstate 80 and Interstate 78 with V/C ratio as high as 1.024. U.S. Route 22 also has segments that are heavily congested. Moderately congested roadways with V/C ratios between 0.51 and 0.75 include U.S. Route 22, NJ 57, NJ 122, and U.S. 46.

The NJDOT CMS database does not have records on V/C and congested conditions for county and local roads.

Traffic congestion data for Warren County are depicted in Figure 3.

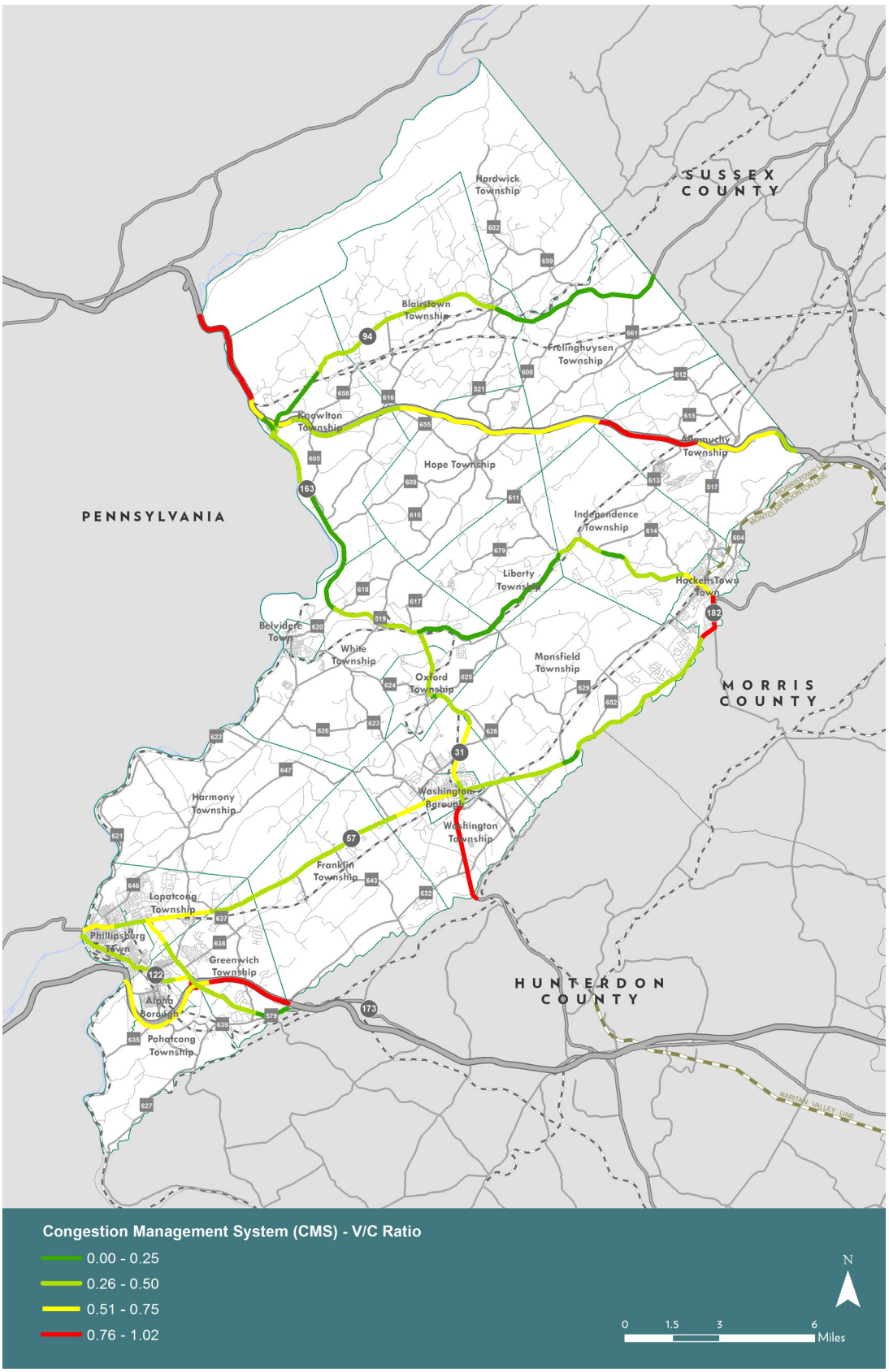


Figure 3: NJDOT Congestion Management System Data, Warren County, 2012

Pavement Conditions

The assessment of pavement conditions is based on NJDOT's Pavement Management System (PMS) data. Pavement condition is evaluated using the Surface Distress Index, measured on a 0-5 scale (5 = perfect pavement with no distress). The most recent pavement conditions assessment was completed in 2016.

A review of the PMS data indicates about 20 miles of deficient pavement on U.S. and State roadways in Warren County, out of a total of 222 roadway miles in the PMS database.

The principal roadways with "Deficient" pavement in Warren County include I-78, I-80, U.S. 22, U.S. 46, NJ 31, NJ 57, NJ 122, NJ 94, NJ 173, and NJ 182.

The NJDOT PMS database does not have records for pavement conditions for county and local roads.

Pavement condition data for Warren County are depicted in Figure 4.

Route 57 in Washington Borough functions as both State Highway and Main Street

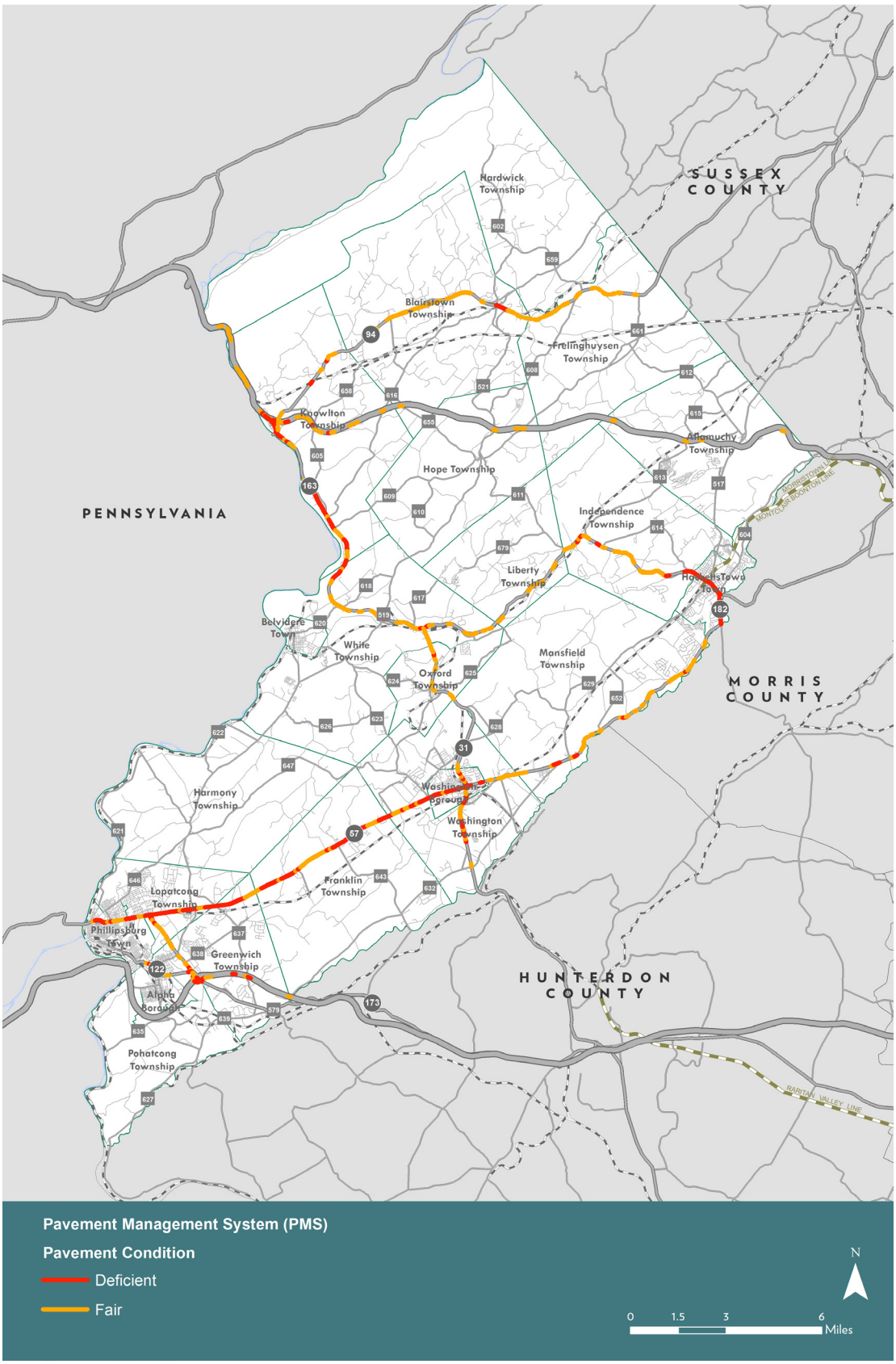


Figure 4: NJDOT Pavement Conditions Data, Warren County, 2016

Bridge Conditions

The assessment of bridge conditions is based on NJDOT Bridge Management System (BMS) data. The BMS is an inventory of all bridges in New Jersey with a span over 20 feet. It includes information on their physical characteristics, condition, and ownership. Bridges are inspected biennially and the condition of various bridge elements is rated on a numerical scale. The most recent BMS data assessment was completed in 2016.

Bridges are evaluated based on the physical condition of the bridge materials and structure elements with a scale ranging from failed to excellent. A Structurally Deficient bridge is one for which the deck (riding surface), the superstructure (supports immediately beneath the driving surface) or the substructure (foundation and supporting posts and piers) are rated as poor or worse. A Functionally Obsolete bridge is one that was not built to the current design standards. Functionally Obsolete bridges are not necessarily deficient, rather they do not meet the current standard for one or more design element such as lane width, shoulder width, or vertical or clearance.[1]

A total of 258 bridges in Warren County were evaluated, with 175 bridges in good condition and 24 bridges rated "Deficient". On state routes three bridges were found "Deficient" on NJ 94, five on NJ 57, one on NJ 31, and one on NJ 173. On U.S. Routes two bridges on U.S. 46, and one on U.S. 22 were found "Deficient". The other "Deficient" bridges are on local or county routes. 58 evaluated bridges are "Obsolete.".

Bridges that are structurally deficient and/or load posted or restricted may adversely impact traffic throughout the region, particularly if a load posted bridge is on a route typically used by freight traffic.

