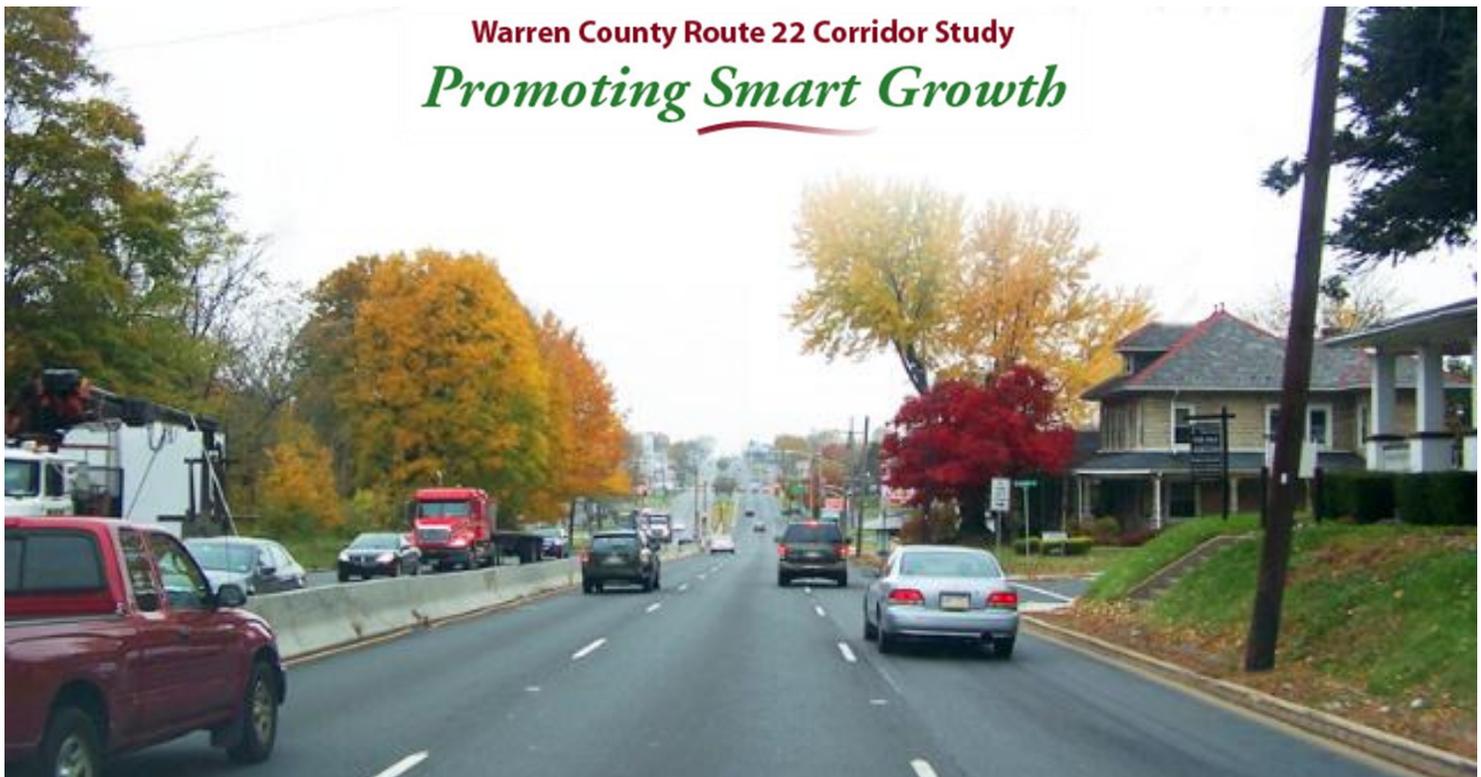




US ROUTE 22 CORRIDOR IMPROVEMENT PLAN

WARREN COUNTY, NEW JERSEY

JULY 2009



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WARREN COUNTY, NEW JERSEY

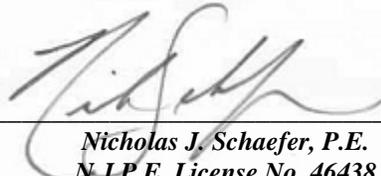
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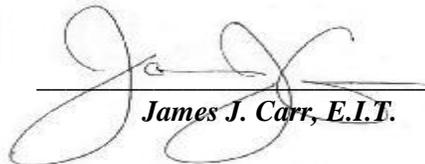
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 Greenwich Township Mayor and Committee
 Greenwich Township Police Department
 Lopatcong Township Mayor and Council
 Lopatcong Township Police Department
 New Jersey Department of Transportation
 New Jersey Highlands Council
 New Jersey Transit
 North Jersey Transportation Planning Authority
 Phillipsburg Mayor and Town Council
 Phillipsburg Police Department
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1. INTRODUCTION

The US Route 22 corridor in Warren County is one of the most studied highways in the State and also one of the most congested. The corridor's relatively constrained right-of-way, varying adjacent development patterns, lack of alternative routes and an abundance of both natural and man-made obstacles to circulation present continuing challenges to improved circulation throughout the sub-region.

In the Fall of 2008, Maser Consulting, P.A. (Maser), the Regional Plan Association (RPA), Reichman-Frankle, Inc. (RFI) and TechniQuest Corp. -- the project team -- were retained by the Warren County Planning Department (WCPD) through a grant from the North Jersey Transportation Planning Authority to develop a Corridor Improvement Plan for US Route 22, from the Delaware River to the Interstate 78 (I-78) interchange. While the project team was tasked with evaluating all of the conventional traffic engineering solutions, the intention was also to look "outside the corridor" and evaluate other type of solutions.

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 (see **Figure 1 - Location Map**). 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.

A series of short, mid and long-term improvements are recommended to mitigate congestion associated with the growth in traffic volumes. The short-term improvements are typically minor improvements, including traffic signal operation modifications and revised signage/stripping, which can be implemented immediately and/or on an as-needed basis for each intersection without disrupting the existing traffic flow. Mid-term improvements mostly involve geometric modifications at the intersection or changes in existing traffic controls. These recommended improvements may be slightly more disruptive to the existing traffic flow but will improve the overall operation of the roadway significantly. Finally, long-term improvements are recommended on a regional level, which encompass a variety of major roadway improvements. The plan looks broadly at a full range of multi-modal strategies, including pedestrian, bicycle and transit. Travel demand management recommendations are also identified. These improvements will serve the corridor as follows:

- More even distribution of traffic throughout the corridor and roadway network;
- Increased vehicular circulation options;
- Creation of a more intuitive roadway network within the Study Area;



2. BACKGROUND ANALYSIS

2.1 OVERVIEW

US Route 22 is unquestionably a vital artery for circulation in the region. It provides direct east/west movement, as well as access to a variety of critical activities along the corridor. Yet, because this busy thoroughfare splits the region, it makes north/south movements difficult and complicates interaction between activities and communities located on either side of the corridor.

Circulation within the US Route 22 Study Area is constrained by a variety of natural and man-made features, including the Delaware River, the Category-One Lopatcong and Pohatcong Creeks and their unnamed tributaries, multiple railroad rights-of-way (the Del-Bel, Central Railroad of NJ, the Lehigh Valley Railroad and the Morris and Essex – Easton branch) and even the remnants of the historic Morris Canal. While these features are all assets to build upon, they also present challenges in that they constrain circulation within the region, limiting the number of crossings and channeling traffic to those few places where crossings do occur.

Indeed, in the five-mile stretch of the US Route 22 Study Area, there are only five opportunities to cross US Route 22. Going west to east, the initial 1-mile stretch of Memorial Parkway between the Delaware River and Ingersoll Avenue has been engineered to facilitate the approach to the Easton-Phillipsburg Toll Bridge, making access to local land uses very awkward – including access to civic uses, such as the High School -- and severing north/south connections. The debilitating effects of this traffic solution on this neighborhood in Phillipsburg -- the most densely developed section of the corridor -- are apparent. East of Ingersoll Avenue, it is approximately 2,000 feet before the next crossing, at Roseberry Street; another 2,500 feet to the 3rd Street/Commerce Park intersection; almost two miles from there to the Route 519 intersection; and another 3/4 mile to the US Route 22/ Route 173 interchange.

As a result, local traffic is funneled to these few intersections that offer an opportunity to cross the corridor. In addition, a portion of local traffic desiring to travel north/south but reaching the corridor elsewhere (where crossing both eastbound and westbound lanes on US Route 22 is not permitted) is forced to travel on US Route 22 until it reaches the next full intersection.

Creating additional intersections along US Route 22 would be counterproductive to increasing progression along US Route 22; however, more opportunities should be provided for local residents to access signalized intersections by using parallel roadways. Potential cut through traffic by motorists wishing to avoid congestion on US Route 22 can be mitigated with “traffic calming” measures that preserve local quality of life.



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The US Route 22 corridor can be divided into three separate sections, with distinct land use conditions: (1) the western section of Memorial Parkway, (2) the eastern section of Memorial Parkway to Ingersoll Avenue and (3) the section east of Ingersoll Avenue. The design of the in-town portion of Memorial Parkway, with its median crossings and strategically located civic buildings, suggests an earlier attempt at creating a grand boulevard access to the Easton-Phillipsburg US Route 22 Toll Bridge in the *City Beautiful* tradition. Unfortunately, this idea was compromised over time by a series of engineering interventions that privileged high speed access to the bridge over local traffic and local activities. With careful redesign, the original design concept could be retained and conditions in this part of the corridor improved.

The eastern section of Memorial Parkway is hampered by multiple curb-cuts and short blocks with multiple “right-in, right out” only streets. The conversion over time of residential structures to commercial uses with higher parking requirements has resulted in a confusing and awkward landscape of multiple driveways and on-site parking on small lots. This section could benefit from targeted access management efforts, including curb-cut and street closures, parking lot consolidation and aggressive streetscape enhancements. Site design solutions leading to possible shared accesses and cross easement circulation should also be explored. These measures would reduce entering and exiting trips onto US Route 22 and increase internal trip circulation.

The area to the east of Ingersoll Avenue is more recent and clearly auto-dependent and is generally characterized by commercial buildings with larger footprints on larger lots. Some of these sites are defunct and may be available for redevelopment with different uses in a different pattern of development if this transformation is considered desirable by the host communities.

Pedestrian and bicycle movement in the corridor is hampered by a lack of suitable infrastructure. There are numerous sections of missing sidewalks, even though foot paths clearly indicate regular pedestrian use. As noted by the Phillipsburg Engineer, there is heavy pedestrian traffic generated by high school students crossing the highway before and after school and during lunch. It was also noted that there are ‘midblock’ pedestrian crossings of US Route 22, from Morris Street in Phillipsburg to Third Street in Lopatcong; signalized intersections between this area are widely spaced and pedestrians typically take the shortest routes unless blocked. Midblock crossings have the grassed median for protection. The low-income population and workforce in Phillipsburg also supports the use of alternative modes (walking, bicycle and transit) to access stores, employment facilities and services in the area. While there has been a limited number of pedestrian casualties identified in the accident reports for the US Route 22 corridor, this may simply suggest that additional pedestrian activity is discouraged by the lack of suitable sidewalks, pedestrian signals and marked crosswalks. Indeed, even along Memorial Parkway, where sidewalks are generally present, the lack of pedestrian amenities, the narrow sidewalks,



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the high speed of traffic, the frequent curb-cuts and the absence of curbside parking (which would buffer pedestrians from passing traffic) constitute serious deterrents to greater pedestrian activity.

Bicycle facilities are also limited in the greater study area and non-existent along the US Route 22 corridor. Certain municipalities, such as Greenwich, Phillipsburg and Pohatcong, have considered bicycle circulation improvements as part of their master plans. Additional efforts are still needed to develop a comprehensive bicycle plan for the subregion with appropriate linkages to key activity generators, such as the new High School, shopping areas and employment centers.

Not surprisingly, local transit services in the corridor are very limited. Ridership is not likely to increase substantially enough to justify enhanced transit service without significant land use changes or aggressive new efforts by the transit providers. Bus stops are also poorly located (such as the one in the back of the Phillipsburg Mall) or difficult for pedestrians to access due to deteriorated or non-existent sidewalks, making transit difficult to find for new users and difficult to access for current users.

An auto-oriented land use pattern combined with a sparse circulation network leads to aggressive driving behavior, dangerous to pedestrians and bicyclists, as well as increased congestion and motorist frustration. Local municipal planning documents suggest “traffic calming” interventions are desired by some of the target communities as a means to slow down traffic and reclaim neighborhood streets.

At the beginning of the study process, the master plans of all five municipalities were reviewed to assess planning conditions especially related to circulation and transportation concerns. Demographic information on population, housing and employment was compiled to assess future development trends. Land use changes that may assist in reducing traffic growth and congestion along the US Route 22 corridor were not specifically considered by the stakeholders through the visioning process. Development patterns are entrenched along the corridor, including redevelopment of key properties, such as the Ingersoll Rand tract, which is underway. Additionally, all five municipalities are within the Highlands Region and future land use changes can be expected at the conclusion of the Highlands consistency review process which is currently underway.

The sections following document demographic conditions in the Study Area. Also, regional planning considerations are highlighted, including the State Development and Redevelopment Plan and the Highlands Regional Master Plan. An environmental scan was also compiled to identify sensitive environmental and cultural resources that should be protected or that would constrain future improvements.



2.2 SOCIOECONOMIC CONDITIONS

In terms of land area, as shown in **Table 1**, Pohatcong Township is the largest municipality in the US Route 22 Study Area, containing almost 14 square miles. Greenwich Township is a close second with over ten square miles of land area. The Borough of Alpha is the smallest municipality with less than two square miles within its municipal boundaries. The total area of the five municipalities is 36.46 square miles.

Municipality	Acres	Square Miles
Alpha Borough	1,099	1.72
Greenwich Township	6,682	10.44
Lopatcong Township	4,683	7.32
Phillipsburg Town	2,107	3.29
Pohatcong Township	8,766	13.70
Total	23,337	36.46

Source: NJDEP Municipalities of New Jersey GIS publication

2.2.1 Population Density

With over 4,600 persons per square mile, the Town of Phillipsburg is by far the most densely populated municipality within the Study Area, indicative of the urban type development found in the Town. The Borough of Alpha has the second highest population density at 1,500 persons per square mile. Lopatcong Township has a typical suburban density given the suburban characteristics of the municipality. Greenwich and Pohatcong Townships, as primarily rural communities, have lower population densities of 515 and 254 persons per square mile, respectively. (See **Table 2 - Population Density**).

Municipality	Persons / Sq. Mi.
Alpha Borough	1,468
Greenwich Township	515
Lopatcong Township	1,144
Phillipsburg Town	4,639
Pohatcong Township	254
Average Overall Density	960

Source: Warren County Planning Department Population Estimates(2000-2007)

2.2.2 Population Trends

Overall, the Study Area has been growing in population since the 1960s. According to the US Census, there were 28,551 residents in the five municipalities in 1960 and WCPD estimated 35,019 residents in 2007, based on building permit and housing demolition data. Although Greenwich and Lopatcong Townships have relatively small populations, they have been growing consistently during this time period, gaining an average of 85 and 120 new residents per year, respectively. Conversely, Phillipsburg has been steadily decreasing in population since 1960, losing an average of 70 residents per year. The population trends in Alpha Borough are indicative of a built-out or nearly built-out community, with population wavering around 2,400 to 2,800 persons at each Census. Surprisingly, the population in



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Pohatcong Township has also been slightly decreasing during this time period. This is uncharacteristic for a municipality of this size. (See **Chart 1** and **Table 3**).

Chart 1 – Population Trends (1960-2007)

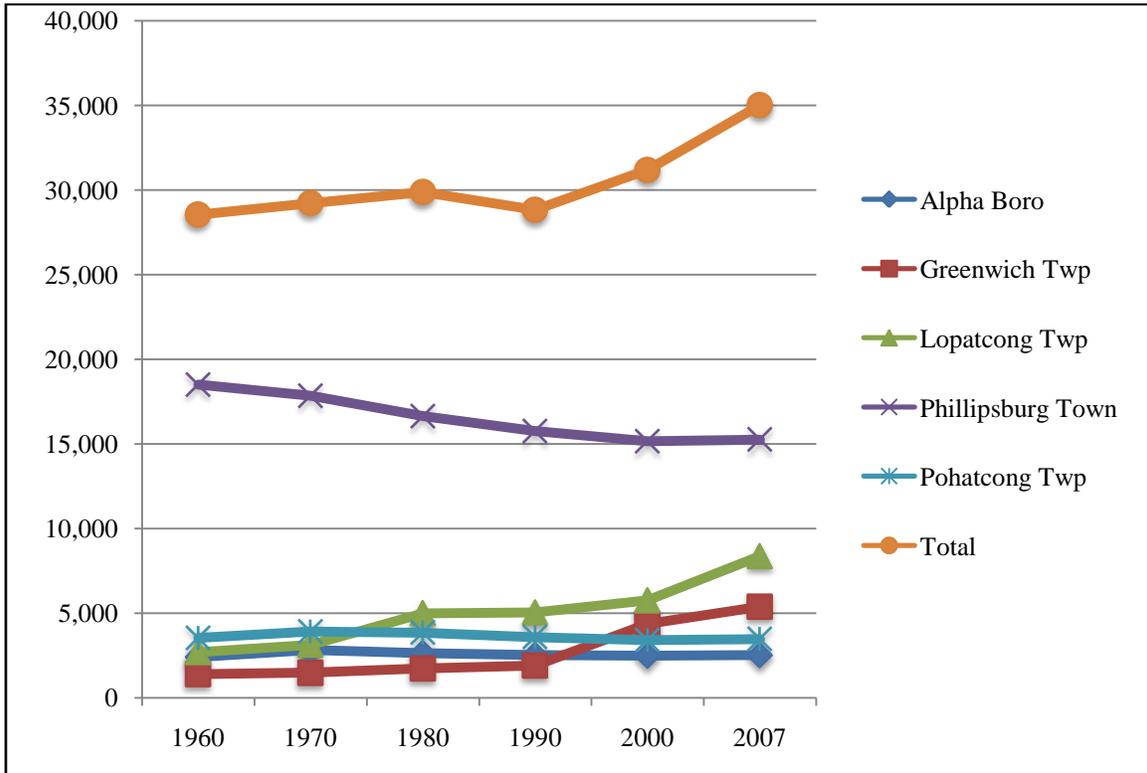


Table 3 – Population Trends (1960 - 2007)

Municipality	1960	1970	1980	1990	2000	*2007
Alpha Borough	2,406	2,829	2,644	2,530	2,482	2,520
Greenwich Township	1,397	1,482	1,738	1,899	4,365	5,381
Lopatcong Township	2,703	3,144	4,998	5,052	5,765	8,374
Phillipsburg Town	18,502	17,849	16,647	15,757	15,166	15,268
Pohatcong Township	3,543	3,924	3,856	3,591	3,416	3,476
Total	28,551	29,228	29,883	28,829	31,194	35,019

Source: U.S. Census Bureau (1960 - 2000 Censuses)
 * Source: Warren County Planning Department Population Estimates (2000-2007)



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2.2.3 Housing Trends

Taken as a whole, the municipalities in the Study Area have been steadily developing new housing units since 1990. A total of 3,659 new units have been constructed within the five municipalities between the 1990 Census and the 2007 estimates from the WCPD. With exception to the Town of Phillipsburg between 1990 and 2000, each municipality has increased its housing stock during this 17-year period. Consistent with the population trends, Alpha and Pohatcong saw very limited housing growth during this period (less than ten percent growth) and Greenwich and Lopatcong saw much higher housing growths (180 percent and 90 percent, respectively). Phillipsburg had a loss of housing units in the 1990s but the housing growth from 2000 to 2007 resulted in a positive growth of nearly ten percent of the 1990 housing stock. (See Chart 2 and Table 4).

