Warren County
transportation technical study update

Technical Memorandums

NJTPA wsp

Technical Memorandum 1:
Revised Study Goals

Warren County Transportation Technical Study Update

JANUARY 2018

FINAL

INTRODUCTION

The study team has worked with the Warren County Planning Department, Study Advisory Committee, NJTPA, and municipal and interagency partners to revisit and refresh the Study Goals. The starting point was the initial list of Goal in the 2005 Warren County Strategic Growth Plan which states that:

> 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. The Plan also helps to coordinate local planning activities with the New Jersey State Development and Redevelopment Plan.
>
> The State Plan and the Strategic Plan seek to increase the effectiveness of local planning by enhancing intergovernmental coordination. The County Plan recommendations serve as a menu of strategies that could be used by the county and municipalities to facilitate the coordination of local plans with the plans of other municipalities in the county as well as with other levels of government.

The original 12 Goals were as follows:

Goal 1 - Preserve and enhance rural character as well as agricultural, natural, environmental, historic and open space resources and provide incentives to achieve this goal.

Goal 2 - Focus growth in existing centers and provide financial incentives to local government, school districts and developers to achieve this goal.

Goal 3 - Protect and enhance water quality and quantity.

Goal 4 - Maintain and improve the existing transportation system to provide safe and efficient mobility and access.

Goal 5 - Provide safe and efficient alternative modes of transportation to reduce auto dependence.

Goal 6 - Improve public infrastructure to support existing centers.

Goal 7 - Encourage desirable development that provides local employment opportunities in existing centers.

Goal 8 - Increase educational and cultural opportunities.

Goal 9 - Promote inter-municipal, county and state cooperation.

Goal 10 - Encourage state legislation to provide localities more control over growth.

Goal 11 - Ensure that benefits and costs of plan implementation are shared equitably among all residents, landowners and businesses in Warren County.

Goals 12 - Provide a mix of housing types.

GOAL REFINEMENT

In addition to assessment of current conditions and needs, planning documents and zoning, and anticipated future needs, the team facilitated an interactive discussion at the first Steering Committee Meeting held at the Warren County offices on June 27, 2017. The team also reviewed comments during the various municipal and interagency coordination events to prepare the revised Study Goals.

Based on these meetings and comments, the following changes are proposed:

- Goal 1 was simplified to emphasize the inherent value and benefit of preserving Warren's rural and agricultural heritage and state this priority in a more precise and succinct way. This goal also recognizes the commitment that Warren County and the municipalities have made to preserving historical and cultural resources

- Goals 2 and 6 were combined based on the related smart growth elements in each: using planning and infrastructure incentives to focus growth in existing centers

- Goal 5 was revised to promote improved transportation mode choices, rather than just access to the various travel modes, as a means of enhancing overall mobility

- A new goal 6 was added to improve infrastructure resiliency

- A new goal 7 (previously goal 12) includes changes that serve to clarify that promoting "a mix of housing types" is necessary to keep pace with changing demographics in Warren County. The county, for example, is seeing changing housing needs due to in-migration of ethnically diverse households and out-migration of younger residents.

- Goal 8 (combined from previous goals 7 and 8) merges the themes of providing appropriate educational and training opportunities to enable County residents to meet the changing needs and skills of the job market

- Goal 9 was modified to explain that the purpose of municipal, county, and state cooperation is "to advance mutual interests" to the benefit of all

- Goal 11 was revised to emphasize the need to "seek equitable outcomes" for plan implementation across Warren county municipalities

- A new goal 12 was added reflecting the need to monitor technological and economic trends that may affect transportation needs over the life of the plan. An example is the emergence of self-driving vehicles.

In addition to these, several questions were asked as to why non-transportation related topics were included in the Goals. As noted, the Goals were derived from the County Strategic Growth Plan which applies to a broad range of needs and disciplines, including transportation and mobility, so that a common set of Goals can be used across all Warren County planning documents, plans, projects, an initiative. In addition, transportation and mobility are closely related to a broad range of factors including housing affordability, job access, economic development, and even health and quality of life, so it is appropriate that the Transportation Study reference related goals.

Questions were also posed as to the order of the goals and whether any priority of importance is reflected in the order. No priority or preference is intended or implied.

The proposed revisions to the Study Goals are as follows:

Goal 1: Preserve and enhance the County's rural character and its agricultural, natural, historic, and tourism resources.

Goal 2: Focus growth in existing centers, using incentives such as improved public infrastructure to support new development and redevelopment.

Goal 3: Protect and enhance water quality and quantity.

Goal 4: Maintain and improve the existing transportation system to provide safe and efficient mobility and access.

Goal 5: Provide transportation choices that increase mobility, including improved public transportation, and bicycle and pedestrian options.

Goal 6: Increase the resiliency of the County's infrastructure to extreme weather events and flooding.

Goal 7: Provide a mix of housing types to accommodate the housing needs of current and future residents.

Goal 8: Increase educational opportunities and encourage desirable development that provides local employment opportunities.

Goal 9: Promote cooperation among municipalities and with other counties and the state to advance mutual interests.

Goal 10. Encourage state legislation to provide localities more control over growth.

Goal 11: Seek equitable outcomes for the plan's implementation, considering the diverse needs of Warren County residents, landowners, and businesses.

Goal 12: Monitor technological and economic trends to identify new opportunities for achieving the County's strategic goals.

Technical Memorandum 2: Environmental Justice Assessment - Part I

Warren County Transportation Technical Study Update

FEBRUARY 2017

FINAL

INTRODUCTION

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

The Environmental Justice (EJ) Assessment is focused primarily on the following characteristics: Poverty, Race/Minority, and Linguistically Isolated.

This EJ Assessment was performed for all of Warren County.

Environmental Justice Methodology

The EJ Assessment is undertaken in a two-phase process: In the first phase the entire study area is evaluated in order to identify areas with high percentages of the three EJ analysis characteristics (Poverty, Race/Minority, and Linguistically Isolated); in the second phase, those areas with high percentages of the EJ analysis characteristics are subjected to detailed analysis to determine if the study recommendations, including projects or construction detours, would disproportionately impact the identified EJ populations.

The EPA Environmental Justice Screening and Mapping tool was utilized to perform a preliminary screening for Warren County and to obtain an overview of where high concentrations of EJ populations are located within the county. The EPA EJ Screen tool was also utilized to create the maps included in this analysis. After identifying these areas, 2014 American Community Survey (ACS) data and 2010 Decennial Census data at the block group and municipal level were used to perform a more thorough analysis. The census data were used to provide a description of current demographic and socioeconomic characteristics. Graphs, tables, and maps display the applicable data.

Households living below poverty were defined as any household living below poverty in the past 12 months. Minority population was defined as any individual that did not identify as only white. Linguistically isolated households were defined as a household in which all members 14 years and over speak English less than “very well.”

Preliminary Assessment

Warren County

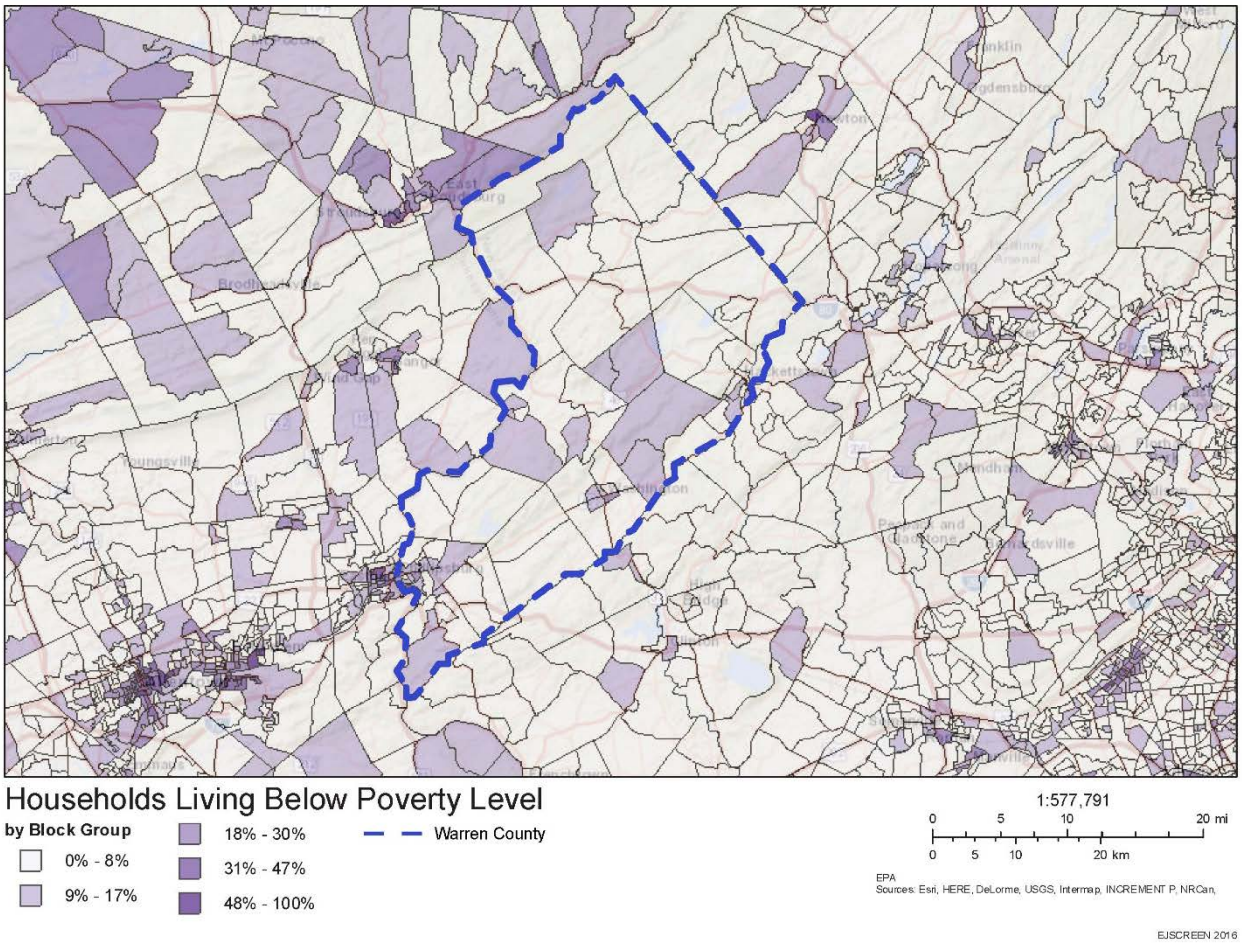
As per the EPA EJ Screen tool, Warren County overall contains a significantly lower percentage of poverty and minority, and a slightly lower percentage of linguistically isolated households compared to the state and the nation. The Warren County average percentage was used as a threshold to determine which block groups contain a high concentration of all three categories of EJ populations. Below are details comparing the county to the state of New Jersey and to the United States, and maps displaying average percentages by block group for Poverty, Minority Population, and Linguistically Isolated Households.

Poverty

Table 1. Households Living Below Poverty Level

Warren County	State	USA
8%	14%	10%

Figure 1. Poverty Households within Warren County

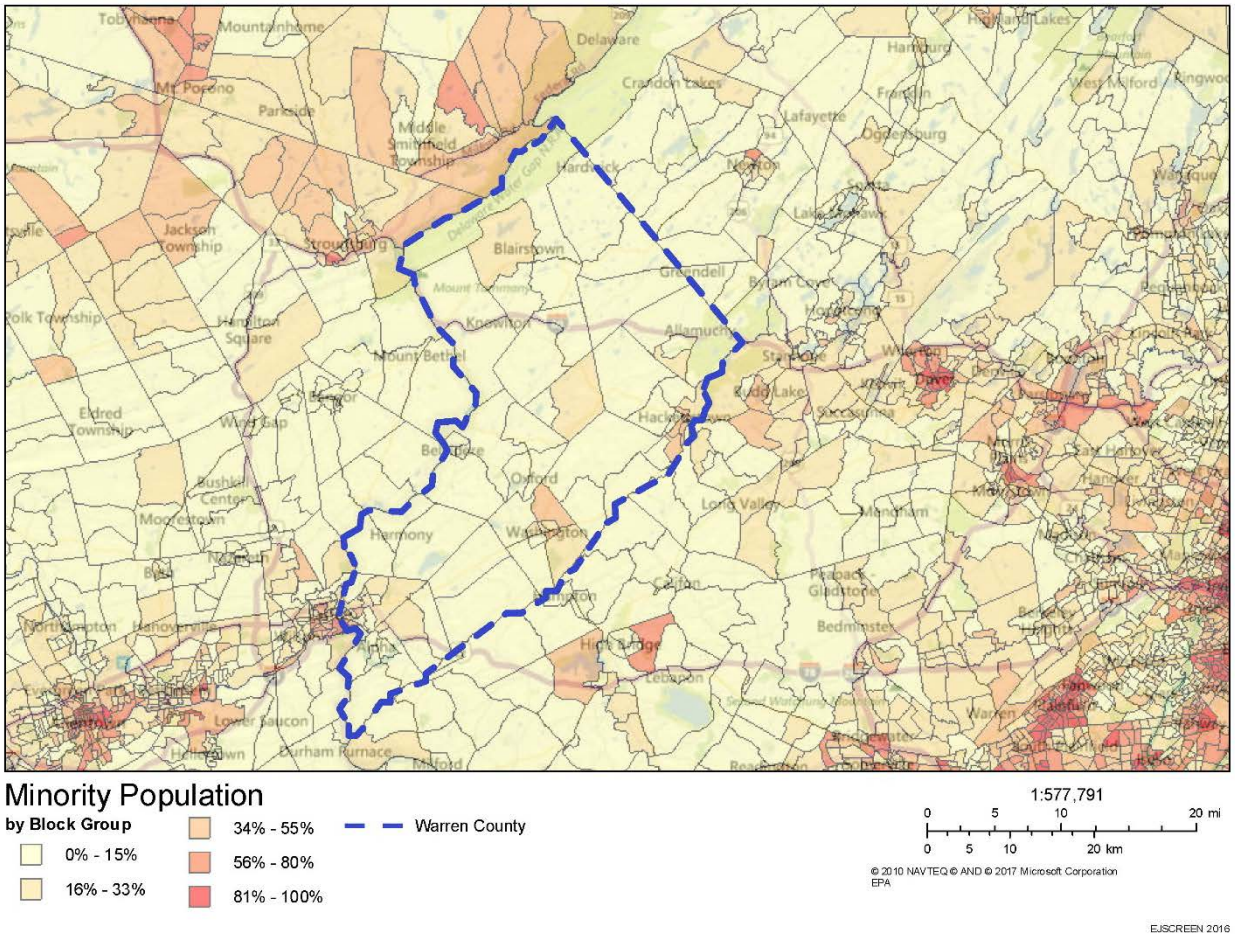


Minority

Table 2. Minority Population

Warren County	State	USA
16%	42%	37%

Figure 2. Minority Population within Warren County

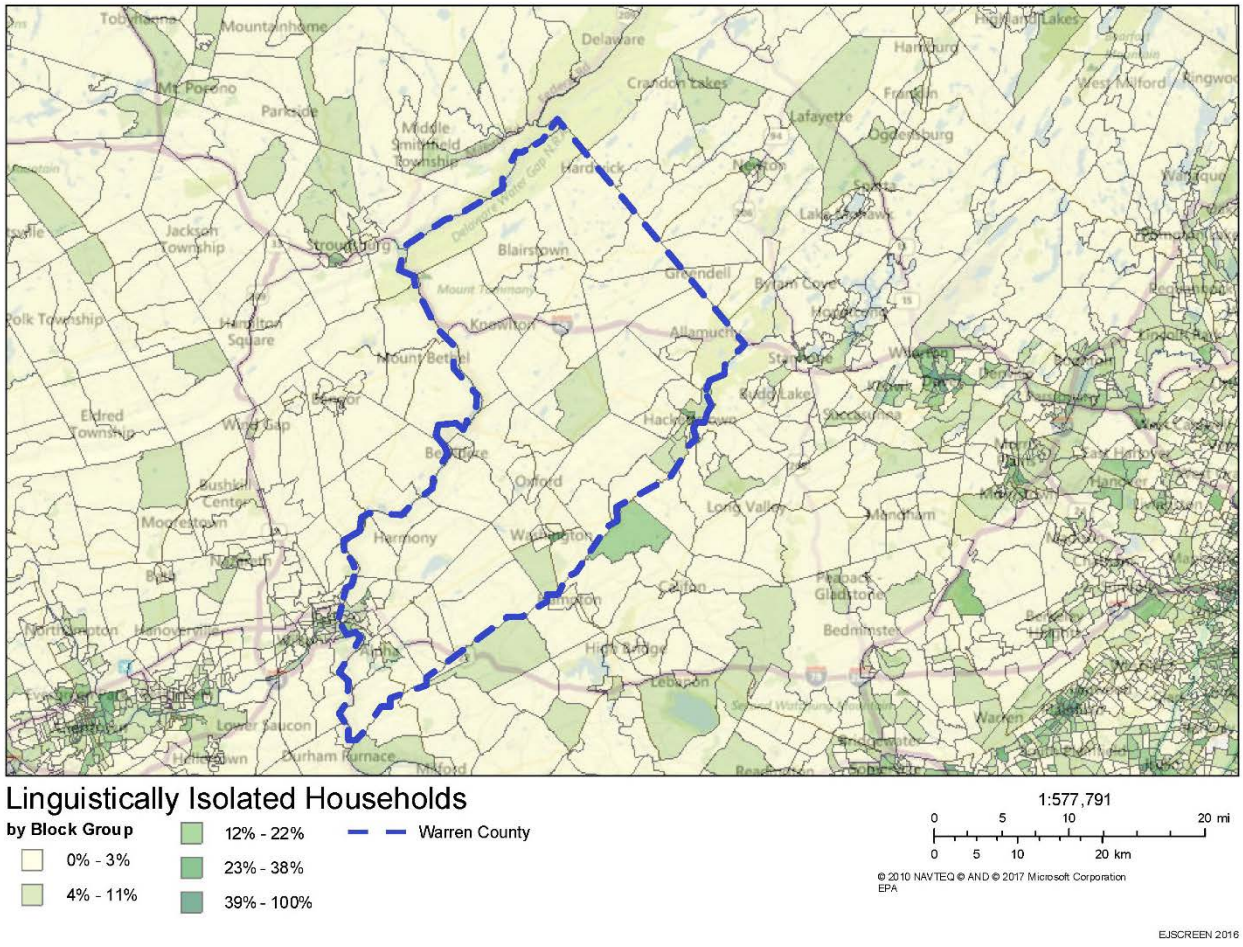


Linguistically Isolated

Table 3. Linguistically Isolated Households

Warren County	State	USA
3%	7%	5%

Figure 3. Linguistically Isolated Households within Warren County



Areas of EJ Populations in Warren County

After reviewing Warren County's overall EJ population, the data was analyzed at the block group and municipality level. Census data was utilized to identify the block groups with an EJ concentration that surpassed that of the county's. Once block groups with a high EJ concentration were identified, an analysis was performed for the municipalities in which those block groups are located. The tables list the block groups with highest EJ population percentages, by municipality. The charts illustrate EJ population percentages in the municipalities compared to Warren County.

Per census data, twelve municipalities in Warren County contain block groups with a comparatively high percentage of at least one EJ characteristic, compared to the county, state and the nation.

Poverty

Census data on poverty populations within the county was obtained from the 2014 ACS for block groups. The data collected provides information about poverty status in the past 12 months by household type.

Philipsburg Township and Washington Borough are the two municipalities with the highest concentration of poverty population (16% each) within Warren County, far surpassing the percentage of poverty population in the county (8%), the state (14%), and the nation (10%). Additionally, the two municipalities contain the highest quantity of block groups that surpass the county's percentage of poverty population.

Table 4 below shows a breakdown of block groups within Warren County that exceed the county's percentage of households living below the poverty level. Figure 4 illustrates what percentage of the county's households below poverty level are contained within the municipalities identified in Table 4. Refer to Appendix A for tables with data for all municipalities in Warren County.

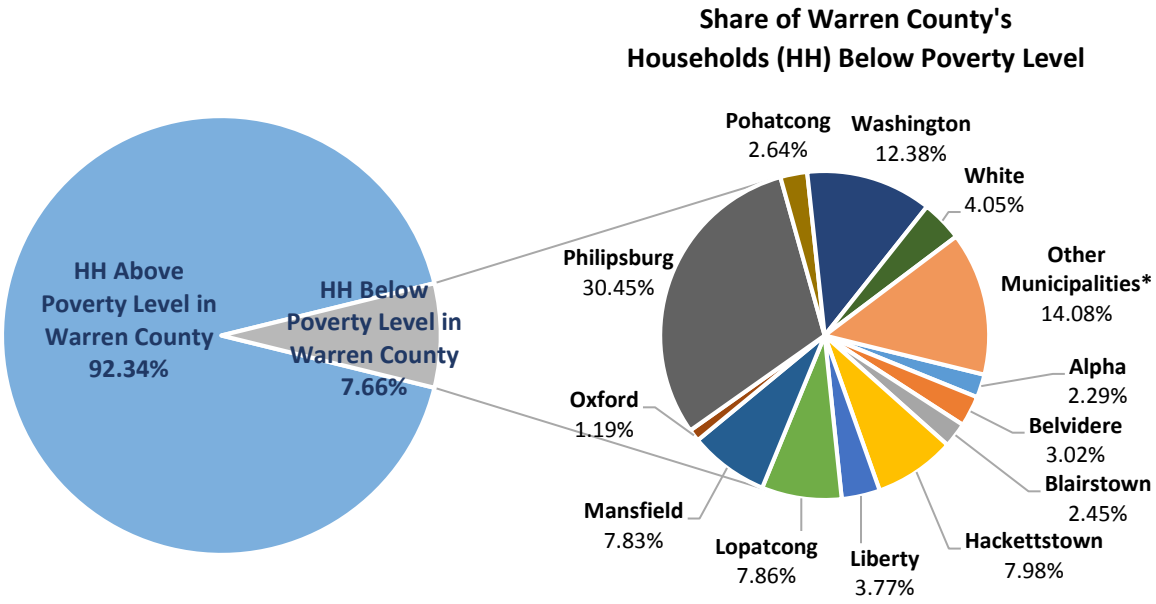
Table 4. Households Living Below Poverty Level, by Block Group

Municipality	Tract	Block Group	Households	Households Below Poverty Level	% Households Below Poverty Level	Share of County's Households Below Poverty Level
Alpha Borough	324	2	573	49	8.55%	1.54%
Belvidere Town	317	3	274	41	14.96%	1.29%
Belvidere Town	317	1	439	41	9.34%	1.29%
Blairstown Township	311.01	2	599	65	10.85%	2.04%
Town of Hackettstown	314.02	3	273	54	19.78%	1.70%
Town of Hackettstown	314.02	2	481	74	15.38%	2.33%
Town of Hackettstown	314.02	4	529	44	8.32%	1.38%
Liberty Township	312	6	372	41	11.02%	1.29%
Liberty Township	312	5	734	79	10.76%	2.48%
Lopatcong Township	322	3	818	136	16.63%	4.27%
Lopatcong Township	322	4	828	114	13.77%	3.58%
Mansfield Township	315	4	343	46	13.41%	1.45%
Mansfield Township	315	5	1,607	162	10.08%	5.09%
Mansfield Township	315	1	459	41	8.93%	1.29%

Municipality	Tract	Block Group	Households	Households Below Poverty Level	% Households Below Poverty Level	Share of County's Households Below Poverty Level
Oxford Township	316.02	2	285	24	8.42%	0.75%
Phillipsburg	309	2	323	134	41.49%	4.21%
Phillipsburg	309	1	419	104	24.82%	3.27%
Phillipsburg	307	1	293	68	23.21%	2.14%
Phillipsburg	307	4	504	113	22.42%	3.55%
Phillipsburg	306	1	654	118	18.04%	3.71%
Phillipsburg	307	3	568	100	17.61%	3.14%
Phillipsburg	308	2	840	133	15.83%	4.18%
Phillipsburg	306	2	454	53	11.67%	1.67%
Phillipsburg	306	3	685	57	8.32%	1.79%
Pohatcong Township	323	1	163	20	12.27%	0.63%
Pohatcong Township	323	3	313	29	9.27%	0.91%
Washington Borough	320	4	580	174	30.00%	5.47%
Washington Borough	320	5	589	83	14.09%	2.61%
Washington Borough	320	2	508	61	12.01%	1.92%
Washington Borough	320	1	501	52	10.38%	1.63%
White Township	316.01	3	1,179	110	9.33%	3.46%

Warren County	41,548	3,182	7.66%

Figure 4. Comparison of Households Living Below Poverty Level



*Includes Warren County's households living below poverty level within all other municipalities in the County, which were not identified as containing a block group with exceedingly high EJ concentration

Minority Population

Data on minority populations in Warren County was obtained from the 2010 Decennial Census for block groups. Minority population was defined as any population that did not identify as only white, per census data.

There are six municipalities with a minority percentage that exceeds Warren County's, all of which correspond to the block groups that were identified as having a high minority population percentage. Hackettstown is the municipality with the highest percentage of minority population (24%), closely followed by Phillipsburg (23%), both are significantly higher compared to the county's percentage (16%) but lower than the state (42%) and the nation (37%).

Table 5 shows a breakdown of the block groups with minority population percentages that exceed the county's threshold. Figure 5 details the racial composition for the municipalities identified in Table 5. Refer to Appendix A for tables with minority data for all municipalities in Warren County.

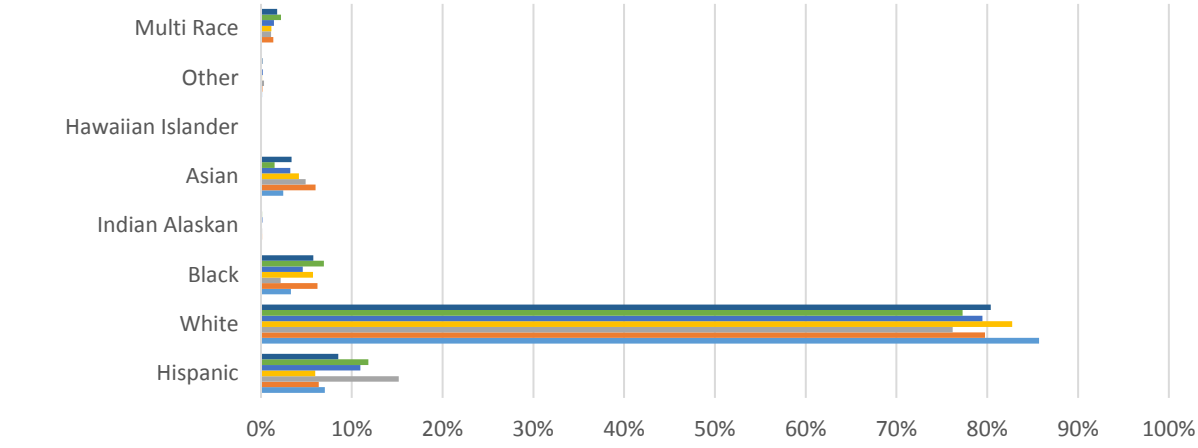
Table 5. Minority Population

Municipality	Tract	Block Group	Total Pop.	Minority Pop.	Hispanic	White	Black	Indian Alaskan	Asian	Hawaiian Islander	Other	Multi Race	% Minority Pop.	Share of County's Minority Pop.
Greenwich Township	321.02	1	3,256	966	281	2,290	303	4	310	1	7	60	29.67 %	6.22 %
Lopatcong Township	322	3	1,403	305	79	1,098	129	1	71	0	4	21	21.74 %	1.96 %
Lopatcong Township	322	2	2,755	564	188	2,191	169	1	168	1	5	32	20.47 %	3.63 %
Mansfield Township	315	4	835	212	77	623	98	6	13	0	4	14	25.39 %	1.37 %
Mansfield Township	315	5	3,545	1,087	622	2,458	191	5	196	0	10	63	30.66 %	7.00 %
Phillipsburg	309	1	945	340	182	605	90	1	31	1	2	33	35.98 %	2.19 %
Phillipsburg	309	2	1,123	353	194	770	109	3	8	0	0	39	31.43 %	2.27 %
Phillipsburg	306	1	1,278	361	145	917	137	4	27	5	2	41	28.25 %	2.32 %
Phillipsburg	307	1	774	211	136	563	43	0	7	0	0	25	27.26 %	1.36 %
Phillipsburg	307	4	1,546	415	230	1,131	145	1	8	1	1	29	26.84 %	2.67 %
Phillipsburg	307	3	1,434	353	211	1,081	105	1	13	1	3	19	24.62 %	2.27 %
Phillipsburg	307	2	1,267	287	163	980	82	1	25	0	1	15	22.65 %	1.85 %
Phillipsburg	306	2	1,144	237	135	907	51	0	18	0	2	31	20.72 %	1.53 %
Phillipsburg	308	2	1,698	313	128	1,385	126	1	13	0	0	45	18.43 %	2.02 %

Municipality	Tract	Block Group	Total Pop.	Minority Pop.	Hispanic	White	Black	Indian Alaskan	Asian	Hawaiian Islander	Other	Multi Race	% Minority Pop.	Share of County's Minority Pop.
Town of Hackettstown	314.02	3	742	291	234	451	11	1	27	0	3	15	39.22 %	1.87 %
Town of Hackettstown	314.01	1	3,090	611	298	2,479	49	1	216	0	8	39	19.77 %	3.94 %
Town of Hackettstown	314.01	2	1,500	507	426	993	19	3	41	0	11	7	33.80 %	3.27 %
Town of Hackettstown	314.02	1	855	199	164	656	9	0	9	0	4	13	23.27 %	1.28 %
Town of Hackettstown	314.02	5	427	88	44	339	8	2	29	0	4	1	20.61 %	0.57 %
Town of Hackettstown	314.02	4	1,148	233	132	915	22	0	66	0	3	10	20.30 %	1.50 %
Town of Hackettstown	314.02	2	1,962	388	176	1,574	92	5	90	0	1	24	19.78 %	2.50 %
Washington Borough	320	4	1,028	232	125	796	66	1	19	1	2	18	22.57 %	1.49 %
Washington Borough	320	5	1,227	235	105	992	67	0	46	0	0	17	19.15 %	1.51 %
Washington Borough	320	1	1,883	464	165	1,419	123	1	126	0	4	45	24.64 %	2.99 %
Washington Borough	320	2	1,174	191	95	983	53	0	20	0	3	20	16.27 %	1.23 %

Warren County	108,692	15,527	7,659	93,165	3,592	107	2,642	19	140	1,368	14.29 %	

Figure 5. Comparison of Racial Composition



	Hispanic	White	Black	Indian Alaskan	Asian	Hawaiian Islander	Other	Multi Race
Washington Borough	8.50%	80.39%	5.76%	0.06%	3.36%	0.02%	0.14%	1.78%
Phillipsburg	11.82%	77.29%	6.94%	0.11%	1.48%	0.05%	0.10%	2.21%
Mansfield Township	10.94%	79.46%	4.60%	0.16%	3.21%	0.01%	0.21%	1.42%
Lopatcong Township	5.99%	82.73%	5.71%	0.10%	4.17%	0.01%	0.12%	1.16%
Town of Hackettstown	15.16%	76.17%	2.16%	0.12%	4.92%	0.00%	0.35%	1.12%
Greenwich Township	6.37%	79.76%	6.21%	0.12%	6.00%	0.04%	0.14%	1.35%
Warren County	7.05%	85.71%	3.30%	0.10%	2.43%	0.02%	0.13%	0.00%

Linguistically Isolated

Census data on linguistically isolated households in Warren County was obtained from the 2014 ACS for block groups. Linguistically isolated households were identified as those where all members 14 years of age and over speak English less than “very well.”

Hackettstown has the highest overall percentage of linguistically isolated households (9%) and Mansfield has the second highest percentage (7%). Phillipsburg and Liberty both contain block groups with a high concentration of linguistically isolated households, and overall both municipalities have a percentage (3% and 4%, respectively) comparable to Warren County (3%) but lower compared to the state (7%) and the nation (5%).

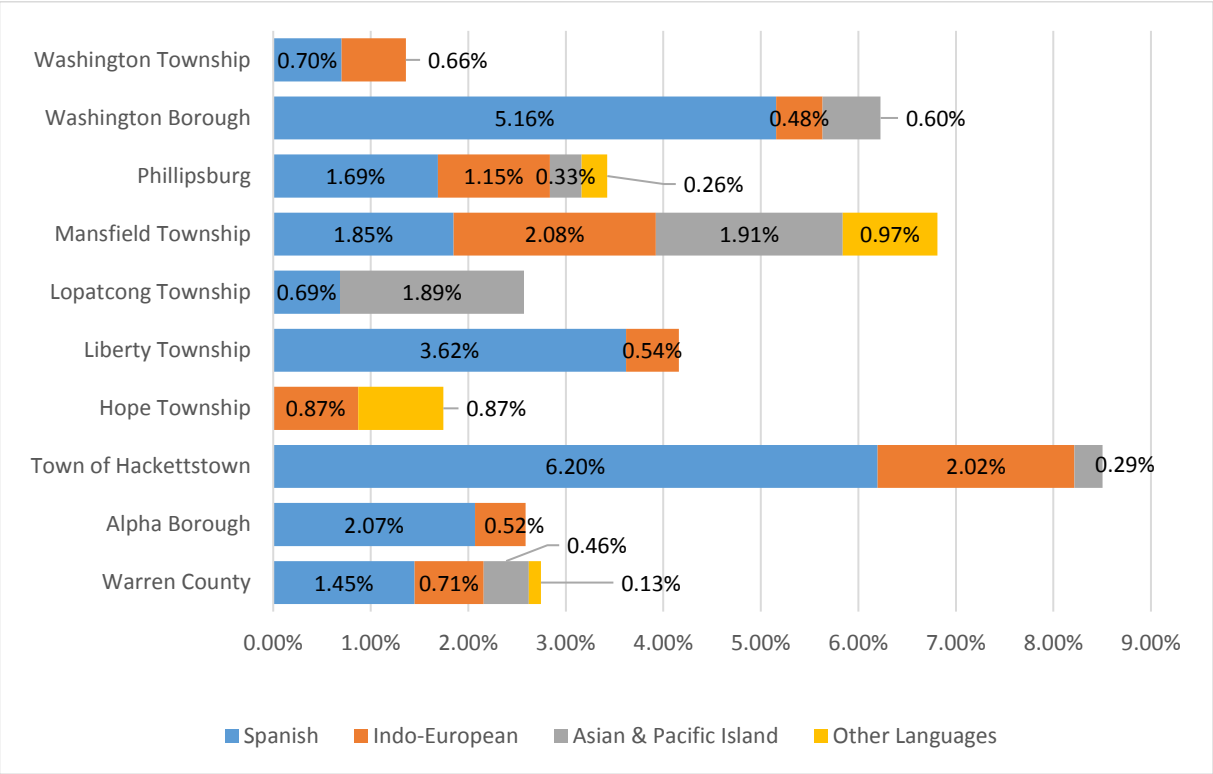
Table 6 shows a breakdown of block groups in the county containing a linguistically isolated household percentage that exceeds the county’s percentage. Figure 6 illustrates a breakdown of linguistically isolated households by household language for the municipalities identified in Table 6. Refer to Appendix A for tables with linguistically isolated households for all municipalities in Warren County.