While some major routes within Warren County have structures classified as structurally deficient, they are generally not load posted or restricted. However, the maintenance, rehabilitation, or replacement work required to return a structurally deficient bridge to a satisfactory level of service would likely cause major traffic disruptions in the form of lane closures, reduced lane widths, slower speeds, and/or lengthy detours.

Bridge condition data for Warren County are depicted in Figure 5.

[1] http://www.virginiadot.org/info/resources/bridge_defs.pdf, accessed May 22, 2018

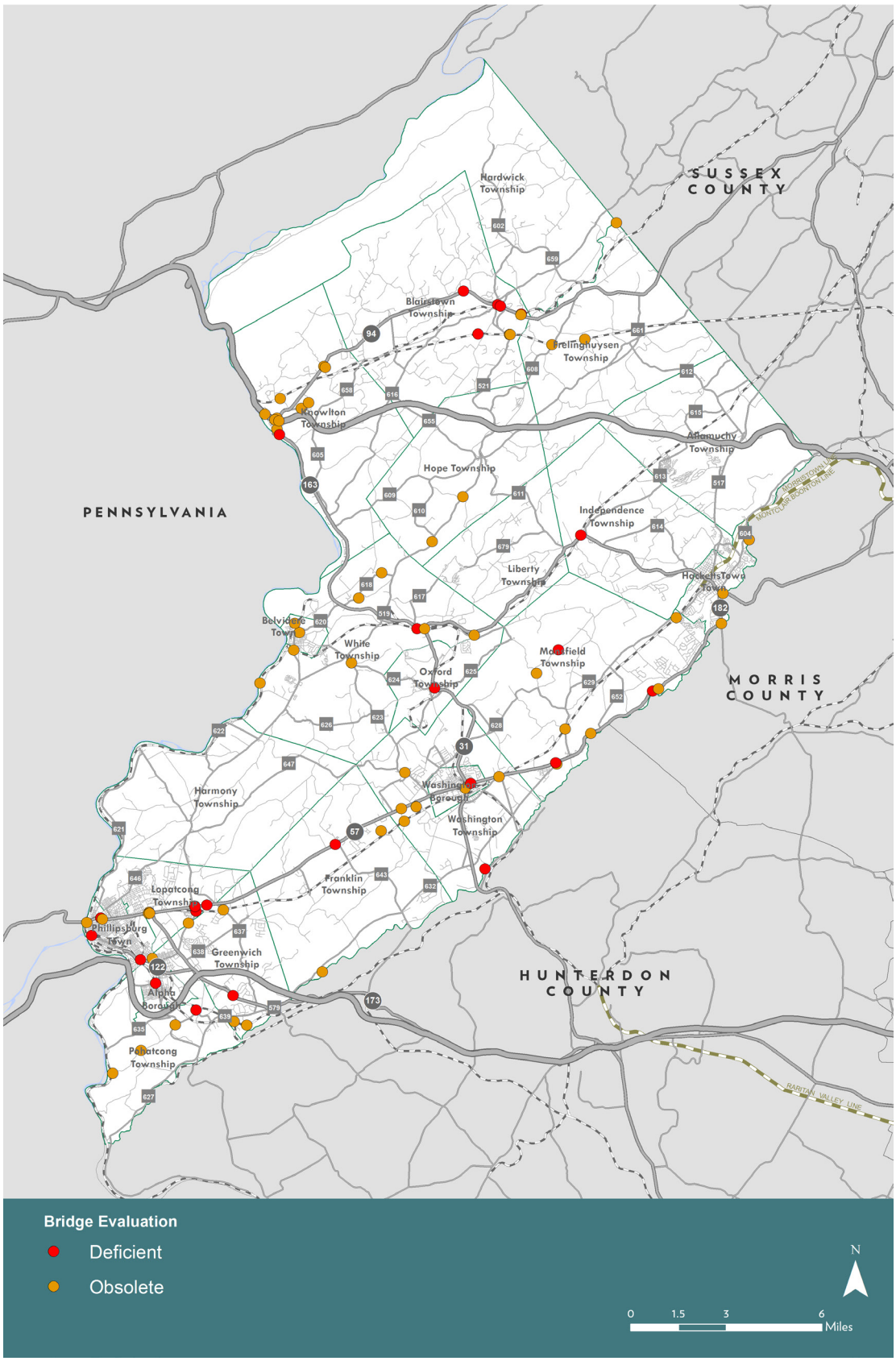


Figure 5: NJDOT Bridge Conditions Data, Warren County, 2016

Transit Conditions

NJ TRANSIT Rail

The county's single passenger rail station is in Hackettstown, served by NJ TRANSIT's Morristown and Montclair-Boonton Lines. The Morristown Line offers Midtown Direct service to Penn Station New York. Trips from Hackettstown to New York Penn Station require a transfer en-route. Both lines provide connections to Secaucus Junction and Hoboken Terminal with intermediate stops in Morris, Essex, Somerset, and Union Counties. Service to Hackettstown is provided on weekdays, with seven trips in each direction that are intended to accommodate travel at key times throughout the day, including reverse travel.

Ridership at the Hackettstown station averages 104 daily passenger boardings (NJ TRANSIT FY 2017 data).

NJ TRANSIT Bus

NJ TRANSIT operates two services in Warren County; Routes 890 and 891 (formerly referred to as Wheels Suburban Transportation Services). These routes offer weekday connections between Phillipsburg, Pohatcong, and Easton, Pennsylvania. Service operates from approximately 7:00 a.m. to 7:00 p.m. Most trips offer flex routing, meaning a passenger may make an advance request by telephone for a deviation from the fixed route of up to ¾mile.

Ridership on Route 890 averages 34 weekday trips (NJ TRANSIT October 2017 data).

Ridership on Route 891 averages 33 weekday trips (NJ TRANSIT October 2017 data).

Wheels Route 973 (Hackettstown/Mansfield Loop) along with several other under-performing bus routes were discontinued in 2010 due to funding constraints, low ridership, low farebox recovery, etc.

Warren County Transportation (WCT) Bus

Warren County's Department of Human Services administers the Warren County Transportation (WCT) system, including shuttle and demand response services. Services are operated by a contractor, Easton Coach Company. Demand response services are available to county residents who are disabled, senior citizens, veterans, low-income, or who live in the areas of Hackettstown, Washington Borough, Phillipsburg, and Belvidere. Service is provided on weekdays from 7:30 a.m. to 5:00 p.m. with advanced reservations and is designed to afford access to medical appointments, food shopping, and the county courthouse.

Demand response ridership averages 5,191 trips per month (January-October 2017 WCT data).

Three shuttle routes also operate on a regular schedule: the 31Ride Shuttle and two routes within the Route 57 Shuttle service. Further information on the 31Ride Shuttle service can be found at: www.31ride.com.

The 31Ride Shuttle operates on weekdays between Oxford and the Clinton park & ride along the Route 31 corridor between the hours of 6:00 a.m. and 8:00 p.m. Increased service is provided on Fridays.

Ridership on the 31Ride Shuttle averages 155 trips per month (January-October 2017 WCT data).

The Route 57 Shuttle operates between Phillipsburg and Washington Borough on weekdays from 6:00 a.m. to 6:00 p.m. and Saturdays from 9:00 a.m. to 4:00 p.m. A second route from Hackettstown to Washington Borough operates on weekdays from 8:00 a.m. to 4:30 p.m. Small deviations (up to two blocks) from the fixed route are allowed with advance arrangements.

Combined Route 57 ridership averages 10,371 trips per month (January-October 2017 WCT data).

Trans-Bridge Lines Bus

Private carrier bus service is offered by Trans-Bridge Lines between Pennsylvania and New York City. The local stop in Warren County is at the Phillipsburg Mall. An additional stop is made outside the county at the Clinton Park & Ride lot on Route 31 (including connections to Newark and JFK airports). Departures from Phillipsburg begin as early as 4:35 a.m. on weekdays through 4:05 p.m. Weekend service operates with five departures from Phillipsburg between 7:00 a.m. and 8:30 p.m.

Ridership data is not available from private bus carriers.

Martz Trailways Bus

Additional regional service is provided by Martz Trailways with a stop in Warren County at the Panther Valley Mall. Three eastbound departures operate between 5:00 a.m. and 6:30 a.m., with six return trips from New York City reaching Panther Valley between approximately 4:30 p.m. and 9:30 p.m. Weekend service is not available in Warren County.

Ridership data is not available from private bus carriers.

Park & Ride Lots

The New Jersey Department of Transportation recognizes 11 Park & Ride lots in Warren County. Informal park & ride options exist in conjunction with specific transit services, such as the Panther Valley Mall stop served by Martz Trailways and select interim parking locations along the 31Ride Shuttle.

Traffic Data Collection

Traffic counts available through NJDOT's Traffic Management System Program (TMS) were collected to support the Technical Study Update. These include 165 Automatic Vehicle Classification (AVC) counts and 508 ATR (Automated Traffic Recorder) counts.

In addition to these existing TMS traffic data, Warren County requested 12 additional AVC counts with speed data and 8 Turning Movement Counts at locations across the study area to support the county's planning and traffic engineering responsibilities. These counts were collected in October and November of 2017 by the study team. The data collected was processed and submitted to the County for review in December 2017.

The new traffic data collection locations for Warren County are depicted in Figure 6.

Detailed Traffic Count Data including tables and maps are available in Technical Memorandum 3.3: Traffic Count Data Collection.