Chart 2 – Housing Trends (1990-2007)

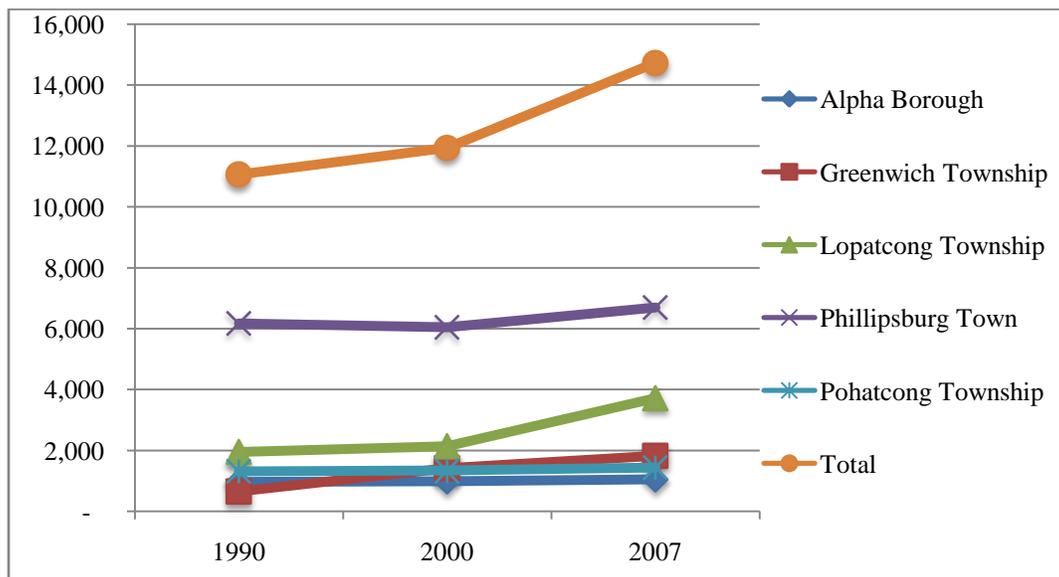


Table 4 – Housing Trends (1990 - 2007)

Municipality	1990	2000	*2007
Alpha Borough	967	989	1,050
Greenwich Township	655	1,421	1,823
Lopatcong Township	1,957	2,143	3,721
Phillipsburg Town	6,172	6,044	6,696
Pohatcong Township	1,316	1,341	1,436
Total	11,067	11,938	14,726

Source: U.S. Census Bureau (1960 - 2000 Censuses)
 * Source: Warren County Planning Department Population Estimates(2000-2007)



2.2.4 Employment

Available employment data for the study area is limited and does not reflect the recent retail and commercial development that has been constructed along the corridor. Based on the limited data from the New Jersey Department of Labor (NJDOLE), in 2003, Phillipsburg contained 607 private businesses, making up about two-thirds of the private sector businesses. Throughout the five municipalities, retail trade is consistently the number one industry in both the number of establishments and number of employees, which, again, was predominantly within Phillipsburg. These businesses are primarily located along the US Route 22 corridor (or within the vicinity), west of the Route 57 Junction.

Please note that this NJDOLE employment data not current. It is solely provided to highlight general employment conditions in the study area. This employment data was not used in the build-out or traffic analyses. (See **Table 5 - Business Establishments by Industry** and **Table 6 - Employment by Industry**).

Table 5 – Business Establishments by Industry (2003)

Industry	Alpha	Greenwich	Lopatcong	Phillipsburg	Pohatcong	Total
Accommodation/food services	7	8	4	60	10	89
Administrative/waste services		12		23	12	47
Agriculture/forestry/fishing/hunting		3				3
Construction	8	21		56	12	97
Finance and insurance				20		20
Health care/social assistance	5	5		90		100
Information				7		7
Manufacturing	7			38	5	50
Other services (not public admin.)		15	4	59	29	107
Professional/technical services		9	6	50	23	88
Real estate/rental/leasing				7		7
Retail trade	8	9	27	125		169
Transportation/warehousing				16	3	19
Unclassified entities				14	10	24
Utilities				3		3
Wholesale trade		6		26		32
Private Sector Municipality Total	47	106	49	607	151	960
Local Government	2	3	2	13	2	22
Federal Government		1		4		5

Source: NJ Department of Labor and Workforce Development, Employment and Wages, 2003 Annual Report

Table 6 – Employment by Industry (2003)

Industry	Alpha	Greenwich	Lopatcong	Phillipsburg	Pohatcong	Total
Accommodation/food services	81	40	87	694	130	1,032
Administrative/waste services		61		141	31	233
Agriculture/forestry/fishing/hunting		10				10
Construction	23	84		221	29	357
Finance and insurance				214		214
Health care/social assistance	26	22		2,034		2,082
Information	.			72		72
Manufacturing	238			1,684	40	1,962
Other services (not public admin.)		45	35	228	63	371
Professional/technical services		9	32	193	444	678
Real estate/rental/leasing				45		45
Retail trade	32	79	623	2,124		2,858
Transportation/warehousing				202	9	211
Unclassified entities				15	12	27
Utilities				72		72
Wholesale trade		11		110		121
Private Sector Municipality Total	451	510	989	8,183	1,837	11,970
Local Government	86	143	151	882	95	1,357
Federal Government		4		156		160

Source: NJ Department of Labor and Workforce Development, *Employment and Wages, 2003 Annual Report*

2.3 NEW JERSEY STATE DEVELOPMENT AND REDEVELOPMENT PLAN

The New Jersey State Planning Commission adopted the 2001 New Jersey State Development and Redevelopment Plan (“SDRP”), which established Planning Areas throughout the State that share common development and environmental characteristics. These planning areas serve as the framework for application of the policies of the State Plan. Each planning area has policy objectives that guide growth. These objectives are intended to guide local and regional planning, to establish a system of Centers, and to encourage livable neighborhoods with a variety of housing types, price ranges and multi-modal forms of transportation, while preserving green space. The five planning areas and their policy objectives are as follows:

Metropolitan Planning Area: PA1

Provide for much of the state's future redevelopment; revitalize cities and towns; promote growth in compact forms; stabilize older suburbs; redesign areas of sprawl; and protect the character of existing stable communities.

Suburban Planning Area: PA2

Provide for much of the state's future development; promote growth in Centers and other compact forms; protect the character of existing stable communities; protect natural resources; redesign areas of sprawl; reverse the current trend toward further sprawl; and revitalize cities and towns.

Fringe Planning Area: PA3

Accommodate growth in Centers; protect the Environs primarily as open lands; revitalize cities and towns; protect the character of existing stable communities; protect natural resources; provide a buffer between more developed Metropolitan and Suburban Planning Areas and less developed Rural and Environmentally Sensitive Planning Areas; and confine programmed sewers and public water services to Centers.

Rural Planning Area: PA4 and Rural/Environmentally Sensitive Planning Area: PA4B

Maintain the Environs as large contiguous areas of farmland and other lands; revitalize cities and towns; accommodate growth in Centers; promote a viable agricultural industry; protect the character of existing stable communities; and confine programmed sewers and public water services to Centers.

Environmentally Sensitive Planning Area: PA5 and Environmentally Sensitive/Barrier Islands Planning Area: PA5B

Protect environmental resources through the protection of large contiguous areas of land; accommodate growth in Centers; protect the character of existing stable communities; confine programmed sewers and public water services to Centers; and revitalize cities and towns.

The five municipalities in the US Route 22 Study Area are designated with a range of planning areas. The Town of Phillipsburg is almost completely within PA1, with the exception of a small area of Parkland. The PA1 designation also spills over into Alpha Borough, Lopatcong Township and Pohatcong Township. There are no PA3 (Fringe) planning areas within the Study Area or anywhere in these five municipalities. The SDRP identifies the Proposed Phillipsburg Regional Center, which



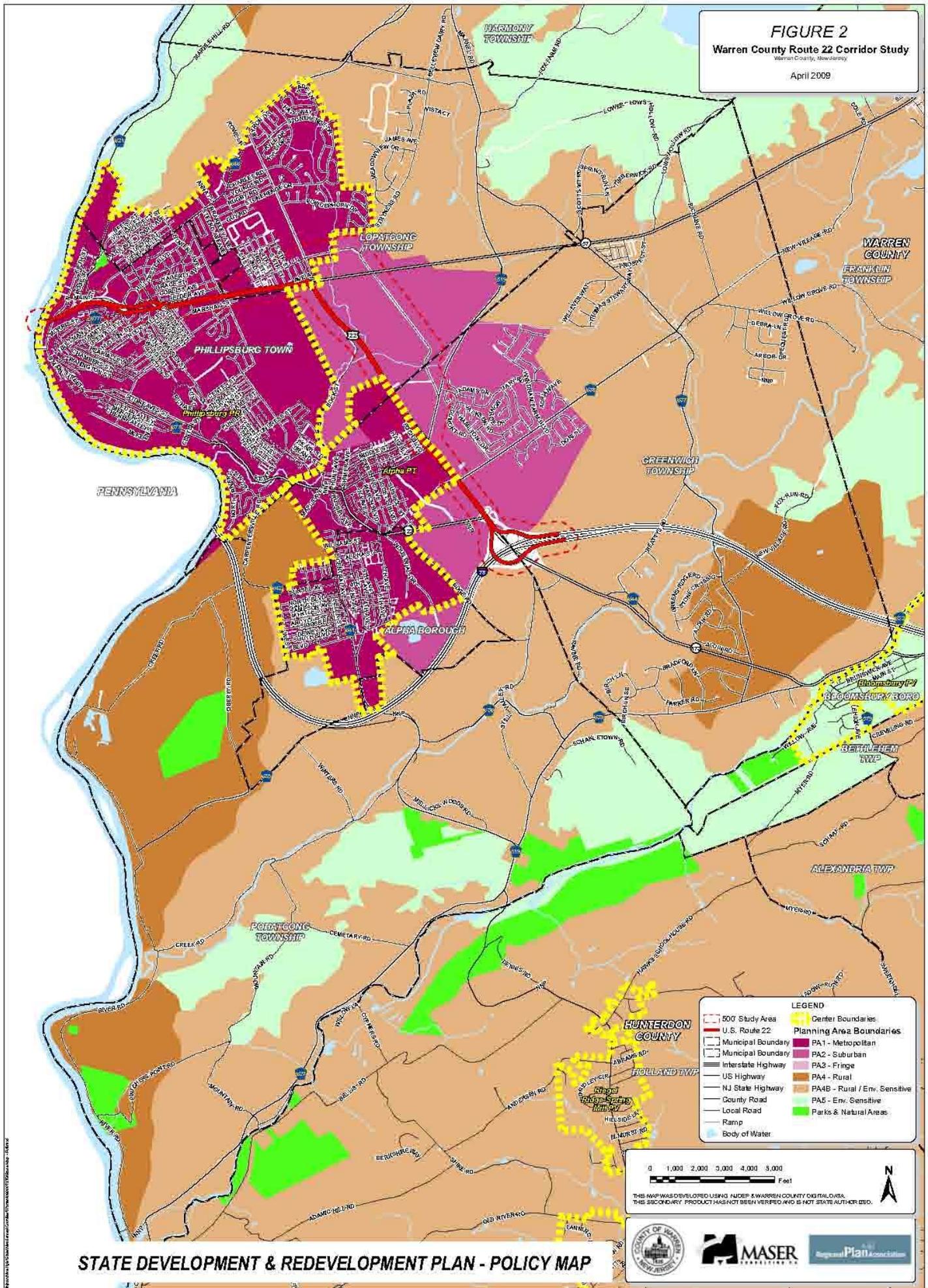
includes all of Phillipsburg and the PA1 portion of Lopatcong. Alpha is also identified as a Proposed Town Center under the SDRP. (See **Table 7 - State Development & Redevelopment Plan - Planning Areas**)

Within the US Route 22 Study Area itself, PA1 and PA2 are the primary planning area designations. The entire corridor west of the Route 57 Junction is designated PA1. South of the Route 57 Junction is primarily PA2 with a patch of PA1 on the western side of US Route 22, between the Phillipsburg Mall and the Greenwich Street intersection. **Figure 2 – State Development & Redevelopment Plan Policy Map** illustrates the SDRP planning area designations in the Study Area.

Table 7 – State Development & Redevelopment Plan - Planning Areas						
Municipality	PA1	PA2	PA4	PA4B	PA5	PARK
Alpha Borough	586 ac	146 ac	67 ac	299 ac		
Greenwich Township		912 ac	1,005 ac	4,324 ac	536 ac	
Lopatcong Township	1,101 ac	795 ac		1,811 ac	977 ac	
Phillipsburg Town	2,025 ac					6 ac
Pohatcong Township	557 ac	252 ac	2,236 ac	3,865 ac	1,292 ac	370 ac
Total	4,253 ac	2,105 ac	3,323 ac	10,299	2,806	377



FIGURE 2
Warren County Route 22 Corridor Study
 Warren County, New Jersey
 April 2009



STATE DEVELOPMENT & REDEVELOPMENT PLAN - POLICY MAP

LEGEND

- 500' Study Area
- U.S. Route 22
- Municipal Boundary
- Interstate Highway
- US Highway
- NJ State Highway
- County Road
- Local Road
- Ramp
- Body of Water
- Center Boundaries
- Planning Area Boundaries
- PA1 - Metropolitan
- PA2 - Suburban
- PA3 - Fringe
- PA4 - Rural / Env. Sensitive
- PA5 - Env. Sensitive
- Parks & Natural Areas

0 1,000 2,000 3,000 4,000 5,000
 Feet

THIS MAP WAS DEVELOPED USING AIDEP & WARREN COUNTY DIGITAL DATA. THIS SECONDARY PRODUCT HAS NOT BEEN VERIFIED AND IS NOT STATE AUTHORITY.



2.4 NEW JERSEY HIGHLANDS PLANNING REGION

The Highlands Water Protection and Planning Act (N.J.S.A 13:20-1 et seq.), signed in August 2004, provides the regulatory authority to preserve open space and protect the State's greatest diversity of natural resources, including the precious water resources that supply drinking water to more than half of New Jersey's families. The Highlands Act documents the geographical boundary of the Highlands Region and establishes the Highlands Preservation Area and the Highlands Planning Area. The Act created a Highlands Water Protection and Planning Council (NJ Highlands Council) to develop a regional master plan for the entire Highlands Region.

The Highlands Preservation Area will limit the amount of build-out development potential in the Study Area. Of the five municipalities, three have land within the Highlands Preservation area, which would significantly limit development in those areas. Alpha and Phillipsburg are completely within the Highlands Planning Area. The US Route 22 Study Area is completely within the Planning Area as well. As municipalities are given the option of conforming to the Highlands Regional Master Plan (RMP) within the Planning Area, the effects of the Highlands regulations on the Study Area are not known at this time.

As part of the Highlands RMP, a Land Use Capability Zone Map (LUCZM) was developed to provide guidance for implementation of the RMP Policies. The LUCZM divides the entire Highlands Region into three primary overlay zone and four subzones, each with a unique purpose, application and development criteria. The effects of each zone or subzone also vary depending on the location within the Preservation or Planning Area. The Highlands RMP provides the following purpose, application and development criteria for each zone or subzone:

Existing Community Zone

Consists of areas with regionally significant concentrated development signifying existing communities. These areas tend to have limited environmental constraints due to previous development patterns, and may have existing infrastructure that can support development and redevelopment provided that such development is compatible with the protection and character of the Highlands environment, at levels that are appropriate to maintain the character of established communities.

Existing Community Zone – Environmentally Constrained Sub-Zone

Consists of significant contiguous Critical Habitat, steep slopes and forested lands within the Existing Community Zone that should be protected from further fragmentation. They serve as regional habitat “stepping stones” to larger contiguous Critical Habitat and forested areas. As such, they are not appropriate



for significant development, and are best served by land preservation and protection. Development is subject to stringent limitations on consumptive and depletive water use, degradation of water quality, and impacts to environmentally sensitive lands.

Conservation Zone

Consists of areas with significant agricultural lands and interspersed with associated woodlands and environmental features that should be preserved when possible. Non-agricultural development activities will be limited in area and intensity due to infrastructure constraints and resource protection goals.

Conservation Zone – Environmentally Constrained Sub-Zone

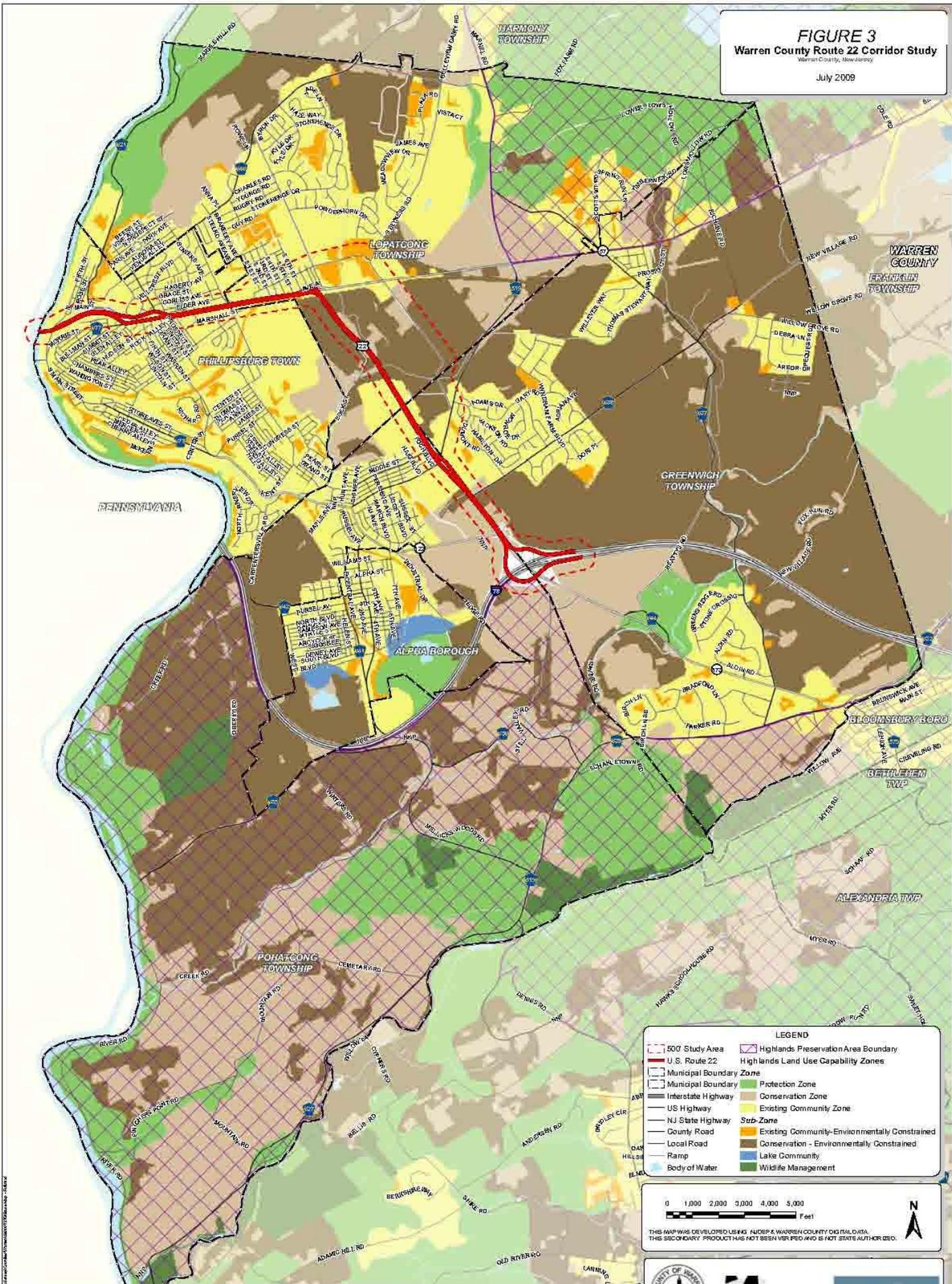
Consists of significant environmental features within the Conservation Zone that should be preserved and protected from non-agricultural development. Development activities will be limited and subject to stringent limitations on consumptive and depletive water use, degradation of water quality, and impacts to environmentally sensitive lands.