Table 6. Linguistically Isolated Households

Municipality	Tract	Block Group	Households	Linguistically Isolated Households	% Linguistically Isolated Households	Share of County's Linguistically Isolated Households
Alpha Borough	324	1	393	25	6.36%	2.19%
Hackettstown Town	314.02	3	273	25	9.16%	2.19%
Hackettstown Town	314.02	4	529	41	7.75%	3.59%
Hackettstown Town	314.02	2	481	35	7.28%	3.07%
Hackettstown Town	314.01	1	1,183	46	3.89%	4.03%
Hackettstown Town	314.02	5	210	7	3.33%	0.61%
Hackettstown Town	314.01	2	544	141	25.92%	12.36%
Hope Township	312	4	270	9	3.33%	0.79%
Liberty Township	312	5	734	46	6.27%	4.03%
Lopatcong Township	322	3	818	29	3.55%	2.54%
Lopatcong Township	322	5	225	39	17.33%	3.42%
Mansfield Township	315	2	378	41	10.85%	3.59%
Mansfield Township	315	5	1,607	159	9.89%	13.94%
Phillipsburg	309	1	419	66	15.75%	5.78%
Phillipsburg	309	2	323	26	8.05%	2.28%
Phillipsburg	307	3	568	38	6.69%	3.33%
Phillipsburg	306	1	654	36	5.50%	3.16%
Phillipsburg	306	3	685	34	4.96%	2.98%
Washington Borough	320	4	580	145	25.00%	12.71%
Washington Township	319	3	322	17	5.28%	1.49%

Warren County	41,548	1,141	2.75%

Figure 6. Comparison of Linguistically Isolated Households



Summary

There are five municipalities that surpass the county's EJ threshold across the three EJ characteristics included in this analysis – Lopatcong Township, Mansfield Township, Phillipsburg, Hackettstown, and Washington Borough. Alpha Borough and Liberty Township both surpassed the County's percentage of poverty and linguistically isolated populations. As such, care needs to be taken to ensure efforts are made to gain meaningful input to the project alternatives from the EJ populations within the County. Additionally, the transportation recommendations must be evaluated to avoid disproportionate or adverse impacts to the EJ populations.

Appendix A: Census Data for Warren County Municipalities

Households Living Below Poverty Level, by Municipality

Municipality	Households	Households Below Poverty Level	% Households Below Poverty Level	Share of County's Households Below Poverty Level
Allamuchy Township	2,017	73	3.62%	2.29%
Alpha Borough	966	73	7.56%	2.29%
Belvidere Town	1,106	96	8.68%	3.02%
Blairstown Township	2,068	78	3.77%	2.45%
Franklin Township	1,166	28	2.40%	0.88%
Frelinghuysen Township	830	27	3.25%	0.85%
Greenwich Township	1,755	33	1.88%	1.04%
Hackettstown Town	3,469	254	7.32%	7.98%
Hardwick Township	528	14	2.65%	0.44%
Harmony Township	947	28	2.96%	0.88%
Hope Township	688	27	3.92%	0.85%
Independence Township	2,328	114	4.90%	3.58%
Knowlton Township	1,092	36	3.30%	1.13%
Liberty Township	1,106	120	10.85%	3.77%
Lopatcong Township	2,917	250	8.57%	7.86%
Mansfield Township	3,083	249	8.08%	7.83%
Oxford Township	998	38	3.81%	1.19%
Phillipsburg	6,101	969	15.88%	30.45%
Pohatcong Township	1,176	84	7.14%	2.64%
Washington Borough	2,521	394	15.63%	12.38%
Washington Township	2,428	68	2.80%	2.14%
White Township	2,258	129	5.71%	4.05%

Warren County	41,548	3,182	7.66%

Municipalities containing block groups with an EJ population higher than the County average.

Minority Population, by Municipality

Municipality	Total Pop.	Minority Pop.	Hispanic	White	Black	Indian Alaskan	Asian	Hawaiian Islander	Other	Multi Race	% Minority Pop.	Share of County's Minority Pop.
Allamuchy Township	4323	443	194	3880	75	5	118	1	4	46	10.25%	2.85%
Alpha Borough	2369	254	125	2115	55	0	36	0	1	37	10.72%	1.64%
Belvidere Town	2681	187	97	2494	38	2	21	0	0	29	6.98%	1.20%
Blairstown Township	5967	409	226	5558	63	5	68	0	3	44	6.85%	2.63%
Franklin Township	3176	289	122	2887	47	3	74	0	4	39	9.10%	1.86%
Frelinghuysen Township	2230	105	57	2125	14	0	12	0	3	19	4.71%	0.68%
Greenwich Township	5712	1156	364	4556	355	7	343	2	8	77	20.24%	7.45%
Hackettstown Town	9724	2317	1474	7407	210	12	478	0	34	109	23.83%	14.92 %
Hardwick Township	1696	101	67	1595	14	0	11	0	0	9	5.96%	0.65%
Harmony Township	2667	77	35	2590	18	5	5	0	0	14	2.89%	0.50%
Hope Township	1952	146	80	1806	23	0	31	0	1	11	7.48%	0.94%
Independence Township	5662	575	307	5087	64	4	126	4	10	60	10.16%	3.70%
Knowlton Township	3055	209	111	2846	27	9	28	0	5	29	6.84%	1.35%
Liberty Township	2942	227	122	2715	30	2	41	0	6	26	7.72%	1.46%
Lopatcong Township	8014	1384	480	6630	458	8	334	1	10	93	17.27%	8.91%
Mansfield Township	7725	1587	845	6138	355	12	248	1	16	110	20.54%	10.22 %
Oxford Township	2514	198	95	2316	40	0	38	0	1	24	7.88%	1.28%
Phillipsburg	14950	3395	1767	11555	1037	16	222	8	15	330	22.71%	21.87 %
Pohatcong Township	3339	240	116	3099	53	0	30	0	3	38	7.19%	1.55%
Washington Borough	6461	1267	549	5194	372	4	217	1	9	115	19.61%	8.16%
Washington Township	6651	648	292	6003	152	9	126	0	4	65	9.74%	4.17%
White Township	4882	313	134	4569	92	4	35	1	3	44	6.41%	2.02%

Municipality	Total Pop.	Minority Pop.	Hispanic	White	Black	Indian Alaskan	Asian	Hawaiian Islander	Other	Multi Race	% Minority Pop.	Share of County's Minority Pop.
Warren County	108692	15527	7659	93165	3592	107	2642	19	140	1368	14.29%	

Municipalities containing block groups with an EJ population higher than the County average.

Linguistically Isolated Households, by Municipality

Municipality	Households	Linguistically Isolated Households	% Linguistically Isolated Households	Share of County's Linguistically Isolated Households
Allamuchy Township	2017	0	0.00%	0.00%
Alpha Borough	966	25	2.59%	2.19%
Belvidere Town	1106	7	0.63%	0.61%
Blairstown Township	2068	13	0.63%	1.14%
Franklin Township	1166	0	0.00%	0.00%
Frelinghuysen Township	830	0	0.00%	0.00%
Greenwich Township	1755	4	0.23%	0.35%
Town of Hackettstown	3469	295	8.50%	25.85%
Hardwick Township	528	6	1.14%	0.53%
Harmony Township	947	4	0.42%	0.35%
Hope Township	688	12	1.74%	1.05%
Independence Township	2328	23	0.99%	2.02%
Knowlton Township	1092	18	1.65%	1.58%
Liberty Township	1106	46	4.16%	4.03%
Lopatcong Township	2917	75	2.57%	6.57%
Mansfield Township	3083	210	6.81%	18.40%
Oxford Township	998	4	0.40%	0.35%
Phillipsburg	6101	209	3.43%	18.32%
Pohatcong Township	1176	0	0.00%	0.00%
Washington Borough	2521	157	6.23%	13.76%
Washington Township	2428	33	1.36%	2.89%
White Township	2258	0	0.00%	0.00%

Warren County	41548	1141	2.75%

Municipalities containing block groups with an EJ population higher than the County average.

Technical Memorandum 3.1:
Previous Studies Summaries

Warren County Transportation Technical Study Update

MAY 2018

FINAL

PREVIOUS STUDIES SUMMARY

The following sections provide an overview of the previously completed studies relevant to the Warren County Transportation Technical Study Update.

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

The various studies summarized in this technical memorandum 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 – plans and studies multimodal mobility and improvement programs, including the Morris Canal, regional transit, and pedestrian safety in Phillipsburg
- Corridor and Intersection Studies – many of 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

1. 2005 Warren County Strategic Growth Plan (2005)

Overview

The Warren County Strategic Plan was prepared to provide policy guidance for local plans, guide future investment in the transportation network, and to ensure that adequate public facilities exist to accommodate growth in the County. The Strategic Plan was used to revise Warren County General Development Plan of 1979 as well as the Transportation Plan of 1984. This study was completed in 2005 and was funded in part by New Jersey Office of Smart Growth. The report was also financed in part by USDOT, NJTPA, FTA and FHWA.

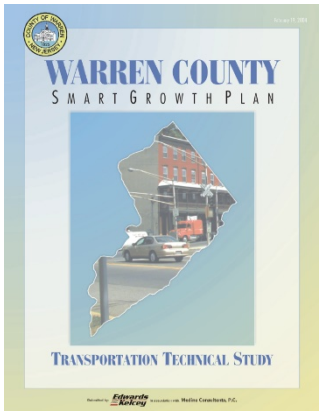
Methods

The Strategic Plan was developed by the Warren County Planning Department with the assistance of a Steering Committee. The steering the committee members were representatives of local government, environmental, agricultural, and business communities. In addition, a series of public workshops and focus groups were conducted for the plan. The key steps in the planning process included; identify key issues, develop goals and indicators, document existing conditions, forecast future conditions under existing zoning, create draft alternative land use visions, forecast future conditions under alternative visions, refine alternative vision and identify implementation recommendations.

Findings and Recommendations

The Strategic Plan provides recommendations for land use, transportation, and water quality. The transportation recommends include site access management strategies, restoring passenger service for the Lackawanna Cut-Off study, Washington Secondary and extension of the Raritan Valley Line. The Plan recommends creation of Transportation Development Districts and Transportation Enhancement Districts in the County. For detailed recommendations in the study please refer to the recommendations matrix appendix.

2. 2004 Transportation Technical Study (2004)



Overview

This study involved the creation of a land use and transportation model to test the impacts of land use decisions on the roadway network, and was performed in coordination with the ongoing Smart Growth Plan. This study was completed in 2004 and was funded in part by New Jersey Office of Smart Growth. The report was also financed in part by USDOT, NJTPA, FTA and FHWA.

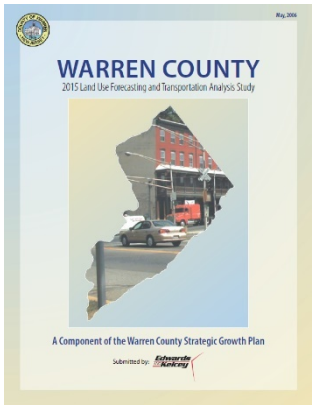
Methods

The Technical Study examined the future cumulative transportation impacts of the current zoning in all 22 municipalities as well as for the alternative land use scenarios. For this study the County's transportation model was updated to year 2002 conditions and enhanced, and a buildout analysis was undertaken which compared the existing zoning regulations with a centers-based land use scenario. Both buildout scenarios were based on zoning densities, environmental constraints and land requirements for roads and utilities.

Findings and Recommendations

The results of the analysis showed that congestion on the County's transportation network increased significantly in both scenarios, but was significantly worse under the existing zoning. The study recommends that measures be taken to preserve the capacity of the transportation network to accommodate existing and future development. Transportation planning recommendations include smart corridor planning, transit improvements, site design, access management, transportation control measures, and transportation financing districts. Detailed recommendations for this study are available in the recommendations matrix in the Appendix.

3. Warren County 2015 Land Use Forecasting and Transportation Analysis Study (2006)



Overview

This study was structured to test and analyze various transportation system improvement projects within Warren County. The analysis procedure makes use of the Warren County Travel Demand Model to analyze the transportation/land use system in the year 2015. The year 2015 was chosen as the timeframe for this study to provide an interim year for planning purposes. This study was completed in May 2006 and was funded by NJTPA.

The Warren County Travel Demand Model includes all significant roadways within Warren County, the tolled and free Delaware River crossings, and

portions of neighboring counties. It is capacity-sensitive, and represents travel during the PM (evening) peak hour.

Forecasting for Land Use and demographics for the year 2015 were developed by the WCDoP at the Traffic Analysis Zones (TAZ) level. Warren County Municipal Planning Boards were asked to review and comment on the proposed estimates provided by NJTPA. The forecasting effort analyzed building permit data, zoning, historic trends, and specific sites within each municipality.

There were 10 roadway improvement alternatives tested, including:

- Widening of NJ 31 from Hunterdon County to Washington Borough
- NJ 57/CR 519 Intersection Improvements
- Center Street Extension to US 22
- Center Street Extension from US 22 to CR 519
- Stryker's Road Improvements
- SR 57 Widening
- CR 638 Extension
- Cat Swamp Road/Water Street (Between CR 517 & US 46)
- Realignment of CR 519 West of Hope
- CR 519 Access Management

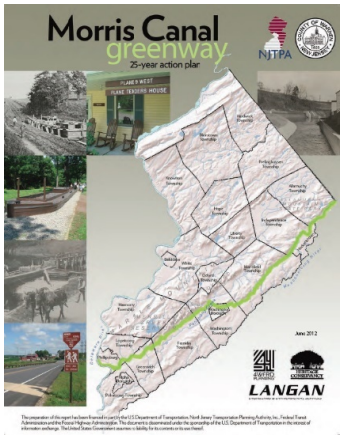
Each alternative was tested separately in the model for its stand-alone utility. After the ten scenarios, had been analyzed, an additional scenario that contained every proposed alternative was run to determine the cumulative system-wide impacts. These, along with the base model system to which each was compared, totaled 12 sets of model runs. For the analysis of the alternatives the model parameters were defined by WCDoP which included speed, capacity, and endpoints.

Findings and Recommendations

Based on the results from the alternatives analysis, the alternatives with the most beneficial impacts on regional and sub-regional traffic movements are Alternative 6 (SR 57 Widening) and Alternative 10 (CR 519 Access Management). These two alternatives are corridor wide improvements rather than spot improvements on SR 57 and CR 519, which are major arterials in the County.
Detailed alternative recommendations can be found in the recommendations matrix in the Appendix.

4. Warren County Morris Canal 25 Year Action Plan (2012)

Overview



The Warren County Morris Canal 25 Year Action Plan will continue the current efforts to establish a greenway and multi-use trail linking major parts of Warren County. The Plan envisions to preserve a valuable historic resource and foster public interest in the Morris Canal. It will provide recreational opportunities for a large audience and guidance for land-use decisions. The plan was funded by NJTPA and completed in June 2012.

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. It is a "road map" but not one meant to be static in the sense of a permanent map. Rather, it will be a living document for the County to revisit during the next 25 years as the canal greenway is implemented. The action in the study examines ways to provide safe pedestrian and bicycle access along the canal greenway while promoting historic awareness.

Findings and Recommendations

The recommendations for this plan are divided into two main categories: segment recommendations and greenway-wide recommendations. Greenway wide recommendations were organized into several strategies including: resource preservation, school educations, economic development, greenway operations, land use policy public participation and organizational strategies.

Alternate routes are identified to bypass inaccessible sections of the canal. Spur routes are identified to access public and private destinations beyond the canal greenway including other trail systems, historic sites and other public attractions. These destinations may also include bus stops and rail stations, residential neighborhoods, business districts, community facilities such as schools, government offices, and other major employment and activity centers. The plan describes general project implementation strategies, with more detailed information to facilitate project funding, design and approval efforts in realizing the project goals.

5. Route 57/46 Connector Study (2003)

Overview

The Warren County Department of Planning retained Edwards and Kelcey to perform this study as a component of the Warren County Strategic Growth Plan. This study was completed in 2003 and was funded by NJTPA.

Methods

For this study origin-destination survey was performed to assess the projected demand for a connection between N.J. Route 57 and U.S. Route 46. The Route 57/46 Connector Study analyzed two scenarios in two years. A simulation of existing conditions was calibrated to year 2003 conditions. No-Build and Build simulations were run for the year 2012. The Build model includes the Route 57/46 connector. Both years and scenarios were run for AM, PM, and Weekend time periods. An October 2000 study, The Hackettstown Bypass Corridor Study, was performed by Urbitran/Garmen. This study analyzed the same

corridor in Hackettstown and Washington Township, Morris County. The purpose of the Route 57/46 Connector Study is to verify the results of this previous study and to update the analysis.

Findings and Recommendations

The proposed Route 57/46 connector would fill a significant missing link in the arterial system. N.J. Route 57 terminates at a traffic signal approximately 1 mile west of U.S. Route 46. The Route 57/46 connector would provide a direct through movement to traffic which currently must travel through two additional traffic lights and make three turning movements.

The Route 57/46 connector would support local economic development in the identified center of Hackettstown, which is a goal of the County Strategic Growth Plan. It would support the "smart growth" development of the Mountain Avenue section of Hackettstown by giving the town the opportunity to retrofit the strip commercial development pattern to one that is more pedestrian and bicycle compatible and is linked in form to Main Street. The current planning and zoning policies in place in Washington Township, Morris County, would be supported by the connector because the farmland that it would pass through is currently zoned for Office/Research. The OR zone could be built to complement the functional development pattern of the Hackettstown Center while providing a tax ratable to Washington Township and ensuring safe and efficient movement though the area. Additional benefits would be felt on both sides of the county border including the facilitation of efficient travel flow by eliminating the circuitous route that must be taken by motorists to access U.S. Route 46 from County Route 517, Mountain Avenue, and N.J. Route 57. The connector would provide better access and improve response times for emergency and police vehicles to incidents in the northwestern section of Washington Township.

Three roadway segments would be most relieved by the proposed connector:

- Mountain Avenue between N.J. Route 57 and East Avenue
- East Avenue between Mountain Avenue and U.S. Route 46
- U.S. Route 46 between East Avenue and the Route 57/46 connector

Additionally, there would be a reduction of truck traffic on Mountain Avenue between N.J. Route 57 and U.S. Route 46 and U.S. Route 46 between Mountain Avenue and the Route 57/46 connector by eliminating the need for truck traffic to negotiate the Mountain Ave/U.S. Route 46/ Willow Grove St. intersection in Hackettstown.

6. Route 57 Corridor Plan (2006)

The Route 57 Corridor Plan was started to examine various alternatives that would preserve the rural nature of Route 57 from Phillipsburg to Hackettstown, one of the last remaining state highways with a rustic character. The 18-month planning effort examined future development and transportation alternatives for the twenty-mile, two-lane rural roadway through Warren County. The study was completed in 2006 and was funded by New Jersey Department of Transportation.

The study built upon related efforts to promote a smart growth and context sensitive approach to future development along the corridor. The outcome of the plan was a recommended development scenario for the region that would focus growth in and around existing urban centers, protecting agricultural land and views between the centers, while minimizing points of congestion along the corridor. This scenario also conserves an estimated 7,000 acres of land.

The Route 57 Corridor Plan was developed through a collaborative planning process that engaged key stakeholders, technical experts and community residents alike. 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 that are common to the corridor. This subset of demonstration plans includes the planning contexts of village/farm preservation, borough/township, transitional areas, small villages and the unique challenges for each context outlined in further detail.

The Route 57 Implementation Toolkit was developed as a companion document to the Corridor Plan. The toolkit provides detailed information and resources, including suggested design guidelines and regulatory measures that municipalities can use to help implement the corridor plan. The Route 57 Corridor Plan and Implementation Toolkit were completed in 2006. The New Jersey Department of Transportation designated the Route 57 corridor as a New Jersey Scenic Byway in February 2009.

7. Route 31 Corridor Study (2000)

Overview

The N.J Route 31/U.S. Route 46 Corridor is a heavily traveled road, and is of vital importance to northwestern New Jersey. The objective of the Route 31 corridor study is to recommend improvements for Route 31/46 Corridor between I078 and I-80 that will mitigate safety problems and ensure that traffic can operate at acceptable levels for both existing case and under future conditions. This study was completed in November 2000 and was developed in collaboration with Warren County Planning Department and Hunterdon County Planning Board.

Methods

This study includes a detailed traffic analysis, recommendations and analysis of 11 intersections. The study methodology included the following steps:

- Evaluation and analysis of 1999 traffic operations for the 11 intersections under study
- Analysis of crashes on the Route 31/46 corridor
- Traffic projections for year 2015
- Evaluation of the need for a new alignment of Route 31

Findings and Recommendations

Based on the analysis of existing and future traffic operations for the Route 31/46 corridor between I-78 and I-80, the following conclusions were made:

- Long-Term Improvements:
    - Widen Route 31 to four lanes, divided with shoulders from County Route 513 to the border of Glen Gardner
    - Widen Route 31 to five lanes (two through lanes per direction, plus a two-way left turn lane), undivided, with shoulders from Warren County Border to the Washington Borough Border
    - Widen Route 31 to three lanes (one through lane per direction, plus a two-way left turn lane), undivided, with shoulders from Warren County border to the Washington Borough Border

    - Optimize the signal timings at both Route 31 and County Route 513 intersections when Warren ted
- Short-Term Improvements
    - Widen Route 31 to four lanes, undivided, without shoulders from the Glen Gardner Border to Warren County Border
    - Initiate an access management plan to consolidate retail driveway access in Washington Township between Asbury-Anderson Road and Washington Borough
    - Initiate an access management plan to consolidate retail driveway access in Washington Township between Jackson Valley Road and Washington Borough

Detailed recommendations can be found in recommendations matrix appendix.

8. US 22 Corridor Improvement Plan (2009)

Overview

The US Route 22 Corridor Improvement Plan (The 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 was 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 efficient traffic flow and operation currently or in the future. The US Route 22 Corridor Improvement Plan was developed to alleviate the expected increase in traffic congestion, as corridor traffic volumes increase over time.

To understand the study area issues a background analysis was conducted which included data collection for socioeconomic conditions, environmental screening, documenting existing roadway conditions, and review of previous studies. For this study five Technical Advisory Committee (TAC) Meetings, two public open house meetings, a visioning workshop and a commuter survey were used to communicate with the residents about this study.

Findings and Recommendations

In the Corridor Plan, the existing and future traffic conditions have been analyzed, traffic mitigation has been recommended and planning has been developed to address the multi-modal transportation needs along the US Route 22 corridor. These improvements are summarized below:

- Pedestrian Improvements
    - Replacement of deteriorating sidewalk and completion of _missing sidewalk links .
    - Install Pedestrian bridges.
        - New bridges at Warren Street and Roseberry Street across US Route 22
        - Retain existing pedestrian bridge at Morris Street across US Route 22.
    - Provide access to new High School with comprehensive sidewalk plan.
- Bicycle Facility Improvements
    - Provide bicycle access to the new High School using Roseberry Street, Center Street, Third Street and other connections crossing US Route 22.
    - Provide bicycle access on proposed pedestrian bridges at Warren Street and Roseberry Street.
    - Develop on-road bike lanes on Route 22 east of Route 57 interchange.
    - Pursue funding to prepare Comprehensive Bicycle Facilities Study.
- Transit Improvements

- Expansion of shuttle service within the US Route 22 subject to employer feasibility assessment.
- Extension of the NJTransit Raritan Valley Rail Line.
- Implementation of express bus system.
- Develop shuttle bus services at select rail stations and activity centers.
- Develop a special purpose interchange transit hub off I-78 to support multi-modal use.
- Improve wayfinding signage to encourage park-and-ride and transit use.
- Expand multi-modal navigation tools to facilitate transit use.

Detailed recommendations for this study are available in the recommendations matrix.

9. I-78 Corridor Study (2007)

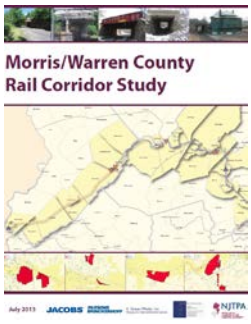
Overview

The NJTPA, in conjunction with the New Jersey Department of Transportation (NJDOT), New Jersey TRANSIT (NJ Transit), and the Lehigh Valley Planning Commission (LVPC) completed I-78 corridor study initiated in response to increasing levels of auto and truck traffic along Interstate 78. The study was completed in June 2007. The I-78 Corridor Transit Study assessed the need, impact and feasibility of various transit strategies along the I-78 corridor between Lehigh County, Pennsylvania to the west and Somerset County, New Jersey to the east. The study is being followed 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 the growth 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 that include strategies such as: new and restructured bus routes, bus preferential treatments, and new and expanded park and ride facilities. These recommendations were presented at a series of public meetings in May 2007.

Public input and coordination with elected officials and agency staff were integral to the success of the study. A Project Steering Committee guided this study effort. The Steering Committee consisted of Freeholders and representatives from the local counties, NJDOT, and NJ Transit, as well as other transportation agencies. A web-based survey was developed to capture public feedback concerning travel issues related to the I-78 Corridor. Public feedback is instrumental in determining the transportation improvements needed for the corridor. The web-based survey was completed in April, 2006, with over 5,000 responses from residents and commuters from both New Jersey and Pennsylvania.
The study recommendations included the following the categories:
• **Transit Improvements:** Expansion and enhancement of bus transit and rail passenger rail service;
• **Park-and-Ride Improvements** – Improvements and expansion of existing park-and-ride facilities, and development of new sites
• **Transit-Ready Corridor and Access Treatments** – Actions to support efficient movement of buses along the US Route 22 corridor, easing flow through congested

areas and facilitating access to and from bus and rail lines
• **Highway Improvements** – Improvements to address key congestion and access issues that affect transit service. Highway improvements are selected to resolve specific hot spots in the corridor; and
• **Land Use and Travel Demand Management** – Actions and policies to encourage development patterns and support services that would reduce dependence on single occupant auto travel.
Detailed recommendations for this study are available in the recommendations matrix.

10. Morris-Warren Freight Rail Study (2013)



Overview

Morris-Warren Freight Rail Study examines the infrastructure and operational improvements necessary to accommodate taller and heavier (263K to 286K) railcars. This was in line with NJTPA's Regional Transportation Plan 2035 that supports investments in rail infrastructure that increase weight capacity from 263K to 286K cars and eliminate overhead height restrictions throughout the NJTPA region. This study was conducted by NJTPA for the primary rail freight corridors serving Morris and Warren Counties and was funded by USDOT, NJTPA, FTA and FHA. This study was completed in July 2013.

Methods

A Technical Advisory Committee was created at the beginning of the study process for technical support, agency/ stakeholder perspective, and to identify constraints and potential improvements. This study collected dimensional and operational data and physical infrastructure conditions along the Corridor. It identified vertical and horizontal clearances and weight constraints along the corridor and assessed economic impacts and potential for new development in Warren and Morris Counties. To gauge potential growth in the use of freight rail, existing and potential users were also interviewed as part of the study.

Findings and Recommendations

The study identified a total of eight locations where infrastructure improvements are needed to accommodate 286K Plate "F" railcars. Two of these eight locations represent vertical constraints and the remaining six were structurally insufficient to accommodate today's heavier railcars. Each of these eight constraints 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. Preliminary order of magnitude cost estimates was developed for comparison against the potential economic value of providing 286K Plate "F" service to existing and future businesses. It was estimated that the improvements to eliminate the two (2) vertical clearance constraints and the six (6) weight restrictions would cost between $18 and $30 million.

11. Raritan Valley Line Extension (2011)

Overview

The Central New Jersey/Raritan Valley Transit 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 of New Jersey and Pennsylvania and the eastern limit along the Raritan Valley Line in Bridgewater, New Jersey in Somerset County. Making transit more attractive would allow residents more travel choices and could 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 so that they can be 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 was funded by NJ TRANSIT.

Methods

A set of short, medium and long-term potential projects made up a Long List of 51 Alternatives that were evaluated. The list was developed based on a review of previous reports, internal NJ TRANSIT evaluation, and consultation with the Study's Technical Advisory Committee (TAC) and Community Liaison Committee (CLC). All proposals identified were included in the Long List, and were categorized by estimated implementation time-frame – Short-term (less than 5 years), Medium-term (5 to 10 years) and Long-term (over 10 years).
Bus services in the Long List include additional service to the Urban Core (Midtown and Downtown Manhattan and Jersey City, but not Newark) and to the Bridgewater/Somerville/Raritan area, where many work trips from the Study Area are destined. Rail services included in the Long List were the extensions of the NJ TRANSIT Morris and Essex Line (M&E) from Hackettstown to Phillipsburg, and the Raritan Valley Line (RVL) from High Bridge to Phillipsburg.

Findings and Recommendations

The Short 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.

The Short List bus alternative includes new express bus service to the Urban Core with a new park-and ride in Bloomsbury/Bethlehem and a second park-and ride in the area where the RVL crosses Route 22 in Clinton Township. A complimentary strategy to support new and existing bus services in congested conditions are the implementation of a bus shoulder bypass lane on I-78, which would allow buses to operate in the shoulder during instances where general traffic flow on I-78 is below 35 mph during weekday peak hours. The proposed eastbound shoulder running would extend along I-78 between the Raritan River Bridge in Clinton (MP15.54) and Rattlesnake Bridge Road (MP 27.11) and the proposed westbound shoulder running would extend between the I-78/I-287 Interchange (MP 30.65) and Rattlesnake Bridge Road (MP 27.11). The Short List rail alternatives include RVL extensions to three potential locations: Hampton, Bloomsbury/Bethlehem and Phillipsburg. A potential train storage yard site is included at the terminal point of each extension option. A new yard was established as a goal for extended service since the existing yard in Raritan is located 20 to 35 miles from the potential endpoints. Repositioning trains over such a great distance would drive up operating costs and present added service reliability risks. To support operations in this manner would likely require additional passing sidings/second track to provide the needed capacity.

12. Warren Heritage Scenic Byway Corridor Management Plan (2011)

Overview

This plan describes the special qualities of the Route 57 Scenic Byway which is a 19-mile two-lane roadway in Warren County, New Jersey. The byway runs through Greenwich Township, Franklin Township, Washington Borough, Washington Township and Mansfield Township to Hackettstown. This plan outlines strategies for preservation, enhancement, and interpretation of the corridor's unique resources. The plan sets forth a vision for the future of the byway, along with practical steps to make its special features more apparent and accessible 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 the New Jersey Department of Transportation (NJDOT). NJDOT provided funding for the preparation of this plan.

Findings and Recommendations

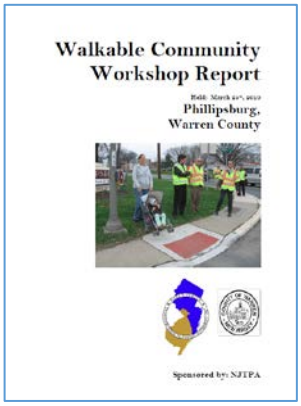
This plan identified goals and strategies for preserving and enhancing the corridor's unique qualities, improving access and transportation, developing a sign program, interpreting byway resources, and encouraging tourism. These actions will require coordination among a variety of organizations over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

The plan recommendation categories include historic and archaeological strategies, scenic resource strategies, cultural asset strategies, natural and recreation strategies, roadway and transportation strategies, signage, utility and site furnishing strategies, interpretive strategies, tourism and marketing strategies. These strategies are overall recommendations for the byway improvements. The recommendation details can be found in the recommendation matrix.

13. NJTPA Walkable Communities (Phillipsburg)

Overview

The North Jersey Transportation Planning Authority (NJTPA) conducts half-day walkable community workshops in municipalities throughout the NJTPA region designed to educate stakeholders and to identify barriers to walking and improve pedestrian safety in each of the identified communities. On March 25th, 2010, a Walkable Community Workshop was held to investigate conditions at and near the intersection of Roseberry Street and Route 22 in the Town of Phillipsburg, Warren County.



Methods

The workshop consisted of four parts: 1) an introduction of local stakeholders; 2) a presentation by a NJTPA facilitator on best practices of walkable communities; 3) a guided walking audit of the study area; and 4) small group sessions where recommendations for improvements were discussed and prioritized.

Participants of 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 within the NJTPA region. Roseberry Street is listed as a high crash segment within the study.

Findings and Recommendations

Five areas were identified in the walking audit for improvements. The areas include; Corliss Avenue to Route 22 along Roseberry Street, Intersection of Roseberry Street and Route 22, Route 22 to Heckman Street along Roseberry Street, Access between residential areas and destinations separated by Route 22 and Route 22.

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 Roseberry Street and Route 22 intersection.

14. Northwest New Jersey Bus Study (2010)

The Northwest New Jersey Bus Study was initiated in order 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 (See Figure ES-1) 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 & US 46). The study also fills a need identified in North Jersey Transportation Planning Authority (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 study was completed in 2010 and was funded by NJTPA.

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, not just traditional bus routes. Passenger and running way 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. The data was used to evaluate existing routes. Costs and benefits of the potential improvements were projected, and initial designs were developed for facilities.

The study was divided in to five tasks including; defining the study corridors, data collection, analysis and forecasting modelling, recommendations, and public outreach. The study focused on four corridors based on existing transit services, roadway corridors and development.

• *Sussex – Passaic Corridor* including corridors along NJ Routes 23, 94, US 202, CR 504/Hamburg Turnpike, CR 511/Ringwood Avenue, CR 515, CR 683/Newark-Pompton Turnpike).

• *Sussex – Morris Corridor* including corridors along NJ Routes 15, US 206, CR 616 & 517/Newton Sparta Road.
• *Morris County Corridor* including corridors along NJ Routes 10, 15, 23, US46, US 202 and I-80.
• *Morris-Warren Corridor* including corridors along US 46, NJ Route 57 [in Hackettstown/Mansfield], and I-80)

The study recommendations specific to Warren County include:
Need 1: Integrate private carriers and locally run services into the area's transit network through service and fare coordination and transit information concepts.

- **Warren County Route 57B (S32):** This no-cost concept would interline routes 57A and 57B and use the savings in layover time to provide a connection to the center of Hackettstown, rather than terminating the route at the Hackettstown Mall. This change is expected to increase ridership, but no formal estimate was made of the effect.

Need 2: Strengthen transit service along the major study area corridors

- **Lakeland 80 Extension from Budd Lake to Hackettstown (S33):** This concept would extend existing peak-period service from or to Budd Lake. The route would be extended a few miles, stopping in Hackettstown (US-46 and NJ-182) and then the Hackettstown Mall.