Outdated strip commercial development and roadway design contribute to chronic peak hour congestion on Mountain Avenue (NJ 182) in Hackettstown

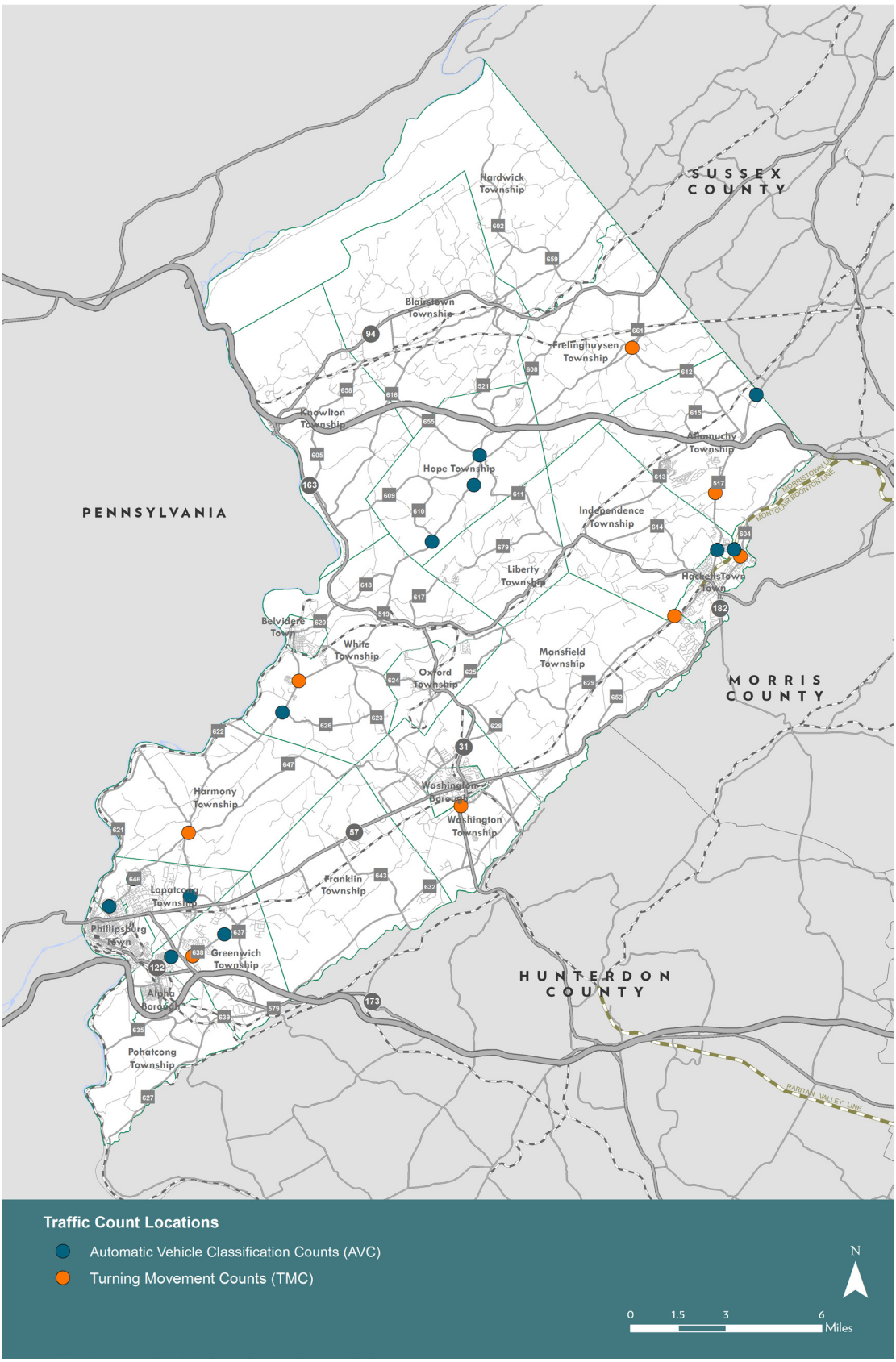


Figure 6: New Traffic Data Collection Locations, Warren County, 2017

02 | Understand How Warren County is Changing

The Warren County Transportation Technical Study Update builds upon the examination of existing conditions and context with a demographic snapshot, environmental justice assessment, and development of baseline travel modeling resources and forecasts.

Demographic resources provide a reliable and consistent set of data to help understand the mobility and transportation needs of county residents, labor force, and businesses. The environmental justice assessment identifies disadvantaged communities and ensures they are not disproportionately affected by any study recommendation, action, or project. The demographic data resources comprise the principal inputs to both the scenario planning process and travel demand modeling methodologies and guide the development of the traffic projections.

Demographic Snapshot

Demographic data provide a reliable and consistent set of resources to help understand conditions and needs, and inform the actions and responsibilities of elected officials and professional staff, stakeholders and advocates, the business community, and general public - to make informed decisions about priorities and investment in infrastructures, utilities, and demand for goods and services.

Demographic data resources include the U.S. Census counts in addition to statistical data, estimates, and projections of population, households, employment and socioeconomic characteristics from various sources. Among these resources, population, households, and employment comprise the principal inputs to both the planning process and travel demand modeling methodologies and are therefore essential to the existing conditions assessment, scenario planning elements, and baseline traffic projections.

Three sources of population and demographic data were examined for this study: U.S. Census population counts and estimates; Warren County future year population projections prepared for the 2005 Strategic Growth Plan; and NJTPA adopted future year population and employment projections, each based on unique resources and methodologies.

Quick Fact

Nearly all Warren's County's growth since 2000 appears to have come from the non-white, Hispanic and foreign-born Census population categories.

Population Growth

Whereas the 2005 Strategic Growth Plan was based on population projections developed by the County's Planning Department, the Technical Study Update utilizes newer and more recent U.S. Census data, and demographic projections and travel demand modeling resources developed and maintained by the NJTPA. This approach provides consistency among the data resources and methodologies used to understand needs and shape planning efforts both locally and across the region.

Warren County has weathered a succession of boom and bust growth cycles since the its incorporation nearly two centuries ago from portions of neighboring Sussex County. Total population has roughly doubled since 1950, but growth has slowed significantly since the 2000 Census. Despite this recent slowing trend, detailed examination reveals the county is becoming more diverse and increasingly a gateway community to new immigrants from a variety of nations and ethnicities.

U.S. Census counts from 1950 to 2010 indicate average annual growth rates of more than 1.15 percent per year over this six-decade period and a doubling of total population. In fact, since Warren's incorporation in 1830, and despite a series of upturns and downturns, the overall annual growth rate has been just below 1 per cent per year for the full 180-year term.

See tables 2 and 3 on the following pages for detailed demographic data summaries.

Based on these trends, and following on the heels of a net population increase of 12 percent in the decade from 1990 to 2000, the 2005 Strategic Growth Plan projected continued robust growth for Warren County between 2000 and 2030, with annual growth rates at or near 1 percent per year over the Plan's 30-year time frame.

What happened instead between the 2000 and 2010 Census counts was a drop to almost one-half of the historic annual growth rate. followed by a decline in total county population in the most recent Census estimate for 2016.

In contrast to 2005 Strategic Growth Plan projections, the newer U.S. Census data and NJTPA projections present a remarkably different and much more restrained assessment of current and future growth in Warren County.

Based on U.S. Census estimates, the 2001 to 2016 period shows only a few years of robust growth, a significant slowing in the middle of the decade, a peak population of 110,000 around 2008, and eventually a small decline by 2010, with estimates for 2016 still below the 2010 Census totals.

A variety of factors may be at play in the pronounced shift in Warren's growth patterns starting in the mid-2000s, including the desire of many young professionals to live in urbanized areas rather than suburban and rural communities, the nationwide and global recession beginning in 2007, the possible impact of the NJ Highlands Act slowing population growth and development, and the expansive growth of the neighboring Lehigh

Valley which may be capturing growth that would otherwise have taken place in Warren County.

Using these recent trends as the starting point, the NJTPA data indicate renewed population growth for Warren County, albeit at a very slow annualized rate of one-quarter percent per year between 2015 and 2045; well below the historic 1 percent annual rate.

Consequently, the NJTPA projections for future decades are well below the Warren County forecasts developed for the Strategic Growth Plan a little more than a decade ago.

These projections also place Warren County well below many of its northern New Jersey counterparts for future population growth. The NJTPA data project an overall growth in population of almost one-half percent per year, twice the rate projected for Warren, and place it near the bottom of the scale among the 13-county NJTPA region.

This finding is significant because demographic data are among the principal inputs to the travel demand modeling process, and the resulting transportation forecasts are one of the key factors in developing and prioritizing future mobility needs and the roadway, bridge, and transit improvements required to accommodate them. So, if the future population is now forecast to grow at a rate much lower than previously projected, travel demand and congestion might also be expected to increase at a slower rate, yielding considerably more flexibility in developing new transportation projects and capital improvements in the long term.

Demographic Composition

Warren County's population is significantly less diverse than is typical of New Jersey, with a much higher percentage of the white population, and much lower percentage of Hispanic, minority, and foreign-born residents than the state as a whole. Yet, while it is still vastly different from much of New Jersey, Warren shows evidence of measurable changes in its demographic composition since the 2000 Census.

From 2000 to 2016, while Warren County's total population increased by just five percent and the total white population actually decreased slightly, the non-white population doubled from about 5,600 persons to more than 11,200, thus accounting for more than the total net increase in population for the 16 years since the 2000 Census. And more than three-quarters of this net increase occurred in just six of Warren's 22 municipalities: Greenwich, Hackettstown, Lopatcong, Mansfield, Phillipsburg, and Washington Borough.

The 2016 Census estimates also reveal similar findings regarding Warren's Hispanic and foreign-born populations which increased by 133 and 76 percent respectively, with the net increase for each group also accounts for almost the entire net change in total county population during this period.

Only four municipalities – Blairstown, Hackettstown, Phillipsburg, and Washington Borough – accounted for the bulk of the net increase in Hispanic population.

The story for foreign-born population repeats the pattern, with the bulk of the increase occurring in just six of Warren's 22 municipalities: Greenwich, Hackettstown, Independence, Mansfield, Phillipsburg, and Washington Borough.

Overall, Warren County's population increased by 4,658 persons from 2000 to 2016; the population categorized as white decreased by 983 persons while non-white increased by 5,641.

Almost all of this net increase of 4,658 can be traced to the minority and foreign-born population groups:

- Non-white increased by 5,641
- Hispanic increased by 4,998
- Foreign-born increased by 4,470

Warren is also aging, with a median age that has advanced from 37.6 to 43.1 in the 16 years from 2000 to 2016, and is doing so at a rate faster than the state as a whole which changed by a much smaller increment – from 36.7 to just 39.5 over the same period. Similar to the other population characteristics, a familiar and small group of six municipalities – Greenwich, Hackettstown, Lopatcong, Mansfield, Phillipsburg, and Washington Borough – is much younger than the rest of Warren County.

The Warren County workforce has New Jersey's second longest mean travel time to work at 34.4 minutes, well above the statewide mean of 30.4 minutes and trailing only neighboring Sussex County at nearly 38 minutes.

Ultimately the demographic data reveal Warren County to be two places, ***one that is getting older, and constrained by stagnant growth*** since 2000 and whose composition remains vastly white, non-Hispanic, and native born, ***and another that is much younger, growing in total population, and rapidly becoming more diverse***.