Table 8 – NJ Highlands Land Use Capability Zones indicates the acreage of each municipality within each Highlands Land Use Capability Zone. **Figure 3 – Highlands Region Map** illustrates the extent of the Land Use Capability Zones in the Study Area. The US Route 22 Corridor is primarily within the Existing Community Zone and Environmentally Constrained Subzone, with the exception of the two areas in the Conservation Zone and Environmentally Constrained Subzone: between Route 57 and the Phillipsburg Mall and from Greenwich Street to I-78.

Table 8 – NJ Highlands Land Use Capability Zones					
Highlands Land Use Capability Zone	Alpha Borough	Greenwich Township	Lopatcong Township	Phillipsburg Town	Pohatcong Township
Protection Zone	109 ac	326 ac	1,004 ac	132 ac	1,914 ac
Conservation Zone	137 ac	1,140 ac	828 ac	64 ac	3,237 ac
Existing Community Zone	396 ac	1,488 ac	1,702 ac	1,758 ac	552 ac
Existing Community Env. Constrained Subzone	46 ac	88 ac	233 ac	153 ac	9 ac
Conservation Env. Constrained Subzone	334 ac	3691 ac	949 ac	2 ac	2,720 ac
Lake Community Subzone	73 ac				
Wildlife Management Area		42 ac	5 ac		359 ac



FIGURE 3
Warren County Route 22 Corridor Study
 Warren County, New Jersey
 July 2009



HIGHLANDS LAND USE CAPABILITY ZONE MAP

LEGEND

500' Study Area	Highlands Preservation Area Boundary
U.S. Route 22	Highlands Land Use Capability Zones
Municipal Boundary Zone	Protection Zone
Municipal Boundary	Conservation Zone
Interstate Highway	Existing Community Zone
US Highway	Sub-Zone
NJ State Highway	Existing Community-Environmentally Constrained
County Road	Conservation - Environmentally Constrained
Local Road	Lake Community
Ramp	Wildlife Management
Body of Water	

0 1,000 2,000 3,000 4,000 5,000 Feet

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2.5 ENVIRONMENTAL SCAN

Environmental features that constrain land development have been identified and, where applicable, were used to limit the build-out for specific parcels (see **Figure 4 - Environmental Scan Map**). These constraining environmental features are as follows:

2.5.1 *Category One Waters*

The Surface Water Quality Standards Rules (N.J.A.C. 7:9B-1.4) define Category One (C-1) Waters as "those waters designated in the tables in N.J.A.C. 7:9B-1.15(c) through (h), for purposes of implementing the anti-degradation policies set forth in N.J.A.C. 7:9B-1.5(d), for protection from measurable changes in water quality characteristics because of their clarity, color, scenic setting, other characteristics of aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, or exceptional fisheries resource(s)". For all C-1 waters, or Special Water Resource Protection Areas (SWRPA), 300-foot riparian buffers are required.

As delineated in the September 2009 edition of the NJDEP Surface Water Quality Standards GIS publication, there are two waterways with C-1 designations within the US Route 22 Study Area: Lopatcong Creek and Pohatcong Creek.

Lopatcong Creek flows westward through the US Route 22 Study Area, following County Route 519 through Greenwich Township and crossing Stryker Roads and US Route 22 in Lopatcong Township. An uncoded tributary (UNT) to Lopatcong Creek flows southward through Lopatcong Township, crossing Route 57 and following along the eastern side of US Route 22 until it crosses US Route 22 and meets Lopatcong Creek. Both Lopatcong Creek and the Lopatcong Creek UNT require 300-foot riparian buffers.

Pohatcong Creek flows westward through the US Route 22 Study Area, crossing US Route 22 in Greenwich Township where the access ramps meet I-78. Pohatcong Creek requires 300-foot riparian buffers, which constraints development at the southern end of the Study Area.

2.5.2 *Delaware River Special Protection Waters (SPW)*

The Delaware River flows southward, making up the westerly boundary of the US Route 22 Study Area. The entire US Route 22 Study Area is in Zone E of the Delaware River Basin Special Protection Waters (SPW), which is regulated by the Delaware River Basin Commission (DRBC). The SPW regulations require DRBC approval for new or expanding industrial and municipal wastewater treatment plants designed to discharge greater than 10,000 gallons per day (gpd).

2.5.3 Flood Prone Areas

According to the Federal Emergency Management Agency, the 100-year and 500-year floodplains extend approximately 1,500 feet eastward from the Delaware River into the US Route 22 Study Area. The Lopatcong Creek 100-year floodplain averages 500 feet in width along the entire corridor, including the tributary.

2.5.4 Freshwater Wetlands

Freshwater Wetlands, as delineated in the 1986 edition of the Freshwater Wetlands of Warren County, New Jersey published on November 1, 1999 by the NJDEP, are very limited within the US Route 22 Study Area, amounting to a total of approximately 30 acres. These wetland patches are generally isolated and found in association with the stream corridors in the area. The NJDEP regulates between 50 and 150-foot buffers or transitional areas, based on the wetland resource value classification.

2.5.5 Steep Slopes

Undeveloped steep slopes of 15 percent or greater within the Study Area are limited to a small portion at the western portion of the Town of Phillipsburg, as shown in the March 3, 2005 publication of the Slope Greater Than 15 Percent, Undeveloped (Draft) GIS data from NJ Highlands Council. The State of New Jersey does not regulate development of steep slopes; however, municipalities are required to prepare and adopt steep slopes ordinances in order to gain NJDEP approval of a Water Quality Management Plan (N.J.A.C. 7:15).

2.5.6 Critical Habitat for Threatened & Endangered Species

According to the June 2007 publication of the NJDEP Species Based Patches (SBP) within the Endangered Nongame Species Program (ENSP) Highlands Extended Boundary (Version 3), there are over 600 acres of critical habitat for Rank 3 (State Threatened) and Rank 4 (State Endangered) species along eastern side of US Route 22 in Pohatcong Township, Lopatcong Township and Greenwich Township. These areas are not currently under public ownership.

2.5.7 Open Space Preservation

Preserved Open Space is very limited within the Study Area. According to NJDEP and Warren County GIS data, a total of less than 65 acres of state, county or municipally owned open spaces exist, including the county-owned Delaware River Bluffs, the Phillipsburg ball field and the Morris Canal Greenway.



2.5.8 Known Contaminated Sites

According to the NJDEP Known Contaminated Sites GIS data, published November 18, 2005, there are nine sites in the Study Area with active contamination, four of which are located in Phillipsburg. As US Route 22 is the primary commercial corridor in the area, most of these sites are located directly adjacent to the US Route 22 corridor. (See **Table 9 – Known Contaminated Sites**)

Municipality	Name	Address
Greenwich Twp	Smp Inc.	405 Rte 519
Phillipsburg Town	Exxon Store 3-0803	500 Memorial Pwy
Phillipsburg Town	Flowserve Corp	942 Memorial Pwy
Lopatcong Twp.	Hess Station 30300	973 Memorial Pwy & Rte 22 W
Lopatcong Twp.	Mico Petro	1075 Rt. 22 W
Phillipsburg Town	Mobil 57368	Rte 22 & Roseberry St
Phillipsburg Town	New Jersey Bell	641 Memorial Pwy
Pohatcong Twp.	Penn Jersey Truck Stop	1400 Rtes 22 & 78 E
Lopatcong Twp	Vista Bancorp	108 Baltimore St

2.5.9 Historic Districts

According to the New Jersey State Historic Preservation Office (NJ-SHPO), there is only one historic district within the US Route 22 Study - the existing and former bed of the Morris Canal (ID#2784). From its construction in 1831, the Morris Canal extended east-to-west from the Delaware River in the Town of Phillipsburg to the City of Newark. It was extended in 1836 from Newark to the Hudson River in Jersey City. The Canal was used to carry coal and other materials from the Lehigh Valley (Pennsylvania) to the New York Harbor until it was decommissioned in 1924. It utilized a series of locks and inclined planes to cross the Highlands of New Jersey¹. This Nationally Registered Historic District crosses US Route 22 in Lopatcong Township, north of the Phillipsburg Mall near the Pohatcong Township border, and also extends across Stryker Road in Greenwich Township. The entire Morris Canal corridor was listed on the State Register on November 26, 1973 and the National Register on October 1, 1974 (N.R. Reference #74002338). In 1981, the Warren County Board of Chosen Freeholders incorporated the Morris Canal into the County's Open Space and Recreation Plan and also established the Morris Canal Committee of the County Planning Board in order to preserve and protect the remains of the Morris Canal. According to the June 2, 2008 Warren County Open Space and

¹ National Canal Museum. <http://www.canals.org/researchers/Canal_Profiles/United_States/Mid-Atlantic/Morris_Canal>



Recreation Plan, engineering plans are currently being prepared to restore the section of the Morris Canal between US Route 22 and Strykers Road (within the US Route 22 Study Area).

2.5.10 Historic Sites

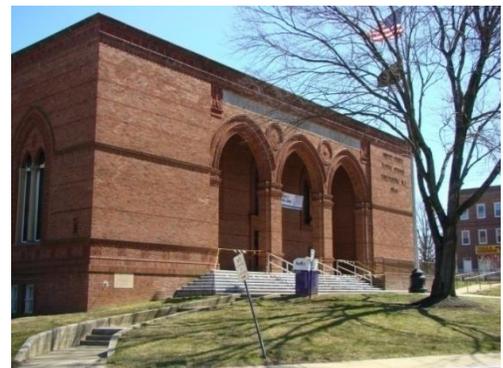
According to the NJ-SHPO, there are two historic sites within the US Route 22 corridor: the St. James Lutheran Church (ID#3501) and the U.S. Post Office (ID#2787).

St. James Lutheran Church

The St. James Lutheran Church, also known as the Straw Church, is located within the US Route 22 median island, between Greenwich Street and County Route 519. The cemetery for the church is located at the northeast quadrant of US Route 22 and County Route 519 in Greenwich Township. Built in 1750, the church was constructed of logs and was thatched with a straw roof, hence the name. The old Straw Church was the first Lutheran Church in the area, with services beginning in 1769. The second building was constructed of field stone in 1790, while the present day structure, built in 1834, is constructed of brick. Although the site is not officially listed on either the State or National Register of Historic Places, the site received a Designation of Eligibility (DOE) on December 27, 1996 from the Keeper of the National Register and an NJ-SHPO Opinion of Eligibility on May 20, 1996.

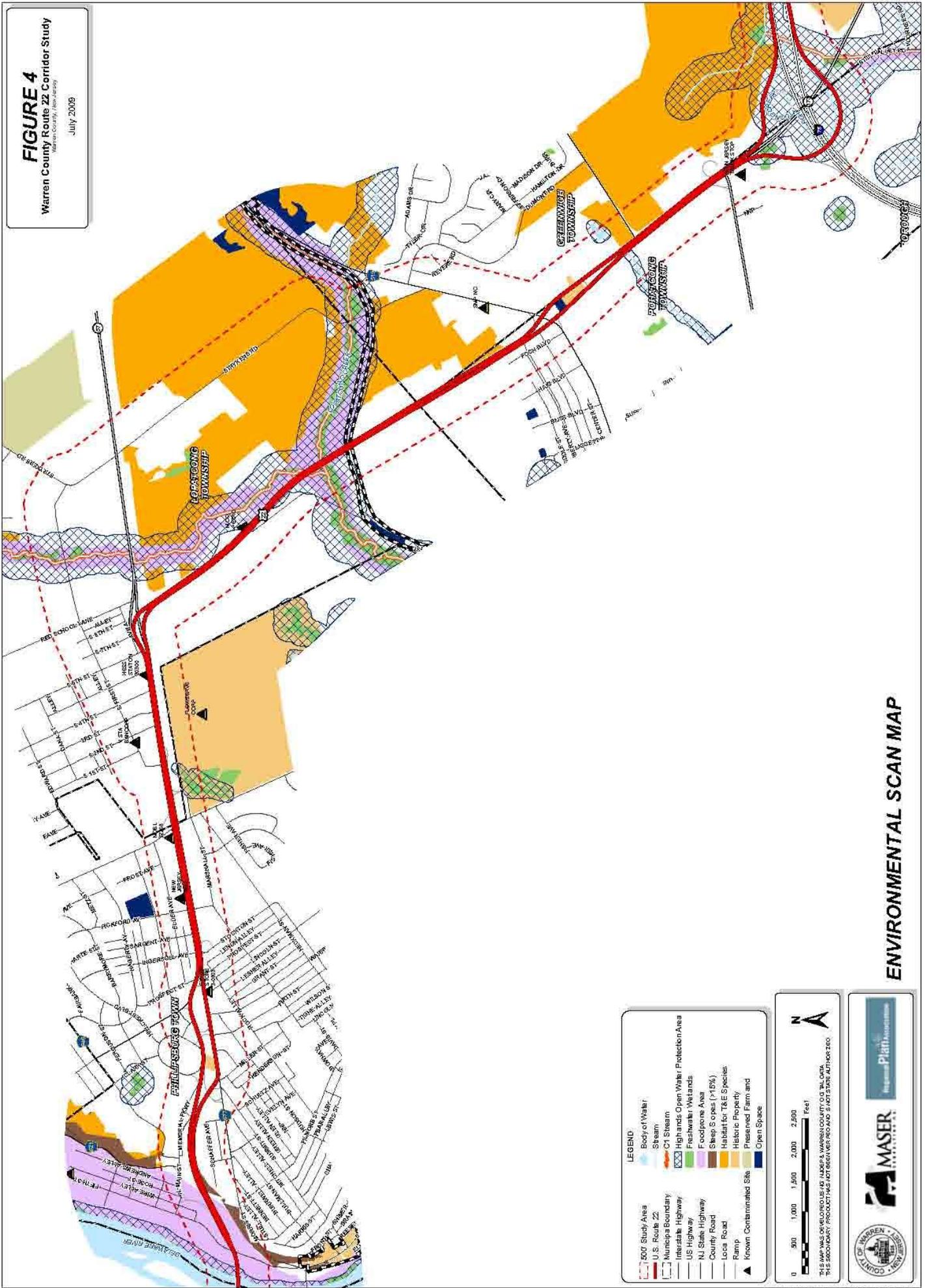
U.S. Post Office

The second historic site is the U.S. Post Office located on in the center of the US Route 22 median near the Hillcrest Boulevard in Phillipsburg. The Post Office is of brick construction and was first opened on August 14, 1934. The Post Office was listed on the State Register on January 1, 1986 as part of a Thematic Nomination of Significant Post Offices.

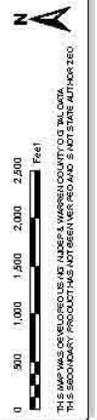


Phillipsburg Post Office

FIGURE 4
Warren County Route 22 Corridor Study
Warren County Planning Board
July 2008



- LEGEND**
- 500' Study Area
 - U.S. Route 22
 - Municipa Boundary
 - Interstate Highway
 - US Highway
 - NJ State Highway
 - County Road
 - Local Road
 - Ramp
 - Known Contaminated Site
 - Body of Water
 - Stream
 - CH Stream
 - Highlands Open Water Protection Area
 - Freshwater Wetlands
 - Floodplain Area
 - Steep Slopes (>15%)
 - Habitat for T&E Species
 - Historic Property
 - Preserved Farm and
 - Open Space



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ENVIRONMENTAL SCAN MAP

3. PUBLIC OUTREACH

3.1 PUBLIC OUTREACH PROCESS

Public involvement is a vital component in the research and development of transportation planning studies. The input, comments, questions and concerns of the residents and commuters in the Study Area are a high priority. 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. Also, a project webpage was set up on the County's website to post study information. Additionally, the County had numerous mailings and emails to interested organizations and individuals. A newsletter was also distributed to explain the US Route 22 Corridor Improvement Plan recommendations. Copies of these documents are provided in the Appendix.

The TAC was comprised of members of various agencies, including the Warren County Planning Department (WCPD), Maser Consulting, PA (Maser), Regional Plan Association (RPA), the New Jersey Transportation Planning Authority (NJTPA), New Jersey Department of Transportation (NJDOT), New Jersey Transit (NJTransit), NJ Highlands Council, TransOptions, Delaware River Joint Toll Bridge Commission (DRJTBC) and representatives of the five municipalities. The agendas and meeting minutes of these five TAC Meetings are included in the Appendix.

Two public open houses were held; the first to review possible strategies and the second to present the Draft US Route 22 Corridor Improvement Plan.

3.2 THE VISIONING WORKSHOP

The visioning workshop was held at the Warren County Vocational School on February 7, 2009 from 10:00 am to 4:00 pm. Over 40 people attended. The participants were distributed amongst three breakout tables, each staffed by several designers / facilitators.



Getting Started



The Creative Juices



Reporting Back to the Group

In preparation for the visioning workshop, a review was made of all municipal master plans, and related planning reports and transportation studies. A Briefing Book was compiled by RPA, which highlighted municipal and regional planning considerations and illustrative aerial maps of the existing road network, key activity generators and environmental constraints. (See Briefing Book in the Appendix.)

During the morning session each breakout table focused on the entire study area; in the afternoon session each breakout table focused on one of three smaller study areas. While the five-mile corridor is too long to allow detailed treatment in a workshop format, the three selected Study Areas were found to exemplify prototypical sets of relationships between land use, transportation and design. As prototypes, the study areas are amenable to design solutions that can be replicated elsewhere along the corridor, as appropriate, provided that the conditions are similar.

The three breakout tables validated many of the issues and suggested design solutions discussed with the stakeholders and included in the Briefing Book. Each of the tables also provided new solutions to problems and dismissed or modified others. Many ideas and concepts, such as the need for increased pedestrian mobility and safety surfaced at multiple tables. However, the workshop participants were generally not receptive to ideas about dramatic future changes to the land use patterns, which is admittedly one of the most effective tools to change travel behavior. There was some discussion about modest changes in land use but the fundamental suburban low-density single-use pattern, with big format retail along the highway frontage, was not seriously challenged.

3.2.1 Questions for Discussion

With stakeholder input, RPA prepared a series of questions designed to frame the discussions during the workshop. These questions were intended to keep the public conversations on target without constraining fruitful discussion. Each group of facilitators was asked to refer to this set of questions at the beginning and end of the session and to make sure the workshop participants at their table stayed focused.