Need 3: Integrate private carriers and locally run services into the area's transit network through service and fare coordination and transit information concepts.

- **Wheels 973 Hackettstown – Convert to Linear Route (S31):** This concept would streamline the existing service by converting it to a linear route, increasing frequency on the most-used portion and providing on-demand service on the remaining portion of the existing loop route. The increased frequency is expected to increase ridership with no change in operating cost. Greater consensus on this concept among stakeholders is needed prior to implementation.

15. NJTPA Truck Rest Stop Study (2008 and 2011)

The North Jersey Transportation Planning Authority completed the North Jersey Truck Rest Stop Study in early 2008. The NJTPA North Jersey Truck Stop Study Refinement was completed in early 2010.

The NJTPA studies were 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 and 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 the identification of 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 some paradigm shifts. Policy/Institutional recommendations are aimed at addressing truck parking issues in relation to pertinent state and regional policies. Some policy recommendations from the study are listed below.

- **Secure Sites as a Necessary Land Use**: Recognize that truck parking is part of the public infrastructure, fulfilling an important public safety function.
- **Advance favorable federal legislation that promotes innovation and Public-Private Partnerships:** New Jersey should collaborate with Pennsylvania and other northeastern states to

advance a policy position on federal legislation. Freight is expected to gain significant attention in the next federal surface transportation reauthorization. Truck Parking should also be a major component of an anticipated national freight policy.

- **Pursue Alternative Fuels, Energy, and Environmental Opportunities**: Include a "green trucks" element as a pilot or demonstration program in the first site to be developed or expanded for truck parking.
- **Advance complementary land use approaches:** Focus truck parking expansion at existing sites that minimize conflicting land uses.

16. Route 57 / 182 / 46 Hackettstown Mobility Improvements Concept Development Study (2015)

The purpose of the CD Study is to develop intersection improvement concepts that will 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. The four intersections are mentioned below. The study was funded by New Jersey Department of Transportation and completed in 2015.

The four intersections are:

- Intersection of US 46 (MP 22.18) and East Avenue (Mount Olive Township and Washington Township, Morris County)
- Intersection of US 46 (MP 21.68) and NJ 182 (Mountain Avenue)/Willow Grove Street/Warren Street (Town of Hackettstown, Warren County)
- Intersection of US 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)

After investigating existing conditions at each project location, including substandard geometric conditions, high crash locations, drainage problem areas, and substandard structural features, opportunities for improvements were identified. Each location was further analyzed and several conceptual alternatives were developed to mitigate existing deficiencies at each location.

The preliminary preferred alternatives for each intersection are described below:

Site 1 Improvements: US 46 and East Avenue

The intersection of US 46 and East Avenue was identified as a high congestion location within the project area. The NJDOT Core Group selected Concept D as the PPA, but asked that the alternative be redesigned to increase the turn radius to an even greater extent. As a result, Concept D was advanced to a second stage to refine the concept. The PPA proposes to widen the curb radius on the SE quadrant of the intersection and revise the signal phasing to provide for a right turn overlap phase for the northbound East Avenue approach right turn onto US 46 eastbound. Additionally, traffic signals should be upgraded at the intersection to include 12 inch lenses and retroreflective backplates to improve conspicuity.

Site 2 Improvements: US 46 and NJ 182 (Mountain Avenue) / Willow Grove Street / Warren Street

The intersection of US 46 and NJ 182 (Mountain Avenue) / Willow Grove Street / Warren Street was identified as a high congestion location within the project area. The full intersection realignment was selected as the PPA, but due to the number of impacts to right-of-way, utilities, and drainage, the Core

Group requested that the design be revised to reduce the impacts. The resulting alternative (Concept C) was advanced to the next stage to refine the design. Concept C, which reduces ROW requirements at the intersection, still raised community concerns with impacts to adjacent properties, specifically to the Hackettstown War Memorial.

Site 3 Improvements: US 46 and High Street/Grand Avenue

The intersection of US 46 and High Street/Grand Avenue was identified as a high congestion location within the project area. The full intersection realignment, designated Concept C, was selected as the PPA but again, because of the impacts, the Core Group requested that this design be revised to reduce impacts. The resultant alternative was advanced to the next stage to revise the design. The PPA proposes to realign the High Street southbound approach in order to improve the traffic flow into the intersections, restripe the westbound approach to ease the motorists' ability to make right turns, restripe the eastbound approach to include a separate left turn lane, and adjust the signal timings accordingly.

Site 4 Improvements: NJ 57 and NJ 182

The intersection of NJ 57 and NJ 182 was identified as a high congestion location within the project area. The PPA, Concept A proposes to reconfigure the intersection to allow a double left hand turn from eastbound NJ 57 to northbound NJ 182. The concept would also require the re-striping of approximately 500 feet of the northbound shoulder on NJ 182 to have two northbound lanes to accommodate the new left turn lane. NJDOT Pavement Unit recommends pavement resurfacing along the northbound shoulder to accommodate the cross slope requirements of a travel lane. Additionally, traffic signals should be upgraded at the intersection to include 12 inch lenses and retroreflective backplates to improve conspicuity.

Technical Memorandum 3.1:
Previous Studies Recommendations Matrix

APPENDIX

A total of 535 individual improvement and policy recommendations are proposed by the previous studies, including recommendations 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 also established the current implementation status as displayed in the following matrix. Only a small percentage – 13% – have been completed through 2018, about 10 percent are planned as long-term improvements, a total of 13% are classified as ongoing or partially completed, and 6% have been submitted to NJDOT as problem statements. The largest group, at 41%, is not completed.

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
1. Warren County Strategic Growth Plan									
Transportation- Site Access	Site access management strategies include: Lot layouts (subdivision parcels into lots that do not require direct access to arterials)	NA						■	■
	Parking lot location and design (make provisions at the back of lots for secondary roads, require reciprocal easements forshared parking or rights of way, site commercial buildings close to the road but outside the existing and planned right of way, and require the creation of on-street parking to calm traffic and buffer pedestrians from moving traffic)	NA						■	■
	Pedestrian and bicycle accomodations (install mid-block crossings within centers, require connections between parking lots and building entrances, limit service roads widths nad curb radii, and minimize the number of conflict points)	NA		■					
	Provisions for bus passenger loading and unloading	NA				■			
	Incentives for smaller and fewer signs by allowing a reduced setback from the road	NA		■					
	Driveway location and design (provide adequate driveway length to allow stacking and establish limits for vertical alignment of major roadways at curb cuts)	NA	■				■		
Transportation- Access Management	Plan for an integrated community street network that links to adjacent areas	NA		■				■	■
	Requiring developers to provide a connected and sufficient local road system to minimize using the main arterial that is designed to accommodate through traffic	NA					■	■	■
	Reducing/limiting the number of curb cuts by considering the location, design, and spacing of driveways	NA		■			■		
	Planning for the location of future signalized intersections	NA					■		
	Requiring shared access points and connectivity parcel	NA						■	■
	Reducing the number of parking spaces by permitting shared parking arrangements among individual businesses	NA						■	■
Transportation- Transit	Lackawanna Cut-Off: This plan recommends evaluation of restoration of passenger service of Lackawanna Cut-off. Feasibility and the potential impacts on the environment, growth and quality of life by the rail line should be determined too	Completed				■			
	Washington Secondary: The plan recommends the restoration of passenger service on the "Washington Secondary" line between Hackettstown and Phillipsburg be evaluated further to determine feasibility and the potential impacts on the environment, growth and quality of life	Not Completed				■			
	Raritan Valley Line: The plan recommends extension of NJ TRANSIT passenger rail service from High Bridge in Hunterdon County to Phillipsburg be evaluated further to determine feasibility and the potential impacts on the environment, growth and quality of life. The extension woul require the shared use of a segment of the "Lehigh Line"	Completed				■			
	Mid-County Bus: The Warren County Transportation Advisory Council is considering adding a shuttle service from Belvidere to Phillipsburg where connections coulf be made with the Rt 57 Shuttle and with connections to the Phillipsburg Mall, the Phillipsburg line run by NJ TRANSIT and LANTA. Another route proposed for a new shuttle bus service is from Washington south to Phillipsburg through Washington Borough, Oxford, Bridgeville, Belvidere, County Center, and Harmony. This route would follow Route 31 to Route 46 to CR 620 to Route 519.	Not Completed				■			
	Land Use: In order to make transit services more viable, municipalities should establish minimum land use densities in centers needed to support ridership. Currently, the existing centers along the transit corridors do not have zoning the meet these thresholds. There is a need to explore the need for additional park and ride lots or spaces. Potential locations include the A&P Shopping Center lot in Washington Township on Route 31, and along Route 22 in Pohatcong Township.	NA				■			
Transportation- Financing Districts	Transportation Development Districts (TDDs)- The districts are a potential tool for planning and funding transportation improvements for high growth areas. The districts are a mechanism to obtain 'fair share' contributions from developers for the cost of improving circulation and mobility. There are not TDD districts in Warren County and this plan recommends creating these districts	NA						■	■
	Transportation Enhancement Districts (TEDs)- There is a bill in NJ Legislature to allow for the creation of Transportation Enhancement Districts (TEDs). The TEDs would address many of the constraints to implementation of TDD. Creation of TEDs is recommended in this plan.	Not Completed						■	■
	Potential Districts- Based on the findings of the Transportation and Land Use Modeling for this Strategic Growth Plan, there are several potential areas for financing districts. Addiitonal analysis will be required to determine if the growth thresholds are met in for TDD's. It is recommended that the county initiate discussions with the involved municipalities and the state to determine the most appropriate use of financing districts.	Not Completed						■	■
	Route 22 Corridor - The corridor would include Routes 57, 519, 637, 638, 646, 173, 122 and 22 in Greenwich, Phillipsburg, Pohatcong and Lopatcong. The corridor includes one of the most extensive areas of commerically and industrially zoned vacant land in the county. In the US Route 22 Corridor Study encompassing US Route 22, NJ ROute 57 and 122 and County Route 519. This corridor was identified as having a high potential for growth activity.	Not Completed		■			■	■	■
	Route 57 Needs Assessment/Concept Development Study (2003) defines a number of improvements to the corridor between Route 22 in Lopatcong and Route 182 in Hackettstown. The study recommended retaining Route 57 as two lanes, widening the shoulder to eight feet and to provide bicycle compatible lanes and recommended intersection nad site roadway improvements to accomodate left turn lanes and improved channelized at major intersections and activity centers. This plan recommends these changes, however land use changes should also be considered to help reduce the extent of necessary transportation improvements and their costs and to reduce congestion.	Not Completed		■				■	■
	Route 519, 646 and 46 Corridor- The corridor extends through the towns of Harmony and White. An access management plan has been developed as part of this Strategic Growth Plan.	Completed		■					

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
	Route 31 Corridor- The study recommended operational improvements to the intersection of Routes 31 and 57, the intersection of Routes 31 with Broad Street and Springtown Road and the widening of Route 31 to two lanes in each direction south of Washington Borough. The Strategic Plan endorses these recommendations	Not Completed							
	County's Transportation Model- The County's Model can be enhanced to perform trip generation based on the land use of individual parcels. This would provide a defensible mechanism to obtain a 'fair share' contribution by a developer	Not Completed							

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
2. 2005 Warren County Transportation Technical Study (2004)									
Smart Growth Alternative Plan	"Smart growth" land use concept proposed as an alternative for development	NA						■	
	Incorporates land-planning practices that create and maintain efficient infrastructure, ensure a strong sense of community, preserve natural systems, and preserve visual character.	NA						■	
Smart Corridor Planning	Avoid the creation of narrow commericial strips along roadway corridors outside of centers	NA						■	
	Encourage mixed uses and higher densities at key locations within centers	NA						■	
	Plan for an integrated community street network that links to adjacent areas	NA						■	
	Require master planning for large tracts of land	Ongoing						■	
	Identify critical areas for open space conservation and create naturla buffers between centers	NA						■	
	Use design guidelines to identify the desired community character	NA						■	
Transit Improvements	Municipalities should establish minimum land use densities (6-8 housing usints per acre for local bus service, 15 housing units per acres for rail within 1600' of transit stops) needed to support ridership within the designated centers	NA				■		■	
	Lackawanna Cut-Off- restoration of passenger service, only station in Warren County is Blairstown	Not Completed				■			
	Washington Secondary - Recommends the restoration of passenger rail service between Hackettstown and Phillipsburg. The service would be an extension of the passenger service by NJ TRANSIT from Morris County	Not Completed				■			
	Raritan Valley Line - The Strategic Plan recommends the extension of NJ TRANSIT passenger rail service from High Bridge in Hunterdon County to Phillipsburg	Not Completed				■			
	Mid-County Bus - A new bus transit service would follow Route 31 to Route 46 to CR 620 to CR 519. It would connect several centers as well as offer transfers with transit service along the Route 57 corridor	Partially Completed				■			
Site Design	Site design guidelines or standards can ensure that best practices are being considered during the review of future projects. The best management practices will pertain to: lot layouts, parking lot location and design, driveway location and design, pedestrian and bicycle accomodations, Incentives for smaller and fewer signs by allowing a reduced setback, guidelines that encourage desired building designs	NA						■	
Access Management	Access management strategies include: Requiring developers to provide a connected and sufficient local road system to minimize using the main arterial that is designed to accommodate through traffic	NA		■				■	
	Reducing/limiting the number of curb cuts by considering the location, design, and spacing of driveways	NA		■				■	
	Planning for the location of future signalized intersections	NA					■		
	Requiring shared access points and connectivity between parcels	NA		■					
	Reducing the number of parking spaces by permitting shared parking arrangements among individual businesses	NA		■				■	
	Planning for a new street network	NA					■		
	Aligning driveways and create regular offsets	NA					■		
	Relating driveway designs to travel speeds and traffic volumes	Completed					■	■	
	Prohibiting direct parking access from a parking space to arterials or collectos	NA					■		
	Planning for public parking	Completed		■				■	
Transportation Control Measures	Strategies may include: ramp modifications, frontage roads, ramp extensions, flyovers, and Intelligent Transportation System (ITS) applications	NA					■		
	Centers based land use plan is TCM as it reduces future trip generation	Not Completed					■		
Financing Districts	Upon completion of the TCM and Access Management program for Warren County, financing districts can be instituted. The districts are a mechanism to obtain 'fair share' contributions from developers for the cost of necessary roadway improvements on the county and local road system.	Not Completed						■	
Transportation Development Districts	TDD can be created on Route 22, Route 57, Route 519, 646 and 46, Route 31, Route 57 based on previous studies completed on these corridors	Not Completed						■	
Land Use	County Transportation Model: can be enhanced to perform trip generation based on the land use of individual parcels	Not Completed					■		
Transportation Enhancement Districts	The TED would provide for the sharing of transportation costs through a long-term comprehensive planning approach. While a TDD is permitted to assess fees on future developments, the TED would allow the County to assess fees on existing properties generating traffic in a district.	Not Completed						■	

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
3. Warren County 2015 Land Use Forecasting and Transportation Analysis Study									
Based on Performance Analysis of the model	Alt 1- Widening of NJ 31 from Hunterdon County to Washington Borough. Cross section increased from 2 lanes to 4 lanes	Not Completed							
	Alt 2- NJ 57 / CR 519 Intersection Improvements. All approaches except EB SR 57 will gain left turn pockets.	Planned							
	Alt 3- Center Street Extension to US 22. Eastern terminus of Lock Street aligned to meet Center Street extension. This alternative would provide some relief to US 22, especially east-west section after the merge with SR 57, by allowing motorists a new option to access the town	Not Completed							
	Alt 4- Center Street extension from US 22 to CR 519. This is a continuation of Alt 3. The second stage of the project continued eastbound externding Center Street from US 22 to CR 519, including new intersection at Stryker's Road and SR 57. This provides relief to the sections of SR 57 and US 22 to the west.	Not Completed							
	Alt 5- Stryker's Road Improvements. Geometric improvements south of SR 57 on Stryker's Road increase capacity of 15%. Realignment of intersection of Dumont Road and Stryker's Road.	Not Completed							
	Alt 6- SR 57 Widening. SR 57 widening from 2 lanes to 4 lanes, doubling its capacity. This widening extends from US 22 in Phillipsburg to SR 182 (Mountain Ave) in Hackettstown. However, because of physical constraints, SR 57 remains 2 lanes through the borough of Washington.	Not Completed							
	Alt 7- CR 638 Extension. CR 638 (Greenwich St) was extended from US 22 to Bliss Boulevard. The extension provides relief to Bliss Boulevard by distributing traffic onto US 22 more efficiently.	Completed							
	Alt 8 - Cat Swamp Road/Water Street (Between CR 517 and US 46). This section improved to act as a northern route to direct through traffic away from downtown Hackettstown	Not Completed							
	Alt 9- Realignment of CR 519 West of Hope. A new alignment of CR 519 was coded to run west of the Town of Hope. This realignment is an attractive option for travelers not destined for Hope	Not Completed							
	Alt 10 - CR 519 Access Management. Under this scenarios, various access management techniques like turn lanes, driveway spacing standards, more restrictive subdivision regulations etc. would be implemented along the CR 519 corridor between Phillipsburg and Belvidere. It is likely that one of the major benefits of this project would be increased safety along the corridor.	Not Completed							

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
4. Warren County Morris Canal 25 year action plan (2012)									
Recommendations Greenway Segment 1 - Downtown Phillipsburg to Lock Street	Support Phillipsburg's efforts to develop a riverfront trail including connections to existing parking facilities and the Morris Canal	Ongoing		■					
	Investigate the feasibility of crossing railroad to make connections to Delaware River Train Excursion/Main Street and Delaware River Park	Not Completed		■					
	Stabilize/restore the canal arch	Not Completed	■						
	Support Phillipsburg's efforts to create connections to Easton utilizing abandoned rail bridge.	Ongoing		■					
	Develop and install trail markers and interpretive signage in coordination with the Phillipsburg historic district.	Ongoing		■					
	Utilize the downtown sidewalk system to create a trail loop to support economic development	Ongoing		■					
	Attain Access rights along abandoned rail line from Delaware River to Delaware River Park	Planned-Long Term		■					
	Acquisition or dedication of open space in proposed Delaware Heights Townhouse Development property to connect South Main with the canal and/or Delaware River Park via Mercer, Stockton and McKeen Streets.	Planned - Long Term			■				
	Engage the Andover-Morris Elementary School in canal preservation efforts	Planned-Long Term			■				
	Work with sewage treatment plant to establish towpath trail through site to Mill Pond Park	Planned-Long Term		■	■				
	Improve Mill Pond Park as a trailhead for the eastern terminus of Segment One	Completed		■					
	Analyze the feasibility of establishing a safe trail connection between Mill Pond Park and Lock Street	Planned-Long Term		■					
Recommendations Greenway Segment 2 - Lock Street to Route 22	Investigate feasibility of using bridge near Ridge and Lock Street intersection to cross street to access Plane 10W.	Ongoing		■					
	Promote sidewalk linkage and programmatic connection between Lock Street Park and Valley View Historic District.	Planned-Long Term		■					
	Complete archaeological investigation at Plane 10W	Completed			■				
	Promote use of self-guided walking tour from Green's Bridge along Lock Street	Completed							
	Establish pedestrian friendly on/off road trail connection from Lock St Park to Sycamore Landing	Ongoing		■					
	Construct parking area on County property in conjunction with completion of Sycamore Landing trail segment	Planned-Long Term		■					
	Investigate feasibility of crossing Route 22 below grade at the Lopatcong Creek with a pedestrian bridge at the existing canal crossing or at grade at signalized intersection with Phillipsburg Mall	Planned-Long Term		■					
	Connect towpath to Phillipsburg Mall via proposed sidewalks in Sycamore Landing development	Ongoing		■					
Recommendations Greenway Segment 3 - Lock Street to Plane 9 West -1.0 mile	Preserve adjacent farm and screen industrial uses and electric power lines for aesthetic purposes	Planned-Long Term						■	
	Construct parking area/trail head at Strykers Road	Completed		■					
	Clear trail from Strykers Rd. to Route 519	Completed		■					
	Address culvert stability and erosion issues in prism near Strykers Road	Planned-Long Term			■				
	Establish path around waste weir location to maintain trail continuity	Completed		■					
	Develop strategy to restore/recreate waste weir as possible interpretive site	Planned-Long Term			■				
	Continue use of Stine House by NJ Youth Corps	Completed							
	Complete a study to address erosion problems associated with proximity of canal to Lopatcong Creek	Ongoing			■				
	Provide pedestrian crossing improvements at Route 519 and Plane 9W	Planned-Long Term		■					
	Implement historic preservation plan and master plan for Plane 9W	Ongoing							
	Create sidewalk connection between Overlook at Lopatcong residential development and Plane 9W	Planned-Long Term		■					
Recommendations Greenway Segment 4 - Plane 4 West to Bread Lock Park 3.2 miles	Work with Greenwich Township to engage Stewart's Hunt residents in canal preservation efforts	Planned-Long Term			■				
	Complete a study of alternative routes for trail connections from Plane 9W to North Main Street	Ongoing		■					
	Establish trail from Plane 9W to North Main Street in Stewartsville based upon selected alternative and results of outreach efforts	Ongoing		■					
	Complete a study of alternative routes for establishing an extended trail from North Main Street to Bread Lock Park using existing roadways and land adjacent to the existing railroad	Completed		■					
	Establish trail from North Main Street to Bread Lock Park using selected alternative	Completed		■					
	Encourage sidewalk connections between the canal and the Village of Stewartsville	Planned-Long Term		■					
	Continue Implementation of historic preservation plan for Bread Lock Park	Ongoing							
	Coordinate preservation and trail development efforts with Warren Heritage Scenic Byway	Ongoing		■					
Recommendations Greenway Segment 5 - Lock Park to Meadow Beach Park -6.0 miles	Preserve canal property and/or pursue access rights between Route 57 and Little Philadelphia Road in accordance with Canal Properties Inventory	Ongoing						■	
	Establish trail and greenway linkages and programmatic connections between the canal and Merrill Creek Reservoir	Ongoing		■					
	Preserve farm at northwest corner of Millbrook Road and Route 57 intersection for historic and aesthetic purposes	Planned-Long Term			■				
	Encourage future sidewalk connections between the canal and the Village of Broadway	Planned-Long Term		■					
	Resolve existing drainage problem in Broadway on Whites Road	Planned-Long Term			■				
	Encourage sidewalk connections between the canal, the Warren County Community College and the Warren County Vo-Tech School/Library following Little Philadelphia Road and Route 57	Planned-Long Term		■					
	Coordinate preservation and trail development efforts with Warren Heritage Scenic Byway	Ongoing		■					

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
Recommendations Greenway Segment 6 - Meadow Breeze Park to Washington Borough Township Line -1.9 miles	Complete an evaluation of alternate greenway and trail routes from Meadow Breeze Park to the Campbell House and implement study recommendations	Ongoing		■					
	Make trail and programmatic connections with Meadow Breeze Park and Brass Castle Elementary School	Planned-Long Term		■					
	Make programmatic connection to Bowerstown Historic District	Planned-Long Term		■					
	Encourage preservation and interpretation of Plane 7 (currently in private ownership)	Planned-Long Term							
	Improve pedestrian crossing at Plane Hill Road and Kinnaman Ave	Planned-Long Term		■					
Recommendations Greenway Segment 7 - Washington Borough to Port Colden - 2.2 miles	Utilize existing sidewalk system to connect downtown Washington Borough with canal	Ongoing		■					
	Pursue easement/connection with JCP&L between Kinnaman and Belvidere Aves.	Ongoing							
	Make physical and programmatic connections between Campbell House, Warren Hills Regional Middle School and Washington Borough Businesses and support efforts to restore Campbell House as interpretive center	Ongoing						■	
	Work with property owners to encourage preservation of structures in Cattel Court (currently in private ownership)	Planned-Long Term						■	
	Work with Washington Borough and residents to complete pedestrian and bicycle trail along Myrtle Avenue and make aesthetic improvements	Planned-Long Term		■					
	Investigate feasibility of acquiring abandoned Warren Railroad right-of-way and associated overpasses for Route 31 crossing and future connection to regional rail-trail networks	Planned-Long Term		■					
	Work with Washington Business Improvement District to make programmatic connections to the canal	Planned-Long Term						■	
	Pursue access rights on preserved farmland for trail connections	Planned-Long Term		■					
Recommendations Greenway Segment 8 - Port Colden to Port Murray - 3.2 miles	Encourage preservation of and enhance physical and programmatic connections between the canal and Port Colden Elementary School, including but not limited to Port Colden Manor, the canal stores, the church, the school house and privately owned canal sites	Ongoing			■				
	Screen view of Recycling Center from canal	Planned-Long Term			■				
	Preserve canal property and/or pursue access rights from Port Colden Elementary School to Brickyard site in accordance with Canal Properties Inventory	Ongoing			■				
	Preserve and interpret Plane 6W and the Easton - Port Colden Trolley Line	Partially Completed			■			■	
	Investigate maintaining existing watered sections in the area between Plan 5W and Plane 6W	Planned-Long Term			■				
	Develop a master plan for stabilization and future use of the Brickyard Site	Ongoing						■	
	Connect canal to Comcast Fields, Mansfield Township Park and Municipal Building and Port Murray Elementary School via a trail along Brickyard and Port Murray Roads	Planned-Long Term						■	
	Construct trail head and parking area along Hoffman Road	Completed		■					
Recommendations Greenway Segment 9 - Port Murray to Rockport Pheasant Farm	Complete a study of railroad crossing options to provide pedestrian and bicycle connections between the Village of Port Murray and surrounding park, school and canal resources	Planned-Long Term		■					
	Preserve canal property and/or pursue access rights from Hoffman Road trail head to Tow Path Road trail head in accordance with Canal Properties Inventory	Ongoing		■					
	Investigate feasibility for parking area, visitor access and development of Port Murray boat basin area	Planned-Long Term						■	
	Complete a study of alternative route for trail routing from existing trail at Cherry Tree Bend Rd. to Washburn Road parking area utilizing agricultural preservation lands with land owner and SADC approval	Planned-Long Term		■					
	Preserve canal property and/or pursue access rights from Washburn Road trail head to Hazen Road trail head in accordance with Canal Properties Inventory	Planned-Long Term			■			■	
Recommendations Greenway Segment 10 - Rockport Pheasant Farm to Florence Kuipers Park - 3.3 miles	Preserve canal property and/or pursue access rights from Rockport Pheasant Farm to Florence Kuipers Park access at Buck Hill Road in accordance with the Canal Properties Inventory	Ongoing			■			■	
	Build partnership with Donaldson Farms, adjacent residential developments, and Mansfield Township to explore alternate route between Rockport Pheasant Farm and Buck Hill Road trail head	Planned-Long Term		■				■	
	Improve Buck Hill Road trail head for pedestrian and bicycle access	Completed		■					
	Provide connections between canal, residential neighborhood and Hackettstown Fish Hatchery south of Grand Avenue	Planned-Long Term		■					
	Repair ATV damage and enact measures to discourage future access	Ongoing		■				■	
	Replace bridge east of the terminus of Roosevelt Avenue	Planned-Long Term					■		
	Enhance sidewalk connections between east end of Florence Kuipers Park, Centenary College and Hackettstown Train Station	Planned-Long Term		■					
	Make trail and programmatic connections between greenway and Hackettstown Business District	Planned-Long Term		■					
Recommendations Greenway Segment 11 - Florence Kuipers Park to Saxton Falls - 4.0 miles	Enhance existing sidewalk system and Route 46 crossing at Prospect Street to extend trail network east of Florence Kuipers Park	Partially Completed		■					
	Encourage pedestrian and bicycle connections between canal and adjacent M&M Mars and residential developments	Planned-Long Term		■					
	Investigate status of canal preservation associated with Phase 2 of Towpath Apartments development	Ongoing		■					
	Construct trail connection adjacent to Oak Hill Apartment property from Towpath Apartments to Bilby Road	Planned-Long Term		■					
	Develop a trailhead and pedestrian crossing at Bilby Road	Ongoing		■					
	Screen views of developments and power lines	Planned-Long Term						■	
	Design and install bridge over canal breach east of Bilby Road on state property	Ongoing		■			■		

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
Recommendations Greenway Segment 12- Saxton Falls to Waterloo Village - 2.5 miles	Support efforts by New Jersey State Parks to implement the General Management Plan for Saxton Falls Area of Allamuchy Mountain State Park	Ongoing							
	Support efforts by New Jersey State Parks and The Canal Society of NJ to implement the recommendations of the Feasibility Study of Locks 4W and 5W	Ongoing							
	Work with New Jersey State Parks to establish towpath trail from Lock 4w to Waterloo Village	Ongoing							
	Support efforts by New Jersey State Parks and The Canal Society of NJ to revitalize Waterloo Village	Ongoing							
Greenway Wide Recommendations - Resource Preservation Strategies	Continue to pursue preservation opportunities as identified in the Greenway Properties Inventory	Ongoing							
	Develop a strategy for prioritizing future historic and archaeological preservation projects	Ongoing							
	Work with land owners to utilize a variety of preservation methods	Ongoing							
	Coordinate agricultural preservation and greenway creation goals and efforts	Ongoing							
	Commission project to reassess the Morrell book and map the resources and information within in a GIS database	Planned-Long Term							
Greenway Wide Recommendations - School Education Strategies	Conduct an inventory of available artifacts and materials (printed, digital, etc.) preserved by Warren County and the WCMCC applicable for educational purposes	Planned-Long Term							
	Meet with the Warren County Department of Education staff to develop a strategy for improving canal related curriculum	Planned-Long Term							
	Develop and implement a canal based curriculum for schools in collaboration with others	Planned-Long Term							
Greenway Wide Recommendations - Economic Development and Funding Strategies	Build Partnerships with the local business community	Ongoing							
	Build partnerships to promote tourism opportunities related to the canal	Ongoing							
	Build partnerships with other local, linearly based cultural and heritage attractions	Ongoing							
	Create database to organize funding opportunities and projects	Planned-Long Term							
	Formalize grant funding standard operating procedures	Planned-Long Term							
	Develop and implement funding strategies to solicit and increase monetary contributions from individuals and organizations	Planned-Long Term							
Greenway Wide Recommendations - Greenway Operation Strategies	Prepare baseline conditions and initial maintenance assesments	Ongoing							
	Document and analyze maintenance tasks, labor, equipment, materials, policies, volunteer involvement and costs for properties currently in County ownership	Ongoing							
	Develop an overall maintenance program	Ongoing							
	Develop and train a network of volunteers to assist in greenway maintenance	Ongoing							
	Explore options for financing long-term maintenance activities	Ongoing							
	Support Warren County Mosquito Commission efforts and continue to strengthen partnership to maintain sites	Ongoing							
	Work closely with adjacent landowners during the development of new trail segments to identify and address potential security and privacy concerns	Ongoing							
	Review liability concerns with the Board of Chosen Freeholders and prepare a landowner education package addressing liability concerns	Planned-Long Term							
	Identify areas where ATVs are illegally accessing trail segments and take global measures to discourage access	Ongoing							
	Develop and implement plan to identify and secure canal artifacts from removal, damage or defacing	Planned-Long Term							
Greenway Wide - Land Use and Policy Recommendations	Encourage acceptance and support of the 25-Year Action Plan at the state and local levels	Ongoing							
	Update canal preservation ordinance and seek adoption/support at the state, county and local levels	Ongoing							
	Promote inclusion of trail connections and amenities in future planning studies and use decisions	Ongoing							
	Create a canal projects review body for County initiated projects which could potentially impact the canal or related resources	Planned-Long Term							
	Build a county-wide Morris Canal Greenway Planning Group	Completed							
	Ensure Morris Canal is portrayed on maps produced and distributed by Warren County	Ongoing							
Greenway Wide - Public Participation Recommendations	Participate in NJTPA Morris Canal Working Group	Ongoing							
	Ask D&L National Heritage Corridor to serve as mentor	Planned-Long Term							
	Host peer to peer conference in collaboration with the Friends of the Delaware Canal	Planned-Long Term							
	Participate in canal, historic preservation and heritage tourism conferences and training programs	Ongoing							
	Expand volunteer support	Ongoing							
	Continue technical partnership with the NJRCD with regard to canal stabilization/restoration	Ongoing							
	Build public support and increase greenway awareness with informational displays at key community events	Ongoing							
	Develop a "Press Kit" containing information to support media interest in canal activities	Completed							
Greenway Wide - Organizational Structure	Use existing authorities	Completed							
	Consider a new organizational structure	NA							
	Pursue heritage area designation	Planned-Long Term							

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
5. 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)	Provide a Route 122westbound lead green interval	Completed					■		
	Provide a northbound approach right turn overlap with the Route 122 westbound approach lead green phase	Completed					■		
	Provide 12" indications for all signal heads	Not Completed	■				■		
	Add a clamp-mounted near left signal head facing CR 519 northbound traffic	Not Completed	■				■		
	Pedestrian crossing provisions: a) provide pedestrian countdown traffic signal heads. B) remove the exclusive pedestrian phase c) provide pedestrian push button operation to cross the west approach of Route 122 d) provide pedestrian operation to cross Hawk Avenue concurrently with the Route 122 right-of-way (i.e. after the termination of the Route 122 westbound lead green interval)	Partially Completed		■					
	As a long range improvement, add a second Route 122 eastbound approach lane for separate right turns and provide an overlap with the CR 519 northbound signal phase. This exclusive eastbound right turn lane can be provided by widening along the north side of Route 122	Not Completed					■		
New Brunswick Avenue (Route 122) / South Main Street (Route 122) and St. James Avenue (CR 519)	Install a new traffic signal and provide a Route 122 eastbound lead green. Appropriate intersection channelization should also be considered	Completed					■		
	Provide a separate lane for the eastbound approach left turns	Completed	■				■		
	Consideration be given to having Shimer Boulevard operate with right-in and right-out movements only. This can be achieved by constructing a physical island to channelize these movements	Completed	■				■		
South Main Street (NJ 122) and Carperntersville Road	Upgrade the traffic signal to current MUTCD standards	Planned	■						
	Provide a "Signal Ahead" sign along the Carpentersville Road approach to be equipped with flashing yellow beacons	Completed	■						
	Provide an enhanced sign package on the Carpentersville Road approach, which would include GA (directional/destination) signs and/or lane use control signs at or in advance of the intersection	Not Completed	■				■		
	Resurface the Carpentersville Road approach to provide a "grooved" or anti-skid riding surface	Not Completed	■						
Route US 22 and Greenwich Street (CR 638)	Adjust the existing PM and Saturday peak traffic signal timing and increase the cycle length to 140 seconds during both peak periods	Planned					■		
	Review traffic signal progression, particularly in the Route US 22 eastbound direction	Planned					■		
Route US 22 and St. James Avenue (CR 519)	An additional 3-5 seconds of green time be alloted for the CR 519 "inside" clearance interval. This step should ensure that the area between the two Route US 22 approaches will be completely open or clear to receive the maximum mumber of Route US 22 left turns instead of having CR 519 vehiclees "trapped" in this area at the end of their green interval	Not Completed					■		
6. Hackettstown Bypass Corridor Study (2000)									
	Tabled	NA							
7. Hackettstown Mobility Study									
	Study ongoing	NA							
8. NJDOT Hackettstown Mobility improvement project (2009)									
US 46 and East Avenue	Curb radius will be widened on the southeast quadrant of the intersection	Not Completed					■		
	Revised signal phasing will provide a right turn overlap phase for the Northbound East Avenue approach right turn movement onto US 46	Not Completed					■		
US 46 and NJ 182 (Mountain Avenue)/Willow Grove St/Warren St	Traffic signals will be retimed	Not Completed					■		
US 46 and High Street/Grand Ave	Realign the High Street southbound approach to improve traffic flow	Not Completed					■		
NJ 57 and NJ 182	Reconfigured to allow a left turn lane and a shared left/through/right turn lane on the eastbound NJ 57 approach to the intersection	Not Completed					■		