Yet while these trends are in line with New Jersey's overall diversity, some of the findings from the EJ assessment indicate that factors such as lower educational attainment, higher poverty rates, and limited English proficiency may set these new Warren County residents apart from their counterparts in other portions of the state, and yield significant implications concerning mobility needs which Warren County must consider when projecting, and preparing for its future.

Table 2: Summary Demographic Data, Warren County and New Jersey, 2000-2016, U.S. Census

Warren County						Percent of Total	
	2000	2010	2016	Net Change	Percent Change	Warren County	New Jersey
Population	102,437	108,692	107,095	**4,658**	**4.5%**		
White Alone	96,846	98,137	95,863	**-983**	**-1.0%**	89.5%	72.4%
Minority	5,591	10,555	11,232	**5,641**	**100.9%**	10.5%	27.6%
Hispanic	3,751	7,659	8,749	**4,998**	**133.2%**	8.2%	20.0%
Foreign-born	5,917	9,207	10,387	**4,470**	**75.5%**	9.7%	21.8%
Median Age (Warren County)	37.6	41.5	43.1	**5.5**	**14.6%**		
Median Age (New Jersey)	36.7	39.0	39.5	**2.8**	**7.6%**		

Table 3: * = Warren County Total Population Counts and Estimates, U.S. Census

Census Year	Population
1830	18,627
1840	20,366
1850	22,358
1860	28,433
1870	34,336
1880	36,589
1890	36,553
1900	37,781
1910	43,187
1920	45,057
1930	49,319
1940	50,181
1950	54,374
1960	63,220
1970	73,960
1980	84,429
1990	91,607
2000	102,437
2008*	*109,897*
2010	108,692
2016*	*107,095*
* = U.S. Census Estimate	

Environmental Justice

Environmental Justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

The U.S. EPA has established this goal for all communities and persons across the nation. Concerns that minorities and/or low-income communities might disproportionately bear potential adverse environmental, traffic, and health impacts from a project led to the issuance of Executive Order (EO) 12898 in 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which makes environmental justice a core mission of projects funded by Federal agencies and an essential part of many planning studies, including all subregional studies funded by the NJTPA.

Title VI prohibits discrimination whether the intentional or unintended effect is unduly burdensome to the recipient.[2]

The Environmental Justice Assessment is focused primarily on the following characteristics: **Low Income** - households living below the poverty line are defined as any household living in poverty in the past 12 months; **Minority** - any individual who did not identify as white only; and **Limited English Proficiency (LEP)** - any household in which all members 14 years and older speak English less than "very well".

Disadvantaged Communities

The EJ Assessment finds that twelve municipalities in Warren County contain block groups with a comparatively high percentage of at least one EJ characteristic. Among these Philipsburg and Washington Borough are the two municipalities with the highest concentration of residents living in poverty (16 percent each) and contain the highest numbers of block groups surpassing the EJ threshold of poverty population for Warren County (8 percent), the state (14 percent), and the nation (10 percent); together they account for almost 43 percent of Warren County's households living in poverty.

Six municipalities exceed the county's threshold of minority population (16 percent); Hackettstown (24 percent) and Phillipsburg (23 percent) have Warren County's highest percentage of minority population.

Hackettstown has the highest overall percentage of LEP households (9 percent) and Mansfield has the second highest percentage (7 percent).

Five municipalities surpass the county's EJ threshold across all three EJ characteristics – Lopatcong Township, Mansfield Township, Phillipsburg, Hackettstown, and Washington Borough. Alpha Borough and Liberty

[2]http://www.state.nj.us/transportation/business/civilrights/faq_titlevi.shtm

Township both surpass the County's percentage of poverty and LEP households.

These findings from the EJ assessment, based on the identification of potentially disadvantaged communities located in pockets across Warren County, led to the development and implementation of outreach activities specifically designed to reach and engage Warren County's EJ communities, particularly those in Hackettstown and Phillipsburg.

ESL Pop-up Events

Direct engagement of EJ communities is recognized as a best practice approach for communicating with disadvantaged, under-represented, and potentially impacted groups.

NJTPA, for example, specifically references conducing workshop events at ESL classes as an outreach methodology for Limited English Proficiency (LEP) residents in Chapter 2 – Innovative Public Outreach of *Plan 2045 – Connecting North Jersey*. Pop-up events are designed to be integrated directly into ESL classes and can serve multiple purposes. Participants are introduced to new vocabulary and concepts, provided the opportunity to practice their English and gain confidence in their ability to speak in public, and discuss issues impacting their communities.[3]

Two "pop-up" engagement events were held in Hackettstown: a roundtable discussion with students at an ESL class in December 2017, and a follow-up discussion with the same class to review and comment on study recommendations in April 2018.

On Saturday, December 2,2017, study team members facilitated a roundtable discussion at an ESL class held at the Trinity United Methodist Church in Hackettstown where ESL classes are held every Saturday morning. About 30 participants were in attendance, representing Russia, Ukraine, and Central and South America.

Team members provided a brief overview of the study, outlining the purpose and goals. Students then participated in small, break-out discussions of transportation and mobility issues in Warren County. Bilingual facilitators were on hand at each table to guide the discussion and take notes. At the end of the small group discussions, the facilitators reported back to the larger group.

Participants comments and concerns included the following:

- Local and out-of-county travel is limited (e.g., to NYC, Dover, Rockaway Mall), even more so on weekends
- Lack of weekend bus or rail service makes it difficult for people to get to work; several people had to quit their jobs due to the lack of reliable weekend service
- Heavy reliance on taxis and ridesharing services such as Uber, which can be very expensive
- Local bus/circulator is needed to get to work, appointments, and the grocery store

[3] https://apps.njtpa.org/plan2045/docs/Chapter%202%20Public%20Outreach.pdf, accessed April 26, 2018

- Lack of sidewalks or poor sidewalk conditions make it difficult to walk
- Some opportunities for better, higher-paying work are missed because of lack of adequate transit

Following the first round, a program of multimodal transportation recommendations was developed by the study team, specifically designed to address the concerns, needs, and mobility limitations identified by the ESL class students.

On Saturday, April 14, 2018, the team facilitated a second round of outreach activities at the Hackettstown, ESL class at the Trinity United Methodist Church to review the draft recommendations. Approximately 23 participants took part in the activities, including students from Central and South America, Russia, China, and Jordan. The purpose of the second meeting was to report back to the participants and ask for their feedback and assessment of proposed multimodal transportation recommendations.

Team members provided a brief overview of the study in English, Spanish, and Russian. Participants were asked to use a dot voting exercise to prioritize which draft recommendations were most important to them. Each participant received nine dot stickers to place on three boards organized by travel mode; transit, walking and biking, and driving improvements.

Voting participants were then divided into four break-out tables to discuss questions pertaining to the potential recommendations. Facilitators were on hand at each table to guide the discussion and take notes.

Overall, the group placed the highest priority on transit improvements, followed by walking and biking improvements, with the lowest priority placed on driving.

Comments and concerns of participants included the following:

<u>Transit Improvements</u>

- The most favored recommendations were for weekend bus service and bus service to locations such as Dover and Rockaway
- Moderate preference was indicated for better access to New York City and/or Newark, and for bus service to more places within Hackettstown and Warren County
- The lowest level of preference was indicated for evening bus service and more information on available transit services.
- Participants added several improvements to the list, including weekend train service to New York City, additional bus shelters, more frequent train service on weekdays, and language-translated transportation information.

Walking and Biking Improvements

- Walking within Hackettstown is the primary mode of transportation for many ESL students
- The most favored recommendation was for sidewalks in key locations and bicycle paths connecting one another
- Lower preference was indicated for safer street crossings
- Participants added several improvements to the list, including better enforcement of pedestrian and tailgating laws, and street sign enforcement

It should be noted that Warren County actively supports improved pedestrian safety through various educational and enforcement initiatives, including the "Cops in Crosswalks" program which is designed to educate, rather than fine, drivers failing to stop for pedestrians within the crosswalk, as required by state law.

Driving Improvements

- Many participants at the ESL event do not own cars, but borrow vehicles from family members when available
- While there was little difference in total votes among the four proposed driving improvements, the most favored recommendations were less traffic congestion at intersections and safer roads
- Participants added several improvements to the list, including police assistance, and language-translated transportation information, and recommendations to reduce distracted driving

Many Rural roadways in Warren County lack adequate pedestrian accommodations

Scenario Planning

Scenario planning is an analytical tool that can help decision makers and stakeholders understand and prepare for what lies ahead. Scenario-based methodologies provide a platform for evaluating a range of potential outcomes, visions, and investment scenarios by testing a mix of infrastructure, demographic, land use, and policy changes.

A defining characteristic of successful public sector scenario planning is active engagement of the public, the business community, and elected officials on a broad scale; educating them about growth trends and trade- offs, and incorporating their values and feedback into future planning initiatives.[4]

As previously noted, this study used a comprehensive community-based planning process to incorporate input from the wide variety of Warren County stakeholders. An inclusive process is essential to identifying the many varied issues, interests, needs, and concerns of those who live, work, govern, and do business in the planning area.

Scenarios were evaluated using a series of performance measures, similar to those used for NJPTA's *Plan 2035: Connecting North Jersey*, including the number of trips, average speed, trip length and various measures of travel and congestion. Detailed model statistics and data, and plots of traffic volumes, speeds, and volume-to-capacity ratios were also examined. These data were reviewed by Warren County planning, SAC and TAC, the municipal partners, and presented to the public for comment and discussion.

Forecasts of population and employment changes are a critical input to the travel demand models, and using the NJPTA's adopted demographic projections helps ensure the process is consistent with the region's transportation planning and investment decision-making processes and plans.

Scenario planning for the Technical Study Update begins with the Warren County 2045 Baseline Scenario which represents the reference point for comparison with all future alternatives; indicating what would happen to travel conditions in the region if no new plans, policies, programs, or projects are introduced beyond what has already been approved and adopted within the 2045 timeframe.

The baseline scenario following the current trend line of growth and development patterns for both Warren County and the overall NJTPA region is based on the official NJTPA

Quick Fact

Warren County is home to the Warren Heritage Scenic Byway along New Jersey State Route 57. Known primarily for its rural Highlands area setting, rolling fertile valleys, and numerous scenic viewsheds, the Heritage Byway also includes historic sites such as the Edison Concrete Mile and Morris Canal Greenway.

[4] https://www.fhwa.dot.gov/planning/scenario_and_visualization/scenario_planning/index.cfm, accessed April 21, 2018

demographic projections, and includes only the approved NJTPA Transportation Improvement Program (TIP) and Plan roadway and transit improvements.