1. If widening US Route 22 is not a feasible alternative, are there other ways to mitigate traffic without increasing capacity?
2. Should parallel roadways that would take some local traffic off the highway be considered as a supplement to mitigating traffic volumes along US Route 22?
3. Are there opportunities for additional street connections at strategic locations across US Route 22 that would facilitate North/ South movement and improve the performance of the overall circulation network?
4. What types of land use changes would be desirable along the corridor?
5. What types of land use and other changes would significantly increase transit ridership?



Promoting Smart Growth

6. What types of access management strategies—such as street closures, curb cut removals or parking lot interconnections—are feasible and applicable in the Eastern portion of Memorial Parkway?
7. Where should traffic calming efforts be focused?
8. Are there opportunities to create an off-road pedestrian/ bicycle circulation system linking important destinations that takes advantage of preserved open space, natural features, historic sites and railroad rights-of-way?
9. What are the major generators of pedestrian traffic near US Route 22 and where are the major pedestrian crossings?
10. Where should existing pedestrian and bicycle facilities be upgraded and where should new facilities be installed such that they encourage increased pedestrian and bicycle activity?
11. Can Memorial Parkway be reconfigured to reclaim pedestrian access to adjacent land uses without compromising access to the Toll Bridge?

3.2.2 Findings and Recommendations

The “Big Picture”

The US Route 22 corridor, extending from the Delaware River in Philipsburg to the I-78 interchange in Pohatcong, is the main thoroughfare for the residents of the surrounding municipalities, including many in the greater Lehigh Valley, the majority of whom are coming to or from I-78. The crush of through traffic during the Morning (AM) and Evening (PM) Peak Hours combined with local traffic can bring the traffic in the corridor and surrounding intersections to a near standstill. This will only be exacerbated by anticipated future development through the year 2035 if the region continues to Build-out according to current zoning.

During the “big picture” exercise, the groups were asked to explore the regional landscape and circulation framework and -- given that the wholesale widening of US Route 22 is admittedly not an option, for a wide variety of reasons -- find both technical fixes and alternate means of movement throughout the region. The groups addressed the discussion questions posed in the Briefing Book and either confirmed, qualified or dismissed them. Additionally, the groups flagged other future problems and potential solutions, such as the approximately 600-housing unit development adjacent to I-78 in Pohatcong and the potential for incorporating a new I-78 interchange to alleviate congestion that might result from such a development. The new interchange (known as Exit 2) has been on paper since the initial construction of I-78; however, it was never built due to reported opposition from Pohatcong Township. Today’s land use and political environment is different; traffic on US Route 22 is increasing and it is widely recognized that additional development in the area will exacerbate the situation, thus making an additional interchange on I-78 a more politically feasible alternative to address increasing traffic levels on US Route 22 and adjacent local roads. Enhancing connections along and among local



Promoting Smart Growth

roads will enable local traffic to remain on local roads, thus eliminating short-haul traffic on US Route 22 and avoiding many unnecessary turning movements on US Route 22.

In a nutshell, the suggestions from the “**big picture**” discussions were as follows:

- Improve the safety and circulation of the intersection of Morris Street and/Miller Street/Summit Avenue and the eastbound US Route 22 Morris Street Ramp with US Route 22 (Memorial Parkway).
- Improve the vehicular traffic safety and circulation within the US Route 22 (Memorial Parkway) corridor between the Morris Street intersection and the Bates/Ingersoll Streets intersection.
- Improve the pedestrian safety and circulation within the US Route 22 (Memorial Parkway) corridor between the Morris Street intersection and the Roseberry Street intersection.
- Extend Center Street east to US Route 22, Strykers Road, Route 57 and County Route 519
- Create a new interchange of I-78 at Carpentersville Road.
- Improve the US Route 22 and Route 57 interchange by repairing or replacing the functionally obsolete bridge—a new bridge should contain sidewalks for pedestrian access.
- Improve the interchange of Route 57 and County Route 519 in all directions.
- Improve the intersection of Dumont Road, County Route 519 and Strykers Road to facilitate a four-way turning movement.
- Create a new street linking the back of the Phillipsburg Mall to the Center Street extension at the Ingersoll Rand parcel.

Participants were also asked to articulate suggestions for “**technical fixes**” that might enhance circulation along US Route 22 itself and, as a result, provide better movement along the corridor. The following summarizes the suggestions:

- Improve the safety and circulation of the intersection of Morris Street/Miller Street/Summit Avenue and the eastbound US Route 22 Morris Street Ramp with US Route 22 (Memorial Parkway) by realigning the intersection of US Route 22 (Memorial Parkway), realigning the intersection with US Route 22, softening the US Route 22 curve, providing proper speed limit and better signage.
- Improve the safety and circulation of US Route 22 (Memorial Parkway) by reducing and eliminating conflicting traffic movements.
- Improve pedestrian safety and circulation of US Route 22 (Memorial Parkway) by installing median barriers, dedicated pedestrian crosswalks and overpasses.
- Remove toll gates at Easton-Phillipsburg Toll Bridge to facilitate west bound mobility through EZ-Pass lanes.
- Complete the interchange at Exit 3 on I-78 to allow a turning movement from I-78 West to Route 173 South.



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- Improve Roseberry Street intersection with US Route 22 and overall connection of Roseberry Street to the new High School.
- Improve intersection at New Brunswick Avenue and US Route 22.
- Implement access management and driveway consolidation along entire US Route 22 and where possible implement the NJDOT Highway Access Management Code.

(See **Figure 5 - “Big Picture” Breakout Sessions**)

Small Area Exercises

The small area exercises were intended to give participants an opportunity to view a specific part of the corridor at a smaller scale, and allow them to pinpoint areas where improvements could enhance the circulation and the quality of life in the surrounding neighborhoods. Each of the three “small areas” was chosen for its unique attributes in the Study Area. Recommendations for improvement included:

- Re-time traffic lights to increase pedestrian safety.
- Build missing segments of sidewalk system and rebuild existing deteriorated sidewalks.
- Eliminate right-on-red at Roseberry Street.
- Reclaim Lopatcong Creek corridor and create bicycle / pedestrian greenway.
- Relocate St. James Lutheran Church next to cemetery; or realign US Route 22 westbound.
- Upgrade pedestrian connection at Roseberry Street to new High School.

(See **Figure 6 - Proposed Improvements to Circulation Network from Visioning Workshop**)

Memorial Parkway

The area of US Route 22 from the Delaware River to the intersection of Ingersoll Ave, known as Memorial Parkway, contains a set of features and issues that are exclusive to that section of the corridor. With the notable exception of a relatively narrow, mostly commercial strip along the highway frontage, the neighborhoods on either side of Memorial Parkway are primarily residential. The highway severs both vehicular and pedestrian cross-circulation and seriously compromises access to the current Phillipsburg High School, as well as the proposed site of the new High School. Further intensifying the situation is the generally rapid speed of peak traffic flow, complicated by several slow moving turnarounds and a number of driveways – including the current Post Office site – that lack proper acceleration and/or deceleration lanes in a highway context.

Participants in the workshop were asked to identify ways to reclaim, rationalize and enhance Memorial Parkway. Design options include:

- Create a new pedestrian overpass and safer cross-walks.



Promoting Smart Growth

- Relocate the Post Office to eliminate an intensive use in the median.
- Eliminate U-turns to prevent left lane turning and acceleration.
- Realign US Route 22 West to remove unnecessary median space between eastbound and westbound lanes.
- Realign Warren Street intersection with US Route 22.
- Consider the use of roundabouts at Warren, Lincoln, and Miller Streets.
- Create an Access Management Plan consistent with the NJDOT Highway Access Management Code.
- Reduce curb cuts along US Route 22 and consolidate parking lot ingress and egress wherever possible.
- Create quality public open spaces with an improved “town center” streetscape.

(See **Figure 7 - Memorial Parkway Proposals from Breakout Sessions**)

Other Issues

- There was concern regarding the public housing across from some retail establishments that is generating “illegal” pedestrian crossings of US Route 22. Participants noted that area residents take huge risks by running across high speed traffic lanes, often pushing baby strollers, while ignoring signalized cross walks in the vicinity. In part, this is due to poor signage, to poorly designed pedestrian facilities (right on red allows vehicular movements to threaten pedestrians) and to poorly located pedestrian crossings relative to adjacent land uses. Participants suggested that installing a pedestrian overpass – or safer and better located surface crossing facilities -- should be considered.
- Suggestions for better and more comprehensive pedestrian and bicycle facilities along roads and bordering open spaces adjacent to US Route 22 were well received. It was considered that creation of a pedestrian/ bicycle route along the Ingersoll Rand property extending to Roseberry Street and up to the new High School would facilitate non-vehicular movement and help relieve congestion.



FIGURE 5

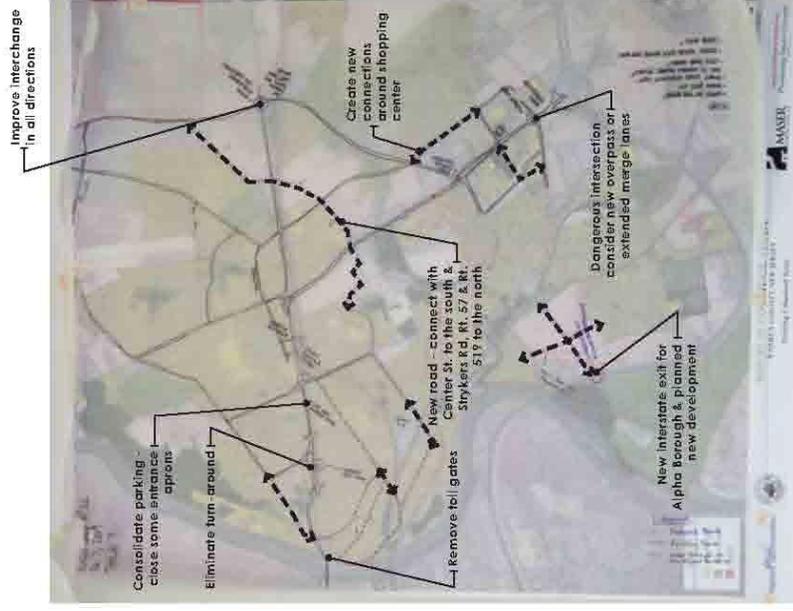


TABLE 3

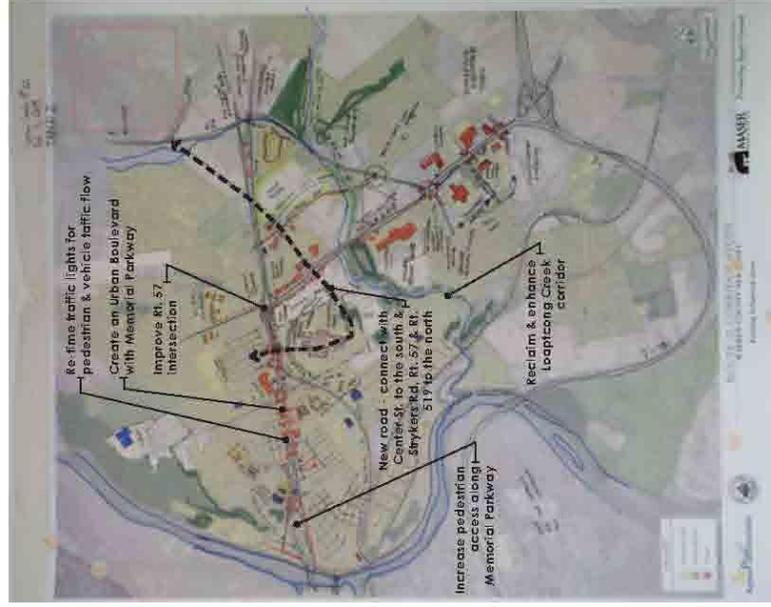


TABLE 2

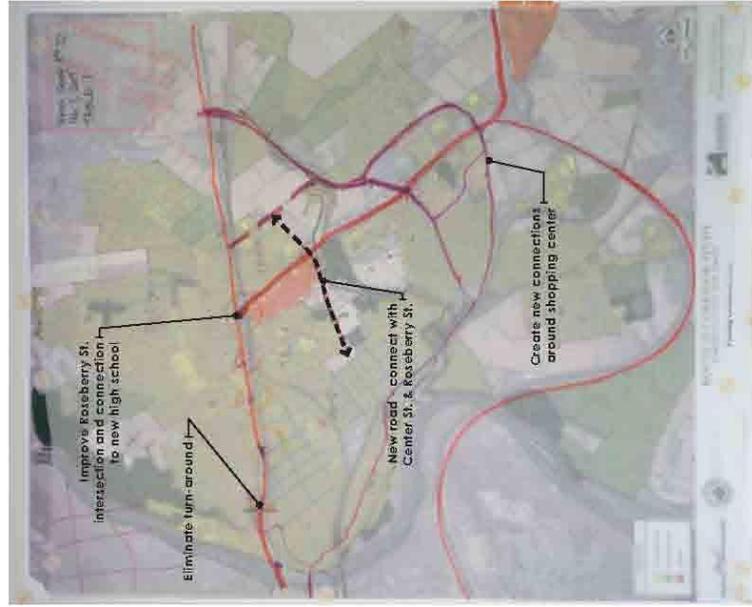
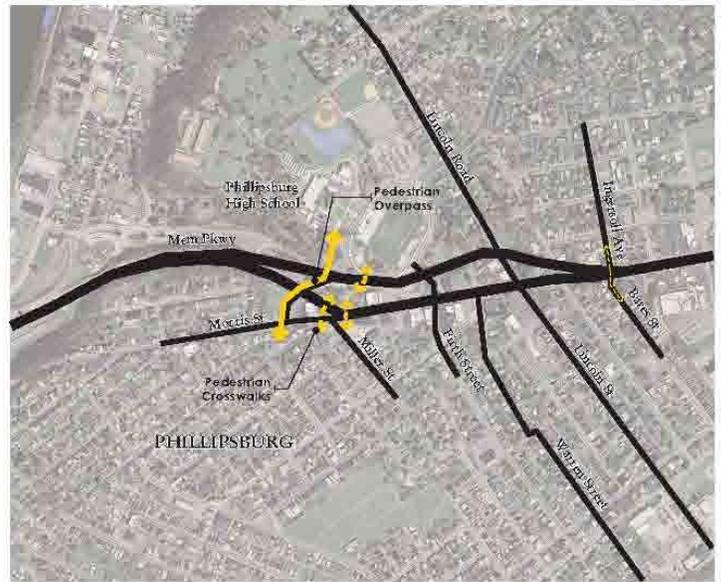


TABLE 1



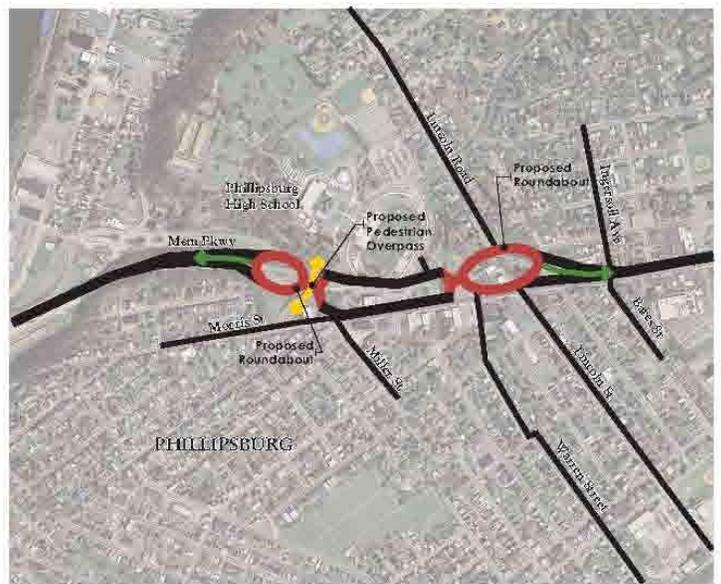
OPTION 1



OPTION 2



OPTION 3



OPTION 4

LEGEND	
	Exist. Major Road
	Exist. Connector Roads
	Proposed Road
	Upgraded Boulevard
	Proposed Ped. Connection

3.3 COMMUTER SURVEY RESULTS

A commuter survey was conducted in January 2009 to obtain information from US Route 22 travelers on their travel patterns and suggestions to improve the corridor. A variable message sign (VMS) was installed from January 5, 2009 to January 23, 2009 within the medium of US Route 22. Approximately 130 responses were received. Highlights of the Commuter Survey are presented below. The complete survey results are included within the Appendix.

1. An overwhelming amount of responses indicated that the lack of transit is not a concern and most drivers preferred the freedom of their own vehicles.
2. The intersection perceived to be the worst along the corridor County Route 519 (76%) followed by Roseberry Street (70%), Route 122 (67%) and Route 57 interchange (63%).
3. The highest percentage, 38%, of the respondents felt that US Route 22 is convenient for their trips; a similar percentage (38%) of respondents felt that US Route 22 was convenient “sometimes”, but they indicated that their commuting times must be adjusted due to traffic.
4. The highest percentage, 29%, drive 60 minutes or more to their place of employment one way.
5. 64% of respondents drive 21 miles or more one way to work.
6. 83% of respondents drive to work alone; 11% carpooled.
7. Almost half of the respondents are aware of the NJDOT sharing program.
8. The most selected improvement to improve traffic flow was the closure of driveways (36%) along US Route 22, followed by adding more turning lanes and providing service road frontage access to businesses.
9. For major routes to get to work, 41% of the respondents use US Route 22, and 32% use Route 78.

4. EXISTING ROADWAY CONDITIONS

4.1 DOCUMENT RESEARCH

In an effort to ensure a thorough and complete investigation of the corridor was completed, studies concerning the analysis of the corridor and adjacent roadway networks were consulted. The following is a list of the studies and plans consulted:

- 2015 Land Use Forecasting and Transportation Analysis Study: A Component of the Warren County Strategic Growth Plan
- Warren County Comprehensive Farmland Preservation Plan
- I-78 Corridor Transit Study
- Route 57 – Needs Assessment/Concept Development Study
- Traffic Engineering Evaluation – Roadway and Intersection Improvements Various Locations along Route US 22 and Route 122
- US Route 22 Corridor Study – including Route 57, Route 122 and County Route 519
- Municipal Circulation Plans
- NJTPA 2025 Regional Transportation Plan
- Municipal Master Plans and Ordinances

Each of the studies provided valuable insight into the existing operation of the corridor, the principal needs of the corridor and the traffic engineering plans and techniques deemed appropriate for addressing these needs. These studies provided a strong foundation for the US Route 22 Corridor Improvement Plan and the recommendations provided within.

4.2 EXISTING ROADWAY CONDITIONS

The corridor traffic study focused on the initial five miles of US Route 22 in Warren County, New Jersey. Within this five-mile expanse, US Route 22 has nine signalized intersections and it intersects four County Routes, three State Routes and one Interstate Highway. A field investigation was conducted between the Easton-Phillipsburg Toll Bridge at Mile Post (MP) 0.00 and I-78 at MP 4.69 to obtain an inventory of existing roadway conditions, posted traffic controls, adjacent land uses, lane configurations of the intersections in the Study Area, and existing vehicular and pedestrian traffic patterns. The following is a brief description of the study corridor:

US Route 22 is an east/west oriented Urban Principal Arterial and includes a variety of roadway conditions and lane configurations. The corridor fluctuates between protected, unprotected and curbed medians while the number of travel lanes varies between four and six lanes. The pavement, median and shoulder width vary greatly over the five-mile stretch of roadway; as does the posted speed limit. The roadway has a posted speed limit of 25 miles per hour (m.p.h.) when crossing the toll bridge and



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progressively increases to a speed limit of 50 m.p.h. at MP 2.30, which continues to the I-78 interchange.