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
9. Route 57 /46 Connector Study(2003)									
Construction of a Route 57/46 connector	Construction of a Route 57/46 connector roadway between the current terminus of N.J. Route 57 and the roadbed of Hearthstone Drive which was built to accept the connector. The standard cross-section of the connector would be one travel lane in either direction and a standard shoulder width. Right-of-way acquired should be 75 feet wide in accordance with the NJDOT standard specifications for a two-lane roadway. (Right-of-way should be sufficient at the intersections with Mountain Avenue and U.S. Route 46 to allow for expansion of turn lanes at these intersections as further development takes place in the adjacent parcels.)	Not Completed					■		
Construction of a signalized intersection at U.S. Route 46 and the Route 57/46 connector	U.S. Route 46 eastbound: 1 through lane; 1 shared through-right turn lane	Not Completed					■		
	U.S. Route 46 westbound: 1 shared through-right lane	Not Completed					■		
	Reverse jughandle from Route 46 westbound: 1 through lane (onto Route 57/46 connector); 1 shared through-left lane (left turning vehicles are making u-turns from U.S. Route 46 WB to EB)	Not Completed					■		
	Route 57/46 connector eastbound: 1 left turn lane and two right turn lanes	Not Completed					■		
	Right turns on red prohibited from connector onto Route 46 eastbound	Not Completed					■		
	Construction of a reverse jughandle from U.S. Route 46 eastbound to connect with the connector at the new signalized intersection. Geometry would be 1 shared left-through lane and 1 through lane.	Not Completed					■		
Construction of a signalized intersection at N.J. Route 57 and the Route 57/46 connector	N.J. Route 57 eastbound: 1 left turn lane; 1 shared through-right turn lane	Not Completed					■		
	Route 57/46 connector westbound: 1 left turn lane; 1 shared through-right turn lane	Not Completed					■		
	Mountain Avenue southbound: 1 shared through-left turn lane; 1 through lane; 1 shared through-right turn lane	Not Completed					■		
	Mountain Avenue northbound: 1 left turn lane; 1 shared throughright turn lane	Not Completed					■		
Control changes at the intersections of East Avenue and Mountain Avenue and	Elimination of both traffic signals (due to the reduction of traffic on East Avenue)	Not Completed					■		
	Stop sign control on East Avenue at both intersections	Not Completed					■		
	Preservation of existing roadway geometry at both intersections	Not Completed					■		
Access management to preserve the efficient flow of traffic on the connector and maintain it as a limited-access facility.	Satisfactory left turn treatment to adjacent land uses as a precondition for development of parcels (whether signalized/unsignalized, by jughandle or turn bays to be determined by detailed individual analyses)	Not Completed					■		
	Adequate setbacks of new development along the Route 57/46 connector to maintain sufficient lines of sight, provide for future sidewalk installation, and to provide for future roadway improvement if ever needed.	Not Completed		■					
	Internal circulation plans for adjacent parcels which allow vehicles ingressing/egressing the adjacent land uses to do so at limited access points without interrupting the safe and efficient flow of traffic	Not Completed	■						
	Shared access roadways and rear access between adjacent developments.	Not Completed	■	■					

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
10. Route 57 Corridor Plan (2006)									
Transit Park and Ride	Shuttle bus service: The county recommends shuttle service to employment centers outside the corridor to help meet the travel needs of target groups who live in the corridor but work elsewhere	Not Completed				■			
	For all present and future bus service in the corridor, it is recommended that provisions be made for designed bus stops and pedestrian accomodations at bus stops. Typical locations which include job sites, retail and schools	Partially Completed				■			
	This plan supports future transit service expansion as well as infill of existing neighbourhoods with either residential or mixed use development	NA				■		■	
Rural Areas	Preserve scenic values and open space, deter sprawl, limit traffic signals and curb cuts, maintain mobility	NA	■	■	■				
Village Areas	Promote selective development, invest in traffic calming and pedestrian improvements	NA		■					
Towns	Promote redevelopment, invest in traffic calming and pedestrian improvements	NA							
Smart Growth Toolkit	Toolkit for zoning amd master plan changes: billboards/signs and coordinated plans throughout the corridor	NA							
	Scenic byway designantion	Completed							
	Implementation toolkit	NA							
Land Acquisition and Scenic Easements	Resources include: NJDEP Green Acres, Warren County Office of Land Preservation, NJDA Planning Incentive Grants and Land Trusts	NA			■				
State Scenic Byway Designation	Benefits would be : funding, tourism promotion and scenic preservation	NA							
Farm Support Services/Farmland Preservation	County easement purchase, direct easement, grants to nonprofits, planning incentive grants, eight year program, fee simple	NA						■	
Tourism Support	Potential to serve niche markets: hertitage and cultural tourism, ecotourism and nature-based tourism	Partially Completed							
Historic Preservation / Restoration	Many corridors along the corridor are listed on the National and State Registers of Historic Places	NA							
	Funds available from federeal, state, and private sources for preservation efforts	NA							
	Ties in with economic developmemt and heritage tourism goals	NA							
Musconetcong River Management Plan	Goals linked to Scenic Byway Plan and Corridor Study	Not Completed						■	
Conservation Zoning	Cluster development zoning	NA						■	
	Incentive zoning	NA						■	
	Rural highway zoning	NA						■	
	Sliding scale zoning	NA						■	
Spot Transportation Improvements	Intersection improvements, traffic calming measures	Partially Completed		■			■		
	Context sensitive design approach	Partially Completed						■	
	Gateway project designed to calm traffic and enhance village identity	Not Completed	■	■					
Greenways and Trails	Proposed trails in the plan include: Musconetcong River Trail, Bread Lock Park, Saxton Falls, Merrill Creek Reservoir Environmental Preserve	Completed			■				

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
11. Route 31 Corridor Study (2000)									
Widening of Route 31 from County Route 513 to Glen Gardner Borough Border	From MP 34.37tp 36.63, this section to be upgraded from a 2 lane section to a 4 lane section with full width shoulders and a median barrier	Not Completed					■		
	Intersection of Route 31 and Van Syckel's Corner Road to be improved to include a far side jughandle for northbound traffic, a near side jughandle for southbound traffic and a n additional left turn lane in the eastbound direction	NA					■		
Widening of Route 31 from Glen Gardner Borough border to Warren County border	From MP 36.63 to MP 39.53, this section to be widened from 2 to 4 lanes without shoulders, left turn lanes or center barriers.	Not Completed					■		
Widening of Route 31 from Warren County border to Washington Borough border	From MP 39.53 to MP 42.31 this section to be widened to a five lane (2 through lanes per direction and a center 2 way left turn lane) undivided roadway with shoulders for this section	Not Completed					■		
	At the intersection of Route 31 and Asbury Anderson Road, it is recommended that left turn lanes be installed on all approaches	Not Completed					■		
	Intersection of Route 31 and Broad Street/Springtown Road be realigned to improve intersection geometry	Not Completed					■		
Route 31 and Route 57 intersection improvements	Traffic signal timings need to be optimized	Completed					■		
	Left turn accidents need to be investigated further, and improvements made to reduce their frequency. This may include upgrading traffic signal displays	Completed					■		
	The eastbound, northbound, and southbound approaches to the intersection will need right turn lanes	Not Completed					■		
Widening of Route 31 from Washington Borough Border to Jackson Valley Road	From MP 43.14 to MP 44.45 is recommended to be widened to a three lane (one through lane per direction and a center two way left turn lane) undivided roadway with shoulders for this section.	Not Completed					■		
	For the intersection of Route 31 and jackson Valley Road, it is recommended that left turn lanes be added to the Route 31 approaches, and an eastbound right turn lane be added	Not Completed					■		
Route 31 and Route 46 Intersection Improvements	Traffic signal timings need to be optimized	Completed					■		
	The eastbound right turn lane needs to be lengthened. It presently has storeage for 2 vehicles, needs to have storage for 10 vehicles by 2015	Not Completed					■		
	South of the intersection, Route 31 will need to have a climbing lane for approximately 2000 feet in the southbound direction in order to avoid congestion on the grade effect traffic operations at the intersection	Not Completed					■		
Route 46 and Bridgeville Road (County Route 519) Intersection Improvements	The clearance time (yellow and all red time) on the Bridgeville Road approaches should be increased from 5 to 7 seconds.	Completed					■		
	Traffic signal timings need to be optimized	Completed					■		
	Left turn lanes should be added to all approaches to this intersection. This may require eliminating the right turn lanes on Bridgeville Road	Not Completed					■		
	Initiate an access management plan for to consolidate retail driveway access in Washington Township between Asbury-Anderson Road and Washington Borough	Not Completed					■		
Route 31 and County Route 513 Intersection Improvements	Optimize the signal timings at both Route 31 and County Route 513 intersections when warranted	NA					■		

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
12. U.S. 22 Corridor Studies (2009)									
US Route 22 and Ingersoll / Bates Avenue	Actuate and coordinate as part of Signal Coordination Zone 1	Problem Statement Submitted					■		
	Background Cycle Length of 150 seconds						■		
	Remove and replace existing school crossing signs and replace with fluorescent MUTCD School crossing sign (S1-1)		■	■					
	Install pedestrian countdown signal heads, pedestrian push-buttons and textured ADA accessible ramps			■					
	Install sidewalk on the northwest and southwest approaches of the intersection			■					
	Revise northbound approach to accommodate an exclusive left-turn lane and a shared through /right-turn lane						■		
	Revise signal phasing to have a northbound and southbound movements run concurrently						■		
	Add permitted / protected left-turn advance phase for northbound approach						■		
	Install textured colored pavement at the intersection		■	■					
	Removal of the traffic signal and revisions to the geometric alignment of all four intersection approaches may be considered in coordination with the Memorial Parkway Improvements						■		
US Route 22 and Roseberry Street	Actuate and coordinate as part of Signal Coordination Zone 1	Completed					■		
	Background Cycle Length of 150 seconds	Completed					■		
	Coordinate Elder Avenue traffic signal on Roseberry Street with US Route 22 traffic signal	Not Completed					■		
	Realign existing southbound crosswalk with depressed curb at southeast corner	Not Completed		■					
	Install pedestrian countdown signal heads, pedestrian push-buttons and textured ADA accessible ramps	Completed		■					
	Restore existing sidewalk on the northeast approach of the intersection	Completed		■					
	Convert northbound and southbound shared through / left-turn lanes to exclusive left-turn lanes	Not Completed					■		
	Revise signal phasing to have a northbound and southbound movements run concurrently	Completed					■		
	Add permitted / protected left-turn advance phase for northbound approach	Not Completed					■		
	Northbound /Southbound widening to accommodate three-lane cross section	Not Completed	■				■		
	Reduce median width on east side of intersection to accommodate southbound left-turn movements	Not Completed	■				■		
	Install turning pavement markings within intersection to identify turning lanes	Completed	■				■		
	Construct pedestrian overpass across US 22	Not Completed		■					
US Route 22 and 1st Street	Install one MUTCD "No Right-Turn" Sign (R3-1) on the westbound approach	Not Completed	■						
	Actuate and coordinate as part of Signal Coordination Zone 1	Not Completed					■		
	Background Cycle Length of 150 seconds	Not Completed					■		
	Install pedestrian countdown signal heads, pedestrian push-buttons and textured ADA accessible ramps	Not Completed		■					
	Install sidewalk from the southeast corner of the 1st Street intersection to the southwest corner of the 3rd Street intersection	Not Completed		■					
	Install / Restore sidewalk along the northeast corner of the intersection	Not Completed		■					
	Southbound approach widening to accommodate exclusive left-turn and right-turn lanes	Not Completed					■		
US Route 22 and 3rd Street	Actuate and coordinate as part of Signal Coordination Zone 1	Not Completed					■		
	Background Cycle Length of 150 seconds	Not Completed					■		
	Install striped crosswalk on westside of the intersection	Not Completed					■		
	Install pedestrian countdown signal heads, pedestrian push-buttons and textured ADA accessible ramps	Not Completed		■					
	Install sidewalk from the southeast corner of the 1st Street intersection to the southwest corner of the 3rd Street intersection	Not Completed		■					
	Install/Restore sidewalk along the northeast and northwest corners of the intersection	Not Completed		■					
	Addition of permitted/protected left-turn phase for southbound approach	Not Completed	■				■		
	Northbound approach widening to accommodate exclusive left-turn lane and a shared through/right-turn lane	Not Completed					■		
	Add a permitted/protected left-turn phase for northbound approach	Not Completed	■				■		
US Route 22 and Phillipsburg Mall Entrance	Actuate and coordinate as part of Signal Coordination Zone 1	Not Completed					■		
	Background Cycle Length of 150 seconds	Not Completed					■		
	Replace existing pedestrian signal head with a new ped countdown signal head	Not Completed		■					
	Replace existing ped push buttom with MUTCD compliant ped push button for Route 22 crosswalk	Not Completed		■					
	Install textured ADA accessible ramp for Route 22 pedestrian movements	Not Completed		■					

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	Install striped crosswalks for US 22 pedestrian movements	Not Completed		■					
	Install pedestrian countdown signal heads, pedestrian push-buttons and textured ADA accessible ramps	Not Completed		■					
	Install sidewalk within grass median on the east and west sides of the intersection to support pedestrian movements	Not Completed		■					
	Install/Restore sidewalk on all four approaches of the intersection	Not Completed		■					
	Relocate westbound stopbar to protect pedestrian movements	Not Completed	■	■					
	Install yield pavement markings at both channelized right-turn movements	Completed	■						
	Install turning pavement markings within intersection to identify left-turning lanes	Completed	■				■		
	Install protected eastbound and westbound left-turn movements	Not Completed	■						
	Install eastbound and westbound near-side jughandles	Not Completed	■				■		
	Addition of permitted/protected left-turn phase for northbound approach	Completed					■		
	Install a third eastbound through lane to the Greenwich Street intersection	Not Completed					■		
	Install striped crosswalk on norht side for US Route 22 pedestrian movements	Not Completed		■					
	Install pedestrian countdown signal heads, pedestrian push-buttons and textured ADA accessible ramps	Partially Completed		■					
	Install sidewalks on all four approaches of the intersection	Not Completed		■					
	Improvements to the intersection as per Walmart Super Center Site Plan	Completed	■	■			■		
	Add two exclusive left-turn lanes on the westbound approach	Completed					■		
	Add a northbound approach to the intersection	Completed					■		
	Northbound and southbound roadway widening and striping to accommodate exclusive dual left-turn lanes, one through lane, and a shared through/right-turn lane	Completed	■				■		
	Eastbound approach modifications. Reassign to include share through /right turn lane for entering Walmart Super Center Site. Extend eastbound through lane eastbound to US Route 122 intersection	Completed					■		
	Add a permitted/protected left-turn phase for northbound approach	Completed					■		
	Install striped crosswalk on north and south side for eastbound/westbound crossing movements	Completed		■					
	Install pedestrian countdown signal heads, pedestrian push-buttons and textured ADA accessible ramps	Completed		■					
	Install a sidewalk on all four approaches of the intersection	Not Completed		■					
	Northbound roadway widening to accommodate channelized right-turn lane	Not Completed	■				■		
	Add a permitted/protected left-turn advance phase for northbound approach	Not Completed	■				■		
Interchange Improvements - Memorial Parkway	Curve warning and speed warning flashing light assemblies	Problem Statement Submitted	■						
	Striping modifications at Morris Street merge to provide an acceleration lane for Morris Street	Problem Statement Submitted	■	■					
	Rumble Strips on eastbound US 22 prior to entering curve	Problem Statement Submitted	■	■					
	Install textured colored pavement at Morris Street	Problem Statement Submitted	■	■					
	Closure of U-Turn adjacent to the Post Office	Problem Statement Submitted	■	■					
	Install a North Prospect Avenue cul-de-sac	Problem Statement Submitted	■	■					
	Convert Firth Street to one-way southbound street (right-turn from US Route 22 Eastbound) coupled with the conversion of Warren Street to one-way northbound (right-turn onto US Route 22 Eastbound)	Problem Statement Submitted					■		
	Soften curve at Morris Street	Problem Statement Submitted	■						
	Move 3rd Street Ramp further west to merge with US Route 22 at top of curve	Problem Statement Submitted	■				■		
	Create parallel roadways	Problem Statement Submitted					■		
	Consider possible removal of Ingersoll Avenue and Bates Avenue signal and introduction of new signal at Lincoln Avenue	Problem Statement Submitted					■		
	Create pedestrian overpass at Warren Street	Problem Statement Submitted		■					

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US Route 22 and Route 57 Interchange	New signage program for motorists traveling eastbound on US Route 22 accessing Route 57	Problem Statement Submitted					■		
	Stripe eastbound Route 57 ramp to create one exiting lane	Problem Statement Submitted		■			■		
	Stripe an exclusive lane for entering the Red School Lane Traffic Circle	Problem Statement Submitted		■					
	Close 6th Street to entering movements	Problem Statement Submitted		■			■		
	Add eastbound Route 57 ramp to US Route 22 westbound	Problem Statement Submitted					■		
	Construct new eastbound US Route 22 ramp over the Norfolk Southern Rail Line	Problem Statement Submitted					■		
	Add pedestrian facilities, widen lanes and include shoulder	Problem Statement Submitted		■					
	Construct new westbound US Route 22 ramp over Route 57 eastbound	Problem Statement Submitted							
	Add pedestrian facilities, widen lanes and include shoulder	Problem Statement Submitted		■			■		
	Signalize Red School Lane and Route 57	Problem Statement Submitted		■			■		
Pedestrian and Bicycle Mobility Improvements US Route 22 and Morris Street	Restore ADA accessible ramps and install striped crosswalks at the existing school crossing location	Funding Requested		■					
US Route 22 and Ingersoll / Bates Avenue	Install pedestrian push-buttons and upgrade equipment	Funding Requested		■					
	Install textured ADA accessible ramps	Funding Requested		■					
	Replace existing signage and signal heads	Funding Requested		■					
US Route 22 and Roseberry Street	Realign existing handicap accessible ramp with crosswalk on southeast intersection corner	Completed		■					
US Route 22 and 1st Street	Install pedestrian signal heads and textured ADA accessible ramps	Not Completed		■					
	Update pedestrian push-buton signs	Not Completed		■					
US Route 22 and 3rd Street	Install crosswalk and textured ADA accessible ramps for US Route 22	Not Completed		■					
	Remove existing and install new pedestrian push-buttons, signs and signal heads	Problem Statement Submitted		■					
US Route 22 and Shopping Center Drive	Provide striped crosswalks and install textured ADA accessible ramps	Problem Statement Submitted		■					
	Remove existing and install new pedestrian push-buttons, signs and signal heads	Completed		■					

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
US Route 22 and County Route 519	Remove existing and install new pedestrian push-button, signs and signal heads	Problem Statement Submitted		■					
	Provide striped crosswalks and install textured ADA accessible ramps	Problem Statement Submitted		■					
US Route 22 and Greenwich Street	Remove existing and install new pedestrian push-buttons, signs and signal heads	Not Completed		■					
US Route 22 and Route 122	Remove existing and install new pedestrian push-buttons, signs and signal heads	Not Completed		■					
	Provide striped crosswalks and install textured ADA accessible ramps	Not Completed		■					
Intersection Traffic Operations: US Route 22 and 2nd Street	Modify existing traffic flow to permit one-way northbound (right-turn from US Route 22) movements	Not Completed					■		
US Route 22 and 4th Street	Modify existing traffic flow to permit one-way southbound (right-turn onto US Route 22) movements	Not Completed					■		
US Route 22 and 5th Street	Modify existing traffic flow to permit one-way northbound (right-turn from US Route 22) movements	Not Completed					■		
US Route 22 and 6th Street	Modify existing traffic flow to permit one-way southbound (right-turn from US Route 22) movements	Not Completed					■		
US Route 22 and Warren Street	Modify existing traffic flow to permit one-way northbound (right -turn onto US Route 22) movements	Not Completed					■		
US Route 22 and North Prospect Avenue	Cul-de-sac North Prospect Avenue	Not Completed							
Pedestrian Improvements	Replacement of deteriorating sidewalk and completion og "missing sidewalk links"	Problem Statement Submitted		■					
	Install pedestrian bridge at Warren Street and Roseberry Street across US Route 22	Not Completed		■					
	Retain existing pedestrian bridge at Morris Street across US Route 22	Problem Statement Submitted		■					
	Provide access to new High School off Roseberry Street, north of US Route 22 with comprehensive sidewalk plan	Problem Statement Submitted		■					
	Install in-pavement lights for crosswalks on Morris Street and Roseberry Street	Not Completed		■					
Bicycle Facility Improvements	Provide bicycle access to the new High School using Roseberry Street, Center Street, Third Street and other connections crossing US Route 22	Not Completed		■					
	Provide bicycle access to proposed pedestrian bridges at Warren Street and Roseberry Street	Not Completed		■					
	Develop on-road bike lanes on US Route 22 east of Route 57 interchange	Not Completed		■					
Bridge Improvements	Easton-Phillipsburg US Route 22 Toll Bridge - Remove EZ Pass toll gates	Not Completed							
Transit Improvements	Expansion of shuttle service within the US Route 22 subject to employer feasibility assessment	Not Completed				■			
	Extension of the NJTRANSIT Raritan Valley Rail Line between High Bridge and Phillipsburg	Not Completed				■			
	Implementation of express bus system	Completed				■			
	Expand multi-modal navigation tools to facilitate transit use	Not Completed				■			
	Improve wayfinding signage to encourage park-and-ride and transit use	Partially Completed				■			
	Develop a special purpose interchange transit hub off I-78 to support multi-modal use	Not Completed				■			
	Develop shuttle bus services at select rail stations and activity centers	Not Completed				■			

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
13. I-78 Corridor Study (2008)									
Recommended Transit Improvements									
Passenger Rail Service Extension	Extension of the NJTRANSIT Raritan Valley Rail Line between High Bridge and Phillipsburg	Not Completed				■			
Express Bus in the I-78 and Route 22 Corridor	Originate at the PA Route 33 and PA Route 412 Park-and Rides in Northampton County	NA				■			
	Follow I-78 and US Route 22 to the eastern Hunterdon and Central Somerset employment centers	Not Completed				■			
	Stop at major Park-and-Rides in Warren and Hunterdon Counties	Completed				■			
Express Bus Service in the Route 31 Corridor	Originate at future Park-and-Rides in the NJ Route 31 Corridor	Completed				■			
	Follow NJ Route 31, I-78, and US Route 22 to the eastern Hunterdon and Central Somerset employment cetners	Not Completed				■			
Shuttle Bus Service at Key Rail Stations and Activity Centers	Phillipsburg: Linking the proposed downtown rail station and residential areas in the vicinity	NA				■			
	Alpha, Pohatcong, and Greenwich: Linking the proposed transit hub on I-78 with nearby residential areas in Alpha and nearby Greenwich Township.	Not Completed				■			
	Clinton, Annandale, Union Township: Linking bus stops to residential areas and to major employers	NA				■			
	Readington and White House Station: Linking the existing Whitehouse Station rail station to major employers along US 22, and to nearby residential areas.	NA				■			
	Branchburg and North Branch: Linking the North Branch rail station, the I-78 / US 22 express bus, Raritan Valley Community College, and employment sites	NA				■			
Recommended Park-and-Ride Improvements									
Planned Park-and-Ride Expansions at PA Route 23 and PA Route 412	PennDOT is planning to aignificantly expand the existing Park-and-Rides at PA Route 33 and at PA Route 412	NA				■			
Park-and-Ride Hub at Alpha or Bloomsbury, NJ	Park-and-Ride to intercept travelers as they enter I-78 in New Jersey	Not Completed				■			
	Easy access to and from I-78 for parkers and buses	Not Completed				■			
	Connections to buses (both New York and US Route 22 Corridor)	Not Completed				■			
	Connections to future Raritan Valley Rail Line (if extended)	Not Completed				■			
Possible Central Hunterdon Transit Access Facilities	Possible transit access facilities and improvements and/or Union Townships	NA				■			
	Pending further study and coordination with local municipalities	NA				■			
Park-and-Ride Expansion and Transit Access Improvements	White House Station (consistent with plans by Township of Readington)	NA				■			
	At Somervile Station (consistent with plans by Borough of Somerville)	NA				■			
Recommended Transit-Ready Corridors and Access Treatments									
Transit-Ready Corridor Treatments	Highway improvements to prioritize bus flow under congested conditions: Bus-on-Shoulder, Traffic Signal Prioritization, Signal Coordination	NA				■	■		
	Shoulder improvements (widening, pavement) to support Bus-on-Shoulder at congested intersections	NA				■	■		
Transit Access Improvements	Bus stop enhancements (shelters, information, lighting)	NA				■			
	Pedestrian access (sidewalks, highway crossings)	NA		■		■			
	Shuttles to major employers	NA				■			
Recommended Highway Improvements									
Provide direct access to transit hubs	From I-78 to Alpha or Bloomsbury Transit Hub	NA				■			
	From NJ Route 31 to Hampton Transit Hub	NA				■			
Leverage proposed improvements to complement	High speed EZ pass at I-78 / Delaware River Bridge	Completed					■		
	Proposed New Jerse y Welcome Center at Alpha/Bloomsbury Transit Hub	Not Completed				■			
Additional improvements to resolve bottleneccks	Truck climbing lane (Eastbound at MP 19) east of the US 22 interchange that would allow trucks to keep right and not interfere with traffic flow	Not Completed							■
	Traffic signal coordination for the section west of US 202/206 on US Route 22. This should be coordinated with the design and implementation of transit-ready corridor improvements	NA				■	■		
	US Route 22 and US Route 202/206 Corridor Improvements (for Somerset County)	NA					■		
Recommended land use and travel management actions: Transportation management association (TMA) activities	Three TMAs in the corridor (Ridewise, HART, and TransOptions). TMAs will be instrumental in supporting commuters' access to and from the proposed express bus services on I-78 and US Route 22, by providing shuttle buses and other transit services to link employers and residential areas to bus stops. It is recommended that the ongoing activities of these TMAs be continued and expanded to promote additional flex-time, rideshare matching, and employer-based travel demand management activities	Completed				■			

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
14. Morris-Warren Freight Rail Study (2013)									
Providing 286K Plate "F" Railcar Access	**Delaware River Crossing: South Main Street Bridge (MP 80.23):** This bridge has a total vertical clearance of 16'-6" inches, which is less than the minimum vertical clearance of 17'-6" required for 286K Plate "F" cars. The bridge height needs to be raised to accomodate 286K Plate "F" cars	Planned							
	Washington Yard	Not Completed							
	Lake Junction Yard: Grand Avenue Bridge (MP 58.00)- Hackettstown. It is recommended that the entire bridge structure be replaced with a bridge type to be determined as part of a detailed engineering investigation. It is recommended that for improvements to this location to accomodate 286K railcars, the entire superstructure and supporting abutments be removed and replaced with a new bridge	Not Completed							
	Lake Junction Yard: Cattle Pass Bridge (MP 57.49) - Hackettstown. It is recommended that the existing bridge be replaced with a precast concrete box structure. The bridge should be advanced into engineering, design and implementation.	Not Completed							
	Lake Junction Yard: Drain Bridge (MP 57.25)- Hackettstown. It is recommended that the existing bridge be removed and a precast concrete box be installed. Further engineering investigation will be required to fully define the scope of the improvement necessary	Not Completed							
	Lake Junction Yard: Shippenport Road Bridge - Roxbury. While further engineering investigation will be required to fully define the scope of the improvement necessary, it is recommended that the bolts and connection angles be replaced with materials of a sufficient size and material grade to safely accomodate 286K railcars.	Not Completed							
	Montclair Line: Mill Brook Bridge (MP 36.41)-Town of Denville. While further engineering investigation will be required to fully define the scope of the improvement necessary. It is recommended that the entire bridge structure, both the concrete slab and the stone arch sections be replaced with structural enhancement of the concrete abutments as necessary to safely accomodate 286K railcars	Not Completed							
	Montclair Line: Franklin Road Bridge (MP 35.28)- Town of Denville. While further engineering investigation will be required to fully define the scope of the improvement necessary. It is recommended that the entire bridge structure be replaced with a bridge type to be determined as part of a detailed engineering investigation	Not Completed							
	Whippany Line: East Hanover Avenue Bridge (MP 31.48) - Catenary lines suspended below the bridge present a vertical constraint. The configuration of the catenary infrastructure limits vertical clearance to approximately 17'-2" in the vicinity of the East Hanover Avenue Bridge. While a minimu strcutural clearance of 17'-6" is required, electrical transmission lines, particularly high voltage catenary lines, require a larger clearance envelope to avoid the arcing of electrical current when a railcar passes beneath the wire. While large separation is desirable, a minimum clearance of 17'-8" between the top of rail and the lowest point of the wire is required for the movement of a Plate "F" railcar	Not Completed							

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
15. Lackawanna Cutoff Study (2008)									
No-Build Recommendations	NJ TRANSIT Access to the Region's Core (ARC) project, consisting of new trans-hudson rail tunnels and a new passenger station under 34th Street in Manhattan, which includes additional peak and off-peak direct rail service to Midtown Manhattan from existing stations on both the Morris & Essex and Montclair-Boonton-Lines	Not Completed				■			
	NJ TRANSIT new commuter rail equipment procurement	Not Completed				■			
	NJ TRANSIT new Morris & Essex Line rail station and park-and ride in Mount Arlington, adjacent to Interstate 80 and Howard Boulevard, Morris County, NJ	Completed				■			
	Sparta Stanhope Road roadway/bridge improvements, Sussex County, NJ. Construction of a new bridge at Sparta Stanhope Raod over Lackawanna Cut-Off	Not Completed	■				■		
	US Route 206 roadway improvements, Sussex County, NJ	Not Completed					■		
	Hope Road/County Route 521 roadway/bridge improvements, Warren County, NJ. Rehabilitation of the existing bridge County Route 521 Hope Road Bridge over Lackawanna Cut-Off to carry southbound traffic; construction of a new bridge to carry northbound traffic	Not Completed					■		
	Interstate 80 Truck Weigh Station, Eastbound, Knowlton Township, MP 1.55-2.75, Warren County, NJ	Not Completed							■
	Interstate 80 Delaware Water Gap Visitors Center, Warren County, NJ	Not Completed				■			
	Interstate 80 Welcome Center at the Delaware Water Gap, Monroe County, PA	Not Completed				■			
	Marshalls Creek Bypass project, Monroe County, PA	Not Completed					■		
	Interstate 80 and 380 Interchange project, Monroe County, PA. Reconstruction of Interstate 380 ramps to and from Interstate 80 eastbound	Not Completed					■		
	Scranton Intermodal Center, Lackawanna County, PA	Not Completed				■			
	Improvements to Route 206, Section, Cat Swamp Mountain, MP 99.7-100.3 and MP 101.15-101.35	Not Completed	■						
	Improvements to Route 206/CR604, Section: Waterloo/Brookwood Roads, MP 98.38-99.70	Not Completed	■						
Build Alternative Recommendations	Reactivating 88 miles of passenger service over the former DL&W Railroad mainline from Scranton to Port Morris	Not Completed				■			
	Rail service east of Port Morris would operate via NJ TRANSIT's Morris & Essex or Montclair-Boonton Lines	Not Completed				■			
	Scranton Yard Facility: A yard facility built in Scranton, west of proposed Station site. Facility would include vehicle storage, maintenance, fueling and cleaning, covered storage tracks, an employee welfare facility and a 30-space employee parking lot	Not Completed				■			
	Scranton Station: The terminus of the line in the City of Scranton would be a regional station located in conjunction with a proposed Intermodal Transit Center (ITC) along Lackawanna Avenue. Parking for the proposed station would occur at the ITC with 30 parking spaces. The proposed station would be situated on Lackawanna Avenue along the northernmost track immediately east of Bridge 60 (RR bridge over Lackawanna River) and to the east of the Cliff Street underpass	Not Completed				■			
	Tobyhanna Station: The station site is located in Coolbaugh Township. The site is adjacent to the former rail station, access to the station is from Church Street. A 102-space surface parking lot would be provided at the station	Not Completed				■			
	Pocono Mountain Station: the station site is located in Coolbaugh Township. The proposed station site would include 1,000 parking spaces and access to the site would be from PA Route 611	Not Completed				■			
	Analomink Station: The site for station is located along PA Route 191 in Stroud Township. The station site would include 250 parking spaces and access to the site would be from PA Routes 191 and 447.	Not Completed				■			
	East Stroudsburg Station: The station location is in the Borough of East Stroudsburg south of the original railroad station. 228 parking spaces are proposed and access to the site would be from Crystal Street and Bridge Street	Not Completed				■			
	Delaware Water Gap Station: The proposed station location is south of the right-of-way at PA Route 2028 (River Road) in Smithfield Township. There is a planned park-and-ride facility by the Delaware Water Gap Visitors Center with 900 parking spaces, located southwest of Interstate 80. Access to the station would be via PA Route 2028	Not Completed				■			
	Blairstown Station: The proposed station is located on Hope Road (County Route 521) in Blairstown Township, NJ. A 230-space surface parking lot is proposed. Access to this site would be from County Route 521	Not Completed				■			
	Greendell Maintenance-of-Way Facility: A maintenance-of-way facility is included as part of the project in Greendell, New Jersey, utilizing the former station building and site at that location for storage of materials for signal maintainers. This proposed facility would be located entirely in a publicly-owned-right-of-way.	Not Completed				■			
	Andover Station: This station is located in Andover Township, NJ on the south side of Roseville Road and Andover Mohawk Road. A 125-space surface parking lot would service this station. Access to this site would be from Roseville Road (County Route 613)	Ongoing				■			
16. Raritan Valley Line Extension (2005)									
Bus Service	Additional Express Bus Service in the I-78 Corridor to Urban Core (Midtown/ Lower Manhattan/ Exchange Place Jersey City)	Not Completed				■			
New Bus Park and Rides	Bloomsbury/Bethlehem I-78 Bus P&R and Future RVL Rail Station	Not Completed				■			
	New Bus/Rail Facility in the area of the Confluence of Rt 33/I-78/Rt 22 and the RVL	NA				■			
Parking Expansion at existing rail stations	Annandale Station RVL – Expand parking on NJT ROW (50 to 100 stalls) and vacant parcel (280 stalls - in possible second phase)	NA				■			
	High Bridge Station RVL – Expand parking via shared use with Casa Maya Restaurant (50 stalls)	NA				■			
Commuter Rail Extensions	Extend the Raritan Valley Line to Hampton	NA				■			
	Extend the Raritan Valley Line to Bloomsbury/ Bethlehem	NA				■			
	Extend the Raritan Valley Line to Phillipsburg former CNJ Main Line	NA				■			
	Extend the Raritan Valley Line to Phillipsburg via the NS Lehigh Line	NA				■			