For the purposes of this study, and leading to development of the Warren County Transportation Plan Element in a future phase two, each of the four proposed scenarios, including the baseline and the three potential future outcome alternatives uses the same 2045 future build year, the same NJTPA modeling platform and demographic forecasts, and the same set of performance measures and metrics.

Travel Demand Modeling

The scenarios were tested using the North Jersey Regional Transportation Model-Enhanced (NJRTM-E); the approved travel demand model for northern New Jersey, includes an enhanced transit component and allows for testing of projects, land use, economic variables, and population and employment data.

In 2008, NJTPA completed a major upgrade to the region's travel demand model and in 2011 the agency completed a revalidation of the model which resulted in the North Jersey Regional Transportation Model-Enhanced (NJRTM-E). This model was developed with NJDOT and NJ TRANSIT and fully incorporates the multi-modal nature of the transportation issues facing northern New Jersey. The model is comprehensive and powerful enough to be used by all major transportation agencies in the region. The NJTPA uses the model for its air quality conformity analysis and long-range planning studies. In 2015, the NJRTM-E was further refined to improve its transit reporting capabilities and ability to estimate external trips entering the NJTPA region. The study team used the latest available model to perform the scenario planning analysis.[5] In consultation with Warren County Planning staff and NJTPA, the study team established a uniform set of performance measures and metrics, consistent with planning studies of this type conducted at the county and regional level. The study team ran the NJRTM-E to establish the baseline for existing conditions and comparison with the proposed future scenarios. Display plots of the Warren County roadway network were prepared for both the a.m. and p.m. peak periods to indicate patterns and changes in traffic congestion in the form of volume-to-capacity ratio, the standard measure to quantify and evaluate traffic congestion.

Warren County 2045 Baseline Scenario

As noted previously, the demographic projections developed for the 2005 Strategic Growth Plan anticipated a continuation of the county's historic population growth rate of approximately one percent per year, and forecast that Warren would maintain this robust growth rate through 2030.

[5] http://njtpa.org/data-maps/modeling/travel-demand-modeling, accessed April 21, 2018

The resulting land use and traffic forecasts therefore included significant levels of new development and population growth over the Plan's 30-year time frame. The Warren County traffic models developed using these projections resulted in more than a 4-fold increase in the model's trip table in just 30 years, and a severe worsening in traffic congestion and mobility. This finding led to the recommendation of a comprehensive centers-based program of smart growth land use strategies and transportation control measures.

What happened instead was a significant slowing of population growth in the mid-2000s followed by a decline in total county population between 2010 and 2016.

In contrast to 2005 Strategic Growth Plan projections, the newer U.S. Census data and NJTPA projections present a remarkably different and much more restrained assessment of current and future growth in Warren County.

Based on these new demographic data the NJTPA regional travel demand models reflect much slower growth in population, households, and employment, and a much less severe assessment of future travel demand and traffic congestion as indicated in the following tables.

The data for 2045 reflect additional traffic congestion in the form of a small decrease in average speed on the roadway network, an increase of 8.5 percent in trip length, and increases of 14 percent and 16 percent respectively, in total vehicle miles traveled (VMT) and vehicle hours traveled (VHT).

Both VMT per capita and VHT capita are projected to increase by 6.5 percent and 8.2 percent respectively.

The NJTPA travel demand models also project an increasing impact to county and local roadways in the future, with VMT growing more rapidly on major arterials and collector streets compared to freeways, expressways, and principal arterials. This pattern has also been observed in planning studies for other NJTPA counties, including Somerset County. As congestion on higher functional classification roadways grows, some travel migrates down to lower functional classification roadways, as travelers seek less congested travel routes.

Overall the 2045 baseline scenario projects Warren County residents and workers will be traveling more miles and more hours, taking longer trips at slightly lower speeds, and traveling more on local and county roads than they do today.

Travel demand model performance measures and plots of volume-to-capacity ratios for the Warren County baseline scenario are depicted on the following pages.

These modest projections for future travel demand and congestion should yield considerably more flexibility in developing new transportation projects and capital improvements in the long term. When combined with changing demographics and diversification of population, these findings translate into the need for more robust and accessible mobility options in Warren County compared to previous generations.

Table 4: Performance Measures Metrics, NJRTM-E

Person Trips Produced (includes trucks)	Non-Motorized Trips	Average Speed (mph)	Average Trip Length (miles)	Vehicle Miles of Travel (VMT)	VMT per Capita (VMT/person)	Vehicle Hours of Travel (VHT)	VHT per Capita (VHT/person)
2017							
259,447	11,583	43.77	14.25	3,695,957	33.53	84,442	0.77
2045							
272,888	12,492	43.05	15.46	4,217,694	35.69	97,977	0.83
% change							
5.2%	7.8%	-1.6%	8.5%	14.1%	6.5%	16.0%	8.2%

Table 5: Vehicle Miles of travel (VMT) by Functional Classification and Model Year, NJRTM-E

Freeways + Expressways	Principal Arterials	Major Arterials	Minor Arterials /Collectors /Locals (%)	Total Vehicle Miles of Travel (VMT)
2017				
50.87%	23.52%	10.51%	15.10%	3,695,957
2045				
49.40%	23.88%	10.90%	15.81%	4,217,694
% change				
-2.9%	1.6%	3.8%	4.7%	14.1%