US Route 22 is a limited access roadway from Allentown, Pennsylvania travelling east where it enters New Jersey via the Easton-Phillipsburg Toll Bridge, which crosses the Delaware River along the western New Jersey State border. US Route 22 extends eastward following the toll booths and continues as a limited-access road that ends at the on/off ramp with Morris Street and Hillcrest Boulevard. This area is a section of both steep grades down to Hillcrest Boulevard with a curved roadway alignment. At this point, the road converts to the at-grade Memorial Parkway, a major four to six-lane divided thoroughfare in Phillipsburg with some U-turns on a variable width median. The need for better signage in this area was strongly noted by study participants.

Left turns are generally prohibited from US Route 22. However, between the Post Office near Morris Street and east of Lincoln Street, there are three median crossings which provide for left turns. Study participants have noted vehicles stacking in the median and extending out into the left lane of eastbound traffic during peak hours and at school dismissal time. (Please note that this was not specifically studied by the Consultant.)

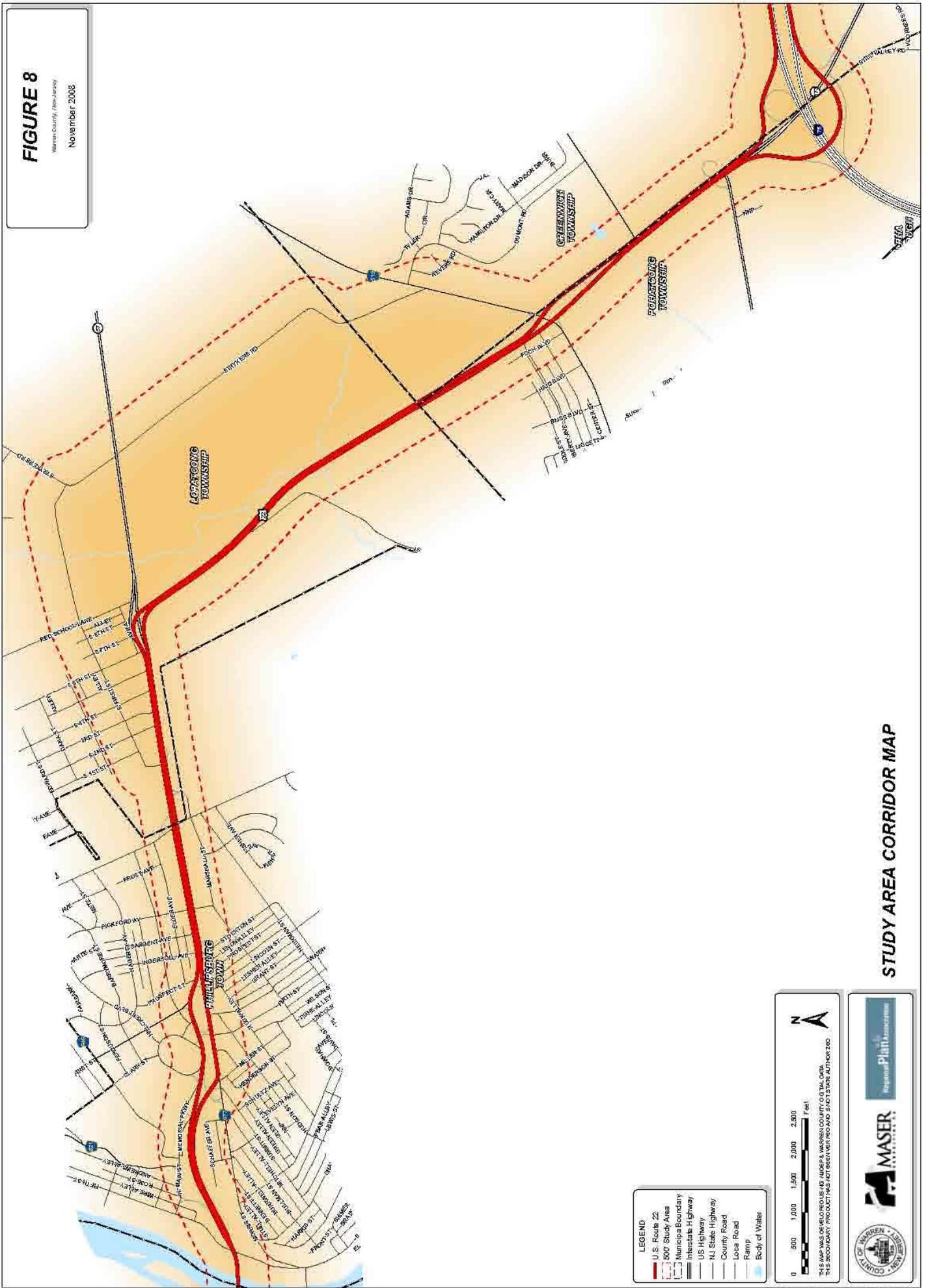
Jughandles were constructed in certain areas to permit these movements while still preserving mobility on US Route 22. East of Phillipsburg's commercial district, the median on US Route 22 converts to a Jersey barrier as it approaches a junction with State Route 57 (Route 57). After passing the Route 57 junction, US Route 22 turns in the southeastern direction and enters a largely undeveloped section of Lopatcong. Past this area, US Route 22 intersects the Phillipsburg Mall Entrance (Shopping Center Drive), County Route 519, County Route 638 (Greenwich Street) and State Route 122/New Brunswick Avenue (Route 122). **Figure 8 - Study Area Corridor Map** details the limits of the study corridor.

The intersections included the data collection process are illustrated on **Figure 9 – US Route 22 Corridor Intersections**) and detailed on the Intersection Worksheets (**Figures 10 through 21**) These intersections were selected based on the existing traffic control and proximity to local areas of interest. The 13 intersections detailed in the following section were the focus of the US Route 22 corridor data collection. A detailed description of the existing signage, striping, pavement markings and signal operations are included on the intersection worksheets, as well as aerial and on-site photographs of the intersection.



FIGURE 8

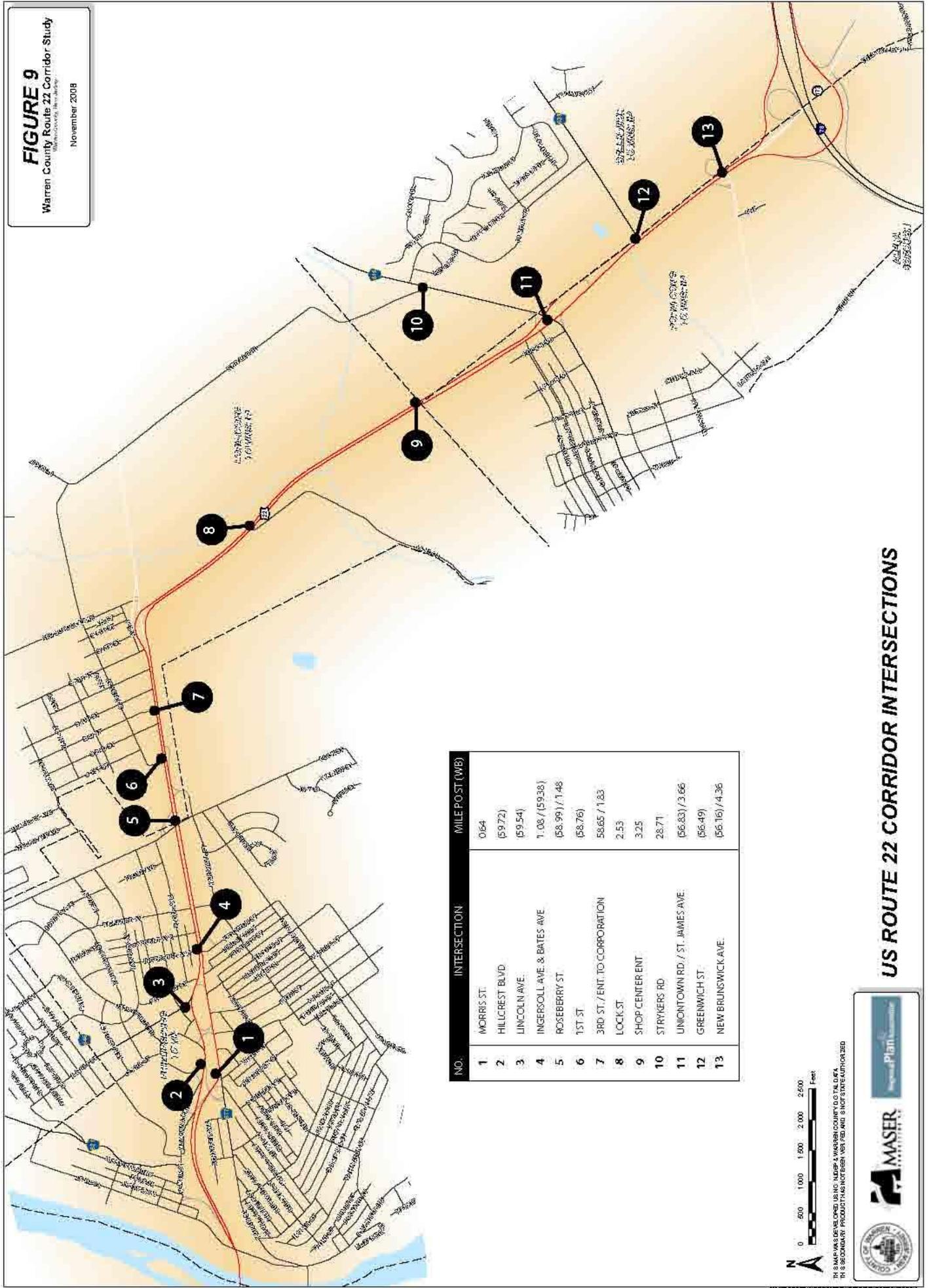
Wayne County, New Jersey
November 2008



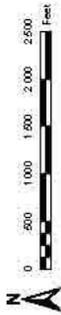
STUDY AREA CORRIDOR MAP

The block contains the logo for Maser Associates, a Regional Planning firm, and the official seal of Wayne County, New Jersey.

FIGURE 9
Warren County Route 22 Corridor Study
November 2008



NO.	INTERSECTION	MILE POST (WB)
1	MORRIS ST.	0.64
2	HILLCREST BLVD.	(59.72)
3	LINCOLN AVE.	(59.54)
4	INGERSOLL AVE. & BATES AVE.	1.08 / (59.38)
5	ROSEBERRY ST.	(58.99) / 1.48
6	1ST ST.	(58.76)
7	3RD ST. / ENT. TO CORPORATION	58.65 / 1.83
8	LOCK ST.	2.53
9	SHOP CENTER ENT.	3.25
10	STRYKERS RD.	28.71
11	UNIONTOWN RD. / ST. JAMES AVE.	(56.83) / 3.66
12	GREENWICH ST.	(56.49)
13	NEW BRUNSWICK AVE.	(56.16) / 4.36



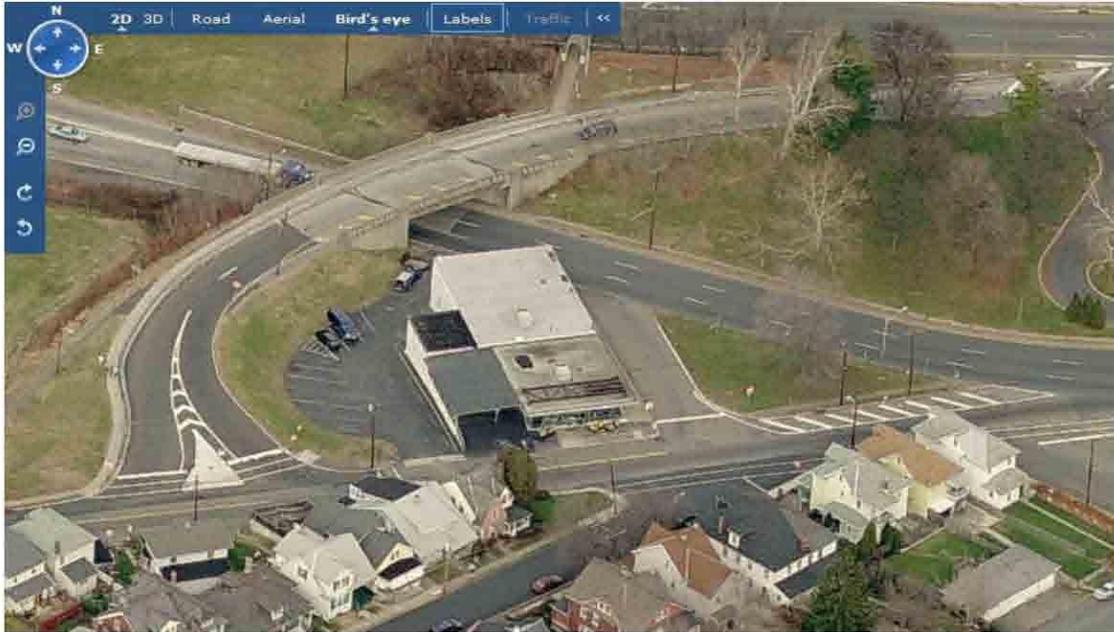
THIS MAP WAS DEVELOPED USING NAD83 & WARREN COUNTY D.G. DATA. THIS SECONDARY PRODUCT HAS NOT BEEN VERIFIED AND IS NOT STATE AUTHORIZED.

MASER ENGINEERING AND PLANNING
WARREN COUNTY, OHIO

US ROUTE 22 CORRIDOR INTERSECTIONS

	US Route 22 Corridor Study - Warren County	Location	
	Intersection Worksheet	Phillipsburg Town Morris Street	

Intersection Aerial Photograph ¹



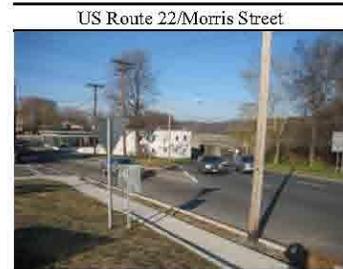
1. Intersection aerial taken from <http://maps.live.com/>

Intersection Information

Traffic Control: Stop-Controlled T-Intersection
Mile Post: 0.64
US Route 22 Access: Eastbound

Intersection Description
Morris Street is a local roadway providing access to US Route 22 Eastbound. The access ramp to Morris Street from US Route 22 Westbound allows vehicles to travel in either direction. The small access from US Route 22 Eastbound aligns with Summit Avenue and is a one-way stop controlled road. The merge with US Route 22 is controlled by a yield sign.

Field Investigation Photographs

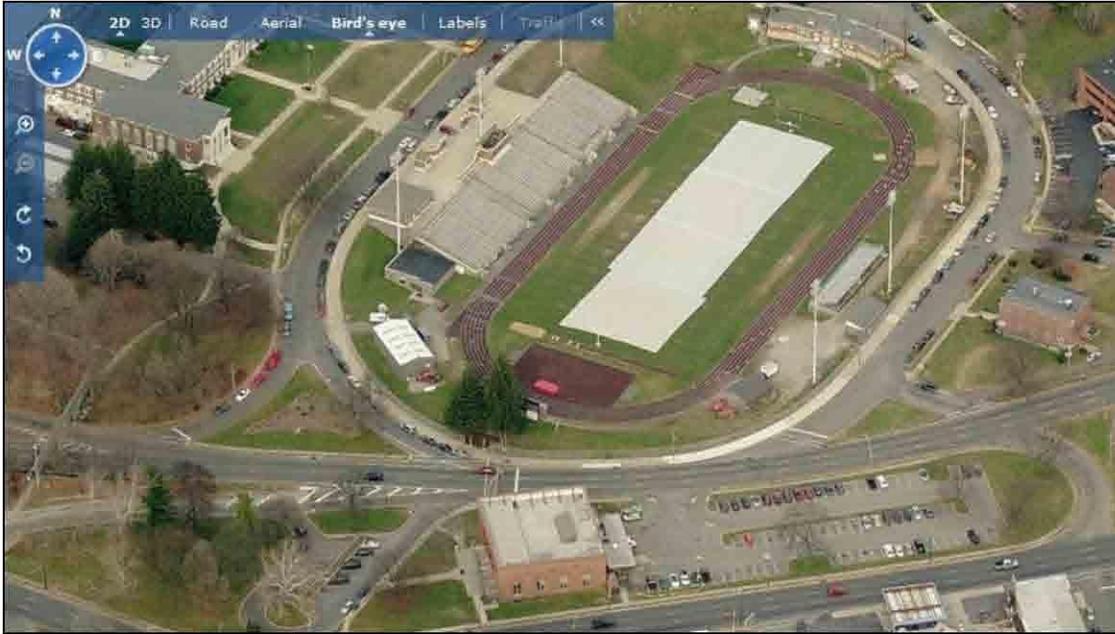


Field Investigation General Notes

1. The existing "Wrong Way" sign on Morris Street Ramp from US Route 22 EB should be relocated inside the guiderail.
2. The "No Pedestrian Crossing" sign should be replaced with the MUTCD Pedestrian Crossing Sign R9-3b (L) to cross through overpass.
3. The existing school crossing is missing MUTCD Supplemental Sign W16-7p (Diagonal Arrow) and a striped crosswalk.
4. Existing one-way signs at Morris Street/Summit Street are not mounted back-to-back.
5. Asphalt recently overlaid; widening and new curbing on northeast corner of Morris Street/Summit Street intersection.
6. At the intersection of Miller Street and US. Route 22, the existing one-way sign should be updated.

	US Route 22 Corridor Study - Warren County	Location	
	Intersection Worksheet	Phillipsburg Town Hillcrest Boulevard	

Intersection Aerial Photograph¹



1. Intersection aerial taken from <http://maps.live.com/>

Intersection Information

Traffic Control: Signalized/Stop-Controlled
 T- Intersection

Mile Post: 0.76 (59.72 - Westbound)

US Route 22 Access: Westbound

Intersection Description
Hillcrest Boulevard is a local roadway that circles the Phillipsburg High School Stadium. The roadway is stop-controlled in two locations accessing US Route 22 Westbound and the traffic is divided by a triangular island at both locations. The traffic signal is located prior to the Morris Street access ramp and is activated by pedestrian push buttons. Two U-Turn ramps are available prior to the traffic signal.

Field Investigation Photographs



Field Investigation General Notes

1. There are depressed curbs and textured handicap accessible ramps crossing the U-Turn Ramps at Hillcrest Avenue; however there are no pavement markings, stop signs or painted crosswalks present.
2. The textured handicap accessible ramps are not aligned properly.

	US Route 22 Corridor Study - Warren County	Location	
	Intersection Worksheet	Phillipsburg Town Lincoln Avenue	

Intersection Aerial Photograph ¹



1. Intersection aerial taken from <http://maps.live.com/>

Intersection Information

Traffic Control: Stop-Controlled T-Intersection
Mile Post: 0.96 (59.54 - Westbound)
US Route 22 Access: Westbound

Intersection Description
Lincoln Avenue is a local roadway which provides access to Route 22 Westbound. The roadway is located just north of the Hillcrest Avenue intersection and is divided by a triangular island. A U-Turn Ramp is located prior to the intersection from US Route 22 Eastbound.