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
17. Warren Heritage Scenic Byway Corridor Management Plan (2011) (Rt 57)									
Historic / Archaeological Resource Strategies	Support efforts to preserve, protect,and link Morris Canal sites	Ongoing			■				
	Support Morris Canal Greenway initiative	Ongoing			■				
	Improve visibility of Edison Concrete Mile	Not Completed			■				
	Establish heritage museum at Bread Lock Park	Not Completed							
	Conduct study of historic preservation needs and prioritities	Not Completed							
	Support preservation efforts by local historical societies	Ongoing							
	Investigate adaptive reuse of Anderson Hotel	Not Completed						■	
	Investigate creation of Heritage Area	Not Completed							
	Identify and preserve archaelogical resources	Ongoing							
	Encouragement enactment of historic preservation ordinance and formation of commisions	Not Completed						■	
	Consider creating historic district overlay zones to guide historic resource conservation	Not Completed						■	
Scenic Resource Strategies	Identify and implement measures to preserve highest ranked scenic vistas	Not Completed							
	Support local farming and farmland/open space preservation	Ongoing			■			■	
	Develop model scenic Corridor Overlay Zone for local consideration	Not Completed							
	Encourage developers to minimize the scenic impacts of their projects	Ongoing						■	
	Support infill development and redevelopment	Not Completed						■	
	Identify and develop locations for scenic pull-offs	Planned							
	Develop byway "beautification" plan to reduce unsightly features	Not Completed							
	Improve appearance of Washington Townhip transition zones approaching Washington Boro	Not Completed							
	Coordinate scenic conservation efforts with Signage Plan	Planned							
Cultural Asset Strategies	Coordinate existing cultural events with byway tourism and marketing	NA							
	Develop new cultural events to highlight byway tourism and marketing	NA							
	Develop new cultural events to highlight byway	NA							
	Develop programs focused on agricultural life	NA							
Natural and Recreation Strategies	Support initiatives to protect environmental quality	Ongoing			■				
	Implement Musconetcong River Management Plan	Ongoing			■				
	Improve access to Musconetcong River and develop parking facilities	Planned		■				■	
	Improve accesss and parking at strategic recreational locations	Not Completed		■					
	Identify priority investments to better serve recreational travelers	Not Completed							
	Investigate establishment of alternate bike route parallel to byway	Not Completed		■					
	Develop bicycle touring map	Not Completed		■					
	Compile information on hiking opportunities	Not Completed		■					

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
Roadway and Transportation Strategies	Provide parking areas at various destinations and points of interest	Not Completed						■	
	Support the installation of parking areas in Washington Borough	Not Completed						■	
	Identify improvements to support exploration of byway features on foot	Ongoing		■					
	Investigate potential to achieve more consistent shoulder width	Not Completed		■					
	Install bicycle-compatible grates and reduce obstacles in shoulder	Not Completed		■					
	Develop off-road network as alternative route for bicyclists and pedestrians	Not Completed		■					
	Improve traffic operations at certain intersections	Not Completed		■			■		
	Investigate visibility at the intersection of Route 57 and Anderson Road	Not Completed	■						
	Consider using signs to help large trucks to avoid narrow side roads	Not Completed							■
	Incorporate safety improvements in maintenance or development projects	Not Completed	■						
	Investigate use of warning signs at locations with crash history	Not Completed	■						
	Improve provisions for the removal of deer killed in collisions	Not Completed	■						
	Update and review crash records periodically to monitor conditions	Not Completed	■						
	Avoid introducing new driver distractions as byway program develops	Planned	■						
	Consider installing more attractive guide rail during future maintenance projects	Not Completed							
Signage, Utility and Site Furnishing Strategies	Develop coordinated sign system for wayshowing and visitor information	Planned		■					
	Work with NJDOT to create byway logo	Completed							
	Develop and implement a process for monitoring compliance with outdoor advertising	Completed							
	Review local sign codes and potential improvements for aesthetics and consistency	Not Completed							
	Work with utilities to identify ways to minimize aesthetic impacts	NA							
	Review local regulations on cell towers and potential for improvements	Not Completed							
	Identify and develop site furnishings to enhance traveler experience	Not Completed							
Interpretive Strategies	Develop interpretive program for proposed heritage museum	Not Completed							
	Support development of coordinated interpretive program for Morris Canal	Not Completed							
	Interpret Edison Concrete Mile with ties to Edison National Historic Site	Not Completed							
	Conduct study to develop comprehensive interpretive program	Not Completed							
	Implement comprehensive interpretive program	Not Completed							
Tourism and Marketing Strategies	Coordinate tourism promotional activities with wayfinding efforts	Completed							
	Conduct assessment of existing tourism and potential opportunities	NA							
	Prepare tourism and marketing plan	NA							
	Develop marketing tools	NA							
	Prepare destinations and support services for visitation	NA							
	Collaborate with key agencies to cross-promote and enhance attractions	NA							
	Support Business Improvement District plans	NA							
	Develop system for measuring tourism success	NA							
	Arrange for attendance at tourism workshops	NA							

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
18. NJTPA Walkable Communities Phillipsburg									
Corliss Avenue to Route 22 along Roseberry Street	Increase set-back of the sidewalk from the street and widen to a minimum width of 5 feet to allow pedestrians to walk side-by-side and comfortably pass each other	Problem Statement Submitted	■	■					
	Resurface sidewalk and delineate sidewalk between Elder Avenue and Route 22	Not Completed	■	■					
	Restripe Elder Avenue and Roseberry Street intersection crosswalks with attention to ADA compliance at intersection corners	Completed	■	■					
	Count-down signal heads and curb ramps with textured surfacing are recommended for the Roseberry Street and Elder Avenue intersection	Completed	■	■					
Intersection of Route 22 and Roseberry Street	Eliminate the right-on-red option for vehicles making a right-turn from Roseberry Street west to Route 22, and from Route 22 south to Roseberry Street	Completed	■						
	Improve street lighting, particularly near the crosswalk	Completed	■						
	Relocate utility poles located at the south-west corner of the intersection. These utility poles narrow the curb ramp and obstruct visibility of the pedestrian head	Not Completed	■						
	Replace existing pedestrian signal heads with new countdown signal heads and push buttons for easy visibility and access on both the north and south sides of Route 22. Explore possibility of increasing crossing time allotted for pedestrians, and placing pedestrian push buttons within the pedestrian refuge in the median of Route 22	Completed	■	■					
	Realign the western side of the intersection's crosswalk and curb ramps to straighten out the crosswalk from its present angle	Partially Completed	■	■					
Route 22	Add sidewalks along this state corridor within the vicinity of the intersection of Route 22 and Roseberry Street	Partially Completed		■					
	Provide a barrier along the Route 22 median west of the intersection to discourage jaywalking at unsafe, unsignalized points	Not Completed		■					
	Investigate local municipal codes to determine whether they mandate the installation of sidewalks with all new development	Not Completed		■					
	Add sidewalk and crosswalk from corner of Route 22 to Marshall Street, and a crosswalk at Heckman Street	Not Completed		■					
	Add striped crosswalks across Roseberry Street at Marshall Street and Heckman Street. Many residents on the west side of Roseberry Street cross this municipal road to access the Wawa and 7 Eleven on the east side of Roseberry	Partially Completed		■					
	Complete sidewalks on the east side of Roseberry Street to connect the Wawa and 7- Eleven convenience stores with the crosswalks at Marshall and/or Heckman Streets	Not Completed		■					
	Consider installation of traffic calming devices and/or edge striping and lane striping to keep vehicles in appropriately defined driving lanes, reduce the speed of motorists and enhance their ability to see and react to crossing pedestrians. Explore whether ROW width in this area would allow a left-turn only lane into the Wawa	Partially Completed		■					
	Add amenities, signage and striping delineation for NJ TRANSIT bus stop in front of Wawa convenience store	Not Completed		■		■			
19. Solid Waste Management Plan									
	Trucks coming from outside Warren County must use only state highways to access the RRF	Completed							■
	It is the county's objective to use federal and state highways for deliveries to the RRF and WCDL to the extent possible.	Completed							■
	Trucks, coming from the east on I-80, are required to travel to Exit 26, Budd Lake to U.S. Route 46 West to N.J. Route 31 or to Exit 4, Columbia, to U.S. Route 46 East to N.J. Route 31 South	Completed							■
	Trucks from eastern New Jersey or New York traveling I-78 must take Exit 3 to US Route 22 west to U-turn at Second Street or Roseberry Street to US Route 22 east to NJ Route 57 north to CR 519 north.	Completed							■
	Trucks from Pennsylvania using U.S. Route 22 must take U.S. Route 22 east to N.J. Route 57 north to CR 519 north. Trucks from Pennsylvania using I-78 must exit at Exit 3, take U.S. Route 22 west to the U-turn at Second Street or Roseberry Street to U.S. Route 22 east to N.J. Route 57 north to CR 519 north	Completed							■

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
20. Northwest New Jersey Bus Study (2010)									
Service Concepts for the Warren -Morris Corridors	Extend the Budd Lake branch of Lakeland 80 to Hackettstown. This concept would make bus service an additional option for Hackettstown residents. It would extend five morning peak eastbound and five evening peak westbound Lakeland 80 Budd Lake Branch trips to the Hackettstown Mall, with a stop in Hackettstown center	Not Completed				■			
Streamline the Wheels 973 Hackettstown Circulator.	The town-subsidized circulator has only 86 boardings per day. The route can reconfigured to be more efficient.	Service Terminated				■			
	Bus stop signs be installed at bus stops in Hackettstown Center and at apartment developments and retail sites and that route and schedule information displays and shelters be installed at the major stops	Service Terminated				■			
	The new proposed route starts at Walmart, serve Shop Rite and Weis super markets and continue north on NJ 57, deviating to serve Mansfield Village Apts. After serving Hackettstown Mall , continue norht on NJ 57, left on Main Street (US 46), left on Moore Street, right on Beatty Street, right on Valentine Street, right on Main Street, Left on High Street, right on Franklin Street, left on Willow Grove Street. Terminate at Hackettstown Hospital and the adjacent Heritage House. The cycle time would be about 70-80 minutes	Service Terminated				■			
	To address locations no longer served by the fixed route, it is recommended that flex deviations be allowed to be requested to any location within 3/4 mile of the route	Service Terminated				■			
Extend Warren County Route 57B to Hackettstown and interline with Route 57A	This concept proposes to extend the Warren County 57B route from its current terminus at the Hackettstown Mall to downtown Hackettstown to improve regional connectivity. A direct connection to Hackettstown center would enable riders to connect to rail service.	Service Terminated				■			
Proposed Transit Hub	A small transit hub is proposed at Hackettstown Center, the existing services are 973 and RR. The changes include extending some peak Lakeland 80 trios and creating new downtown express bus stops	Service Terminated				■			
21. Intersection Improvements County Route 519 and NJ 57									
Traffic Engineering	New traffic signal equipment is proposed	Planned					■		
	The intersection is projected to be LOS C in 2025 in the PM peak hour with the preferred alternative compared to LOS F in the 2025 PM peak hour without any improvements	Planned					■		
Pedestrian/Bicycle Compatibility	On Route 57, a four foot shoulder is provided for bicycle compatibility	Planned		■					
	On County Route 519, the outside lanes are 15 feet to accommodate shared use with bicycles	Planned		■					
	A minimum border width of ten feet will be provided which allows a minimum of six feet from the roadway to the guide rail for use by pedestrians. The bridges will also include this widht for pedestrians	Planned		■					
Context Sensitive Design	The type of structures proposed for the bridges are precast arches that can easily accommodate architectural finishes on the spandrel walls	Planned							
Description	The proposed improvement maintains existing centerline geometry of Route 57 and CR 519	Planned							
	Provides exclusive left turn lanes and shared through/right lanes on all approaches except provides exclusive left, through and right-turn lanes or CR 519 NB approach	Planned					■		
	Provides four foot shoulders on Route 57 and 15 feet outside lanes on CR 519 to accommodate cyclists	Planned		■					
	Provides an off-site detention basin that meets the NJDEP rules	Planned			■				
	Route 57: four foot shoulders, 11 feet through/right lane and 12-foot left turn lane	Planned		■			■		
	CR 519 north approach: 15 feet through/right lane and 12 feet left turn lane	Planned		■			■		
	CR 519 south approach: 15 feet right lane, 12 feeet through lane and 12 feet left turn lane	Planned		■			■		

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
22. NJTPA Truck Parking Study									
Policy / Institutional - Secure Sites as necessary land use	Recognize that truck parking is part of the public infrastructure, fulfiiling an important public safety function	Not Completed							
	If expanded public sites are deemed neither feasible nor desirable, accelerate public-private partnership approaches in which public sector joins with private truck operators to expand or even establish new private facilities	Not Completed							
	Provide financial incentives, including but not limited to, grants, low or no interest loans or other tax abatements	Not Completed							
	Focus on sites for which truck parking may conceivable be the highest and best use	Not Completed							
	Recognize that some sites may be most appropriate for specific truck parking needs such as port or terminal staging but regional need should be kept in view	Not Completed							
	Evaluate the potential for tax revenue sharing with municipalities using a model or approach similar to the state's Urban Enterrprise Zone program	Not Completed							
	Identify potential land-swap candidates in collaboration with municipalities and property owners. Unique opportunities may exist to secure truck parking through land swaps that represent win-win opportunities	Not Completed							
Advance favorable federal legistlation that promotes innovation and Public-Private Partnerships	NJ should collaborate with PA and other northeastern states to advance a policy position on federal legislation. Truck parking should be a major component of an anticipated national freight policy	Not Completed							
	Regionally specific organizations such as the Northeastern Association of Transportation Officials and the I-95 corridor coalition should act upon the several regional truck parking studies completed or being completed in the Northeast	Not Completed							
	There is an opportunity for significant innovation in developing federal policy. It is recommended that the US DOT or FHWA convene a facilitated workshop that would include the private truck operators industry and federal and state public DOT representatives. This workshop could be done under the NGA or AASHTO auspices. The purpose would be to find common ground that would be the basis for policy development that focus on public-private partnership. Senior officials expressed interest in this concept at the meeting with NJTPA staff and consultants in April 2006.	Not Completed							
Pursue alternative fuels, energy, and environmental opportunities	Include a "green trucks" element as a pilot or demonstration program in the final site to be developed or expanded for truck parking	Not Completed							
	Secure federal and state grants for this demonstration program. Use these grants to leverage private sector money as well. The "green trucks" demonstration should include specific objectives including but not limited to: air quality and emission minimization, site buffering if necessary, energy savings, and the testing of alternative technologies	Not Completed							
Advance complimentary land use approaches	Consider development of a model ordinance for truck parking. This would be an opportunity to proactively identify and address key mitigation issues and land use concerns. It should be done in a way however, that does not effectively make new or expanded truck parking capacity unachievable through excessive regulatory burden.	Not Completed							
	Focus parking expansion at existing sites that minimize conflicting land uses	Not Completed							
	Target truck parking facilities not just for regional truck parking needs but also on areas to cater the specific major truck generators	Not Completed							
	Work with private shippers/receivers to identify potential opportunities for providing inspection and logistics services at a central truck parking location	Not Completed							
Provide incentives for private sector development of truck parking	Identify the full range of existing incentives that could be used including grants, tax incentives, industrial development bonds, etc.	Not Completed							
	Assess the utility and feasibility of each potential incentive. Apply those incentives that will work best	Not Completed							
	Seek incentives at a national level as part of the federal policy and surface transportation reauthorization recommendations	Not Completed							
Incorporate truck parking as a future design parameter for facility improvement planning and design	Highway design, construction and reconstruction typically add capacity for traffic. Routinely these capacity adding activities should consider whether there are related opportunities for providing truck capacity as well	Not Completed							
	ROW acquisition and disposition actions of transportation agencies are also an opportunity to consider any opportunities for increasing truck parking spaces	Not Completed							
	Guidance and supporting checklists for potential truck parking opportunities should be developed for the routine use by NJDOT and NJ Turnpike, and their consultants	Not Completed							
Integrate truck parking as an element of port and intermodal facility development and growth planning	Consider updating the regional forecast of truck traffic, and determine the regional truck parking need for benchmark years. This entails establishing a reasonable estimate of the demand gap in five year increments.	Not Completed							
	Consider establishing goals and processes for addressing these parking needs	Not Completed							
	Incorporate truck stop needs into the regional planning process	Completed							
	Incorporate truck parking in port master plans for Newark and Elizabeth along with all other supporting uses for port sustainaibility and growth	Completed							
Promote Public-Private-Partnerships	Establish a dialogue between representatives of NJ and surrounding states and the truck parking industry	Completed							
	Explore opportunities for innovative "one time" public financing to eliminate the economic barriers of private industry to establish truck parking locations. This can be in the form of land purchase, access improvements, etc. Any feasible bonding capacity should also be considered particularly if there is an identified revenue stream for debt service	Partially Completed							
Collaborate on a broader scale with neighboring DOTs, MPO regions, and local planning	Continue the current partnership efforts with NYMTC and ConnDOT and future coordination with PA, MD, and the I-95 Corridor Coalition	Completed							
	Work with NJTPA member agencies to identify locations, incorporate truck parking as a necessity for efficient goods movement and resulting economic benefits	Completed							
Warren County Specific Recommendations	No truck parking sites have been proposed in Warren County	Completed							

Category	Recommendation	Implementation Status	Type of Recommendation						
			Safety	Mobility	Environment	Transit	Congestion	Land Use	Freight
23. Route 57 / 182 / 46 Hackettstown Mobility Improvements Concept Development Study									
Site 1: US 46 and East Avenue	Concept A: Widen intersection approach to realign roadway geometry, and separate turning and through traffic movements. Create double left turn configuration from US 46 westbound to East Avenue. Create a second receiving lane on East Avenue. Optimize phasing and timing.	Not Completed							
	Concept B: Install far side type "C" jughandle from US 46 westbound to East Avenue westbound. Install channelized right turn from eastbound East Avenue to eastbound US 46. Optimize phasing and timing.	Not Completed							
	Concept C: Install near side type "A" jughandle from US 46 westbound to East Avenue westbound. Install channelized right turn from eastbound East Avenue to eastbound US 46. Optimize phasing and timing.	Not Completed							
	Preffered Alternative Concept D: Widen curb radius on SE quadrant of the intersection and revise signal phasing to provide for a right turn overlap phase for northbound East Avenue approach right turn onto eastbound US 46.	Not Completed							
Site 2: US 46 and NJ 182 (Mountain Avenue) / Willow Grove Street / Warren Street	Concept A: Widen intersection approach to align roadway geometry and provide separate turning and through traffic movements. Optimize phasing and timing	Not Completed							
	Concept B: Modern roundabout configuration	Not Completed							
	Concept C: Scaled back intersection improvements to slightly realign roadway and provide additional lanes for the eastbound and westbound approaches	Not Completed							
	Prefered Alternative Concept D: Signal timing optimization	Completed							
Site 3: US 46 and High Street / Grand Avenue	Concept A: Widen intersection approach to realign roadway geometry, and separate turning and through traffic movements. Optimize phasing and timing.	Not Completed							
	Concept B: Modern roundabout configuration	Not Completed							
	Prefered Alternative Concept C: Scaled back intersection widening to slightly realign roadway, provide an additional lane for the eastbound approach, and improve operation for the westbound approach	Not Completed							
Site 4: NJ 57 and NJ 182	**Preferred Alternative Concept A:** Restriping roadway to allow double left turn from NJ 57 onto NJ 182. Retiming traffic signal.	Not Completed							

Technical Memorandum 3.2: Data Assessment: Crash Analysis, Management Systems, and Transit

Warren County Transportation Technical Study Update

MAY 2018

FINAL

INTRODUCTION

This Technical Memorandum presents an inventory and assessment of crash data, management systems, and transit systems in Warren County. The project team obtained data resources from the New Jersey Department of Transportation (NJDOT), including crash and management systems data for congestion, pavement and bridges along state highways within Warren County. The data was mapped and tabulated to identify known issues or problem areas within the County. The project team also obtained data on existing transit services, to summarize public transportation access within the County. These data resources have used by the project team to inform development of the three-part framework plan in the final report.

CRASH DATA ANALYSIS

To conduct crash data analysis, crash data was obtained from NJDOT's Safety Voyager program (2014-2016) and Warren County's road safety assessments conducted from 2011-2015.

CRASH ANALYSIS – NJDOT DATA

The project team evaluated NJDOT crash data obtained through Safety Voyager for the most recent three-year period, 2014-2016. This section refers only to the NJDOT crash data for the year 2014-16, all tables and figures use these same data resources.

Crashes from the three-year evaluation period were mapped to identify crash clusters throughout the County. After mapping the crashes, a hotspot analysis was conducted to identify crash hotspots. This analysis helped in identifying the top intersections and corridors with safety issues within the County. To identify bicycle and pedestrian safety issues, bicycle and pedestrian crashes were separately studied. Additionally, Warren County crash data was compared to statewide crash data to identify patterns.

From 2014 to 2016 there were 9,787 crashes in Warren County. As shown in Table 1, 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 significantly different from State percentages where 72.4 percent occurred away from the intersection and 27.6 percent of the crashes occurred at the intersection.

As shown in Table 2, 12.9 percent of the total crashes occurred in "dark" conditions with no street lights in Warren County which is significantly different from the State percentages (3.85%).

Table 1: Crash Location

CRASH CHARACTERISTIC	COUNTY #	COUNTY %	STATE %
LOCATION			
At Intersection	1938	19.8%	27.6%
Not at Intersection	7849	80.2%	72.4%
Total	9787	100.0%	

Source: NJDOT Safety Voyager (2014-2016)

Table 2: Lighting Condition at the Time of Crash

LIGHT CONDITION			
Unknown	53	0.5%	0.6%
Daylight	6546	66.9%	71.0%
Dawn	215	2.2%	1.6%
Dusk	259	2.7%	2.4%
Dark (street lights off)	111	1.1%	0.9%
Dark (no street lights)	1269	13.0%	3.9%
NOT RECORDED	5	0.1%	0.4%
Dark (street lights on, continuous)	882	9.0%	16.4%
Dark (street lights on, spot)	447	4.6%	3.3%
Total	9787	100.0%	

Source: NJDOT Safety Voyager (2014-2016)

The high crash corridors are Interstate 78, Interstate 80, NJ 57 in Hackettstown, Washington Borough, and Phillipsburg. These data are displayed in Figure 1. The hotspot analysis also highlights US Route 22, NJ 31 in Washington Borough, and downtown areas of Hackettstown, Washington Borough and Phillipsburg. The three municipalities are denser urban areas compared to other parts of Warren County. So, higher crash concentrations are present in these municipalities creating hotspots. Hotspot analysis is illustrated in Figure 2.

In the analysis period from 2014-2016, 92 bicycle and pedestrian crashes occurred in Warren County. Out of the 92 crashes, 29 crashes involved bicyclists. The bicycle and pedestrian crashes are illustrated in Figure 3. As shown in Figure 3, the majority of the bicycle and pedestrian crashes occurred in Hackettstown, Washington Borough, and Phillipsburg. As shown in Table 3, 65.4 percent of the pedestrians involved in crashes were male, which is higher than the state percentage (51.8%). As shown in Table 3, 16.7 percent of the pedestrians involved in crashes in Warren County were between the ages of 20-29, which is higher than the State percentage (13.8%).

Table 3: Pedestrian Crashes (2014-2016): Gender and Age

CRASH CHARACTERISTIC	COUNTY #	COUNTY %	STATE %
GENDER			
Female	25	32.05%	43.25%
Male	51	65.38%	51.79%
Unknown	2	2.56%	4.96%
Total	78	100.00%	
AGE			
0-9	2	2.56%	4.01%
10-19	3	3.85%	12.44%
20-29	13	16.67%	13.81%
30-39	10	12.82%	10.78%
40-49	10	12.82%	10.98%
50-59	8	10.26%	11.69%
60-69	6	7.69%	7.65%
70+	9	11.54%	7.72%
Unknown	17	21.79%	20.92%
Total	78	100.00%	

Source: NJDOT Safety Voyager (2014-2016)

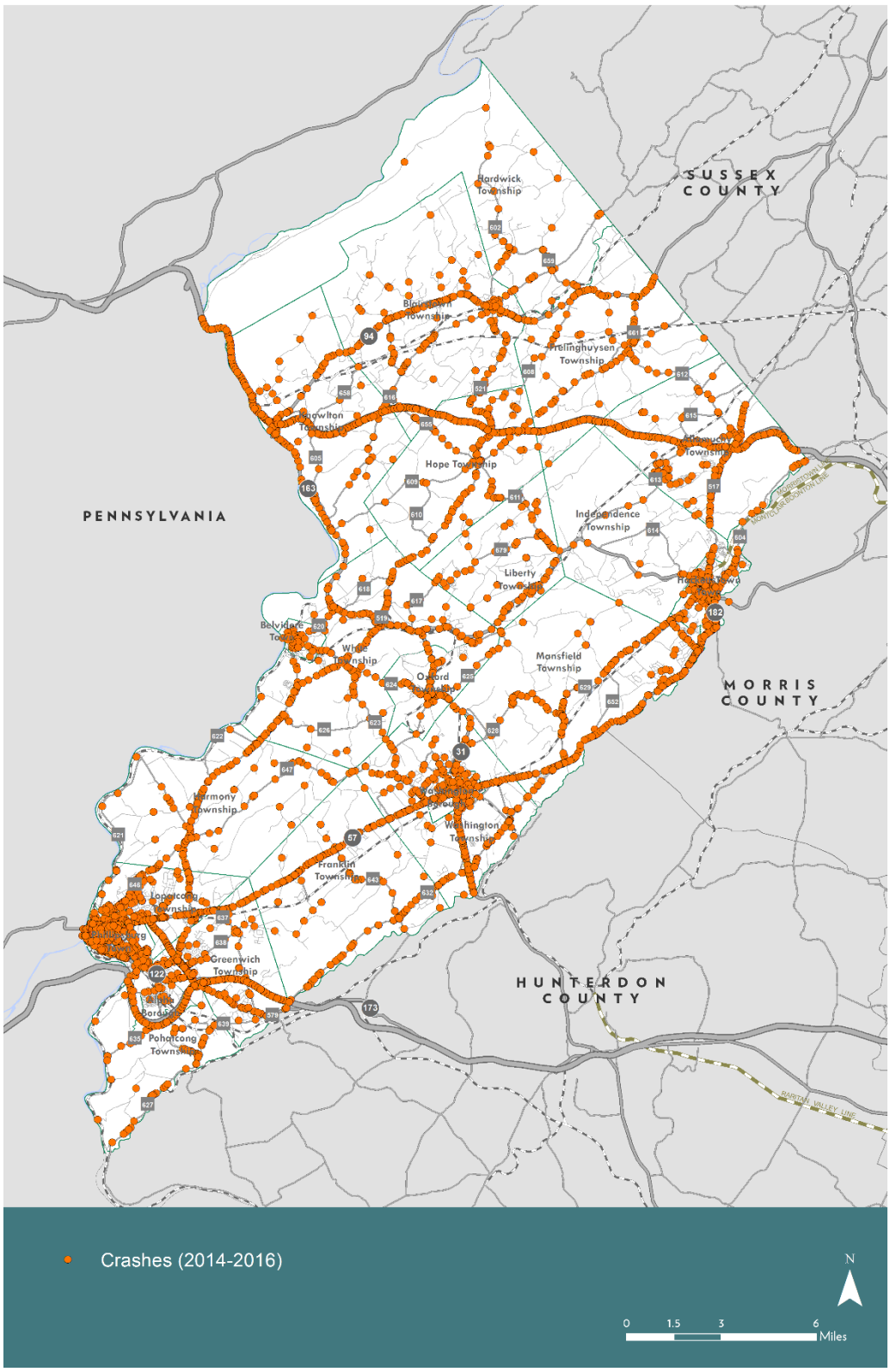

Figure 1: Crash Locations in Warren County (2014-2016)

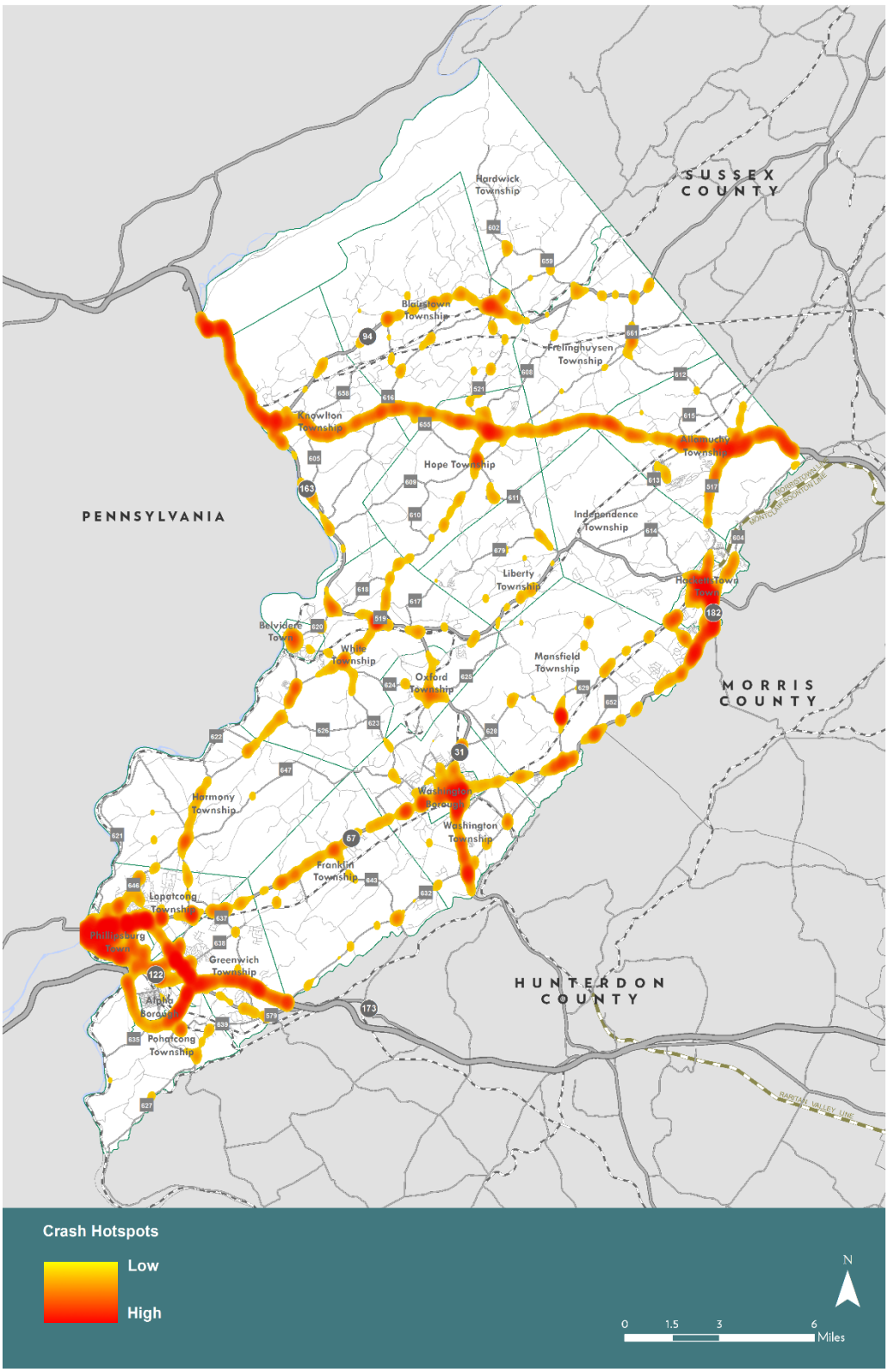

Figure 2: Crash Data Hotspots in Warren County (2014-2016)

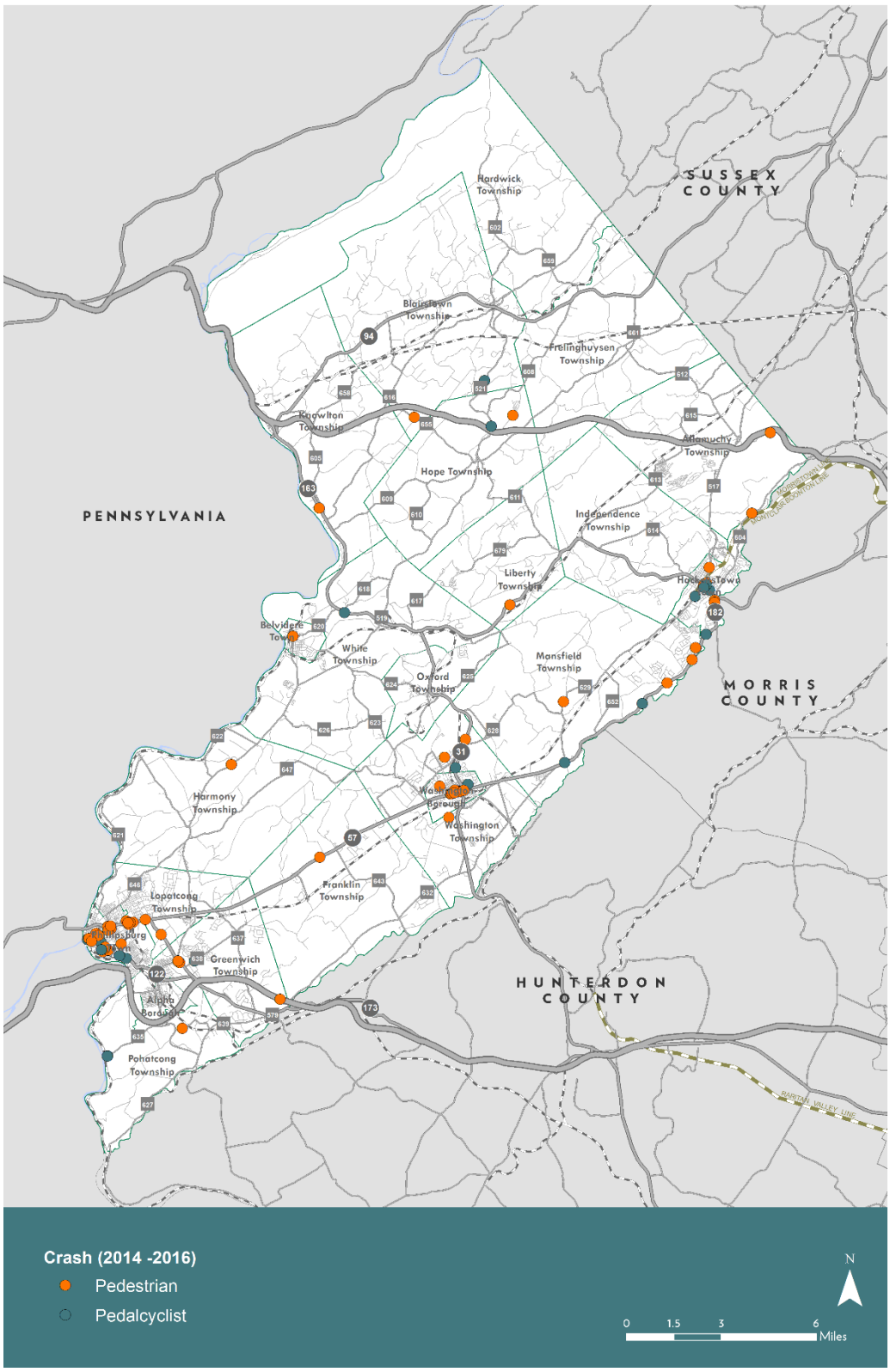

Figure 3: Bicycle and Pedestrian Crashes in Warren County (2014 - 2016)

CRASH ANALYSIS - WARREN COUNTY

Warren County conducted an independent effort to collect and analyze crash and road safety data only for Warren County roadways for the years 2011 to 2015. These data are separate and independent of the NJDOT crash data resources and analysis. This section refers only to the Warren County crash data; the table below uses these same data resources.