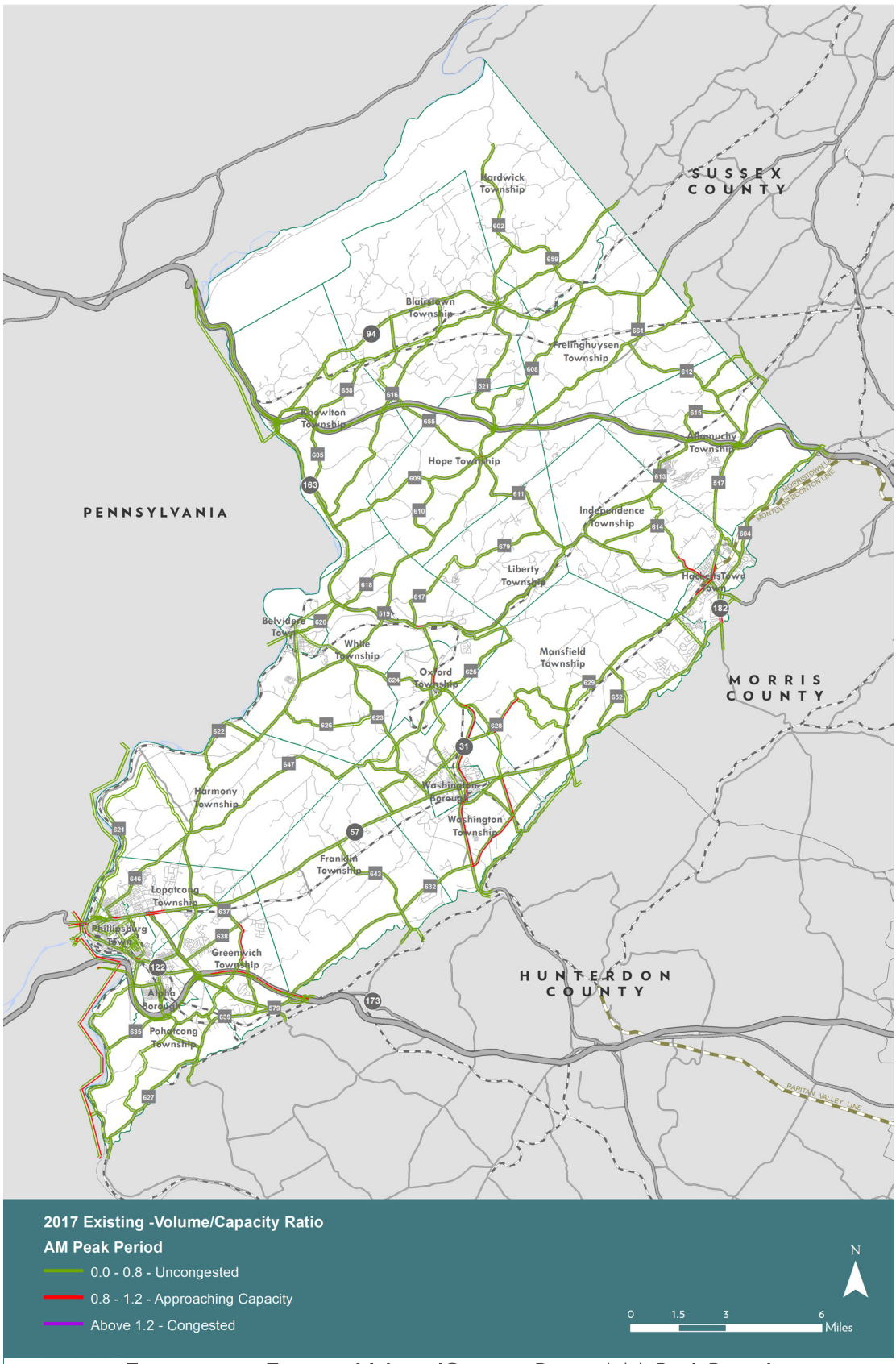


Figure 7: 2017 Existing -Volume/Capacity Ratio- A.M. Peak Period

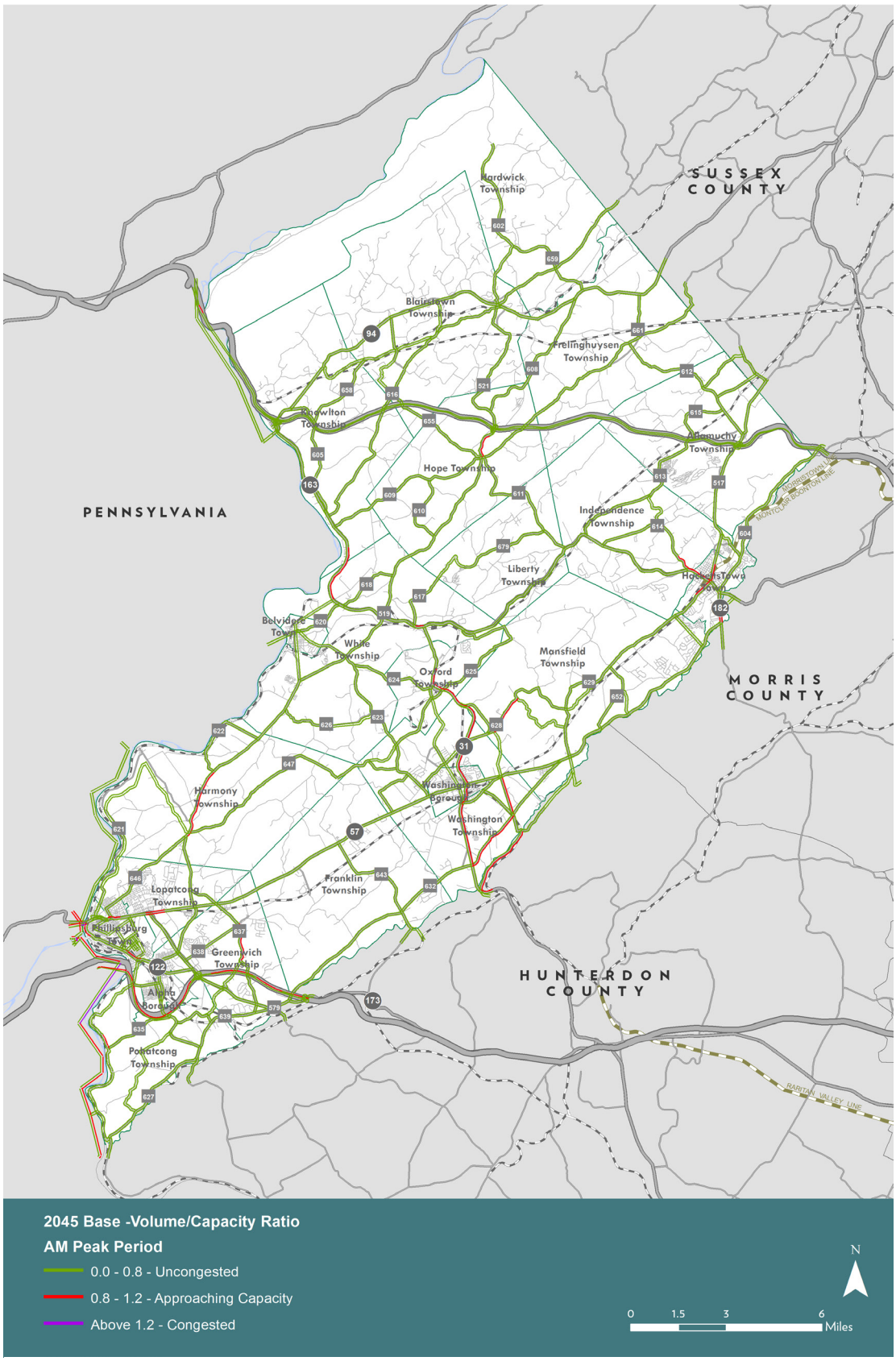


Figure 8: 2045 Base -Volume/Capacity Ratio- A.M. Peak Period

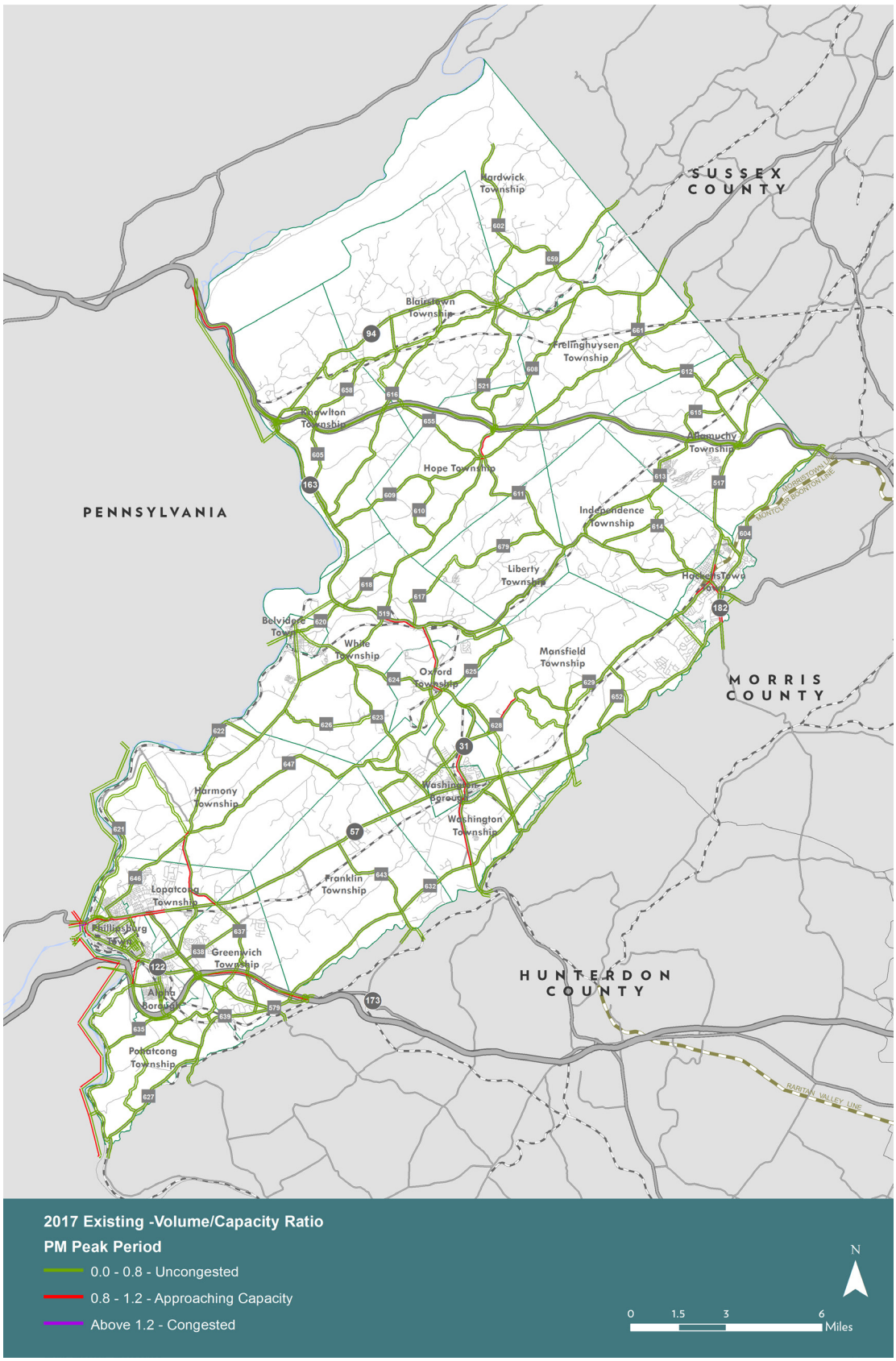


Figure 9: 2017 Existing -Volume/Capacity Ratio- P.M. Peak Period

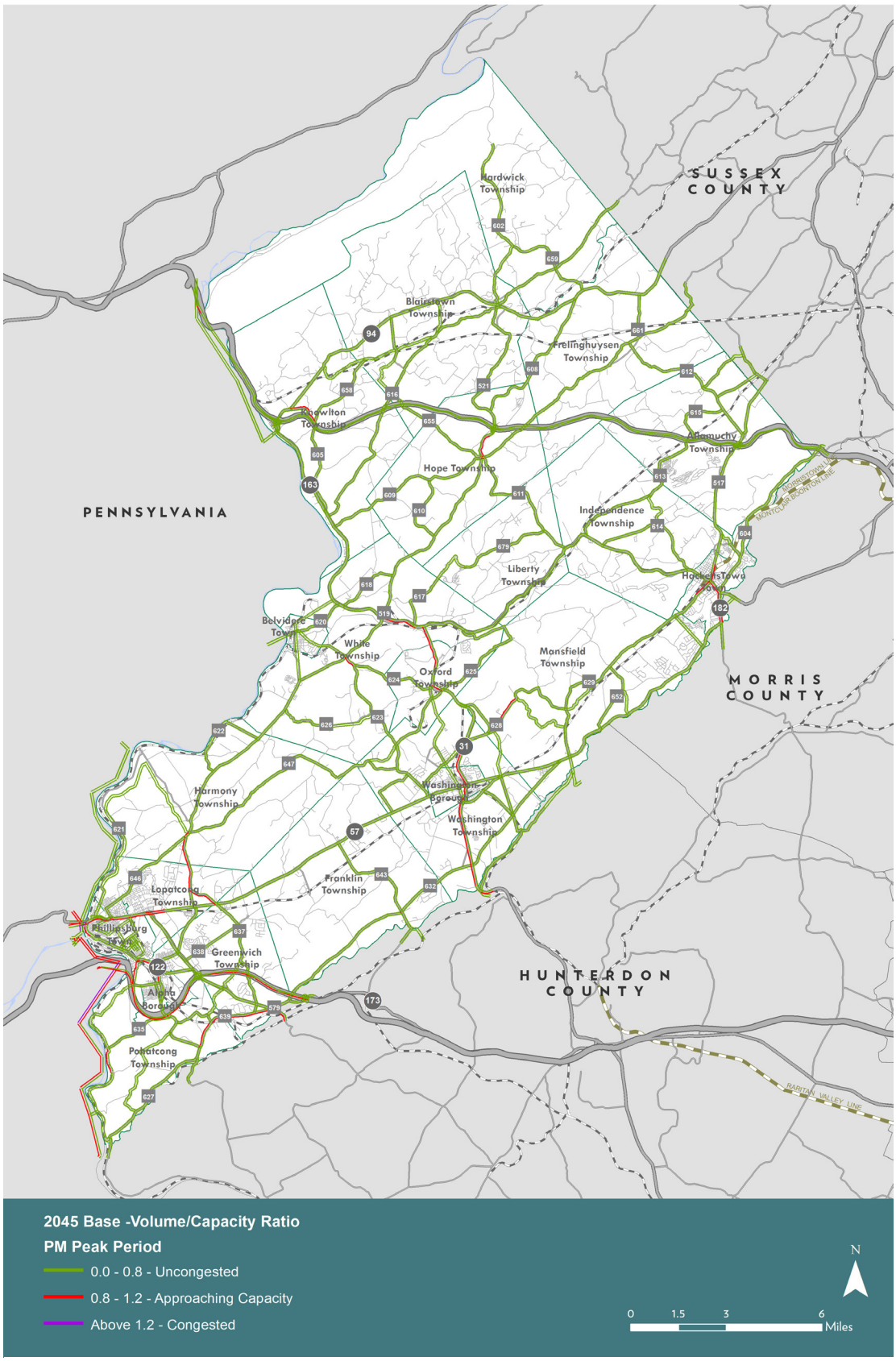


Figure 10: 2045 Base -Volume/Capacity Ratio- P.M. Peak Period

03 | Explore Potential Future Outcomes

Consistent with Warren County's historic, environmental, and preservation priorities, the Warren County Transportation Technical Study Update advances innovative, lower-cost, and context sensitive design alternatives to meet its current and projected future transportation needs. These projects, policies, and services are designed to better reflect and enhance local character, context, and sensitive natural resources and assets, and address mobility and safety needs and considerations in a lower-cost, lower-impact manner.