Field Investigation Photographs

Pedestrian Crosswalk: Existing Condition



Lincoln Ave: Southbound Approach



US Route 22/Lincoln Avenue

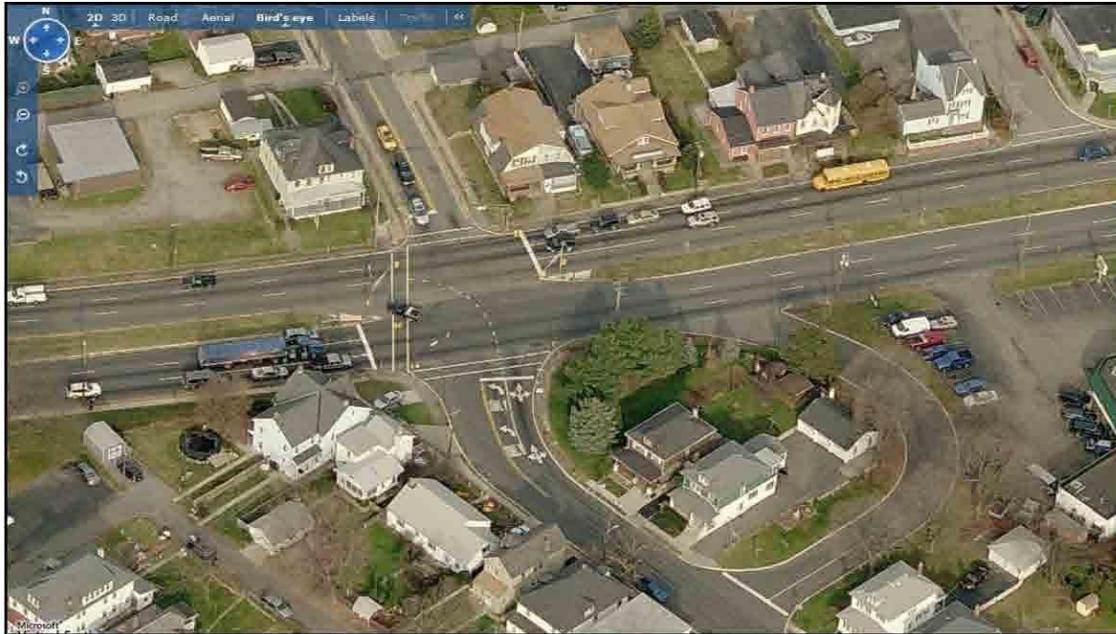


Field Investigation General Notes

1. Existing sidewalk on the southerly side of the roadway is in adequate condition.

	US Route 22 Corridor Study - Warren County	Location	
	Intersection Worksheet	Phillipsburg Town Ingersoll Avenue/Bates Avenue	

Intersection Aerial Photograph ¹



1. Intersection aerial taken from <http://maps.live.com/>

Intersection Information

Traffic Control: Actuated Signalized Intersection
Mile Post: 1.08 (59.38 - Westbound)
US Route 22 Access: Eastbound/Westbound

Intersection Description
The signalized four-legged intersection operates with two (2) signal phases. Left-turn movements are not permitted from US Route 22 and a U-Turn Ramp is provided in the Eastbound direction. Bates Avenue represents the northbound approach, Ingersoll Avenue represents the southbound approach.

Field Investigation Photographs

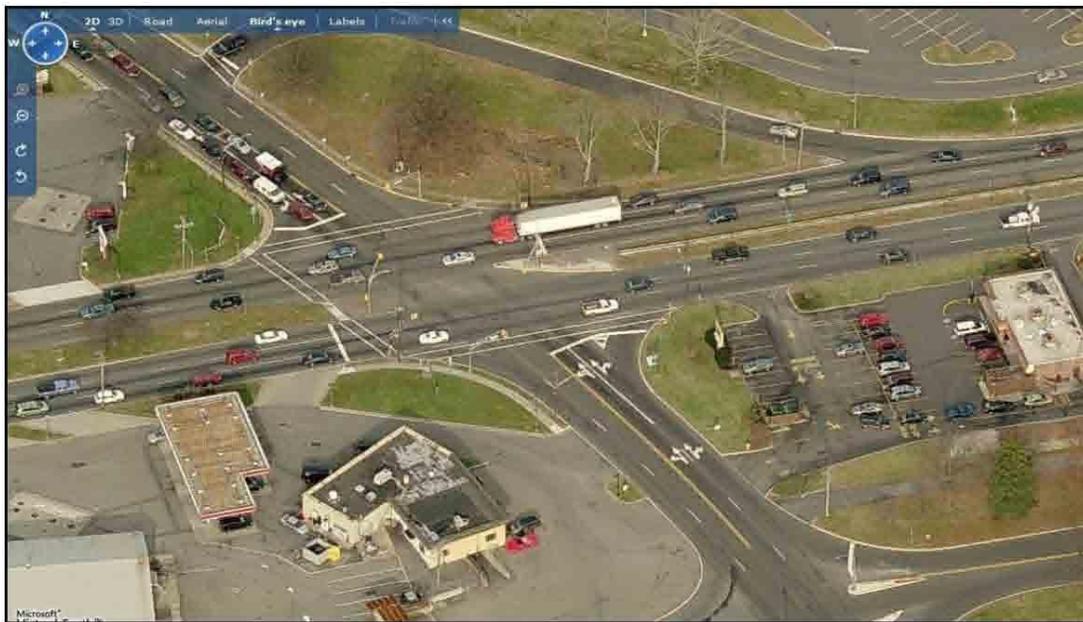


Field Investigation General Notes

1. Traffic signal preemption and video detection are installed on all four (4) approaches.
2. The existing pedestrian equipment and signage is antiquated.
3. The sidewalk installed on the southeast corner of the intersection is damaged; a footpath is present traveling eastbound on US Route 22.
4. The sidewalk traveling eastbound from Lincoln Avenue to Bates Avenue is in disrepair
5. The asphalt sidewalk on the northwest corner of the intersection is narrow and not protected adequately from US Route 22 traffic.
6. The pavement, curbing and pavement markings are in good condition.
7. There is evidence of pedestrian crossing present on the grass median prior to the intersection opposite Prospect Street.
8. There are three crosswalk present; no pedestrian access provided from the northeast corner to the southeast corner.

	US Route 22 Corridor Study - Warren County	Location	
	Intersection Worksheet	Phillipsburg/Lopatcong Township Roseberry Street	

Intersection Aerial Photograph¹



1. Intersection aerial taken from <http://maps.live.com/>

Intersection Information

Traffic Control: Actuated Signalized Intersection

Mile Post: 1.48 (58.99 - Westbound)

US Route 22 Access: Eastbound/Westbound

Intersection Description

The traffic signal is fully actuated and signalized with left-turns prohibited from US Route 22. U/Left-Turn Ramps are provided east of the traffic signal in both directions on US Route 22. The minor street approaches both contain two travel lanes, with shared left and right-turn lanes. The northbound approach also contains a channelized right-turn lane.

Field Investigation Photographs

Eastbound Pedestrian Push Buttons



Intersection: Southeast Corner



US Route 22: Eastbound Approach

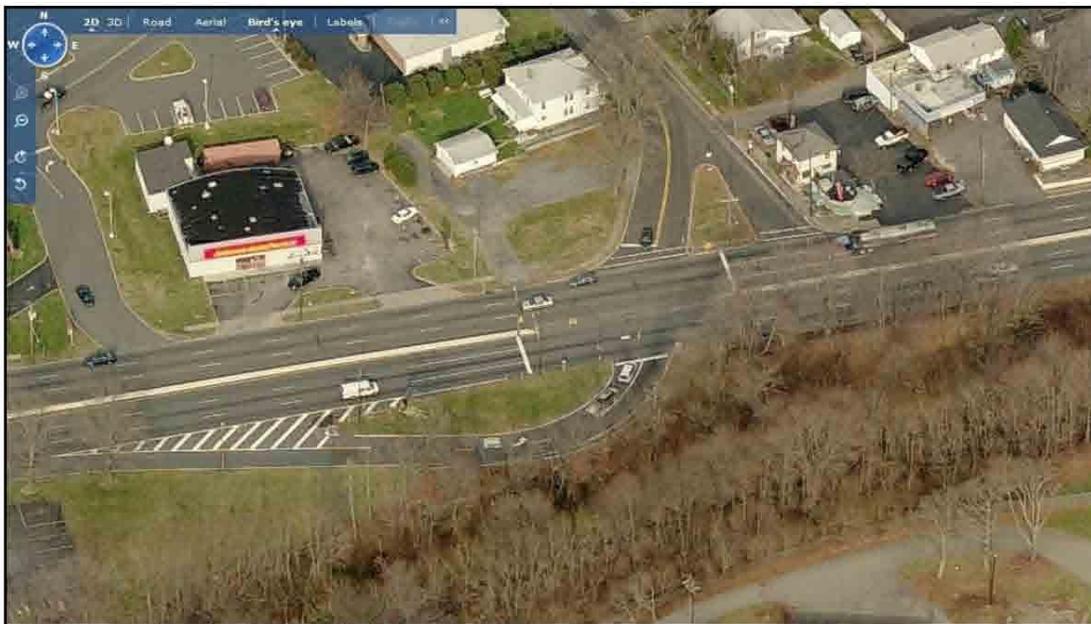


Field Investigation General Notes

1. **US Route 22 needs access control.** There are seven (7) access points on US Route 22 Eastbound from Aharts Market to the Exxon Mobil Gas Station. The Burger King located on the northwest corner contains four (4) access points.
2. The traffic signal is equipped with preemption and video detection.
3. The pedestrian push buttons are in good condition and contain brail text for handicapped individuals.
4. There is no sidewalk present for the pedestrian facilities installed at the southeast corner of the intersection and the textured handicap accessible ramp is not aligned with the existing crosswalk.
5. The sidewalk on the northeast corner is in adequate condition and should be cleaned.
6. The existing northbound right-turn movement is poorly channelized via striping; it should be channelized with a curbed island.
7. There are three (3) crosswalks present; no pedestrian access provided from the northeast corner to the southeast corner.

	US Route 22 Corridor Study - Warren County	Location	
	Intersection Worksheet	Lopatcong Township 1st Street	

Intersection Aerial Photograph¹



1. Intersection aerial taken from <http://maps.live.com/>

Intersection Information

Traffic Control: Semi-Actuated
Signalized Intersection

Mile Post: 1.71 (58.76 - Westbound)

US Route 22 Access: Eastbound/Westbound

Intersection Description

The traffic signal is semi-actuated on the minor approach with left-turns prohibited from US Route 22. The US Route 22 median narrows at this intersection and is divided by a Jersey Barrier. The eastbound approach of the intersection is provided with a U-Turn/Left-Turn Ramp.

Field Investigation Photographs

Pedestrian Equipment for Route 22



Existing Sidewalk Condition



US Route 22/1st Street

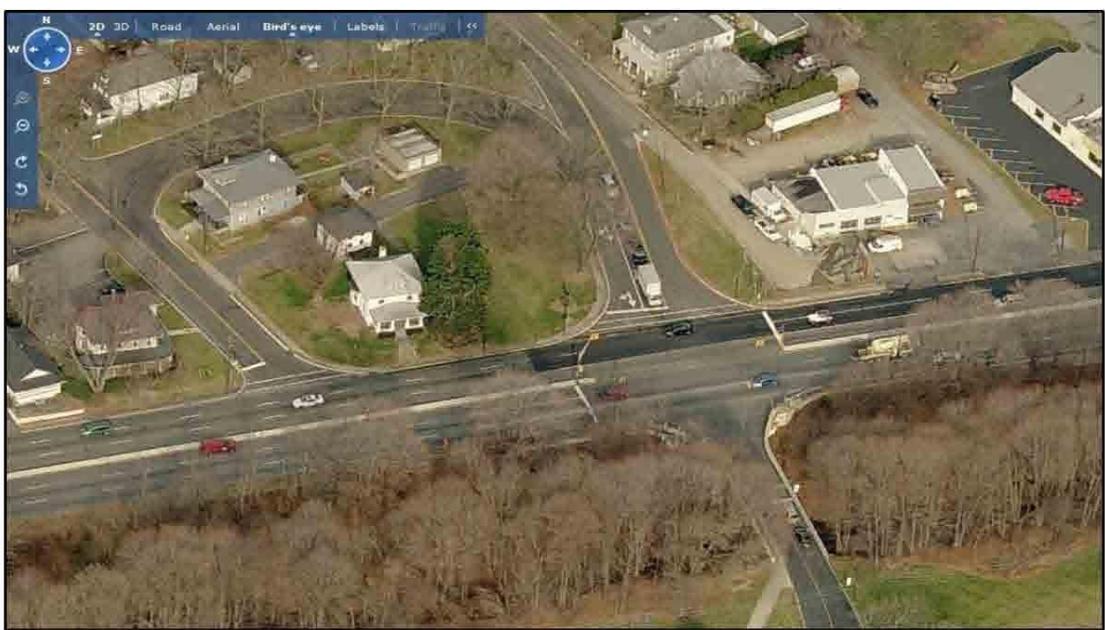


Field Investigation General Notes

1. Video detection present on 1st Street approaches; no vehicle preemption at this traffic signal.
2. There is no sidewalk present at the southeast corner; a footpath is present traveling eastbound.
3. The intersection contains only one crosswalk, located on the southbound approach of 1st Street.
4. The intersection contains pedestrian push buttons on the SW and NE corners; however there are no crosswalks present.
5. The NE corner sidewalk is in disrepair.
6. The westbound approach of the intersection does not include a "No Right-Turn" Sign.
7. The existing signal heads in the median are positioned too low.

	US Route 22 Corridor Study - Warren County	Location	
	Intersection Worksheet	Lopatcong Township 3rd Street	

Intersection Aerial Photograph¹



1. Intersection aerial taken from <http://maps.live.com/>

Intersection Information

Traffic Control: Semi-Actuated
Signalized Intersection

Mile Post: 1.83 (58.65 - Westbound)

US Route 22 Access: Eastbound/Westbound

Intersection Description
The traffic signal is semi-actuated on the minor street approach with left-turns prohibited from US Route 22. The minor street southbound approach of the intersection is Third Street; the northbound approach is represented by the Phillipsburg Commerce Park site access. Westbound travel is provided with a U-Turn Ramp accessible at Second Street.

Field Investigation Photographs

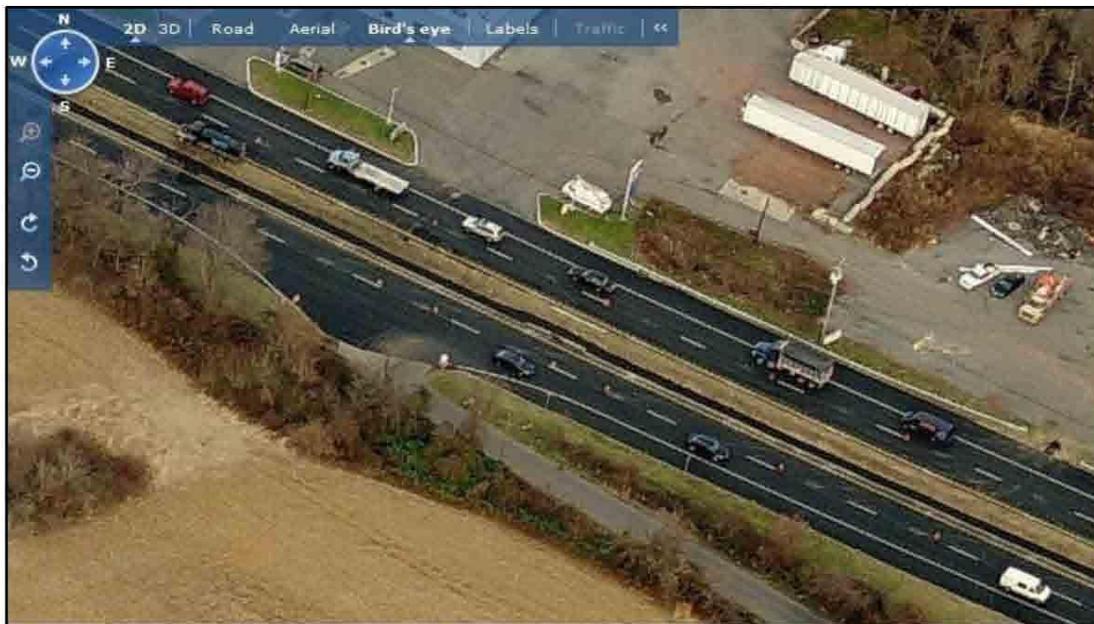


Field Investigation General Notes

1. Video detection is present for the 3rd Street approach of the intersection; there is no vehicle preemption.
2. Pedestrian push buttons are present for crossing Route 22, however no crosswalks are present.
3. The pedestrian push buttons at the intersection are in need of replacement.
4. The textured handicap accessible ramp is damaged at the northeast corner of the intersection.
5. The northwest and southwest approaches of the intersection do not include sidewalk.
6. The signal head on the northeast corner of the intersection is damaged.

	US Route 22 Corridor Study - Warren County	Location	
	Intersection Worksheet	Lopatcong Township Lock Street	

Intersection Aerial Photograph ¹



1. Intersection aerial taken from <http://maps.live.com/>

Intersection Information

Traffic Control: Stop-Controlled T-Intersection

Mile Post: 2.53

US Route 22 Access: Eastbound

Intersection Description

The unsignalized intersection is stop-controlled on the minor street approach and intersects US Route 22 EB at a very acute angle. Lock Street traffic may only perform right-turn movements.