During the years 2011 to 2015 Warren County prepared crash data and road safety assessments from crash reports received from local and state police departments in Warren County. Crash data collected were processed by Warren County to identify high crash location on County roads. From years 2011 to 2015 the top eleven locations with highest number of crashes are listed below in Table 6. The top 3 crash locations include CR 519 at US 22, CR 638 at US 22, and CR 519 at NJ 57.

Table 4: Crash Data Ranking by Warren County 2011-2015

Rank	CR	Cross Street	Municipality	MP	Crashes (2011 – 2015)
1	519	US 22	Greenwich / Pohatcong Twp	28.33	155
2	638	US 22	Greenwich Twp	0	113
3	519	NJ 57	Lopatcong Twp	29.93	68
4	630 Spur	NJ 31	Washington Twp	0	66
5	632	NJ 31	Washington Twp	7.45	45
6	517	I-80 WB ramp	Allamuchy Twp	20.63	29
7	604	US 46	Hackettstown	0	25
8	623	NJ 57	Washington Twp	0	22
9	628	NJ 31	Washington Twp	2.07	22
10	517	US 46	Hackettstown	15.85	19
11	517	CR 665	Independence Twp	17.1	18

NJDOT PAVEMENT MANAGEMENT SYSTEM

A review of Pavement Management System (PMS) data was conducted. The PMS data are available only for US and State roadways. These data are for the 2016 analysis year, the most recent datasets available from NJDOT.

The pavement condition is evaluated using the Surface Distress Index, measured on a 0-5 scale (5 = perfect pavement with no distress). Out of the 564 links on the County roadway network 199 links are “Deficient” and “264” are in “Fair” condition. The roadways with “Deficient” pavement condition in Warren County Include I-78, I-80, US 22, US 46, NJ 31, NJ 57, NJ 122, NJ 94, NJ 173, and NJ 182. The pavement condition with mileposts are detailed in Table 2. Pavement conditions (“deficient” and “fair”) in Warren County from NJDOT PMS system are shown in Figure 4.

Records on pavement conditions are not available for the county and local roads within Warren County.

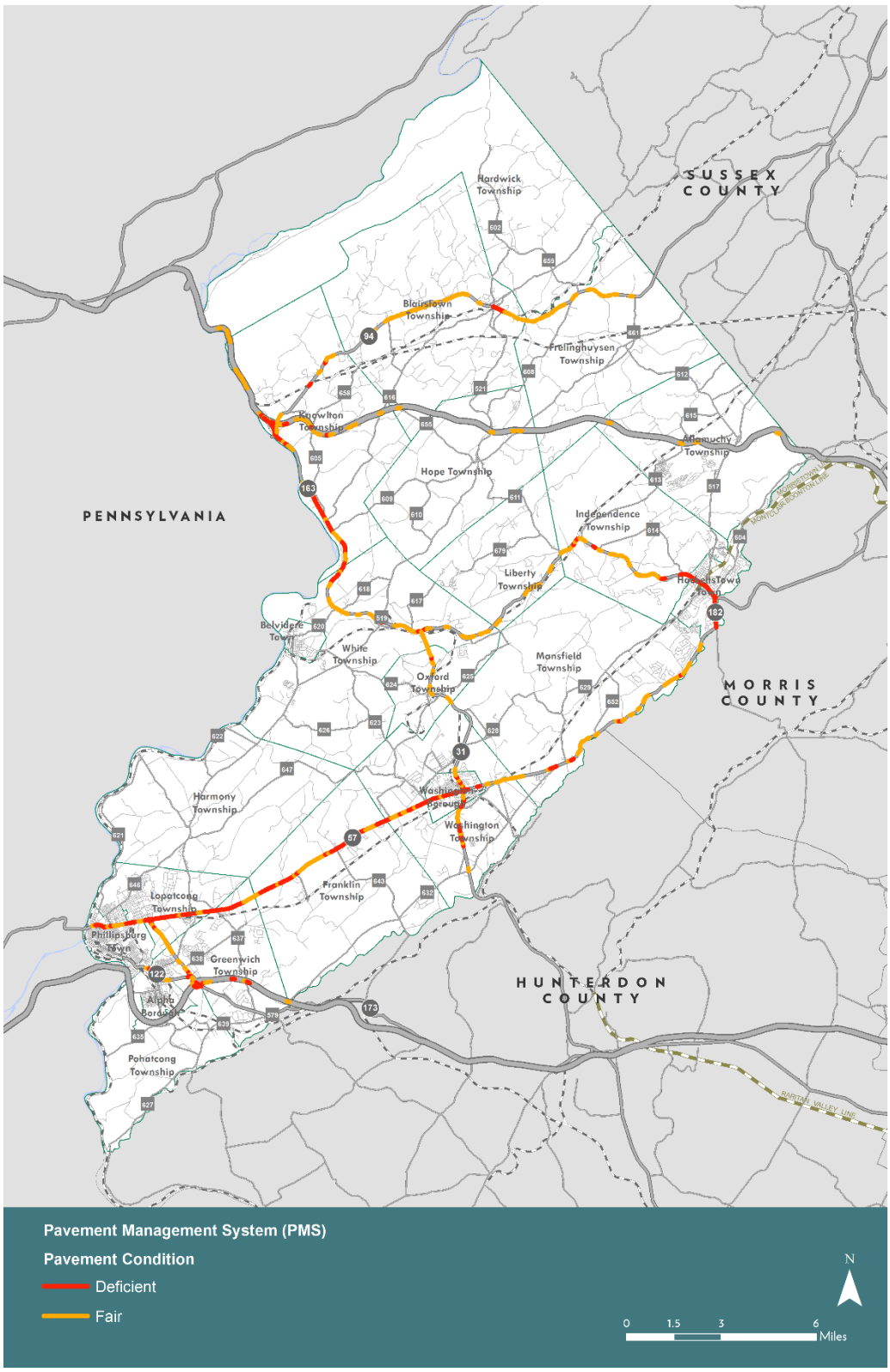

Figure 4: NJDOT Pavement Management System Data

Table 5: "Deficient" Pavement in Warren County

SLD_NAME	Length	MP Start	MP End	Speed Limit	Pavement Type	AADT	SDI	PaveCond
I-78	0.1	5	5.1	65	BC	35539	2.62	Deficient
I-78	0.1	5.5	5.6	65	BC	42828	2.61	Deficient
I-80	0.1	4.1	4.2	55	CO	24616	4.07	Deficient
I-80	0.1	4.5	4.6	55	CO	25656	3.88	Deficient
I-80	0.1	4.6	4.7	55	CO	25656	3.88	Deficient
I-80	0.1	4.9	5	55	CO	25656	2.76	Deficient
I-80	0.1	5.9	6	65	CO	27622	2.72	Deficient
I-80	0.1	6.5	6.6	65	CO	27622	4.41	Deficient
US 22	0.1	0.4	0.5	35	CO	18620	2.64	Deficient
US 22	0.1	0.5	0.6	35	CO	18620	2.79	Deficient
US 22	0.1	0.6	0.7	35	CO	18620	2.81	Deficient
US 22	0.1	0.7	0.8	35	CO	18620	2.32	Deficient
US 22	0.1	0.9	1	35	CO	18620	5	Deficient
US 22	0.1	1.3	1.4	40	CO	21484	3.88	Deficient
US 22	0.1	1.4	1.5	40	CO	21484	4.03	Deficient
US 22	0.1	1.5	1.6	40	CO	21484	5	Deficient
US 22	0.1	2.1	2.2	40	CO	19470	3.5712	Deficient
US 22	0.1	2.3	2.4	50	CO	17412	1.27	Deficient
US 22	0.1	4	4.1	50	CO	18196	2.47968	Deficient
US 22	0.1	4.3	4.4	50	CO	18090	4.03	Deficient
US 22	0.1	4.5	4.6	50	RC	14852	3.84	Deficient
US 22	0.1	4.6	4.7	50	RC	14852	3.84	Deficient
US 22	0.1	4.7	4.8	50	RC	14852	3.84	Deficient
US 22	0.1	4.8	4.9	50	RC	14852	3.84	Deficient
US 46	0.1	0	0.1	50	BC	4460	3.11	Deficient
US 46	0.1	0.1	0.2	50	BC	4460	2.72	Deficient
US 46	0.1	0.2	0.3	50	BC	4460	2.71	Deficient
US 46	0.1	0.3	0.4	50	BC	4460	2.55	Deficient
US 46	0.1	0.4	0.5	50	BC	4460	2.54	Deficient
US 46	0.1	0.5	0.6	50	BC	4460	2.37	Deficient
US 46	0.1	0.6	0.7	50	BC	4460	2.18	Deficient
US 46	0.1	0.7	0.8	45	BC	4460	2.18	Deficient
US 46	0.1	0.8	0.9	45	CO	4460	2.19	Deficient
US 46	0.1	0.9	1	45	CO	4460	2.2	Deficient
US 46	0.1	1.1	1.2	45	CO	4460	1.56	Deficient
US 46	0.1	2.9	3	45	CO	4001	1.18	Deficient
US 46	0.1	3	3.1	45	CO	4001	1.18	Deficient

SLD_NAME	Length	MP Start	MP End	Speed Limit	Pavement Type	AADT	SDI	PaveCond
US 46	0.1	3.1	3.2	45	CO	4001	1.18	Deficient
US 46	0.1	3.2	3.3	45	CO	4001	1.18	Deficient
US 46	0.1	3.3	3.4	45	CO	4001	1.04	Deficient
US 46	0.1	3.4	3.5	45	CO	4001	1.04	Deficient
US 46	0.1	3.5	3.6	45	CO	4036	1.0296	Deficient
US 46	0.1	3.6	3.7	45	CO	4036	1.15	Deficient
US 46	0.1	3.7	3.8	45	CO	4036	2.03	Deficient
US 46	0.1	3.8	3.9	45	CO	4036	2.58	Deficient
US 46	0.1	4	4.1	50	CO	4036	2.51808	Deficient
US 46	0.1	4.1	4.2	50	CO	4036	2.1712	Deficient
US 46	0.1	4.2	4.3	50	CO	4464	2.04	Deficient
US 46	0.1	4.3	4.4	50	CO	4464	2.15	Deficient
US 46	0.1	4.8	4.9	50	CO	4464	2.14	Deficient
US 46	0.1	4.9	5	50	CO	4464	2.03	Deficient
US 46	0.1	5	5.1	50	CO	4464	2.3166	Deficient
US 46	0.1	5.1	5.2	50	CO	4464	1.98128	Deficient
US 46	0.1	5.5	5.6	50	CO	4464	2.03	Deficient
US 46	0.1	5.6	5.7	50	CO	4464	2.2	Deficient
US 46	0.1	5.7	5.8	50	CO	4464	2.02188	Deficient
US 46	0.1	5.9	6	50	CO	4464	2	Deficient
US 46	0.1	6	6.1	50	CO	4464	1.88	Deficient
US 46	0.1	6.1	6.2	50	CO	4464	1.88	Deficient
US 46	0.1	6.2	6.3	50	CO	4464	1.93848	Deficient
US 46	0.1	8.7	8.8	50	CO	3626	5	Deficient
US 46	0.1	10	10.1	50	CO	3626	5	Deficient
US 46	0.1	10.2	10.3	50	CO	3626	4.46	Deficient
US 46	0.1	16.4	16.5	40	CO	3755	2.76	Deficient
US 46	0.1	16.6	16.7	40	CO	5880	3.88	Deficient
US 46	0.1	17.2	17.3	40	CO	5880	2.76	Deficient
US 46	0.1	19.8	19.9	45	CO	5880	5	Deficient
US 46	0.1	20.4	20.5	45	CO	5880	5	Deficient
US 46	0.1	20.5	20.6	45	CO	5880	5	Deficient
US 46	0.1	20.6	20.7	35	CO	5880	5	Deficient
US 46	0.1	20.7	20.8	35	CO	6695	5	Deficient
US 46	0.1	20.8	20.9	35	CO	6695	5	Deficient
US 46	0.1	20.9	21	35	CO	6695	3.1065	Deficient
US 46	0.1	21	21.1	30	CO	6695	5	Deficient
US 46	0.1	21.1	21.2	30	CO	6695	2.8428	Deficient
US 46	0.1	21.2	21.3	30	CO	6695	2.6496	Deficient
US 46	0.1	21.3	21.4	30	CO	6695	2.63	Deficient

SLD_NAME	Length	MP Start	MP End	Speed Limit	Pavement Type	AADT	SDI	PaveCond
US 46	0.1	21.4	21.5	30	CO	6144	2.45	Deficient
US 46	0.1	21.5	21.6	30	CO	6144	2.489	Deficient
US 46	0.1	21.6	21.7	30	CO	6144	2.60952	Deficient
US 46	0.1	21.7	21.8	30	CO	6144	2.62	Deficient
NJ 31	0.1	41	41.1	50	CO	9050	3.31	Deficient
NJ 31	0.1	41.2	41.3	50	CO	9050	2.72	Deficient
NJ 31	0.1	41.3	41.4	50	CO	9050	2.70912	Deficient
NJ 31	0.1	41.5	41.6	50	CO	9050	2.72	Deficient
NJ 31	0.1	41.6	41.7	50	CO	7915	2.72	Deficient
NJ 31	0.1	41.7	41.8	50	CO	7915	2.72	Deficient
NJ 31	0.1	42.3	42.4	35	CO	7626	2.76	Deficient
NJ 31	0.1	42.4	42.5	35	CO	7626	2.45	Deficient
NJ 31	0.1	42.5	42.6	35	CO	7626	1.55	Deficient
NJ 31	0.1	42.8	42.9	35	CO	7324	1.56	Deficient
NJ 31	0.1	42.9	43	35	CO	7324	1.56	Deficient
NJ 31	0.1	43.1	43.2	45	CO	7324	2.48	Deficient
NJ 31	0.1	43.3	43.4	45	CO	7324	1.56	Deficient
NJ 31	0.1	48	48.1	45	BC	5069	1.56	Deficient
NJ 57	0.1	0	0.1	45	CO	7218	3.99	Deficient
NJ 57	0.1	0.1	0.2	45	CO	7218	2.74	Deficient
NJ 57	0.1	0.2	0.3	45	CO	7218	2.60544	Deficient
NJ 57	0.1	0.3	0.4	50	CO	6366	2.60544	Deficient
NJ 57	0.1	0.4	0.5	50	CO	6366	2.41776	Deficient
NJ 57	0.1	0.5	0.6	50	CO	6366	1.33444	Deficient
NJ 57	0.1	0.6	0.7	50	CO	6366	2.57712	Deficient
NJ 57	0.1	0.7	0.8	50	CO	6366	2.5392	Deficient
NJ 57	0.1	0.8	0.9	50	CO	6366	2.33496	Deficient
NJ 57	0.1	0.9	1	50	CO	6366	2.3128	Deficient
NJ 57	0.1	1	1.1	50	CO	6366	2.47296	Deficient
NJ 57	0.1	1.2	1.3	50	CO	6366	2.52264	Deficient
NJ 57	0.1	1.3	1.4	50	CO	6366	2.5944	Deficient
NJ 57	0.1	1.4	1.5	50	CO	6366	2.3736	Deficient
NJ 57	0.1	1.5	1.6	50	CO	6366	2.5116	Deficient
NJ 57	0.1	1.6	1.7	50	CO	6366	2.25456	Deficient
NJ 57	0.1	1.9	2	50	CO	6366	2.5116	Deficient
NJ 57	0.1	2	2.1	50	CO	6366	2.622	Deficient
NJ 57	0.1	2.1	2.2	50	CO	6366	1.719	Deficient
NJ 57	0.1	2.2	2.3	40	CO	6366	1.55044	Deficient
NJ 57	0.1	2.3	2.4	40	CO	6366	2.3214	Deficient
NJ 57	0.1	2.4	2.5	40	CO	6366	2.40448	Deficient

SLD_NAME	Length	MP Start	MP End	Speed Limit	Pavement Type	AADT	SDI	PaveCond
NJ 57	0.1	2.5	2.6	40	CO	6366	1.28	Deficient
NJ 57	0.1	2.6	2.7	40	CO	6366	2.21	Deficient
NJ 57	0.1	2.7	2.8	50	CO	6366	3.7145	Deficient
NJ 57	0.1	2.8	2.9	50	CO	6366	3.54632	Deficient
NJ 57	0.1	2.9	3	50	CO	6366	2.46432	Deficient
NJ 57	0.1	3	3.1	50	CO	6366	2.9585	Deficient
NJ 57	0.1	3.1	3.2	50	RC	6366	3.26796	Deficient
NJ 57	0.1	3.8	3.9	50	RC	6156	4.58864	Deficient
NJ 57	0.1	3.9	4	50	CO	6156	4.79076	Deficient
NJ 57	0.1	4	4.1	50	CO	6156	2.16	Deficient
NJ 57	0.1	4.1	4.2	50	CO	6156	1.5288	Deficient
NJ 57	0.1	4.2	4.3	50	CO	6156	1.56	Deficient
NJ 57	0.1	4.3	4.4	50	CO	6156	1.5048	Deficient
NJ 57	0.1	4.5	4.6	40	CO	6156	2.7	Deficient
NJ 57	0.1	4.6	4.7	40	CO	6156	1.52	Deficient
NJ 57	0.1	4.7	4.8	40	CO	6156	1.52	Deficient
NJ 57	0.1	4.8	4.9	40	CO	6156	2.72	Deficient
NJ 57	0.1	4.9	5	40	CO	6156	2.72	Deficient
NJ 57	0.1	5.1	5.2	40	CO	6156	2.72	Deficient
NJ 57	0.1	6.2	6.3	50	CO	6363	1.49568	Deficient
NJ 57	0.1	6.4	6.5	50	CO	6363	1.3386	Deficient
NJ 57	0.1	6.5	6.6	40	CO	6363	1.38	Deficient
NJ 57	0.1	6.6	6.7	40	CO	6363	1.28	Deficient
NJ 57	0.1	6.7	6.8	40	CO	6363	1.38	Deficient
NJ 57	0.1	6.8	6.9	40	CO	6363	1.44	Deficient
NJ 57	0.1	6.9	7	40	CO	6363	1.25	Deficient
NJ 57	0.1	7	7.1	40	CO	7094	1.41	Deficient
NJ 57	0.1	7.1	7.2	40	CO	7094	3.6	Deficient
NJ 57	0.1	7.2	7.3	50	CO	7094	1.28	Deficient
NJ 57	0.1	7.4	7.5	50	CO	7094	1.27488	Deficient
NJ 57	0.1	7.5	7.6	50	CO	7094	1.9109	Deficient
NJ 57	0.1	7.6	7.7	50	CO	7094	1.17528	Deficient
NJ 57	0.1	8.1	8.2	50	CO	7094	0.846	Deficient
NJ 57	0.1	8.2	8.3	50	CO	7094	2.47008	Deficient
NJ 57	0.1	8.3	8.4	50	CO	7094	2.48	Deficient
NJ 57	0.1	8.4	8.5	50	CO	7094	1.12	Deficient
NJ 57	0.1	8.5	8.6	40	CO	7094	2.63	Deficient
NJ 57	0.1	8.9	9	45	CO	7094	2.72	Deficient
NJ 57	0.1	9.2	9.3	45	CO	7094	1.08	Deficient
NJ 57	0.1	9.3	9.4	45	CO	7094	2.72	Deficient

SLD_NAME	Length	MP Start	MP End	Speed Limit	Pavement Type	AADT	SDI	PaveCond
NJ 57	0.1	9.5	9.6	45	CO	7094	1.08	Deficient
NJ 57	0.1	9.6	9.7	45	CO	7094	2.76	Deficient
NJ 57	0.1	9.7	9.8	40	CO	7094	1.08	Deficient
NJ 57	0.1	9.8	9.9	40	CO	7094	2.75	Deficient
NJ 57	0.1	9.9	10	40	CO	7094	2.76	Deficient
NJ 57	0.1	10	10.1	40	CO	7094	3.12	Deficient
NJ 57	0.1	10.1	10.2	40	CO	7671	1.66	Deficient
NJ 57	0.1	10.2	10.3	30	CO	7671	1.56	Deficient
NJ 57	0.1	10.4	10.5	30	CO	7671	1.32	Deficient
NJ 57	0.1	10.5	10.6	25	CO	7671	1.56	Deficient
NJ 57	0.1	10.6	10.7	25	CO	7671	1.55	Deficient
NJ 57	0.1	10.7	10.8	25	CO	7671	1.56	Deficient
NJ 57	0.1	10.8	10.9	25	CO	7026	1.5288	Deficient
NJ 57	0.1	10.9	11	25	CO	7026	1.56	Deficient
NJ 57	0.1	11	11.1	30	CO	7026	1.55	Deficient
NJ 57	0.1	11.1	11.2	30	CO	7026	5	Deficient
NJ 57	0.1	11.5	11.6	40	CO	6120	4.82	Deficient
NJ 57	0.1	13.9	14	45	CO	5972	1.56	Deficient
NJ 57	0.1	14	14.1	45	CO	5972	1.53504	Deficient
NJ 57	0.1	14.6	14.7	45	CO	5972	3.8	Deficient
NJ 57	0.1	16.7	16.8	50	CO	5972	3.2696	Deficient
NJ 57	0.1	19.2	19.3	35	CO	5846	5	Deficient
NJ 122	0.1	0.9	1	30	BC	4626	3.46	Deficient
NJ 122	0.1	1.2	1.3	30	BC	4626	2.76	Deficient
NJ 122	0.1	1.3	1.4	30	BC	4626	5	Deficient
NJ 122	0.1	1.4	1.5	40	BC	4626	5	Deficient
NJ 122	0.1	2.3	2.4	50	BC	5266	4.76	Deficient
NJ 94	0.1	0.1	0.2	35	BC	3140	5	Deficient
NJ 94	0.1	2.1	2.2	50	CO	2912	2.76	Deficient
NJ 94	0.1	3	3.1	35	CO	3232	1.1088	Deficient
NJ 94	0.1	9.1	9.2	35	CO	3942	5	Deficient
NJ 94	0.1	9.2	9.3	35	CO	3942	4.33	Deficient
NJ 94	0.1	9.3	9.4	40	CO	3380	3.39	Deficient
NJ 94	0.1	9.4	9.5	45	CO	3380	3.24194	Deficient
NJ 173	0.1	0.2	0.3	50	CO	4812	5	Deficient
NJ 173	0.1	0.3	0.4	50	CO	4812	5	Deficient
NJ 182	0.1	0	0.1	40	CO	11768	1.56	Deficient
NJ 182	0.1	0.1	0.2	40	CO	11768	1.56	Deficient
NJ 182	0.1	0.2	0.3	40	CO	11768	1.52	Deficient
NJ 182	0.1	0.5	0.6	40	CO	11768	1.41	Deficient

SLD_NAME	Length	MP Start	MP End	Speed Limit	Pavement Type	AADT	SDI	PaveCond
NJ 182	0.1	0.7	0.8	40	CO	11768	1.41	Deficient
NJ 182	0.065584	0.9	1	40	CO	11768	2.33496	Deficient

CONGESTION MANAGEMENT SYSTEM

Several performance measures are used to measure and track congestion. The measure used in NJDOT's Congestion Management System (CMS) is Volume to Capacity (V/C) ratio. These data are for the 2012 analysis year, the most recent datasets available from NJDOT.

The V/C ratio is an index to measure the congestion of a traffic network. If V/C is very small then capacity is surplus and the network is not congested, and if V/C has a large value then the traffic network is congested. The V/C ratio data is obtained from NJDOT's Congestion Management Systems (CMS).

In case of Warren County V/C >0.75 is considered "heavily" congested and V/C ratio between 0.51>VC>0.75 is considered "moderately" congested. Heavily and moderately congested links in Warren County are shown in Table 3 and Table 4. These categories and titles are derived directly from the NJSOR CMS documentation.

Some of the most congested links in Warren County are on Interstate 80 and Interstate 78 with V/C ratio as high as 1.024. US Route 22 also has links which are heavily congested. Moderately congested links/roadways with V/C ratios between 0.51 and 0.75 include US Route 22, NJ 57, NJ 122, and US 46. Records are not available for the County or local roadways. V/C ratios from the CMS system are shown in Figure 5.

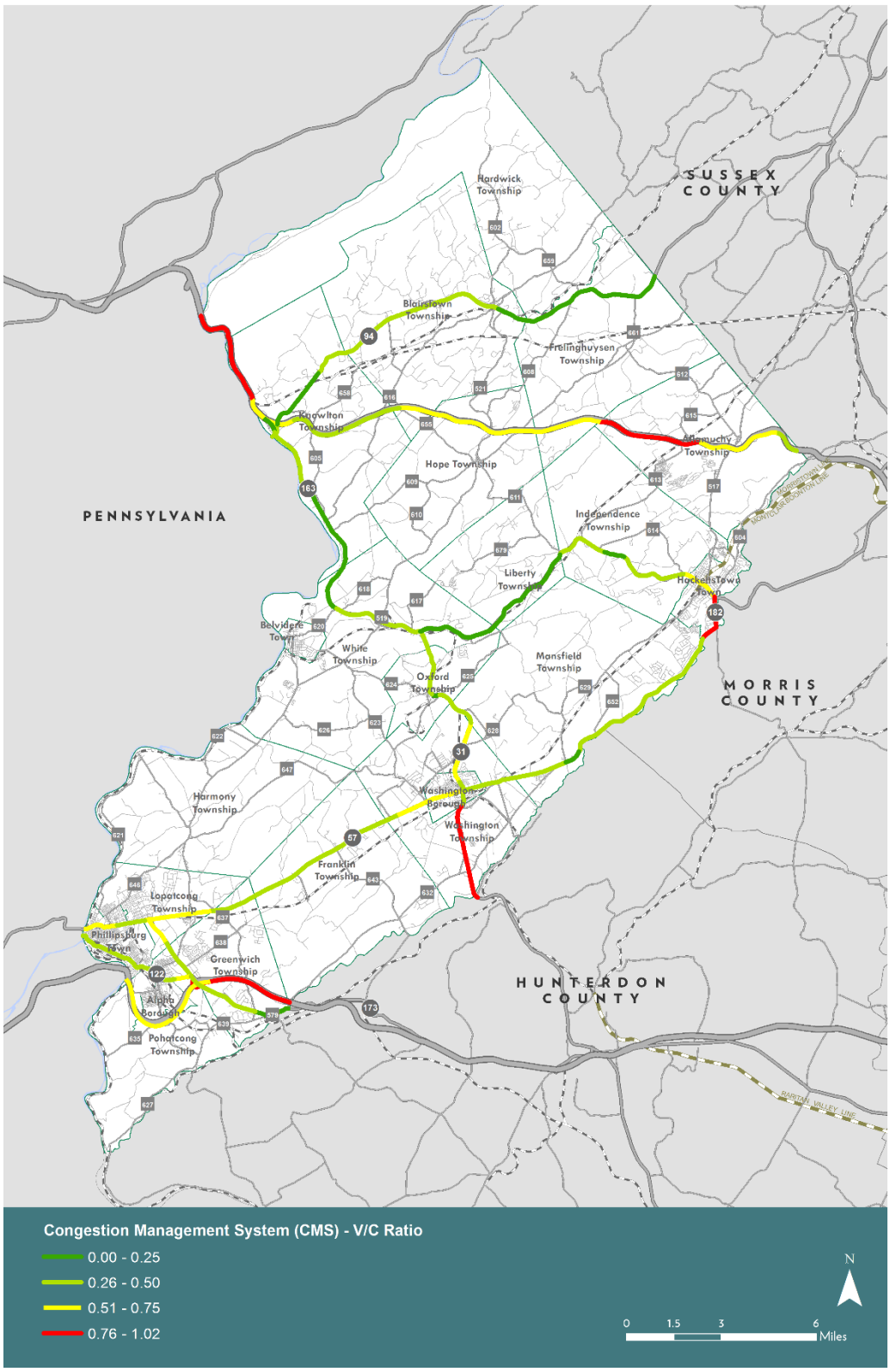

Figure 5: NJDOT Congestion Management System Data

Table 6: "Heavily" Congested Links in the Roadway Network V/C Ration >0.75

ROUTE	MilePost Start	MilePost End	Municipality Name	VC_Max
I-80	0.1	0.87	Hardwick Twp	1.024
I-80	0	0.1	Hardwick Twp	1.024
I-80	1.45	3.59	Knowlton Twp	1.024
I-80	0.87	1.45	Hardwick Twp	1.024
I-80	3.59	1.45	Knowlton Twp	1
I-80	1.45	0.87	Hardwick Twp	1
I-80	0.87	0.1	Hardwick Twp	1
I-80	0.1	0	Hardwick Twp	1
I-78	5.48	7.03	Greenwich Twp	0.996
I-78	4.16	5.48	Greenwich Twp	0.988
US-22	5.07	4.42	Pohatcong Twp	0.891
I-78	5.48	4.16	Greenwich Twp	0.863
US-22	4.42	5.07	Pohatcong Twp	0.86
NJ-31	41.96	39.3	Washington Twp	0.854
NJ-31	42.31	41.96	Washington Twp	0.816
US-22	4.36	4.42	Pohatcong Twp	0.815
NJ-31	39.3	41.96	Washington Twp	0.808
US-22	4.42	4.36	Pohatcong Twp	0.801
NJ-182	0.96	0.56	Hackettstown Town	0.799
NJ-182	0.56	0	Hackettstown Town	0.799
NJ-57	20.53	21.1	Hackettstown Town	0.79
I-78	7.03	5.48	Greenwich Twp	0.784
NJ-31	41.96	42.31	Washington Twp	0.778
NJ-182	0.56	0.96	Hackettstown Town	0.772
I-80	12.82	13.16	Hope Twp	0.771
I-80	15.58	18.83	Allamuchy Twp	0.771
I-80	21.51	22.4	Allamuchy Twp	0.759

Table 7: " Moderately Congested" Links in the Roadway Network V/C Ration0.75 <0.51

ROUTE	MP_START	MP_END	MUNNAME	VC_Max
US-22	0	0.64	Phillipsburg Town	0.742
NJ-57	21.1	20.53	Hackettstown Town	0.695
NJ-57	0.29	0	Lopatcong Twp	0.67
NJ-57	0	0.29	Lopatcong Twp	0.67
I-80	4.32	4.43	Knowlton Twp	0.665
I-80	3.59	4.32	Knowlton Twp	0.665
NJ-57	11.01	10.5	Washington Boro	0.662
I-80	21.51	19.88	Allamuchy Twp	0.656
I-80	4.43	4.32	Knowlton Twp	0.649
I-80	4.32	3.59	Knowlton Twp	0.649
NJ-57	10.5	10.19	Washington Boro	0.635
US-46	20.96	21.7	Hackettstown Town	0.625
US-22	2.07	3.03	Lopatcong Twp	0.622
I-80	4.43	5.1	Knowlton Twp	0.614
I-80	9	12.03	Hope Twp	0.614
NJ-57	10.5	11.01	Washington Boro	0.61
NJ-122	2.41	1.88	Pohatcong Twp	0.599
I-80	12.03	9	Hope Twp	0.592
I-80	9	5.1	Knowlton Twp	0.592
I-80	5.1	4.43	Knowlton Twp	0.592
US-22	3.03	2.07	Lopatcong Twp	0.591
I-80	18.83	15.58	Allamuchy Twp	0.59
I-80	15.58	13.16	Frelinghuysen Twp	0.59
I-80	13.16	12.82	Hope Twp	0.59
I-80	12.82	12.03	Hope Twp	0.59
I-80	19.88	18.83	Allamuchy Twp	0.59
NJ-122	1.88	2.41	Pohatcong Twp	0.586
US-46	21.7	20.96	Hackettstown Town	0.583
NJ-57	10.19	10.5	Washington Boro	0.582
I-80	12.03	12.82	Hope Twp	0.578
I-80	18.83	19.88	Allamuchy Twp	0.578
I-80	13.16	15.58	Frelinghuysen Twp	0.578
I-80	19.88	21.51	Allamuchy Twp	0.569
NJ-57	0.29	2.07	Lopatcong Twp	0.568
I-78	0	4.16	Pohatcong Twp	0.563

ROUTE	MP_START	MP_END	MUNNAME	VC_Max
NJ-57	2.07	0.29	Lopatcong Twp	0.56
I-78	4.16	0	Pohatcong Twp	0.544
US-22	0.64	0	Phillipsburg Town	0.544
NJ-57	10.19	9.73	Washington Boro	0.544
US-22	0.64	1.08	Phillipsburg Town	0.537
US-46	20.54	20.96	Hackettstown Town	0.533
NJ-31	43.55	43.14	Washington Boro	0.53
NJ-57	9.73	8.76	Washington Twp	0.519
NJ-57	20.53	18.94	Mansfield Twp	0.516
US-46	20.96	20.54	Hackettstown Town	0.513
NJ-31	43.55	45.15	Washington Twp	0.502

BRIDGE MANAGEMENT SYSTEM

Bridge Management Data was obtained from NJDOT to evaluate bridge conditions. These data are for the 2016 analysis year, the most recent datasets available from NJDOT.