This study advances a Three-Part Framework Plan of proposed policies, programs, and projects. The study themes and priorities guide development of the Framework Plan, based on comments and priorities gathered and assembled during the stakeholder outreach and coordination process.

Three alternative future outcomes scenarios are recommended for detailed study and assessment during the proposed next phase of the planning process – development of the Warren County Transportation Plan Element.

Study Themes & Priorities

Study comments, concerns, trends, and priority issues and needs were assembled and reorganized into three overarching study themes representative of Warren County's past, present, and desired future vision:

Together these themes guide the decision-making process and encourage balancing among competing needs and interests to achieve consensus on achievable Framework Plan recommendations.

Understand the region's ongoing demographic changes and the resulting mobility challenges

- Changing demographics and diversification of population
- Significant backlog of transportation improvement projects hamper local and regional mobility
- Need for more robust, accessible, affordable mobility options

Use travel forecasting and scenario planning methodologies to understand what the future might look like

- How much growth is likely over the long term and where it may take place?
- Investigate employment and development implications of anticipated logistics and supply chain industry growth

Balance the strongly-expressed interest in preservation vs. the need for, and impact of, future growth and development

- The region's complex geography and many sensitive environmental and historic sites constrain new development and essential transportation improvements
- County-wide need for traffic calming and gateways to preserve traditional villages, small town quality of life, and safety
- Balance the need for economic and housing development with maintaining the desirable lifestyle that continues to draw new residents and businesses to Warren County

Three-Part Framework Plan

The Framework Plan is a cooperative effort by Warren County, its 21 municipal partners, regional and state agencies, and advocates and business organizations. The Plan makes the case for Warren County to receive its fair share of the region's funding and resources for planning, design, construction, operation, and maintenance of multimodal transportation facilities, and advancement of supporting policies and programs.

1. Recommendations from the Coordination and Outreach Process

The study team employed a comprehensive and community-based planning process to engage a diverse range of stakeholders, advocates, decision makers, professional staff, and the general public; seeking feedback and comment, and building consensus on study methodology, priorities, and recommendations.

The following recommendations are derived from stakeholder comments and priority issues identified during the many outreach events and methodologies.

Understand and Respond to Changing Demographics

Although Warren County's total population has roughly doubled since 1950, growth has slowed significantly since the 2000 Census and decreased slightly since 2010. The 2016 Census estimate is still below the 2010 Census total.

Detailed examination reveals Warren is becoming more diverse and increasingly a gateway community for new immigrants. The county's minority population is primarily of Hispanic origin, and nearly all the population growth since the 2000 Census appears to have come from the non-white, Hispanic and foreign-born categories.

Despite this slowdown in population growth, changing demographics and diversification of population translate into the need for more robust and accessible mobility options compared to previous generations.

Many of these new county residents lack access to automobile ownership. In addition to the demographic data and projections, the comments received at the ESL pop-up events indicate a strong desire and need among these new Warren County residents for expanded and enhanced multimodal travel options, including transit, Park & Ride, ridesharing, walking and biking.

Recommendations and priorities include the following:

Transit

- Improve access to key destinations, including Warren County Community College, schools and vocational high school, Veterans Affairs New Jersey Health Care System, hospital locations, grocery stores, and employment centers
- Include extended and non-peak transit service for shift work, evenings, and weekends

- Provide information on transit service and schedules in various languages
- Mitigate capacity limitations at Clinton Park & Ride
  - 31Ride Shuttle (Warren County) ridership below expectations
  - Identify and advance applicable strategies designed to increase ridership
  - Consider hub and spoke service models to connect remote Warren County park & ride locations with long-distance bus service available at the Clinton Park & Ride, which experiences chronic parking capacity limitations
- Working with TransOptions TMA and consider service innovations such as the subsidized ride-sharing methodologies

Potential for Expanded Bicycle Network

- Study potential for a program of improvements connecting residential hubs with priority destinations, which may include employment centers, government, libraries, social services, dining and entertainment, and recreation, tourism, and parks
- Discussion and comment from focus groups and public outreach indicate an interest in developing a regional multiuser trail and bicycle network, building on existing facilities, including the Paulinskill Valley Trail, Pequest Wildlife Management Trail, and the Morris Canal Greenway, with the potential to greatly expand the regional network with connections to facilities as varied as the Delaware & Lehigh Canal Towpath in neighboring Pennsylvania, the Sussex Branch Trail in Sussex County, and the Columbia Trail in Hunterdon and Morris Counties.
- In addition to mobility and access benefits, Rail Trails have proven to be an effective and innovative tool for economic development and tourism

Improve Sidewalk Connectivity in Towns and Commercial Corridors

- Prioritize improvements that improve local access and mobility in urban and suburban areas

Targeted Intersection Improvements

- Consider innovative design using lower cost, context sensitive, smart growth design concepts to address multiple needs with a reduced cost and regulatory burden

Trucking Issues

- Trucking registered as both a positive and a negative issue during the planning and outreach tasks.
- Trucking professionals and advocates identified the lack of truck stops and rest areas, and restrictions on truck access, circulation, and operating hours as a growing challenge constraining the ability to conduct business and maintain profitability and adequate working conditions
- Infrastructure challenges are anticipated to grow with the expansion of the logistic industry. The proposed I-78 Logistics Park in Phillipsburg and Lopatcong Township is

anticipated to significantly increase the number of trucks, both on local roadways and traveling to and from nearby I-78.

- Mitigating heavy truck impacts was cited frequently as a concern particularly among representatives and officials from Warren County's historic small towns and villages where no alternative routing exists to bypass heavy trucks away from local streets and downtowns, creating local congestion and safety concerns

Maintain Rural Character

- "Don't overbuild" was a frequent-expressed comment and priority
- Traffic calming and gateway treatments to preserve traditional communities and downtowns

Use Pilot Projects to Test Policy Alternatives and Design Innovations

- Where support exists, work with municipalities to conduct targeted testing of traffic calming, gateway treatments, roundabouts and road diets, and related innovative improvement concepts etc.
- Collaborate with communities with strong local support and interest to develop local success stories and champions

Rolling hills and valley farms characterize much of the Warren County landscape

2. Recommendations from the Technical Assessment

The technical assessment included review of previous studies, implementation status of previously proposed projects, plans, and recommendations, and assessment of system performance, including using crash data and NJDOT management systems. Each identifies existing deficiencies and needs informing development of the project pipeline process at the local, county, regional, and statewide levels. Warren County will work with the funding agencies to develop and advance priority projects from among the needs identified in the technical assessment.

Bridges

Bridge Management System data identifies 24 "Structurally Deficient" bridges in Warren County and 58 "Functionally Obsolete" bridges. On state routes three bridges were found "Deficient" on NJ 94, five on NJ 57, one on NJ 31, and one on NJ 173. On U.S. Routes two bridges on U.S. 46, and one on U.S. 22 were found "Deficient". The other "Deficient" bridges are on local or county routes.

Pavement

Pavement Management System (PMS) data indicates about 20 miles of deficient pavement on U.S. and State roadways in Warren County, out of a total of 222 total roadway miles in the PMS database. The principal roadways with "Deficient" pavement in Warren County Include I-78, I-80, U.S. 22, U.S. 46, NJ 31, NJ 57, NJ 94, NJ 122, NJ 173, and NJ 182.

Congestion

New Jersey CMS data indicates about 24 miles of U.S. and State roadways in Warren County are heavily congested, out of a total of 222 total roadway miles in the CMS database. Some of the most heavily congested roadway segments in Warren County are on Interstate 80 and Interstate 78. U.S. Route 22 also has segments that are heavily congested. Moderately congested roadways with V/C ratios between 0.51 and 0.75 include U.S. Route 22, NJ 57, NJ 122, and U.S. 46.

Safety

The highest crash corridors are Interstate 78, Interstate 80, and NJ 57 in Hackettstown, Washington Borough, and Phillipsburg. The hotspot analysis also highlights U.S. Route 22, NJ 31 in Washington Borough, and downtown areas of Hackettstown, Washington Borough and Phillipsburg.

Warren County staff conducted supplemental crash data and road safety assessments to identify county road locations with the highest number of crashes. The bulk of these crashes occurred at the top three locations: CR 519 at U.S. 22, CR 638 at U.S. 22, and CR 519 at NJ 57.

Transit Services

The 2004 Transportation Technical Study placed an emphasis on the value of increased residential development densities in designated centers (though not explicitly pursued as a recommendation, given community concerns) and the importance of pedestrian connectivity to foster transit improvements and service effectiveness.

Four principal opportunities for transit were highlighted in the 2004 study:

1. **Lackawanna Cut-off:** An effort to restore passenger rail service in northern Warren County, linking the county (and eastern Pennsylvania) with employment centers to the east. A single station was proposed in Warren County; on Route 521 in Blairstown.

   Status: NJ TRANSIT is working to advance construction of a 7.3-mile segment of the line from a junction with the Morristown Line at Port Morris to Andover. The project includes a new intermodal station and park-ride at Andover, rehabilitation of the Roseville Tunnel, track and signals, a grade crossing, and right-of-way infrastructure improvements.

2. **Washington Secondary:** A proposed restoration of passenger rail service between Hackettstown and Phillipsburg. The rail right-of-way parallels Route 57 through Port Murray, Washington Borough, Broadway, New Village, and Stewartsville. This restoration would afford more Warren County residents access to NJ TRANSIT Midtown Direct rail service to Secaucus Junction and New York City.

   Status: Not actively under study.

3. **Raritan Valley Line (RVL):** A recommended extension of the NJ TRANSIT Raritan Valley rail line from High Bridge (Hunterdon County) to Phillipsburg.

   Status: Not implemented.

   Initial recommendations were linked to the Access to the Region's Core (ARC) project and dependent on additional trans-Hudson rail capacity to send RVL trains directly to New York City. Other significant capital investments are needed to expand RVL, including additional mainline tracks on the Raritan Valley and Lehigh Lines.

4. **Mid-County Bus:** A recommendation for new bus service from Washington to Phillipsburg, via Oxford, Bridgeville, Belvidere, County Center, and Harmony. Service was proposed to operate along Route 31, Route 46, CR 620, and CR 519.