Field Investigation Photographs

Lock Street: Northbound Approach



US Route 22 Approach



US Route 22/Lock Street

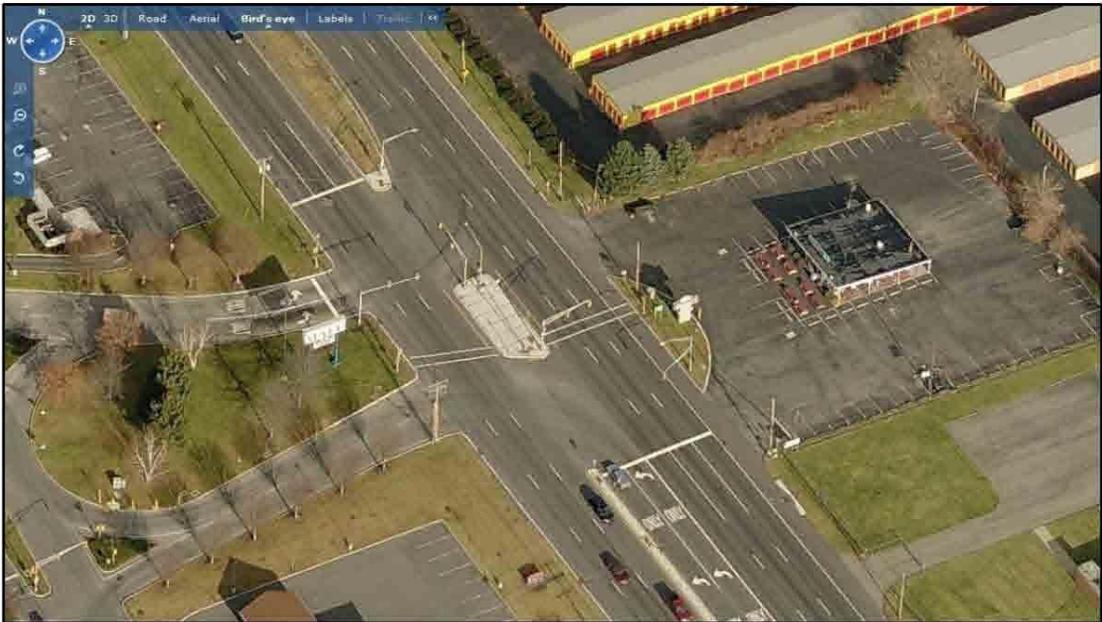


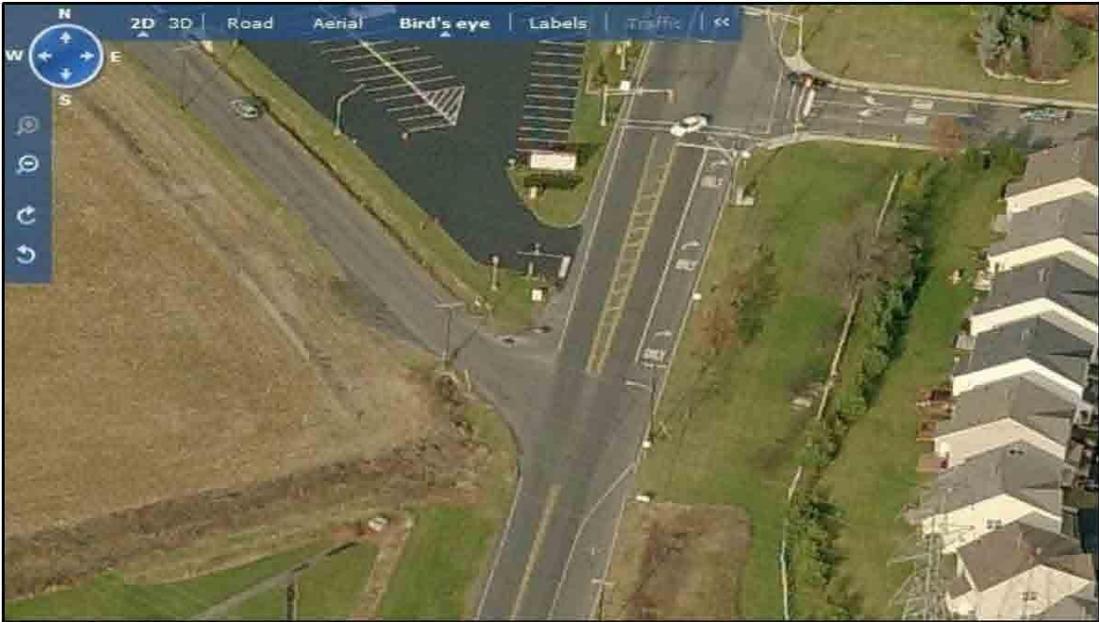
Field Investigation General Notes

1. The existing "Do Not Enter" Sign is inappropriate and may confuse motorists. This sign should be replaced with MUTCD Sign R3-2 Sign ("No Left Turn") or MUTCD Sign R6-1 ("One Way") placed on the median.
2. The intersection does not include a street sign indicating the name of the intersecting roadway.
3. The intersection does not include any advanced signage to alert drivers of traffic entering the roadway.
4. There is no existing striping to position vehicles entering/exiting US Route 22.

Figure 18 – US Route 22 & Shopping Center Drive Intersection Worksheet

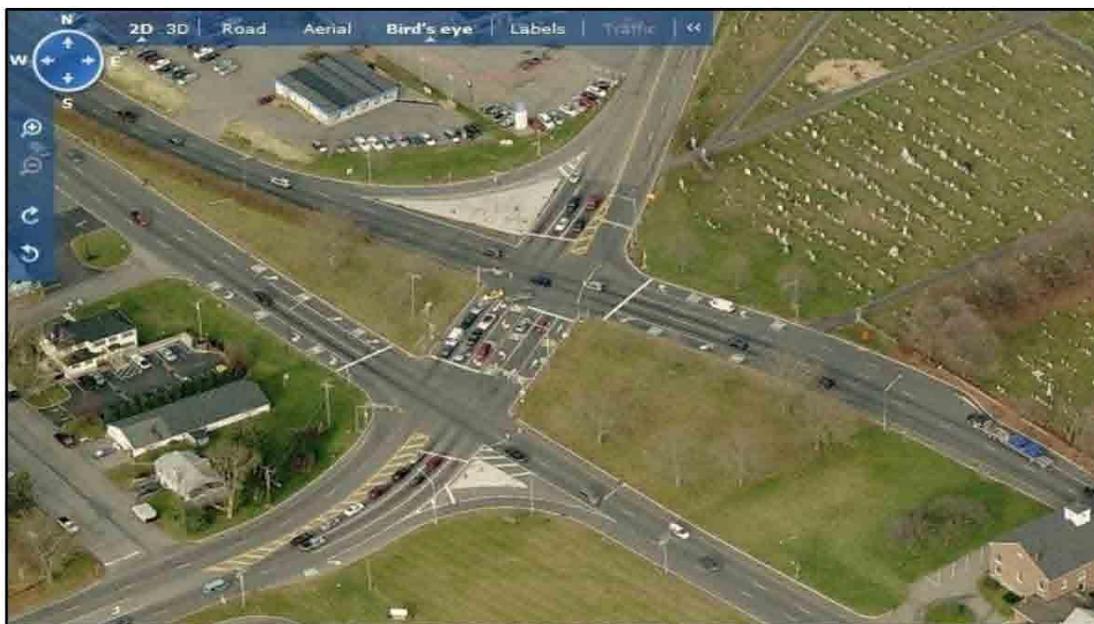
FIGURE 18

	US Route 22 Corridor Study - Warren County	Location	
	Intersection Worksheet	Lopatcong/Pohatcong Township Shopping Center Drive	
Intersection Aerial Photograph ¹			
			
1. Intersection aerial taken from http://maps.live.com/			
Intersection Information			
<p>Traffic Control: Signalized Intersection</p> <p>Mile Post: 3.10</p> <p>US Route 22 Access: Westbound</p>	<p style="text-align: center;">Intersection Description</p> <p>US Route 22 is an eight-lane cross section at the signalized intersection of Shopping Center Drive. Both approaches contain three (3) through movements, however vehicles traveling westbound may perform left-turn movements into the site. Additionally, vehicles exiting the site may only perform left-turn movements on US Route 22 Westbound. Eastbound site access ramps are provided prior to and after the intersection.</p>		
Field Investigation Photographs			
Southwest Corner: Pedestrian Crosswalk 	US Route 22 Cross-Section 	US Route 22: Eastbound Approach 	
Field Investigation General Notes			
<ol style="list-style-type: none"> 1. There are no video detection or vehicle preemption devices present. The signal phasing may be pre-timed. 2. The shopping center approach contains eight inch (8") signal heads and should be replaced with twelve inch (12") signal heads. 3. There are pedestrian push buttons and signal heads present from crossing US Route 22 on both sides of the Shopping Center Exit Access. 4. The pedestrian crosswalks do not contain depressed curbs or textured handicap accessible ramps. 5. There are no sidewalks present in the vicinity of the pedestrian facilities. 			

	US Route 22 Corridor Study - Warren County	Location			
	Intersection Worksheet	Greenwich Township Strykers Road			
Intersection Aerial Photograph¹					
					
1. Intersection aerial taken from http://maps.live.com/					
Intersection Information					
<p>Traffic Control: Unsignalized Stop-Controlled T- Intersection</p> <p>Mile Post: 28.71 (County Route 519)</p> <p>US Route 22 Access: Not Available</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Intersection Description</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"> The intersection of County Route 519 and Strykers Road is an unsignalized stop-controlled intersection. The eastbound approach of Strykers Road is an unstriped roadway and prohibits left-turn movements. Additionally, the roadway has a five (5) ton weight limit and does not permit U-Turns. County Route 519 is uncontrolled at this intersection. </td> </tr> </tbody> </table>			Intersection Description	The intersection of County Route 519 and Strykers Road is an unsignalized stop-controlled intersection. The eastbound approach of Strykers Road is an unstriped roadway and prohibits left-turn movements. Additionally, the roadway has a five (5) ton weight limit and does not permit U-Turns. County Route 519 is uncontrolled at this intersection.
Intersection Description					
The intersection of County Route 519 and Strykers Road is an unsignalized stop-controlled intersection. The eastbound approach of Strykers Road is an unstriped roadway and prohibits left-turn movements. Additionally, the roadway has a five (5) ton weight limit and does not permit U-Turns. County Route 519 is uncontrolled at this intersection.					
Field Investigation Photographs					
Strykers Road: Eastbound Approach 	Strykers Road: NB Edge of Pavement 	Existing Conditions: Northwest Corner 			
Field Investigation General Notes					
<ol style="list-style-type: none"> 1. The eastbound approach of the intersection does not have pavement markings to indicate the traffic control present at the intersection. 2. The existing 'Stop' Sign and 'No Left Turn' Sign are posted at too low a height. 3. The southbound right-turn movements onto Strykers Road have created ruts in the grass. 4. There is a drainage swale present on the northbound side of Strykers Road. Guiderail may be required. 5. The pavement is in poor condition, particularly along the edge of pavement and the existing intersection. 6. Due to the proximity of the intersection to Dumont Lane, the subsequent signalized intersection, realignment and signal coordination between the two intersections is a possibility 					

	US Route 22 Corridor Study - Warren County	Location	
	Intersection Worksheet	Pohatcong Township Uniontown Road/St. James Avenue	

Intersection Aerial Photograph¹



1. Intersection aerial taken from <http://maps.live.com/>

Intersection Information

Traffic Control: Semi-Actuated
Signalized Intersection

Mile Post: 3.66 (56.85 - Westbound)

US Route 22 Access: Eastbound/Westbound

Intersection Description

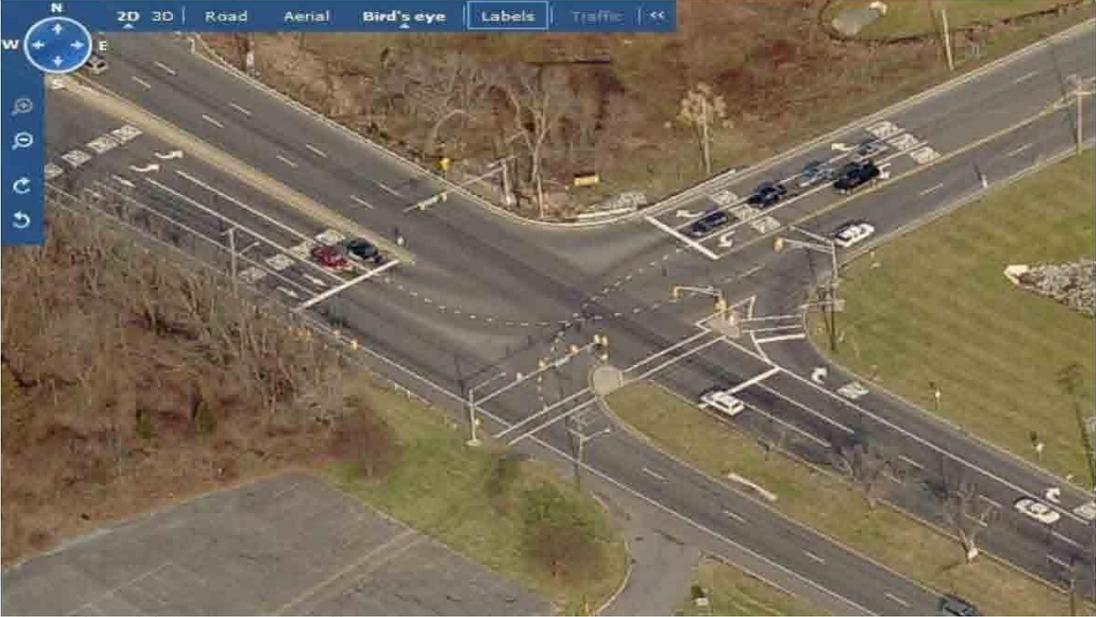
The US Route 22 approaches each contain four (4) approach lanes, with a dedicated left-turn and right-turn lane. Both minor street approaches are aligned with a left-turn only lane, two (2) through movement lanes and a channelized right turn lane. Due to the geometrical alignment of the intersection, all of the turning movements onto US Route 22 occur between the eastbound and westbound approaches of US Route 22.

Field Investigation Photographs



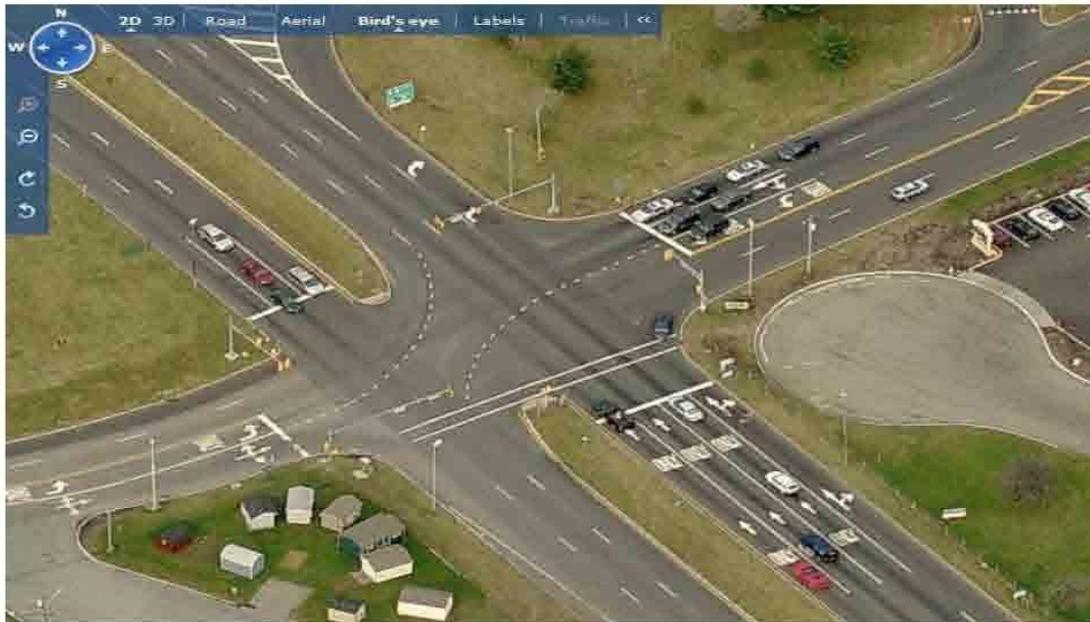
Field Investigation General Notes

1. The signalized intersection is not equipped with video detection or vehicle preemption.
2. The traffic signal heads are equipped with LED lights.
3. Three (3) access points exist on the eastbound approach of the intersection that could be consolidated.
4. Each corner of the intersection contains pedestrian push buttons, however, there are no pedestrian crosswalks present.
5. Both channelized right-turn movements do not include yield pavement markings.
6. There are no sidewalks, depressed curbs or textured handicap accessible ramps present at any of the existing pedestrian facilities.

	US Route 22 Corridor Study - Warren County	Location			
	Intersection Worksheet	Pohatcong/Greenwich Township Greenwich Street			
Intersection Aerial Photograph¹					
					
1. Intersection aerial taken from http://maps.live.com/					
Intersection Information					
<p>Traffic Control: Semi-Actuated Signalized Intersection</p> <p>Mile Post: 4.02 (56.49 - Westbound)</p> <p>US Route 22 Access: Eastbound/Westbound</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Intersection Description</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"> The signalized intersection contains four (4) approach lanes on US Route 22, with two (2) dedicated left-turn lanes traveling eastbound and one channelized right-turn lane in the westbound direction. The minor street approach also provides two left-turn lanes and a right turn lane. The left-turn and right-turn movements are identified with pavement markings. </td> </tr> </tbody> </table>			Intersection Description	The signalized intersection contains four (4) approach lanes on US Route 22, with two (2) dedicated left-turn lanes traveling eastbound and one channelized right-turn lane in the westbound direction. The minor street approach also provides two left-turn lanes and a right turn lane. The left-turn and right-turn movements are identified with pavement markings.
Intersection Description					
The signalized intersection contains four (4) approach lanes on US Route 22, with two (2) dedicated left-turn lanes traveling eastbound and one channelized right-turn lane in the westbound direction. The minor street approach also provides two left-turn lanes and a right turn lane. The left-turn and right-turn movements are identified with pavement markings.					
Field Investigation Photographs					
US Route 22/Greenwich Street 	US Route 22 Westbound Approach 	US Route 22 Eastbound Approach 			
Field Investigation General Notes					
<ol style="list-style-type: none"> 1. Pedestrian push buttons and crosswalks are present but there are no pedestrian signal heads. 2. Traffic signal heads contain LED lighting. 3. The eastbound approach contains a damaged signal head LED light. 4. There are no sidewalks present at the intersection pedestrian facilities. 5. The pedestrian facilities within the median on the westbound side of the intersection are damaged and need replacement. 					

	US Route 22 Corridor Study - Warren County	Location Pohatcong/Greenwich Township	
	Intersection Worksheet	State Route 122	

Intersection Aerial Photograph¹



1. Intersection aerial taken from <http://maps.live.com/>

Intersection Information

Traffic Control: Semi-Actuated
Signalized Intersection

Mile Post: 4.36 (56.16 - Westbound)

US Route 22 Access: Eastbound/Westbound

Intersection Description

The signalized intersection contains three (3) through movement lanes on US Route 22, with Left/U-Turn Ramps located west of the intersection. The westbound approach contains a fourth lane for right-turn movements and a through movement entering the jughandle. The northbound approach of SR 122 consists of an exclusive left turn lane and a shared left/through/right lane. The southbound approach consists of an exclusive left, a through and a shared through/right lane.

Field Investigation Photographs

US Route 22 Westbound Jughandle



US Route 22 Pedestrian Crossing



US Route 22/New Brunswick Avenue



Field Investigation General Notes

1. Westbound reverse jughandle is stop-controlled but also displays yield pavement markings.
2. There is no video detection or vehicle preemption installed. Minor street has loops.
3. One crosswalk is installed across US Route 22 but none on SR 122.
4. Pedestrian push buttons and pedestrian signal heads are present.
5. There is no sidewalk installed at the intersection.
6. The signal heads at the intersection are installed with LED lights.

4.3 DATA COLLECTION

Due to the length of the corridor and the number of intersections to be observed, Maser contracted with TechniQuest Corporation, a local data collection specialist. The data collection process included the strategic placement of automatic traffic recorders (ATRs) and performance of manual turning movement counts (MTCs) during peak hour time periods. Data was also acquired from the NJDOT Interactive Database from previous reports by others.