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 are included in the Warren County BMS data. There are 175 bridges in good condition in Warren County. Twenty-four bridges were found “Deficient” in the evaluation. The “Deficient” bridges are listed below in Table 5.

On State routes three bridges were found “deficient” on NJ 94, five bridges on NJ 57, one bridge on NJ 31, and one bridge on NJ 173. On US Routes two bridges on US 46, and one bridge on US 22 were found “deficient”. The other “deficient” bridges are on local or county routes. There are 58 bridges found “Obsolete” in the evaluation. “Deficient” and “Obsolete” bridges are shown in Figure 6.

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

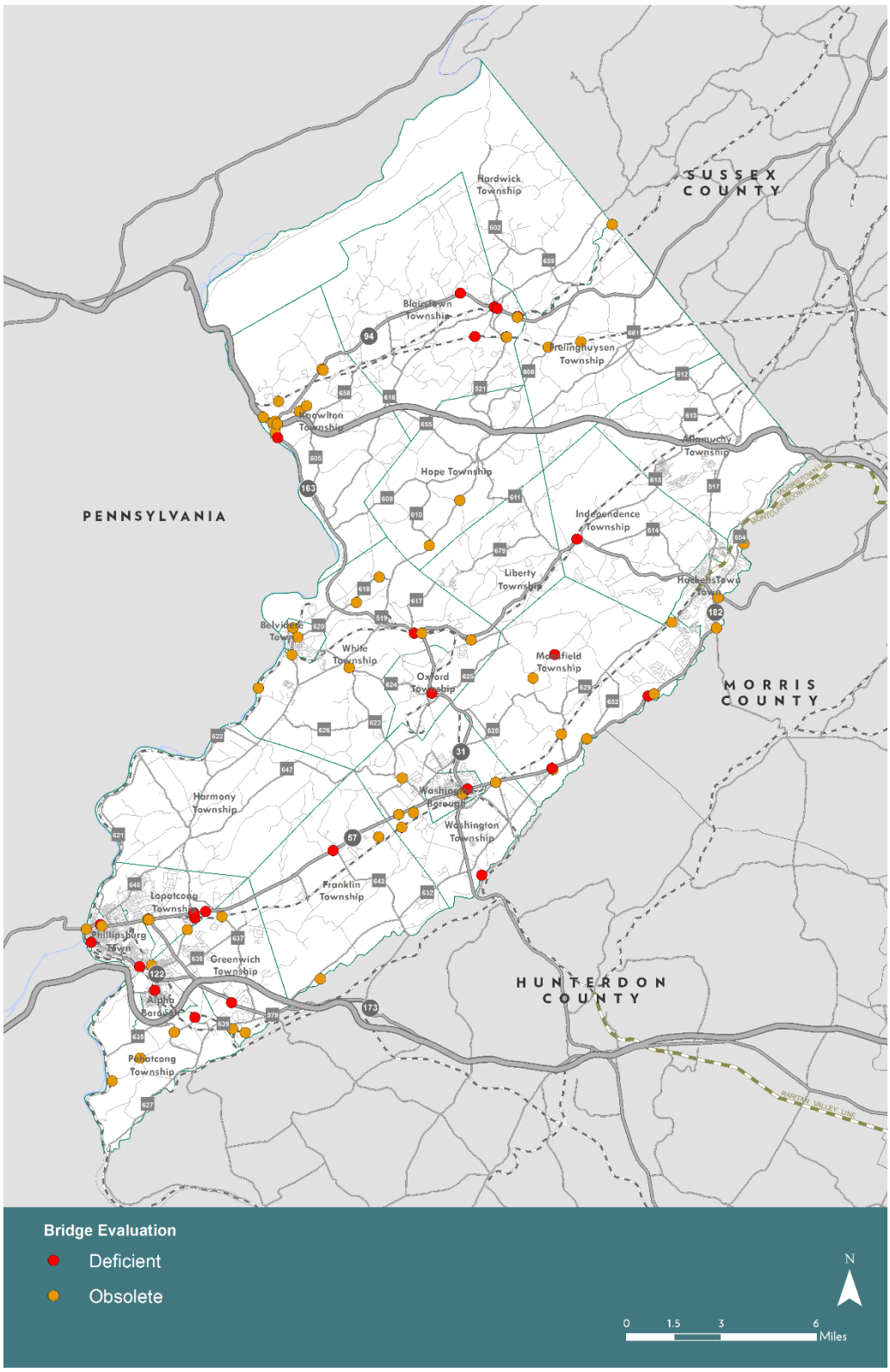

Figure 6: NJDOT Bridge Management System Data

Table 8: Warren County Rated as Deficient

Muni	Bridge Name	MP	Year Built	Number of Lanes	ADT	Evaluation
Alpha borough	2100204 () CR 642(High Street) N. SOUTHERN RR (LEHI VALY M.L.)	0.140	1973	2	2550	DEFICIENT
Blairstown township	2100410 () EAST CRISMAN ROAD OVER PAULINS KILL	0.000	1956	1	490	DEFICIENT
Lopatcong township	2101517 () Uniontown Road (CR 519) over Lopatcong Creek	29.790	1930	01	2600	OBSOLETE
Mansfield township	2101605 () OLD TURNPIKE ROAD OVER MUSCONETCONG RIVER	0.000	1900	2	510	DEFICIENT
Mansfield township	2101644 () VALLEY ROAD OVER POHATCONG CREEK	0.000	1910	2	260	DEFICIENT
Phillipsburg town	2101903 () SOUTH MAIN STREET OVER LOPATCONG CREEK	0.590	1925	3	9960	DEFICIENT
Pohatcong township	2102002 () STILL VALLEY ROAD OVER POHATCONG CREEK	0.000	1900	1	970	DEFICIENT
Washington township	2102225 () RYMON ROAD OVER MUSCONETCONG RIVER	0.000	1868	1	388	DEFICIENT
White township	2102307 () BUTTZVILLE ROAD OVER PEQUEST RIVER	0.000	1902	1	107	DEFICIENT
Blairstown township	2153161 () Dirt Farm Road over Scranton Branch (Abandoned)	0.000	1911	1	1	DEFICIENT
Phillipsburg town	2154160 () South Main St over Washington Secondary (Conrail)	0.430	1910	2	10610	DEFICIENT
Blairstown township	2117157 () NJ 94 OVER JACKSONBURG CREEK	7.950	1931	02	7943	DEFICIENT
Blairstown township	2117160 () ROUTE NJ 94 OVER PAULINS KILL	9.160	1931	02	8745	DEFICIENT
Blairstown township	2117161 () ROUTE NJ 94 OVER ABANDONED NYS&W RR	9.260	1931	02	8745	DEFICIENT
Franklin township	2105159 () NJ 57 OVER MILL BROOK	6.430	1922	2	13000	DEFICIENT

Muni	Bridge Name	MP	Year Built	Number of Lanes	ADT	Evaluation
Greenwich township	2103152 () NJ 173 OVER POHATCONG CREEK	1.500	1914	02	10308	DEFICIENT
Independence township	2108155 () ROUTE US 46/ HUDSON BRANCH (ABANDONED)	0016.560	1924	2	10745	DEFICIENT
Knowlton township	2107156 () US 46 OVER PAULINS KILL	0.740	1933	4	8960	DEFICIENT
Lopatcong township	2105152 () NJ 57 OVER LOPATCONG CREEK	1.530	1921	2	15300	DEFICIENT
Lopatcong township	2105153 () ROUTE NJ 57 OVER BRANCH LOPATCONG CREEK	1.910	1921	02	11610	DEFICIENT
Mansfield township	2106156 () NJ 57 / BRANCH OF MUSCONETCONG RIVER	13.910	1924	2	11360	DEFICIENT
Oxford township	2111154 () NJ 31 OVER FURNACE BROOK	46.830	1926	06	11843	DEFICIENT
Phillipsburg town	2101150 () US 22 WB OVER MEMORIAL PARKWAY EB	0.580	1961	2	18826	DEFICIENT
Washington borough	2106151 () NJ 57 OVER SHABBACONG CREEK	11.120	1907	2	12440	DEFICIENT

EXISTING TRANSIT SERVICES

Summary of Recommendations from 2004 Transportation Technical Study

The 2004 plan included support for a number of rail and bus transit initiatives, summarized below. The plan also 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 plan:

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: Currently 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 infrastructure improvements to the right-of-way.

Previously, on October 2, 2009, the Federal Transit Administration (FTA) issued a revised Finding of No Significant Impact (FONSI) for a Supplemental Environmental Assessment (EA). Taken together, the EA and Supplemental EA evaluated the full-length 133-mile corridor and this FONSI covers both the minimal operable segment (MOS) and the non-MOS and supersedes and replaces the FONSI issued on September 12, 2008 for the first project phase. Anticipated project completion: 2020.

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.

Existing Services

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, with connections. 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 continues to operate 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 AM to 7:00 PM. 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 ¾ mile.

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, was 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 AM to 5:00 PM on an advance reservation basis, designed to afford access to medical appointments, food shopping trips, and trips to the county courthouse.

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

Three shuttle routes are also operated on a regular schedule: the 31Ride Shuttle and two routes within the Route 57 Shuttle service. Further information on the Route 31 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 AM and 8:00 PM. Additional trips are operated 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 on weekdays from 6:00 AM to 6:00 PM and on Saturdays from 9:00 AM to 4:00 PM. A second route from Hackettstown to Washington

operates on weekdays from 8:00 AM to 4:30 PM. Small deviations (up to two blocks) from the fixed route are possible when customers make 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 AM on weekdays through 4:05 PM. Weekend service operates with five departures from Phillipsburg between 7:00 AM and 8:30 PM.

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 AM and 6:30 AM, with six return trips from New York City reaching Panther Valley between approximately 4:30 PM and 9:30 PM. Weekend service is not available in Warren County.

Ridership data is not available from private bus carriers.

Park & Ride Lots

NJDOT 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 location served by Martz Trailways and select interim parking locations along the 31Ride Shuttle.

Name	Location	Spaces	Fees
Hackettstown (Liberty Street)	Liberty and High Streets	106	Yes
Hackettstown (Moore Street)	Route 46 and Moore Street	31	Yes
Hackettstown (Plane Street)	Main and Plane Streets	15	Yes
Hackettstown (Sharp Street)	Route 46 and Moore Street	45	Yes
Hope	I-80 and CR 521	60	No
Phillipsburg Mall	1200 Route 22	125	No

Technical Memorandum 3.3:
Traffic Count Data Collection

Warren County Transportation Technical Study Update

JANUARY 2018

FINAL

INTRODUCTION

For the Warren County Transportation Technical Study the study team collected traffic counts available through NJDOT's Traffic Management System (TMS) Program. Through the TMS program 165 AVC and 508 ATR traffic counts were obtained. The locations of traffic counts available through TMS Program are shown in Figure 1.

In addition to the traffic counts from the TMS program, Warren County requested 12 Automatic Vehicle classification counts (AVCs) with speed data and 8 Turning Movement Counts (TMCs) at different locations in the County. These counts were performed from October 2017-November 2017 by the study team. The data collected was processed and submitted to the County for review in December 2017. Table 1and Table 2 show the locations of the AVC and TMC counts conducted in the County along with their location Map (Figure 2).

Table 1: Turning Movement Count Locations Request

ID	Location	Latitude	Longitude	Cross St 1	Cross St 2
1	CR 517 and Cat Swamp Rd, Allamuchy Twp.	40.89508	-74.82668	Cat Swamp Rd	517
3	CR 519 and CR 612, Frelinghuysen Twp.	40.96199	-74.87687	Allamuchy Rd (612)	Johnsonburg Bypass Rd (519)
5	CR 519 and CR 646, Harmony Twp.	40.73657	-75.14087	Harmony Brass Castle Rd (519)	Belvidere Rd (646)
6	CR 519 and CR 620, White Twp.	40.80716	-75.07558	Belvidere Rd (620)	CR 519
7	CR 629 and Allen Road, Mansfield Twp.	40.83802	-74.85074	Rockport Rd (629)	Allen Rd
8	CR 630 Spur (South Broad St) and SR 31, Washington Twp.	40.74981	-74.97805	Springtown Rd (CR 630 Spur)	NJ 31
9	CR 638 and Dumont Rd, Greenwich Twp.	40.67959	-75.13789	Dumont Rd	Greenwich St (638)
10	CR 665 and CR 604, Hackettstown	40.86579	-74.8115	Bilby Rd	Willow Grove St

Table 2: Automatic Vehicle Classification Count Locations Request

ID	County Route	Cross Street 1	Cross Street 2	Main Street	Request	Latitude	Longitude
1	517	Tow Path Dr	Country Side Dr	High St (517)	Classification/Speed Special Attention to Trucks (7 day)	40.867137	-74.825983
2	517	Tranquility Farm Ln	Kennedy Rd (CR 611)	Decker Pond Rd (517)	Classification/Speed Special Attention to Trucks (7 day)	40.939790	-74.802969
3	519	Bliss Blvd	Haig Blvd	St James Ave (519)	Classification/Speed Special Attention to Trucks (7 day)	40.679167	-75.150782
4	519	Memorial Parkway (NJ 57)	Liberty Rd	Uniontown Rd (519)	Classification/Speed Special Attention to Trucks (7 day)	40.706740	-75.139590
5	519	White Rd	Gaston Pl	Belvidere Rd (519)	Classification/Speed Special Attention to Trucks (7 day)	40.790579	-75.087966
6	519	Doe Hollow Ln	Swayze Mill Rd	Hope Bridgeville Rd (519)	Classification/Speed Special Attention to Trucks (7 day)	40.871739	-74.996564
7	638	Valerie Pl	S Main St	Greenwich St (638)	Classification/Speed Special Attention to Trucks (7 day)	40.690724	-75.211736
8	646	Hagerty Ave	3rd St	Belvidere Rd (646)	Classification/Speed Special Attention to Trucks (7 day)	40.702944	-75.186679
9	646	Red School Ln	Rowe Ln	Belvidere Rd (646)	Classification/Speed Special Attention to Trucks (7 day)	40.714945	-75.173771
10	665	Old Bilby Rd	Willow Grove St	Bilby Rd (665)	Classification/Speed Special Attention to Trucks (7 day)	40.869010	-74.815250
11	519	Lake Just It Rd	High St	Hope Bridgeville Rd (519)	Classification/Speed Special Attention to Trucks (7 day)	40.897881	-74.971819
12	521	Dogwood Rd	Ramp from I-80	Hope Blairstown Rd (521)	Classification/Speed Special Attention to Trucks (7 day)	40.921133	-74.963367

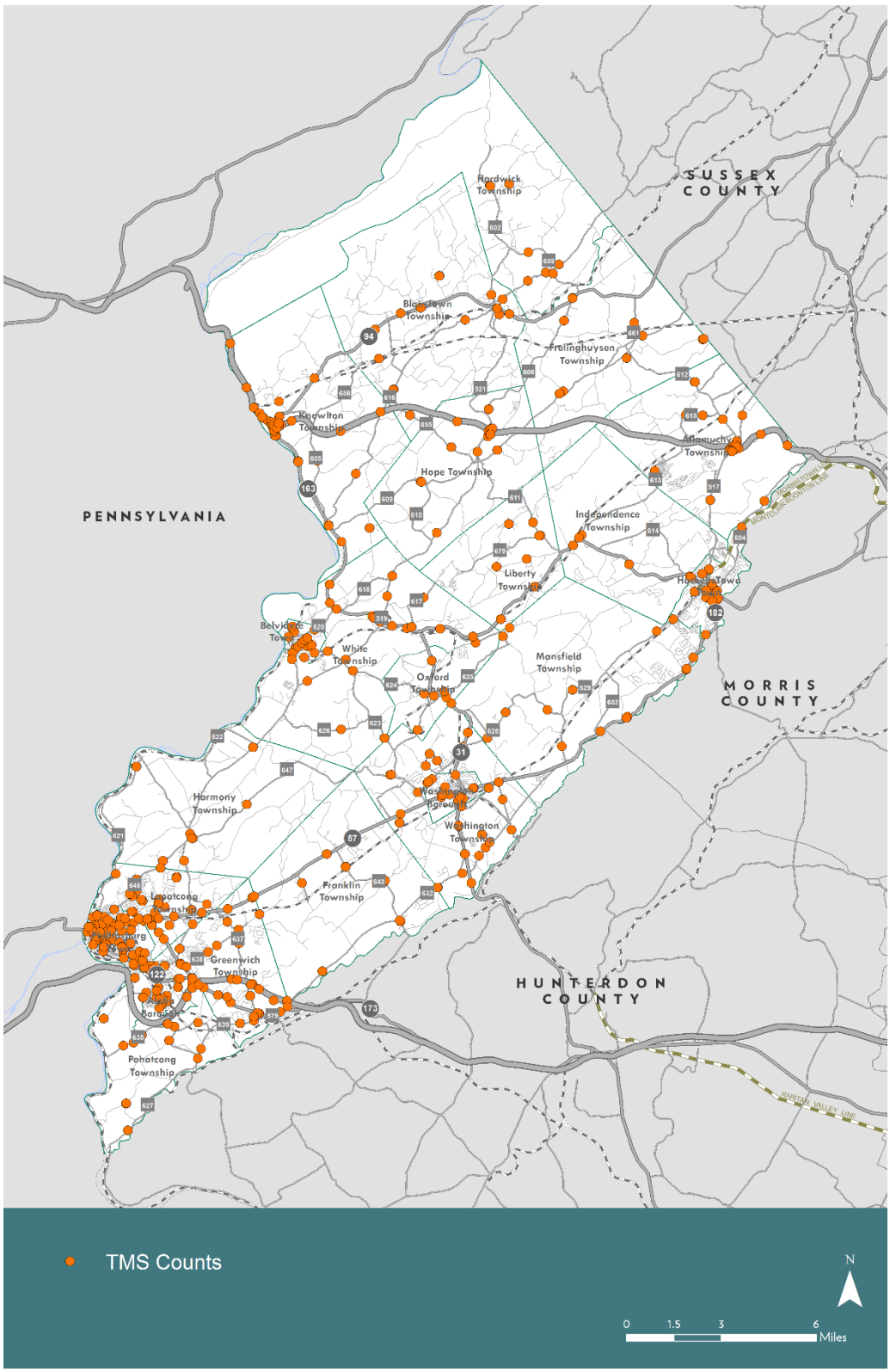

Figure 1: Existing NJDOT Traffic Count Locations

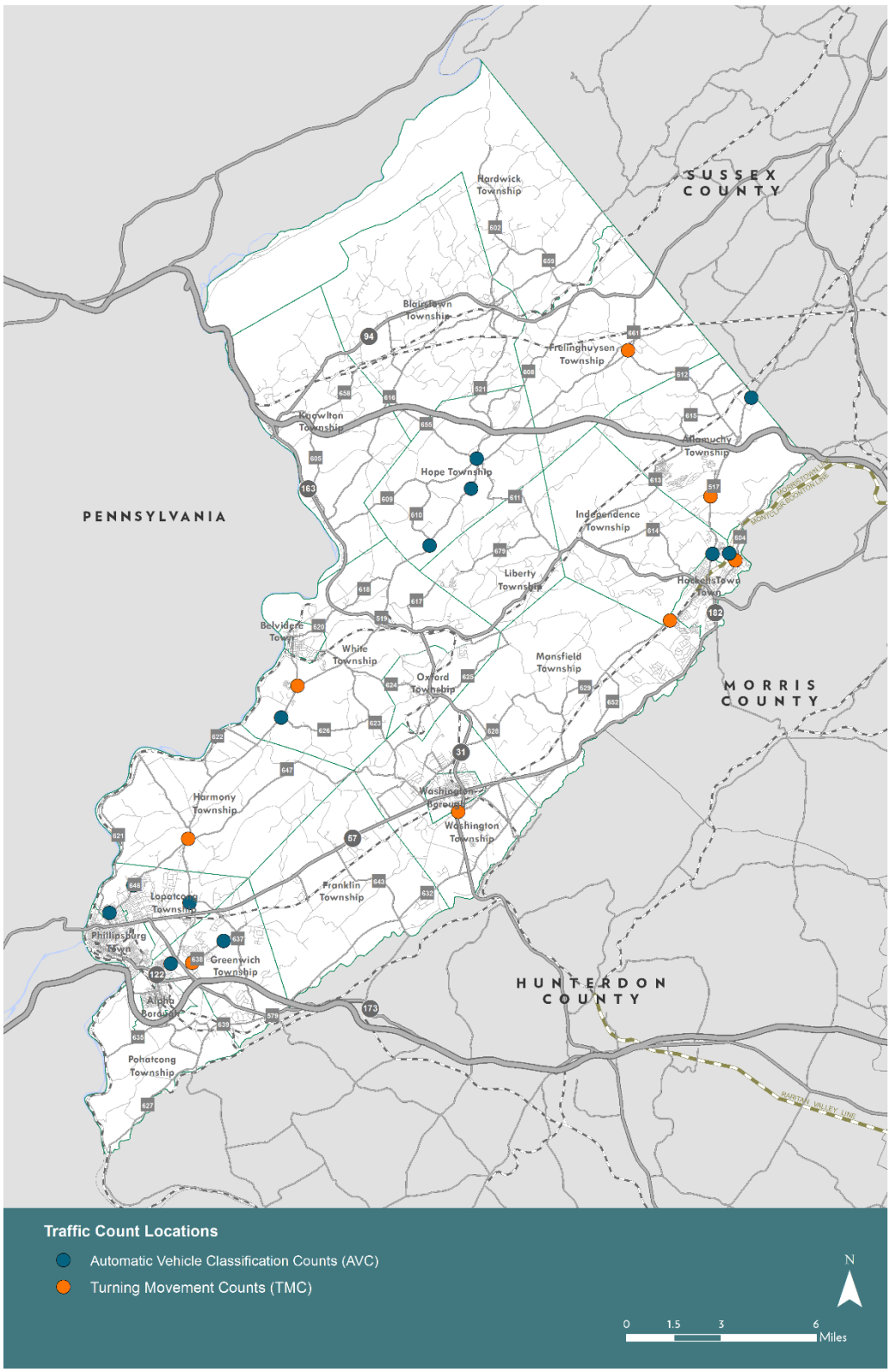

Figure 2: Warren County Requested Traffic Count Locations

Technical Memorandum 4.0:
NJRTME Model Analysis

Warren County Transportation Technical Study Update

MAY 2018

FINAL

INTRODUCTION

This Technical Memorandum presents a brief overview of the travel demand modeling methodology for the Warren County Transportation Technical Study Update (Technical Study Update) and use of the North Jersey Regional Transportation Model-Enhanced (NJRTM-E), the approved travel demand model for northern New Jersey. The use of the travel model supports for the scenario planning process.

Scenario planning is an analytical tool that can help transportation professionals understand and prepare for what lies ahead. Scenario-based methodologies, which can be undertaken at the statewide level or for metropolitan regions, 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.

The baseline scenario was evaluated using a series of performance measures, similar to those used for NJTPA's Plan 2035. 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 members, the municipal partners, and presented to the public for comment and discussion.

Three alternative future outcomes scenarios are proposed for detailed study and assessment during the next phase of the planning process – development of the Warren County Transportation Plan Element. The three scenarios to be tested are Multimodal/centers based scenarios, logistics hub scenario and Warren County blend scenario. These scenarios are discussed in detail in the final report.

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, which 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 project team used the latest available model to perform the scenario planning analysis.[1]In consultation with Warren County Planning staff and NJTPA, the project 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 project 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 AM and PM

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

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.

In consultation with Warren County Planning staff and NJTPA, the project 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 project 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 AM and PM 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.

Travel Demand Model Description

NJRTM-E is a standard four-step travel demand model that runs on Citilabs software products CUBE (an interface), and Voyager with additional FORTRAN programs used for mode choice and reporting elements. There are 2,553 traffic analysis zones (TAZs) (over 1,500 of these are in the NJTPA region) and no external stations. The model now includes all of New York City and Long Island, portions of southern New Jersey, portions of southern New York State, and portions of eastern Pennsylvania. Within the NJTPA region, the highway network includes most arterials (major and minor) with most 500 level and 600 level county roads. Most collector or local roads are not included. Outside the NJTPA region, the highway network is more schematic, generally representing major regional roadways.

The model covers eight trip purposes ranging from home-based work, shopping, and work-based other to non-home-non-work based trips as well as airport trips and university trips made by students to and from regional colleges and universities. Six modes of travel are considered for most trip purposes covering a range of automotive modes such as single occupancy vehicles to increasing degree of high occupancy vehicles, public transit-walk access, public transit-drive access, and trucks which are not specified by trip purpose. The public network includes NJ TRANSIT rail and bus network, some private bus lines, and ferry services.

The model considers population, household (differentiated by the presence of children and/or retirees) and income data to develop the trip generation. There are four separate networks for the time periods in the model (including expanded peak hour periods) of AM Peak (6:00am-9:00am), Midday (9:00am-3:00pm), PM Peak (3:00pm-6:00pm), and Night (6:00pm-6:00am).

Network Map and Traffic Analysis Zones

Warren County Model's roadway network and the TAZs used to run the NJRTM-E model for the existing and future baseline conditions are shown in Figure 1. NJRTME model divides Warren County into 27 TAZs and 1,032 links or roadway segments.

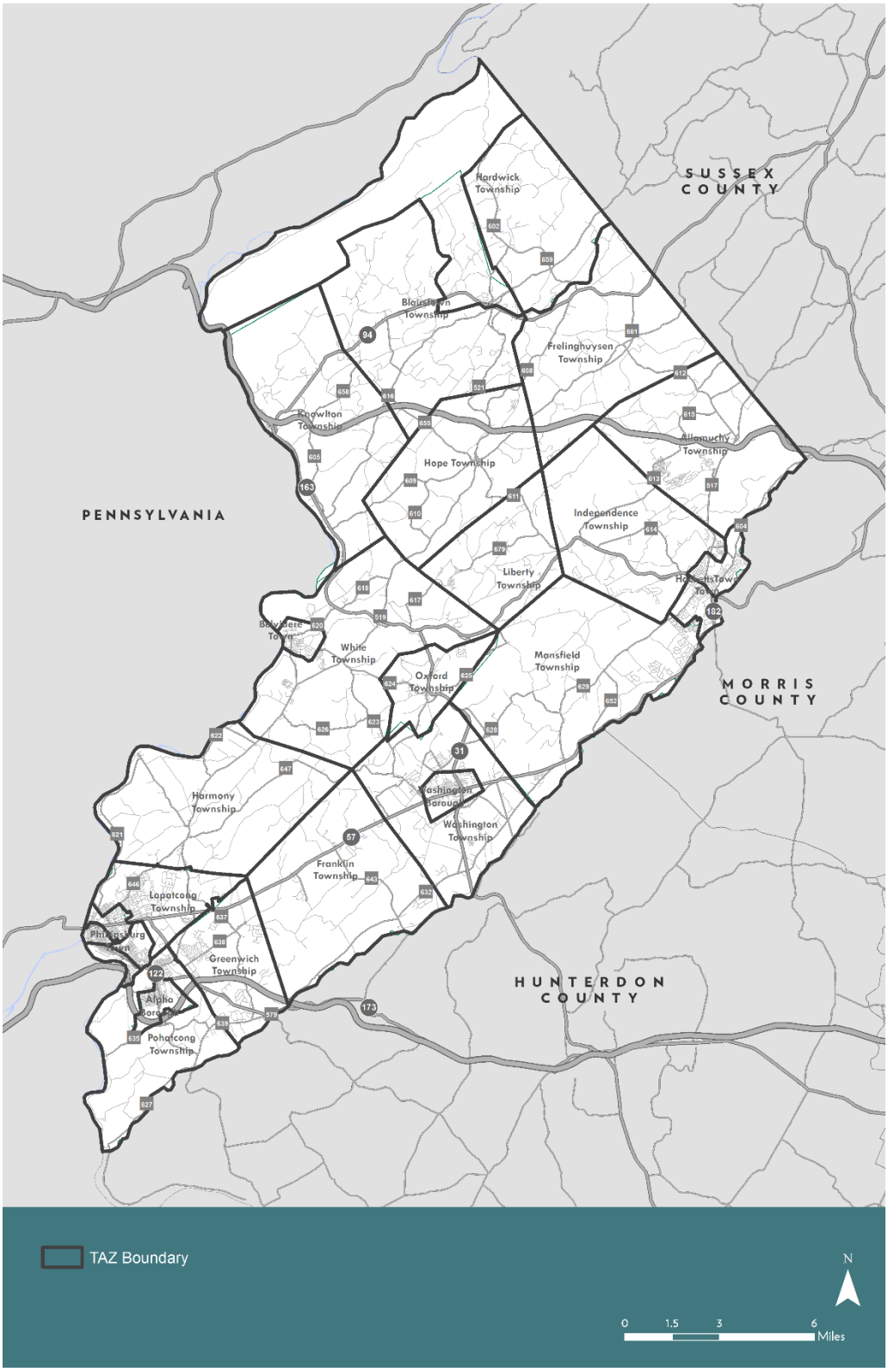

Figure 1: Warren County Traffic Analysis Zones and Model Network

SCENARIO PLANNING

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; it represents what would happen to travel conditions in the region if no new plans, policies, or programs are introduced beyond what has already been approved and adopted within the 2045 timeframe.

The baseline scenario, which follows the current trend line of growth and development patterns for both Warren County and the overall NJTPA region, is based on the official NJTPA demographic projections, and includes only the approved NJTPA TIP and Plan roadway and transit improvements.

For the purposes of this study, and leading to development the Warren County Transportation Plan Element in a proposed 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.

The existing volume-to-capacity ratio conditions of the Warren County roadway network in 2017 for AM and PM peak periods are shown in Figure 2 and **Error! Reference source not found.** below. The range of volume-to-capacity ratios are divided into three categories: "uncongested" conditions representing volume-to-capacity ratio of 0 – 0.8, "at capacity" conditions representing volume-to-capacity ratio between 0.8 – 1.2, and "congested" conditions representing volume-to-capacity ratio greater than 1.2.

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 about one percent per year, and forecast that Warren County would maintain this robust growth rate through 2030.

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, smart growth program of smart growth land use strategies, and transportation control measures.

What happened instead was a steep drop-off in 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 this new demographic data the NJTPA regional travel demand models reflect much slower growth in population, households, and employment, and much a 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% in trip length, and increases of 14% and 16% 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% and 8.2% respectively.

The NJTPA traffic 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 traffic models for other NJTPA counties, including Somerset County.

Overall the 2045 baseline models project that 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.

Performance measures and data for VMT by functional classification are displayed in Table 1 and 2 on the following page.

Congestion data using volume-to-capacity ratios for the baseline scenario are depicted for Warren County on the following pages, including AM peak congestion for 2017 and 2045, and PM peak congestion for 2017 and 2045.

As expected, 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. Detailed analysis of the scenario modelling and performance measures is available in APPENDIX A.

Table 1: Performance Measures and Metrics

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 2: Vehicle Miles of Travel (VMT) by Functional Class and Model Year

Freeways + Expressways (%)	Principal Arterials (%)	Major Arterials (%)	Minor Arterials /Collectors /Locals (%)	Total Vehicle Miles of Travel (VMT)
2017				
51%	24%	11%	15%	3,695,957
2045				
49%	24%	11%	16%	4,217,694
% change				
-2.9%	1.5%	3.8%	4.7%	14.1%

Future Baseline Conditions

The future baseline volume-to-capacity ratio conditions of Warren County roadway network in the year 2045 for AM and PM peak periods are shown in Figure 4 and Figure 5 below.