   Status: Not implemented.

Priority Intersections

Collaboration with NJDOT and NJTPA identified a consensus list of high priority intersections on state-owned roads in Warren County. For each location, the team identified the current status of the technical assessment, including data for congestion, pavement and bridge conditions, crash hot spots, and the designated Highlands Act area (which may constrain the ability to make necessary repairs and/or improvements).

- U.S. 22 at NJ 122 in Phillipsburg Area
  - High priority intersection
  - Congestion: Heavily Congested
  - Pavement: NJ 122 Deficient
  - Crashes: 68 crashes 2014-2016
  - Highlands Area: Planning

- U.S 22 at County Route 638 in Greenwich
  - High priority intersection
  - Congestion: Heavily Congested
  - Pavement: U.S. 22 Deficient
  - Crashes: 71 crashes 2014-2016
  - Highlands Area: Planning

- U.S. 22 at County Route 519 in Pohatcong/Greenwich
  - High priority intersection
  - Congestion: Heavily Congested
  - Crashes: 90 crashes 2014-2016
  - Highlands Area: Planning

- NJ 57 at County Route 519 in Hopatcong
  - High priority intersection
  - Congestion: Heavily Congested
  - Bridge: CR 519 Functionally Obsolete
  - Bridge: NJ 57 Structurally Deficient
  - Pavement: NJ 57 Deficient
  - Crashes: 35 crashes 2014-2016
  - Highlands Area: Preservation/Planning

- NJ 57 at County Route 629 in Mansfield
  - High priority intersection
  - Congestion: Not Congested
  - Crashes: 3 crashes 2014-2016
  - Highlands Area: Planning

- U.S. 46 at County Route 519 in White Township
  - High priority intersection
  - Congestion: Moderately Congested
  - Pavement: U.S. 46 Deficient
  - Crashes: 22 crashes 2014-2016
  - NJRTM-E: U.S. 46 Approaching Capacity; CR 519 Approaching Capacity
  - Highlands Area: Planning

- U.S. 46 at Mountain Avenue (NJ 182) in Hackettstown
  - High priority intersection
  - Congestion: Heavily Congested
  - Pavement: U.S. 46 Deficient
  - Pavement: NJ 182 Deficient
  - Crashes: 30 crashes 2014-2016
  - NJRTM-E: U.S. 46 Approaching Capacity; NJ 182 Approaching Capacity
  - Highlands Area: Planning

Traffic Data Collection

New traffic counts were collected to support the Warren County Planning and Engineering Departments assessment of need and to support concept development, design, and prioritization. Twelve Automatic Vehicle Classification counts data and eight Turning Movement Counts were collected.

These data will be used to assess need and support concept development and design.

Detailed Traffic Count Data including tables and maps are available in Technical Memorandum 3.3: Traffic Count Data Collection. The new traffic count locations are depicted in Figure 11 in Chapter 1 of this report.

The Pequest River is a prominent feature passing directly through the town of Belvidere, NJ, both defining and constraining development patterns and roadway alignments

3. Scenario Planning Alternatives

The Framework Plan recommends three potential alternative future scenarios for detailed study and assessment during the proposed next phase of the planning process, development of the Warren County Transportation Plan Element. The planning process as proposed will define in detail applicable projects, land use elements, economic variables, and population and employment data inputs for each scenario. The alternative future scenarios are derived from the various outreach, coordination, and technical assessment tasks of this study.

These future scenarios will be tested using the NJRTM-E and compared to the Warren County Baseline Scenario, each using the same 2045 build year. The baseline scenario is the reference point for all future alternatives, using the same set of performance measures and metrics. Detailed model statistics and performance measures, and plots of traffic volumes, speeds, and volume-to-capacity ratios will be prepared to evaluate the relative pros and cons of each scenario.

Three potential future scenarios are proposed for detailed analysis and comparison:

- **Multimodal/Centers-Based Scenario –** derived from the 2004 Transportation Technical Study, which projected significant growth in overall travel and resulted in considerable worsening of traffic congestion and overall mobility.

  Consequently, the study recommended measures be taken to preserve the capacity of the transportation network to accommodate existing and future development.

  The Centers-Based concept is also consistent with nationwide trends of preference for urbanized areas and lifestyles, and many of America's cities, large and small, are capturing much of the nation's new development and population growth.

  Specific planning recommendations include land use strategies that cluster development and create walkable communities with a mix of land uses and an interconnected network of streets, targeted corridor planning and transit improvements, site design and access management tools, transportation control measures, and transportation financing districts to supplement existing funding streams.

  Although many of these elements are derived from what might be considered innovative smart growth principles, part of the resulting outcome is both consistent with, and reflective of, the traditional look and style of Warren County as rural and small-town rather than strip commercial and highway-oriented development along state and county arterial roadways.

  Keeping the control totals (demographic inputs to the trip tables) for each municipality unchanged, the Centers-Based Scenario identifies targeted municipal centers in Warren County, including those with significant EJ

communities, i.e. Phillipsburg, Washington Borough, and Hackettstown, and adjusts the constituent employment and household data inputs to move more people and jobs from the municipal fringe areas to the downtown municipal centers without changing the overall demographic projections at the municipal or aggregate county level. This scenario will examine the pros and cons of encouraging targeted urban growth in existing centers rather than continued decentralization of housing and jobs, including future mobility and transportation needs, and qualitative discussion of potential opportunities for transit enhancement that may derive from greater clustering of population and employment into centers.

- **Logistics Hub Scenario –** derived from the proposed I-78 Logistics Park in Phillipsburg and Lopatcong Township, which is currently in planning and early development. Still in the planning stages as of June 2018, approximately 3,000 jobs and 3.8 million square feet of warehouse and distribution space are anticipated at the 365-acre site; one of the largest current development sites in New Jersey.

  The logistics hub scenario targets a limited number of model analysis zones as high growth logistic and supply chain hubs. Factors or increments to increase both jobs and truck trips to and from these zones will be developed to evaluate the development of one or more regional logistics hubs in Warren County.

  This estimate of 3,000 new jobs at the I-78 site could significantly boost new employment in the County. The NJTPA projections currently estimate approximately 3,600 new jobs for Warren County through 2045, so this one project could almost double the projections, with significant implications in terms of new residents and households, and the resulting impact to mobility needs, transportation demand, and new truck trips.

- **Warren County Blend –** assumes a mix of multimodal, policy, and land use elements from the Multimodal/ Centers-Based scenario, along with applicable elements of the Logistics Hub scenario and transit investments to achieve a better integration of transportation access, mobility enhancements, and economic development.

  The Blend scenario is envisioned to include the overall themes of both the Centers-Based and Logistics Hub scenarios and would include some elements of each. This scenario could include all or part of the proposed I-78 Logistics Park, and some of the many and varied recommendations of the Centers-Based scenario, albeit it a lower threshold and more targeted fashion. For example, the Centers-Based elements might be more focused on just a few communities, in particular those in which strong support is found for new development. The Centers-Based scenario should also emphasize basic smart growth principles including walkability, transit, and innovative site design and access management techniques.

Scenario Assessment & Future Analysis

As noted previously, relatively slow growth is projected for population, households, employment, and traffic congestion in Warren County.

The data for 2045 indicate additional traffic congestion in the form of a small decrease in average speed on the roadway network, along with small increases in trip length, total vehicle miles traveled, and vehicle hours traveled.

The NJTPA travel demand model also projects an increasing impact to county and local roadways in the future, with travel growing more rapidly on major arterials and collector streets compared to freeways, expressways, and principal arterials. This pattern has also been observed in planning studies for other NJTPA counties, including Somerset County.

Overall the 2045 baseline scenario projects Warren County residents and workers will be driving more miles and more hours, taking longer trips at slightly lower speeds, and traveling more on local and county roads than they do today.

These data and findings represent the current assessment of what would happen to travel conditions in the region if no new plans, policies, programs, or projects are introduced beyond what has already been approved and adopted within the 2045 timeframe.

Development of the Transportation Plan Element of the Warren County Master Plan will compare and contrast these baseline conditions with the results from the three alternative future scenarios.

The proposed Transportation Plan Element will evaluate and advance an appropriate and feasible mix of planning, policy, and transportation improvements to meet the many and varied transportation demand and mobility needs outlined in this study.

Study Advisory Committee Members

Dan Callas, TransOptions
John Ciaffone, TransOptions
Carol Cook, Warren County Transportation Advisory Council
Michael Donchez, Lehigh Valley Planning Commission
Desiree Dunn, Warren County Planning Board
Linda M. Empson, Easton Coach Company
Maryjude Haddock-Weiler, New Jersey Highlands Council
George Kinney, Lehigh Valley Planning Commission
Brian Leckie, New Jersey Department of Transportation
Louis Millan, New Jersey Transit
Gerald Scharffenberger, New Jersey Department of State
Linda H. Stettler, Warren County Economic Development Advisory Council

Blythe Eaman, NJTPA
Peter Zambito, NJTPA
David K. Dech, PP, Warren County Planning Department
Brian Appezzato, Warren County Planning Department
Marie Raffay, Warren County Engineer's Office

Warren County Board of Chosen Freeholders

Edward J. Smith, Freeholder Director
Jason J. Sarnoski, Deputy Director
Richard D. Gardner, Freeholder

Planning Board Members

Deborah A. Pasquarelli, Chair
Louis J. Baduini, Vice Chair
Desiree L. Dunn, Secretary
Robert I. Frey, Member
Richard D. Gardner, Freeholder
William Gleba, P.E., County Engineer
William E. Hann, Jr., Member
David A. Smith, Member
Edward J. Smith, Freeholder, Member
Adam Baker, Alternate 1
Robert Hopkins, Alternate 2
Jason J. Sarnoski; Alternate Freeholder
Guy R. Wilson, Attorney

Planning Department

David K. Dech, PP, Planning Director
Richard A. Miller, PP, Principal Planner
Elizabeth Roy, PP/AICP, Principal Planner
Brian Appezzato, Senior Planner
Albert Krouse, GISP, Senior Planner
Irene Gordon, Administrative Clerk
Theresa Nicolls, Keyboarding Clerk Typist II

Planning Board

Wayne Dumont, Jr. Administration Building
165 County Route 519 South
Belvidere, NJ 07823-1949
(908) 475-6532 Fax (908) 475-6537
Email: planningdept@co.warren.nj.us

2000 Lenox Drive, 3rd Floor
Lawrenceville, NJ 08648
609-512-3500

wsp