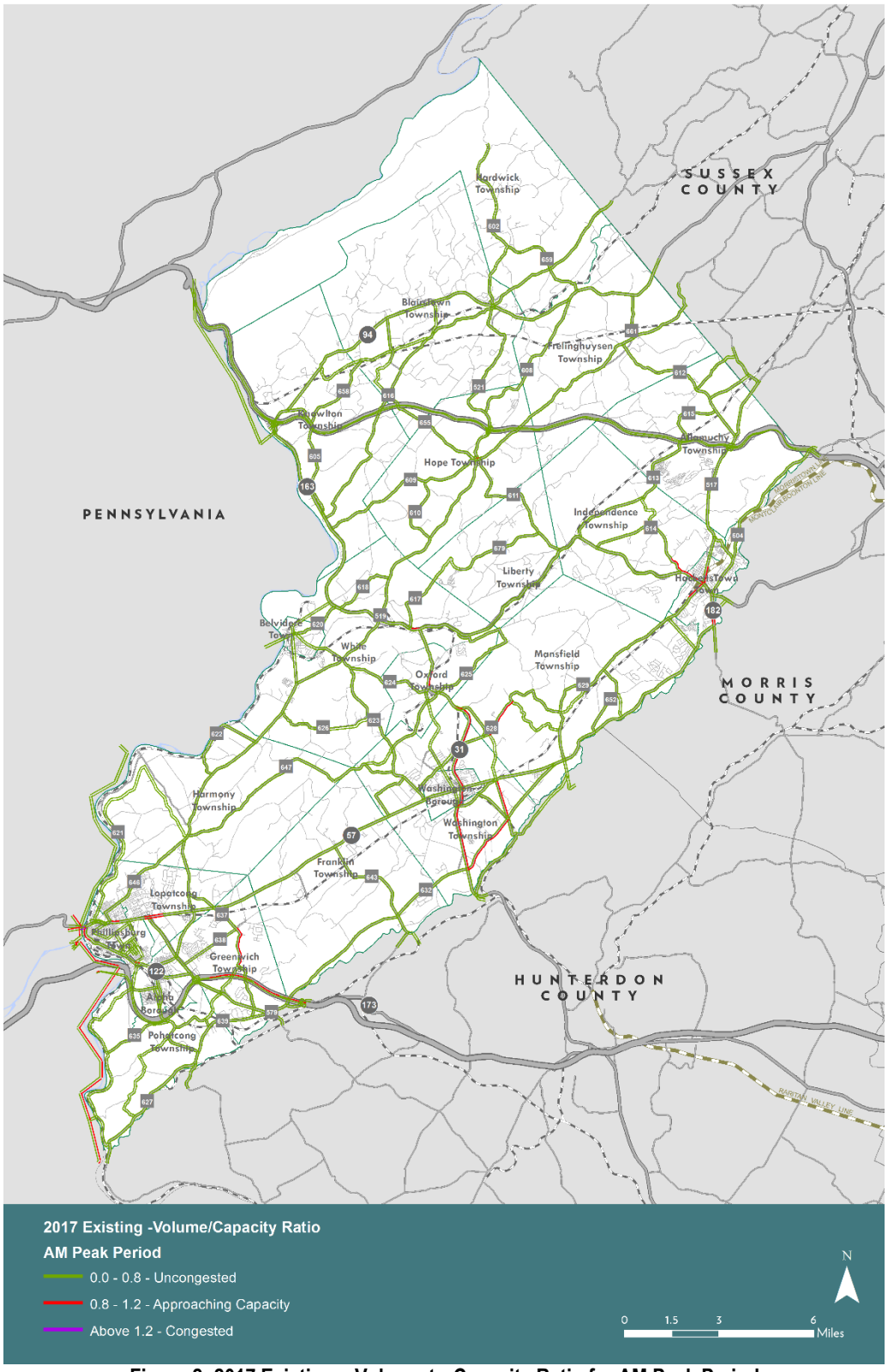

Figure 2: 2017 Existing – Volume-to-Capacity Ratio for AM Peak Period

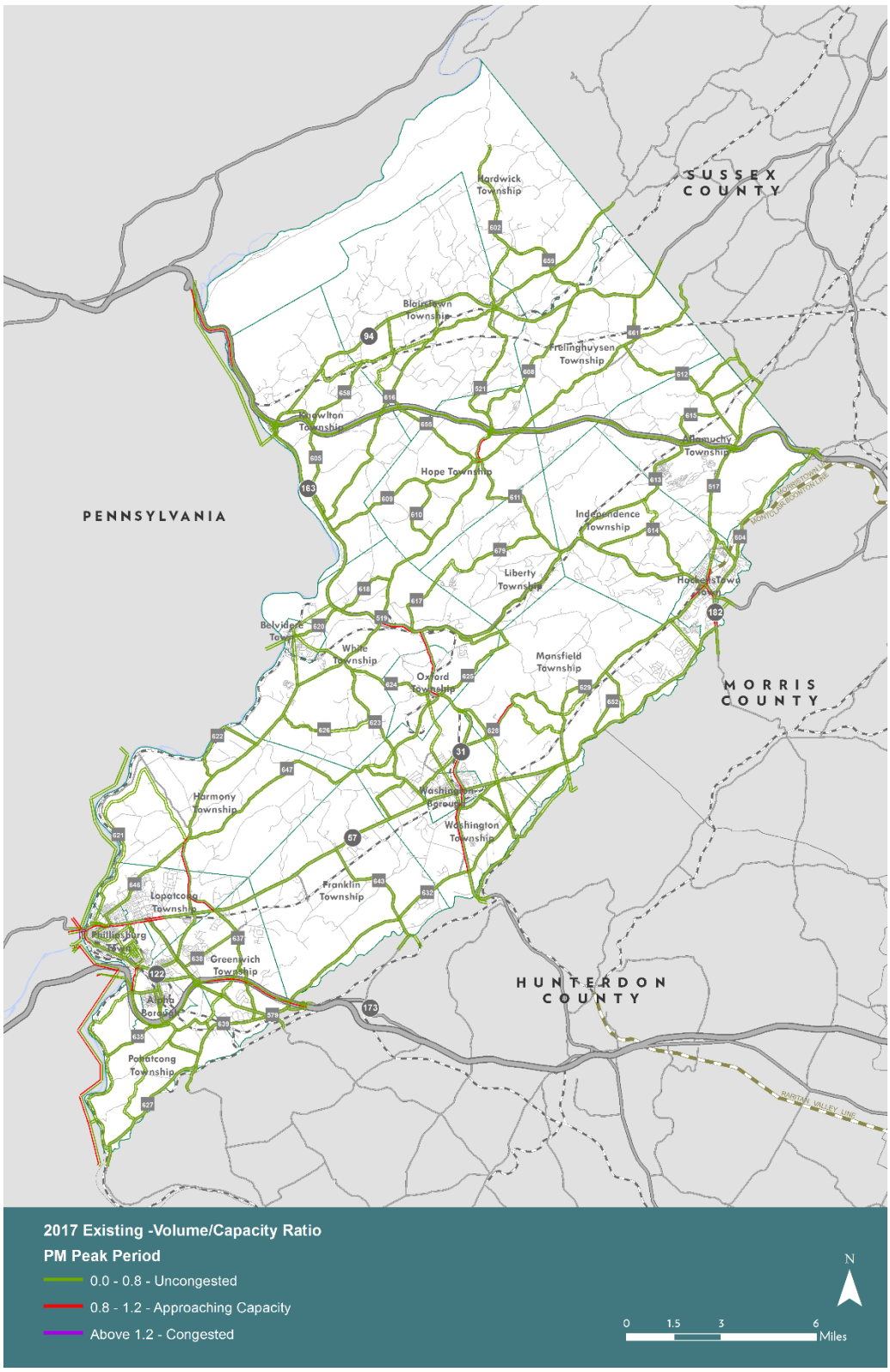

Figure 3: Existing – Volume-to-Capacity Ratio for PM Peak Period

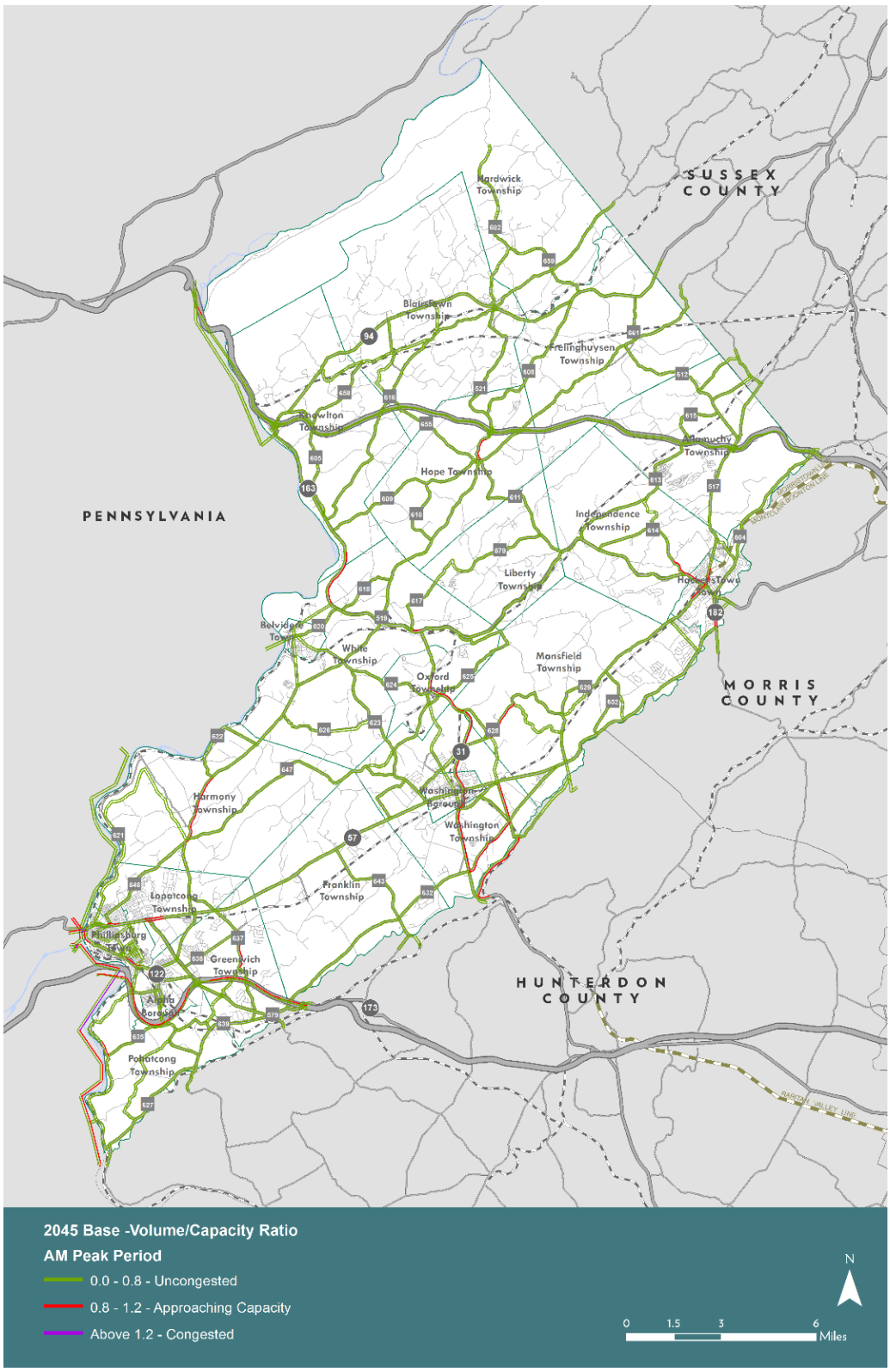

Figure 4: 2045 Future Baseline – Volume-to-Capacity Ratio for AM Peak Period

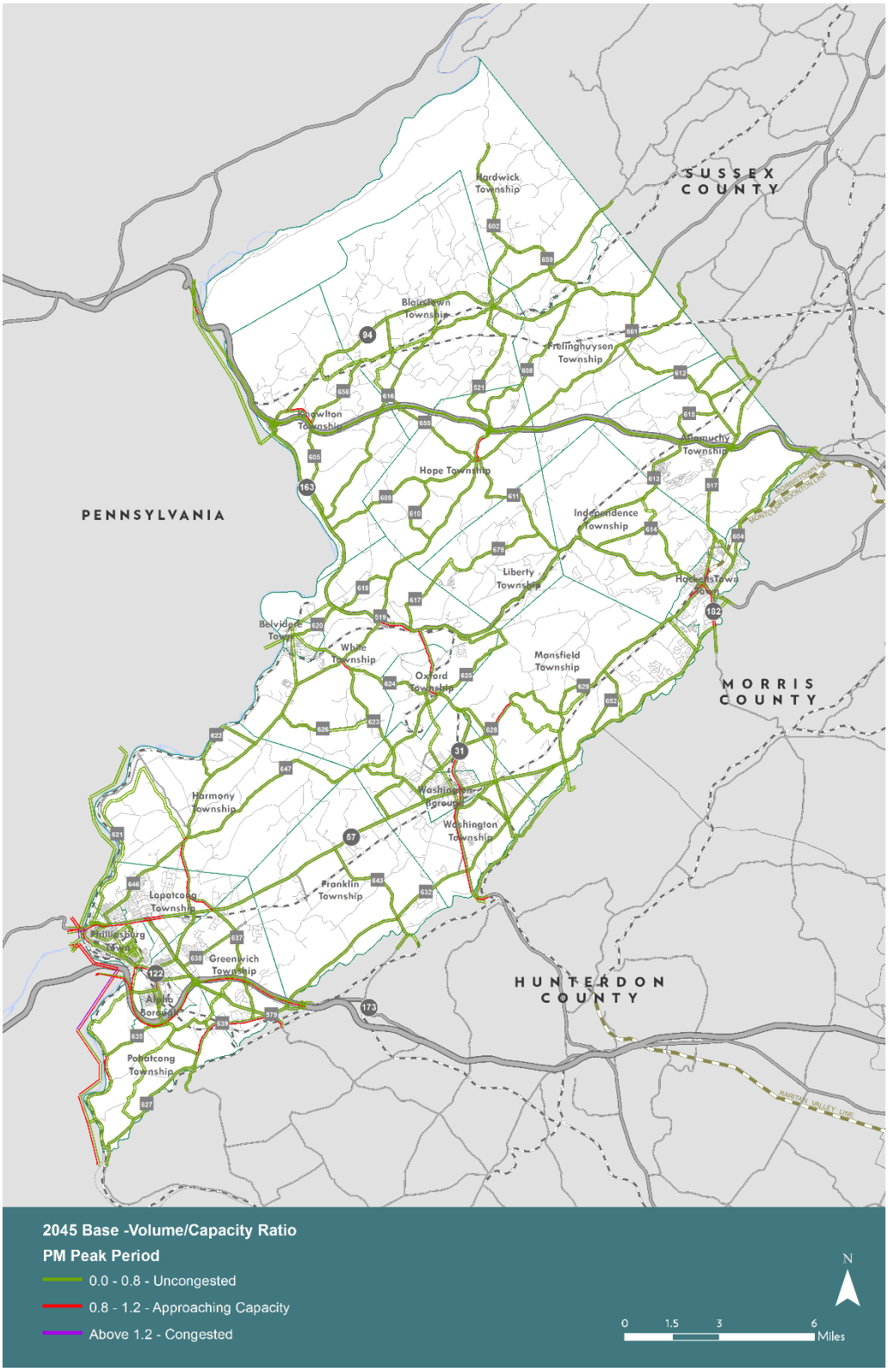

Figure 5: 2045 Future Baseline – Volume-to-Capacity Ratio for PM Peak Period

Technical Memorandum 4.0:
NJRTME Model Analysis

APPENDIX A

NJRTME Scenario Modeling and Performance Measures

Performance Measure	Unit	2017 Conformity	2045 Conformity	% Change from 2017 Conformity
Warren County - Statistics				
Transit Person Trips Produced		289	292	1.04%
Person Trips Produced (includes trucks)		259,447	272,888	5.181%
Home Based Work & University (HBW&U)				
SOV	Trips	70,682	76,858	8.74%
HOV2	Trips	9,651	10,459	8.37%
HOV3+	Trips	1,536	1,669	8.66%
HOV4	Trips	1,293	1,401	8.35%
Walk to Rail	Trips	16	2	-87.50%
Walk to Path	Trips	6	9	50.00%
Walk to Bus	Trips	36	36	0.00%
Walk to Ferry	Trips	0	0	0.00%
Walk to LRT	Trips	0	0	0.00%
Walk to LH Ferry	Trips	0	0	0.00%
Total Walk to Transit	**Trips**	58	46	-20.69%
Drive to Rail	Trips	180	201	11.67%
Drive to Path	Trips	6	4	-33.33%
Drive to Bus	Trips	5	4	-20.00%
Drive to Ferry	Trips	0	0	0.00%
Drive to LRT	Trips	0	0	0.00%
Drive to LH Ferry	Trips	0	0	0.00%
Total Drive to Transit	**Trips**	191	209	9.42%
Home Based Shop (HBSH)				
SOV	Trips	8,271	8,465	2.35%
HOV2	Trips	7,284	7,450	2.28%
HOV3+	Trips	1,463	1,496	2.26%
HOV4	Trips	1,482	1,516	2.29%
Walk to Rail	Trips	0	0	0.00%
Walk to Path	Trips	0	0	0.00%
Walk to Bus	Trips	1	1	0.00%
Walk to Ferry	Trips	0	0	0.00%
Walk to LRT	Trips	0	0	0.00%
Walk to LH Ferry	Trips	0	0	0.00%
Total Walk to Transit	**Trips**	1	1	0.00%
Drive to Rail	Trips	0	0	0.00%
Drive to Path	Trips	0	0	0.00%
Drive to Bus	Trips	0	0	0.00%
Drive to Ferry	Trips	0	0	0.00%
Drive to LRT	Trips	0	0	0.00%
Drive to LH Ferry	Trips	0	0	0.00%
Total Drive to Transit	**Trips**	0	0	0.00%

Performance Measure	Unit	2017 Conformity	2045 Conformity	% Change from 2017 Conformity
Home Based Other (HBO)				
SOV	Trips	51,026	53,111	4.09%
HOV2	Trips	42,488	44,152	3.92%
HOV3+	Trips	15,666	16,273	3.87%
HOV4	Trips	14,475	15,029	3.83%
Walk to Rail	Trips	1	0	0.00%
Walk to Path	Trips	0	0	0.00%
Walk to Bus	Trips	19	18	-5.26%
Walk to Ferry	Trips	0	0	0.00%
Walk to LRT	Trips	0	0	0.00%
Walk to LH Ferry	Trips	0	0	0.00%
Total Walk to Transit	**Trips**	20	19	-5.00%
Drive to Rail	Trips	8	6	-25.00%
Drive to Path	Trips	0	0	0.00%
Drive to Bus	Trips	2	2	0.00%
Drive to Ferry	Trips	0	0	0.00%
Drive to LRT	Trips	0	0	0.00%
Drive to LH Ferry	Trips	0	0	0.00%
Total Drive to Transit	**Trips**	10	8	-20.00%
Non-Home Based (NHB)				
SOV	Trips	17,625	18,123	2.83%
HOV2	Trips	9,380	9,599	2.33%
HOV3+	Trips	4,606	4,714	2.34%
HOV4	Trips	2,230	2,283	2.38%
Walk to Rail	Trips	1	0	0.00%
Walk to Path	Trips	0	0	0.00%
Walk to Bus	Trips	6	5	-16.67%
Walk to Ferry	Trips	0	0	0.00%
Walk to LRT	Trips	0	0	0.00%
Walk to LH Ferry	Trips	0	0	0.00%
Total Walk to Transit	**Trips**	6	6	0.00%
Drive to Rail	Trips	2	2	0.00%
Drive to Path	Trips	0	0	0.00%
Drive to Bus	Trips	0	0	0.00%
Drive to Ferry	Trips	0	0	0.00%
Drive to LRT	Trips	0	0	0.00%
Drive to LH Ferry	Trips	0	0	0.00%
Total Drive to Transit	**Trips**	3	3	0.00%

Performance Measure	Unit	2017 Conformity	2045 Conformity	% Change from 2017 Conformity
Non-Motorized Trips		11,583	12,492	7.84%
Home Based Work Direct (HBWD)	Trips	794	873	9.97%
Home Based Work Strategic (HBWS)	Trips	335	368	9.93%
Home Based Shopping (HBSH)	Trips	1,322	1,440	8.93%
Home Based Other (HBO)	Trips	7,382	7,963	7.87%
Work Based Other (WBO)	Trips	529	552	4.26%
Non-Home Non-Work (NHNW)	Trips	1,195	1,270	6.34%
Home Based University (HBU)	Trips	26	25	-4.65%
Average Speed	mph	43.77	43	-1.65%
Home Based Work Direct (HBWD)	mph	37.51	35.39	-5.64%
Home Based Work Strategic (HBWS)	mph	35.87	33.96	-5.32%
Home Based Shopping (HBSH)	mph	23.72	22.82	-3.82%
Home Based Other (HBO)	mph	22.92	21.74	-5.16%
Work Based Other (WBO)	mph	30.25	30.37	0.39%
Non-Home Non-Work (NHNW)	mph	20.68	21	0.15%
Average Trip Length				
Home Based Work Direct (HBWD)	Miles	26.20	25.35	-3.23%
Home Based Work Strategic (HBWS)	miles	21.84	21.42	-1.95%
Home Based Shop (HBSH)	miles	6.73	6.31	-6.27%
Home Based Other (HBO)	miles	6.05	5.54	-8.41%
Work Based Other (WBO)	miles	11.70	11.91	1.80%
Non-Home Non-Work (NHNW)	miles	5.11	5	1.04%
Vehicle Miles of Travel (VMT)	MVMT	3.696	4	14.12%
Freeways + Expressways	%	50.87%	49.40%	-2.88%
Freeways	%	50.87%	49.40%	-2.88%
Expressways	%	0.00%	0.00%	0.00%
Principal Arterials	%	23.52%	23.88%	1.55%
Major Arterials	%	10.51%	10.90%	3.76%
Minor Arterials /Collectors /Locals	%	9.68%	10.53%	8.77%
VMT per Capita	VMT/Person	33.529	35.693	6.46%
%VMT at Congested Conditions (V/C > 1.0)	%	0.6%	0.9%	44.15%
Vehicle Hours of Travel (VHT)	MVHT	0.084	0.098	16.03%
VHT per Capita	VHT/Person	0.766	0.829	8.24%
Total Truck Trips				
I-I Trk Medium	Trips	3,503	3,926	12.08%
I-I Trk Heavy	Trips	2,561	2,976	16.20%
Commercial	Trips	2,565	2,851	11.15%
E-I Hwy Trk Medium	Trips	96	94	-2.08%
E-I Hwy Trk Heavy	Trips	280	272	-2.86%
E-I MC Trk Medium	Trips	4	4	0.00%
E-I MC Trk Heavy	Trips	15	15	0.00%
E-I-E Trk Medium	Trips	4	4	0.00%
E-I-E Trk Heavy	Trips	90	90	0.00%
E-E Trk Medium	Trips	0	0	0.00%
E-E Trk Heavy	Trips	0	0	0.00%
All Trk Medium	Trips	3,956	4,400	11.22%
All Trk Heavy	Trips	3,822	4,286	12.14%
Commercial	Trips	2,565	2,851	11.15%
Truck - (VMT)	MVMT	0.468	0.379	-18.97%

Performance Measure	Unit	2017 Conformity	2045 Conformity	% Change from 2017 Conformity
Population		110,233	118,165	7.20%
Employment		36,491	39,659	8.68%
Households		43,563	49,020	12.53%
NJTPA Region - Statistics				
Person Trips Produced (includes trucks)		32,529,720	37,652,773	15.749%
Home Based Work & University (HBW&U)				
SOV	Trips	7,018,313	8,139,588	15.98%
HOV2	Trips	990,285	1,146,266	15.75%
HOV3+	Trips	187,210	216,318	15.55%
HOV4	Trips	148,481	170,815	15.04%
Walk to Rail	Trips	71,064	97,751	37.55%
Walk to Path	Trips	137,841	164,210	19.13%
Walk to Bus	Trips	230,309	247,067	7.28%
Walk to Ferry	Trips	25,395	29,987	18.08%
Walk to LRT	Trips	18,343	23,020	25.50%
Walk to LH Ferry	Trips	94	112	19.15%
Total Walk to Transit	**Trips**	483,046	562,147	16.38%
Drive to Rail	Trips	117,178	176,827	50.90%
Drive to Path	Trips	17,952	18,623	3.74%
Drive to Bus	Trips	70,612	75,799	7.35%
Drive to Ferry	Trips	60,131	66,297	10.25%
Drive to LRT	Trips	10,937	12,750	16.58%
Drive to LH Ferry	Trips	2,268	3,406	50.18%
Total Drive to Transit	**Trips**	279,079	353,701	26.74%
Home Based Shop (HBSH)				
SOV	Trips	1,480,368	1,721,250	16.27%
HOV2	Trips	1,392,472	1,609,252	15.57%
HOV3+	Trips	277,480	320,468	15.49%
HOV4	Trips	276,311	319,626	15.68%
Walk to Rail	Trips	771	548	-28.92%
Walk to Path	Trips	2,286	2,657	16.23%
Walk to Bus	Trips	14,887	16,321	9.63%
Walk to Ferry	Trips	113	78	-30.97%
Walk to LRT	Trips	1,254	1,828	45.77%
Walk to LH Ferry	Trips	0	0	0.00%
Total Walk to Transit	**Trips**	19,311	21,431	10.98%
Drive to Rail	Trips	564	328	-41.84%
Drive to Path	Trips	789	228	-71.10%
Drive to Bus	Trips	517	515	-0.39%
Drive to Ferry	Trips	636	129	-79.72%
Drive to LRT	Trips	102	141	38.24%
Drive to LH Ferry	Trips	4	0	0.00%
Total Drive to Transit	**Trips**	2,612	1,341	-48.66%

Performance Measure	Unit	2017 Conformity	2045 Conformity	% Change from 2017 Conformity
Home Based Other (HBO)				
SOV	Trips	5,033,308	5,866,790	16.56%
HOV2	Trips	4,403,252	5,123,628	16.36%
HOV3+	Trips	1,623,062	1,891,194	16.52%
HOV4	Trips	1,511,998	1,763,709	16.65%
Walk to Rail	Trips	11,941	13,282	11.23%
Walk to Path	Trips	51,132	58,882	15.16%
Walk to Bus	Trips	86,888	96,363	10.90%
Walk to Ferry	Trips	9,392	10,360	10.31%
Walk to LRT	Trips	1,689	2,032	20.31%
Walk to LH Ferry	Trips	0	0	0.00%
Total Walk to Transit	**Trips**	161,042	180,919	12.34%
Drive to Rail	Trips	4,150	4,676	12.67%
Drive to Path	Trips	737	760	3.12%
Drive to Bus	Trips	3,458	3,793	9.69%
Drive to Ferry	Trips	1,549	1,269	-18.08%
Drive to LRT	Trips	780	941	20.64%
Drive to LH Ferry	Trips	1	1	0.00%
Total Drive to Transit	**Trips**	10,676	11,440	7.16%
Non-Home Based (NHB)				
SOV	Trips	3,687,018	4,179,401	13.35%
HOV2	Trips	1,987,582	2,281,354	14.78%
HOV3+	Trips	978,149	1,121,946	14.70%
HOV4	Trips	480,651	550,941	14.62%
Walk to Rail	Trips	6,453	6,239	-3.32%
Walk to Path	Trips	16,012	14,275	-10.85%
Walk to Bus	Trips	60,527	63,836	5.47%
Walk to Ferry	Trips	1,814	1,891	4.24%
Walk to LRT	Trips	1,608	1,724	7.21%
Walk to LH Ferry	Trips	0	0	0.00%
Total Walk to Transit	**Trips**	86,414	87,965	1.79%
Drive to Rail	Trips	6,430	6,195	-3.65%
Drive to Path	Trips	1,252	1,022	-18.37%
Drive to Bus	Trips	2,776	2,998	8.00%
Drive to Ferry	Trips	899	802	-10.79%
Drive to LRT	Trips	242	261	7.85%
Drive to LH Ferry	Trips	3	3	0.00%
Total Drive to Transit	**Trips**	11,601	11,281	-2.76%

Performance Measure	Unit	2017 Conformity	2045 Conformity	% Change from 2017 Conformity
Transit Trips - Regionwide		161	160	-0.82%
Peak Walk Access				
Rail	Trips	0	0	0.00%
Path	Trips	0	0	0.00%
Bus	Trips	85	86	0.84%
Ferry	Trips	0	0	0.00%
LRT	Trips	0	0	0.00%
LH Ferry	Trips	0	0	0.00%
Peak Auto Access				
Rail	Trips	0	0	0.00%
Path	Trips	0	0	0.00%
Bus	Trips	3	4	5.39%
Ferry	Trips	0	0	0.00%
LRT	Trips	0	0	0.00%
LH Ferry	Trips	0	0	0.00%
Off-Peak Walk Access				
Rail	Trips	0	0	0.00%
Path	Trips	0	0	0.00%
Bus	Trips	71	69	-3.12%
Ferry	Trips	0	0	0.00%
LRT	Trips	0	0	0.00%
LH Ferry	Trips	0	0	0.00%
Off-Peak Auto Access				
Rail	Trips	0	0	0.00%
Path	Trips	0	0	0.00%
Bus	Trips	2	2	0.54%
Ferry	Trips	0	0	0.00%
LRT	Trips	0	0	0.00%
LH Ferry	Trips	0	0	0.00%
West Trenton Rail Line				
West Trenton Station	Passngr			
I-95	Passngr			
Hopewell	Passngr			
Belle Mead	Passngr			
Hillsborough	Passngr			
AM Peak Period Eastbound Boardings	Passngr			
West Trenton Station	Passngr			
I-95	Passngr			
Hopewell	Passngr			
Belle Mead	Passngr			
Hillsborough	Passngr			
Off-Peak & PM-Peak Eastbound Boardings	Passngr			
West Trenton Station	Passngr			
I-95	Passngr			
Hopewell	Passngr			
Belle Mead	Passngr			
Hillsborough	Passngr			
Total Eastbound Daily Boardings	Passngr			
Flemington Rail Line				
Allentown	Passngr			
Bethlehem	Passngr			
Easton	Passngr			
Phillipsburg	Passngr			
Bloomsbury	Passngr			

Performance Measure	Unit	2017 Conformity	2045 Conformity	% Change from 2017 Conformity
Hampton	Passngr			
Total Easbound Daily Boardings	Passngr			

Technical Memorandum 5.0: Implementation Plan

Warren County Transportation Technical Study Update

MAY 2018

FINAL

INTRODUCTION

The Technical Study Update presents implementation recommendations in the form of a Three-Part Framework Plan. The Framework Plan includes scenario planning and travel demand modeling methodologies and tools. The plan provides a platform for exploring a range of potential future outcomes, visions, and investment scenarios by testing a mix of infrastructure, demographic, land use, and policy changes, and comparing each scenario alternative to the 2045 baseline travel projections.

This Technical Memorandum presents a brief overview of the travel demand modeling methodology for the Warren County Transportation Technical Study Update (Technical Study Update) and use of the North Jersey Regional Transportation Model-Enhanced (NJRTM-E), the approved travel demand model for northern New Jersey. The use of the travel model supports the scenario planning process.

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

1. Coordination and Outreach Process
2. Technical Assessment and High Priority Projects
3. Scenario Alternatives

The proposed framework plan advances three alternative future scenarios for detailed assessment during the potential next phase of the planning process, the 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 also 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 planning and early development. News reports indicate that the *Hub* will support approximately 3,000 jobs and 3.8 million square feet of warehouse and distribution space at the 365-acre site, one of the largest current development sites 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.

Methodology

Scenario planning is an analytical tool that can help transportation professionals understand and prepare for what lies ahead. Scenario-based methodologies, which can be undertaken at the statewide level or for metropolitan regions, 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 that it actively involves 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.[1]

As noted previously, 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.

The baseline scenario was evaluated using a series of performance measures, similar to those used for NJTPA's *Plan 2035*. 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 members, the municipal partners, and presented to the public for comment and discussion.

Forecasts of population and employment changes are a critical input to the NJRTM-E, and using the NJTPA's official 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; it represents what would happen to travel conditions in the region if no new plans, policies, or programs are introduced beyond what has already been approved and adopted within the 2045 timeframe.

The baseline scenario follows the current trend line of growth and development patterns for both Warren County and the overall NJTPA region, is based on the official NJTPA demographic projections, and includes only the approved NJTPA TIP and Plan roadway and transit improvements.

For the purposes of this study, and leading to development 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

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

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, which includes an enhanced transit component and allows for testing of projects, land use, economic variables, and population and employment data.

In consultation with Warren County Planning staff and NJTPA, the project 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 project 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 AM and PM 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.

Three-Part Framework Plan

1. Recommendations from the Planning 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 comments, and building consensus on study methodology, priorities, and recommendations. The following are recommendations derived from stakeholder comments and priority issues identified during the planning process.

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 the 2010 Census. The 2016 Census estimate is still below the 2010 census total.

Detailed examination reveals that Warren County is becoming more diverse. Increasingly, the county is 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 environmental justice assessment and the comments received at the ESL pop-up events indicate a strong desire among these new Warren County residents for expanded and enhanced multimodal travel options, including transit, Park & Rides, 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 Service and Hospital locations hospital, grocery stores, work locations.
- Include extended and non-peak transit service for shift work, evenings, and weekends
- Provide Information on transit service and schedules with multilingual availability
- Mitigate capacity limitations at Clinton Park & Ride
    - Route 31 Shuttle (Warren County) ridership below expectations
    - Identify and advance applicable strategies designed to increase ridership

- Consider and hub and spoke service models to connect remote Warren County park & ride locations with the long-distance bus service available at the Clinton Park & Ride, which experiences chronic capacity limitations

- Consider service innovations such as the subsidized ride-sharing methodologies, working with TransOptions TMA

Potential for Expanded Bicycle Network

- Study potential for a program of improvements connecting residential hubs with priority destinations potentially including the following: employment centers, business districts, government offices, libraries, parks, tourist sites, and a potential regional trail network
- Discussion and comments from focus groups and public outreach events indicate an interest in developing a regional multi-user trail and bicycle network, building on existing facilities, including the Paulinskill Valley Trail, Pequest Wildlife Management Trail, and Morris Canal Greenway, with the potential to greatly expend 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 economic development and tourism generator

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, including roundabouts, 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 which constrain the ability to conduct business and maintain profitability and adequate working conditions
- Infrastructure challenges are anticipated to growth with the expansion of the logistic industry. The proposed I-78 Logistics Park in Phillipsburg and Lopatcong Township is

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

- Mitigating localized 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 frequently-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

- 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

2. Recommendations from Technical Assessment

The technical assessment included review of previous studies; identification of 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 that inform 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.

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 Highland 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

- 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 2014-201
  - NJRTM-E: U.S. 46 Approaching Capacity
  - NJRTM-E: 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 2014-201
  - NJRTM-E: U.S. 46 Approaching Capacity
  - NJRTM-E: NJ 182 Approaching Capacity
  - Highlands Area: Planning

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 bridges on NJ 57, one bridge on NJ 31, and one bridge on NJ 173. On U.S. Routes, two bridges on U.S. 46, and one bridge 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 about 222 total roadway miles in the PMS database. The principal roadways with "Deficient" pavement in Warren County Include I-78, I-80, US 22, US 46, NJ 31, NJ 57, NJ 122, NJ 94, NJ 173, and NJ 182.

Congestion

New Jersey 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. 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 US Route 22, NJ 57, NJ 122, and US 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 US 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 for the years 2011 to 2015 to identify the locations with highest number of crashes along county routes. The bulk of these crashes occurred at the top three locations: CR 519 at US 22, CR 638 at US 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: Currently 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 infrastructure improvements to the right-of-way.

   Previously, on October 2, 2009, the Federal Transit Administration (FTA) issued a revised Finding of No Significant Impact (FONSI) for a Supplemental Environmental Assessment (EA). Taken together, the EA and Supplemental EA evaluated the full-length 133-mile corridor and this FONSI covers both the minimal operable segment (MOS) and the non-MOS and supersedes and replaces the FONSI issued on September 12, 2008 for the first project phase. Anticipated project completion: 2020.

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 the 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.

Traffic Data Collection

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

3. Scenario Planning Alternatives

The framework plan proposes three alternative future scenarios for detailed study and assessment during the potential next phase of the planning process, development of the Warren County Transportation Plan Element. The planning process will define in detail applicable projects, land use, 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.

The scenarios will be tested using the North Jersey Regional Transportation Model- Enhanced (NJRTM-E), the approved travel demand model for northern New Jersey. Each scenario will be compared to the Warren County Baseline Scenario, each using the same 2045 build year. The baseline scenario is the reference point with all future alternatives, using the same set of performance measures and metrics to compare and contrast each scenario. Detailed model statistics and data, 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 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 that measures be taken to preserve the capacity of the transportation network to accommodate existing and future development. Specific planning recommendations include land use strategies that cluster development and create walkable communities with a mix of land uses and interconnected streets, targeted corridor planning and transit improvements, site design and access management tool, 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, it is consistent with 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 populations, 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. It will also include a 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. News reports indicate that the *Hub* will support approximately 3,000 jobs and 3.8 million square feet of warehouse and distribution space at the 365-acre site, one of the largest current development sites in New Jersey.

  The logistics hub scenario targets a limited number of TAZ locations 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 would be a significant boost to new employment in the County. The NJTPA projections currently estimate about 3,600 total new

jobs for Warren through 2045, so this one project could almost double the official 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 Scenario –** assumes a mix of multimodal, policy, and land use elements from the Multimodal/ Centers-Based Development 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 the both the centers-based and logistics hub scenarios and would include some elements of each. This scenario might include all or part the proposed I-78 Logistics Park, and some of the many and varied recommendations of the centers-based scenario, albeit 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 element should also emphasize basic smart growth principles including walkability, transit, and innovative site design and access management techniques.

Scenario Assessment and 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 traffic models also project 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 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 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 that have been outlined in this study.

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