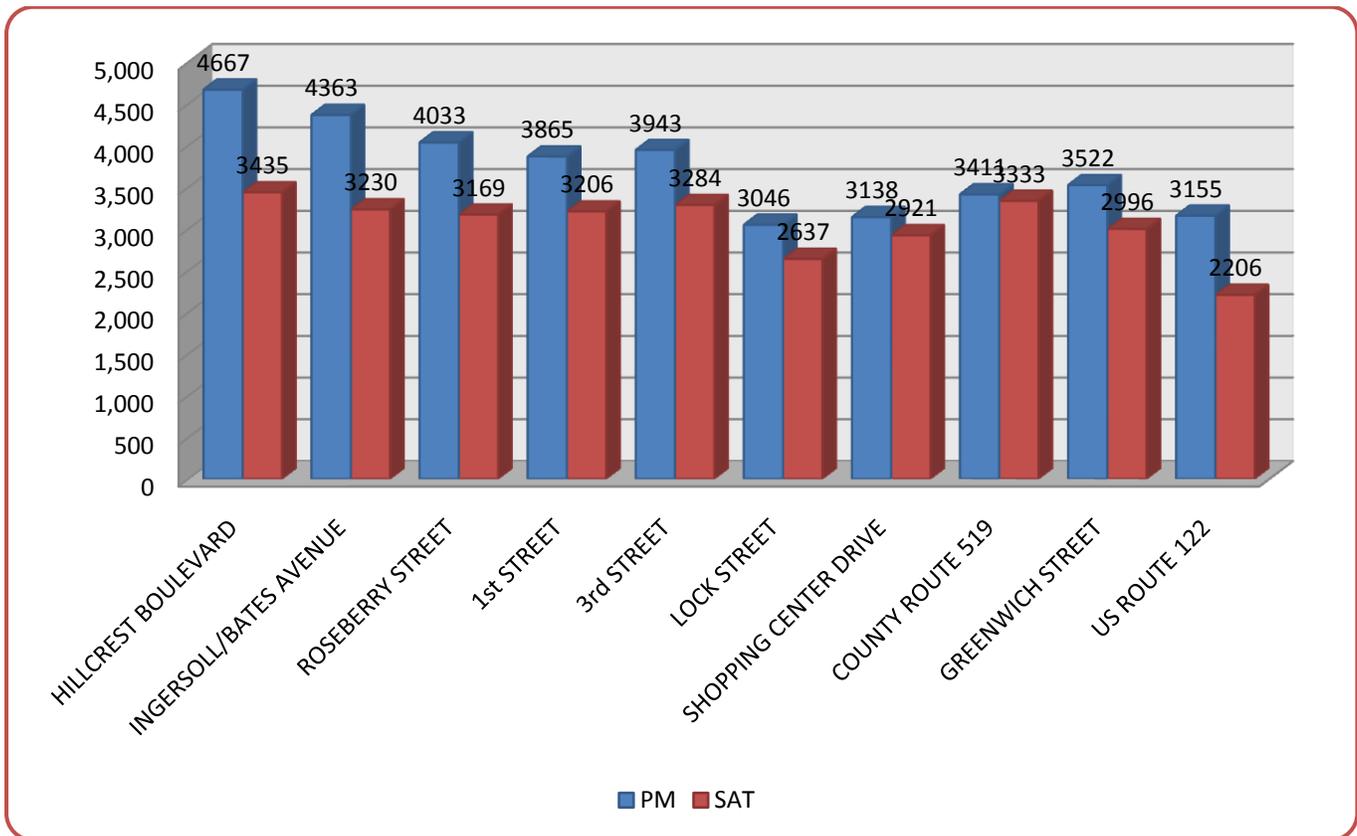
Critical locations were identified in the corridor and MTCs were performed at those intersections. This included the signalized intersections and the unsignalized segment of roadway within the first mile of the corridor, which also includes several access ramps. Before performing the data collection, critical locations were cross-referenced with the NJDOT Interactive Database and previous traffic reports. Overall, data was retrieved at three intersections from previous reports and collected by TechniQuest at 13 locations (including ten intersections and three access ramps), with four locations provided by the NJDOT. (See **Figure 23 – Manual Turning Movement Count Locations**).

The MTCs of intersections were conducted to coincide with the observed peak hours of operation. Based on the ATR data acquired from the NJDOT, the Weekday Evening (PM) Peak Hour was considered critical. With three major shopping centers in the five-mile corridor, the Mid-day Saturday (SAT) Peak Hour was also considered vital.

The MTCs were conducted in the evening between the hours of 4:00 PM and 6:00 PM and on Saturdays between the hours of 11:00 AM and 1:00 PM. The traffic volumes were collected for the entire network, combined with the ATR data and the previously acquired data to create the network volumes shown in the chart below. **Chart 3** details the total through volume on the US Route 22 corridor at each intersection traveling eastbound. As shown, the traffic volume lightens between Hillcrest Boulevard and Lock Street, which is just east of the Route 57 interchange. At the following intersection, Shopping Center Drive, the traffic volumes being to increase again.

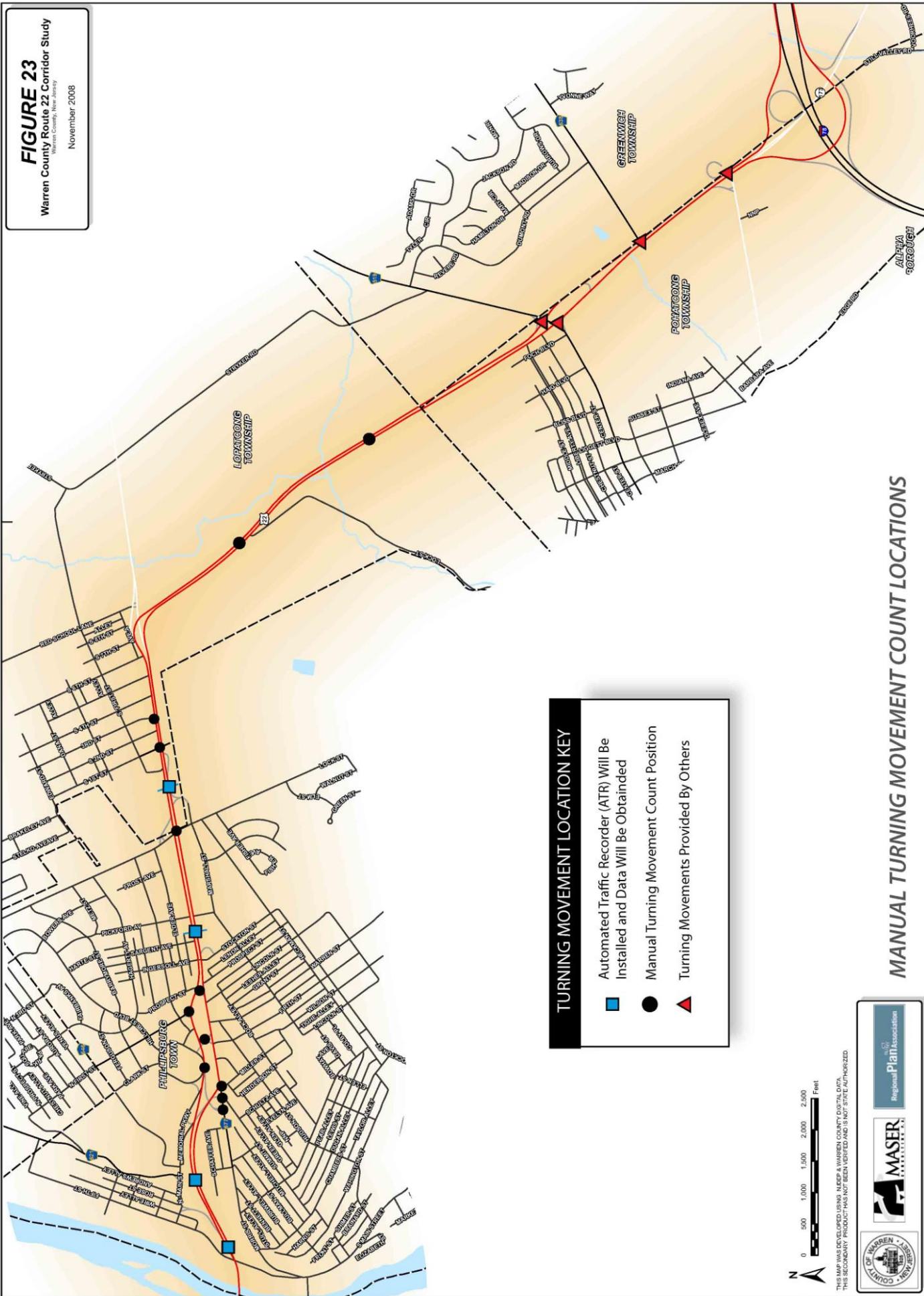


Chart 3 – US Route 22 Corridor Traffic Volume Summary



Figures 24 and 25 detail the total traffic volumes and movements observed at each intersection during PM and SAT Peak Hours.

FIGURE 23
Warren County Route 22 Corridor Study
November 2008



TURNING MOVEMENT LOCATION KEY

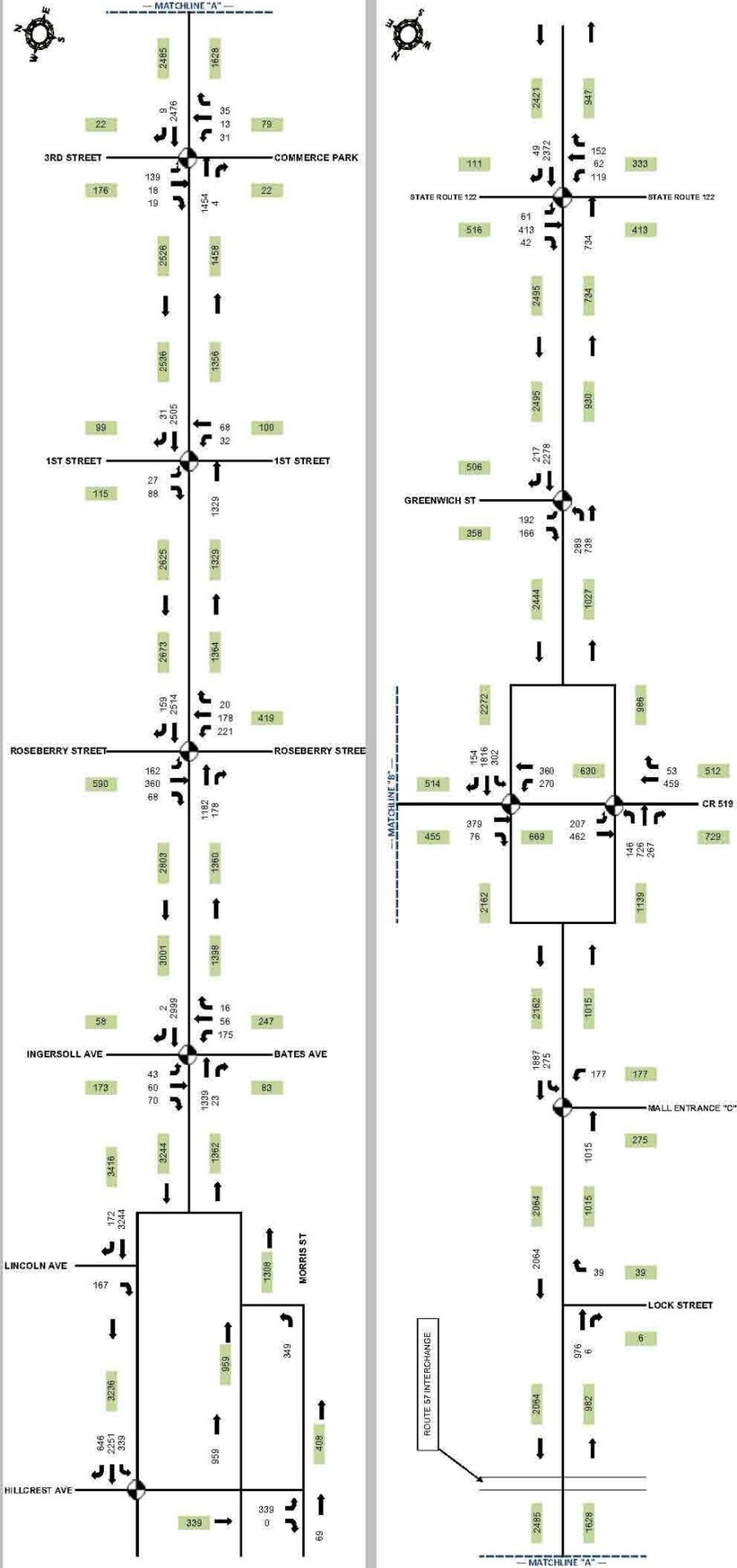
- Automated Traffic Recorder (ATR) Will Be Installed and Data Will Be Obtained
- Manual Turning Movement Count Position
- ▲ Turning Movements Provided By Others



THIS MAP WAS DEVELOPED USING MAPXpress AND WARREN COUNTY DIGITAL DATA. THIS SECONDARY PRODUCT HAS NOT BEEN VERIFIED AND IS NOT STATE AUTHORIZED.

MANUAL TURNING MOVEMENT COUNT LOCATIONS

FIGURE 24
 2008 EXISTING CONDITIONS - PM PEAK HOUR
 US ROUTE 22 - TRAFFIC VOLUMES





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LEGEND

-  Signalized Intersection
-  Through Movement
-  Turning Movement
-  Mkmt: Traffic Volume
-  Approach Totals

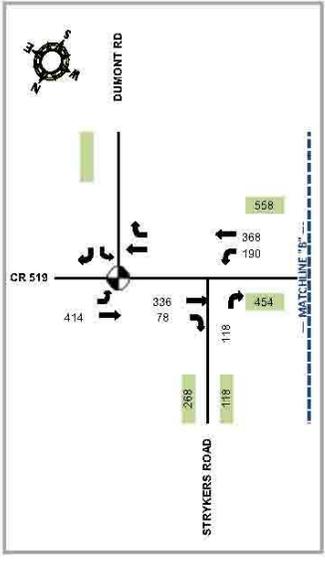
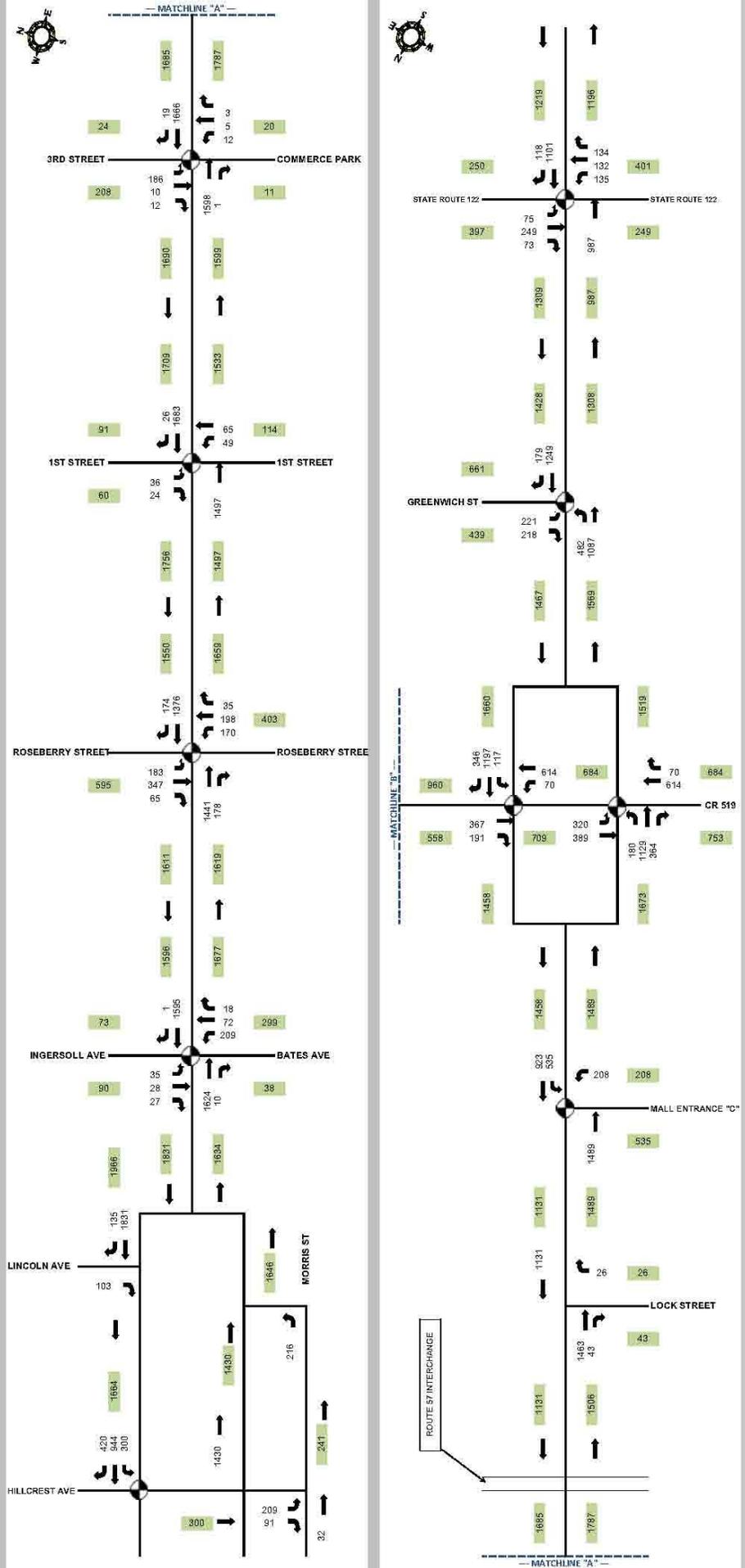


FIGURE 25

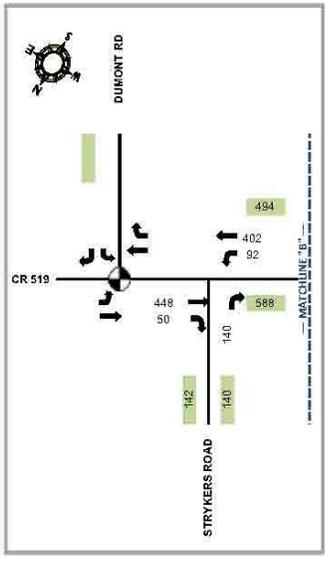
2008 EXISTING CONDITIONS - SATURDAY PEAK HOUR
US ROUTE 22 - TRAFFIC VOLUMES



LEGEND

- Signalized Intersection
- Through Movement
- Turning Movement
- Mvmt. Traffic Volume
- Approach Totals

Planning, Analysis & Engineering
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4.4 2008 CAPACITY ANALYSIS

The peak hour traffic operations within US Route 22 roadway network were evaluated using the latest version (Version 7.0) of *Synchro Trafficware*, a traffic analysis and simulation program. The results of these analyses provide level of service (LOS), volume/capacity descriptions and average seconds of delay for the intersection movements.

4.4.1 Synchro Capacity Analysis

The efficiency with which an intersection operates is a function of volume, capacity and roadway operational characteristics. The capacity of an intersection is the volume of vehicles it can accommodate during a peak hour. To determine the LOS for each intersection, the *2000 Highway Capacity Manual (HCM 2000)*², was used and its methodology was applied within this capacity analysis.

LOS is a qualitative measure describing operational conditions within a traffic stream in terms of traffic characteristics such as freedom to maneuver, traffic interruption, comfort and convenience; all measures concur with “quantitative” calculations related to empirical values. Six LOS are defined for each type of facility with analysis procedures available which range from grades "A" through "F". Level "A" represents excellent conditions with no delays. Overall deficient operations are denoted by a level of "F" for failure. The LOS criteria for intersections, as provided by the HCM 2000, are summarized in Table 10.

Table 10 – HCM 2000: Signalized and Unsignalized LOS/Delay Criteria		
LOS	Average Delay (sec/veh)	
	Signalized Intersection	Unsignalized Intersection
A	< 10	0 - 10
B	> ten – 20	> ten - 15
C	> 20 – 35	> 15 – 25
D	> 35 – 55	> 25 – 35
E	> 55 – 80	> 35 – 50
F	> 80	> 50

The peak hour of operation was evaluated at the study intersections for the PM and SAT traffic volumes under the 2008 Existing Conditions. The results of these analyses provide LOS, average seconds of

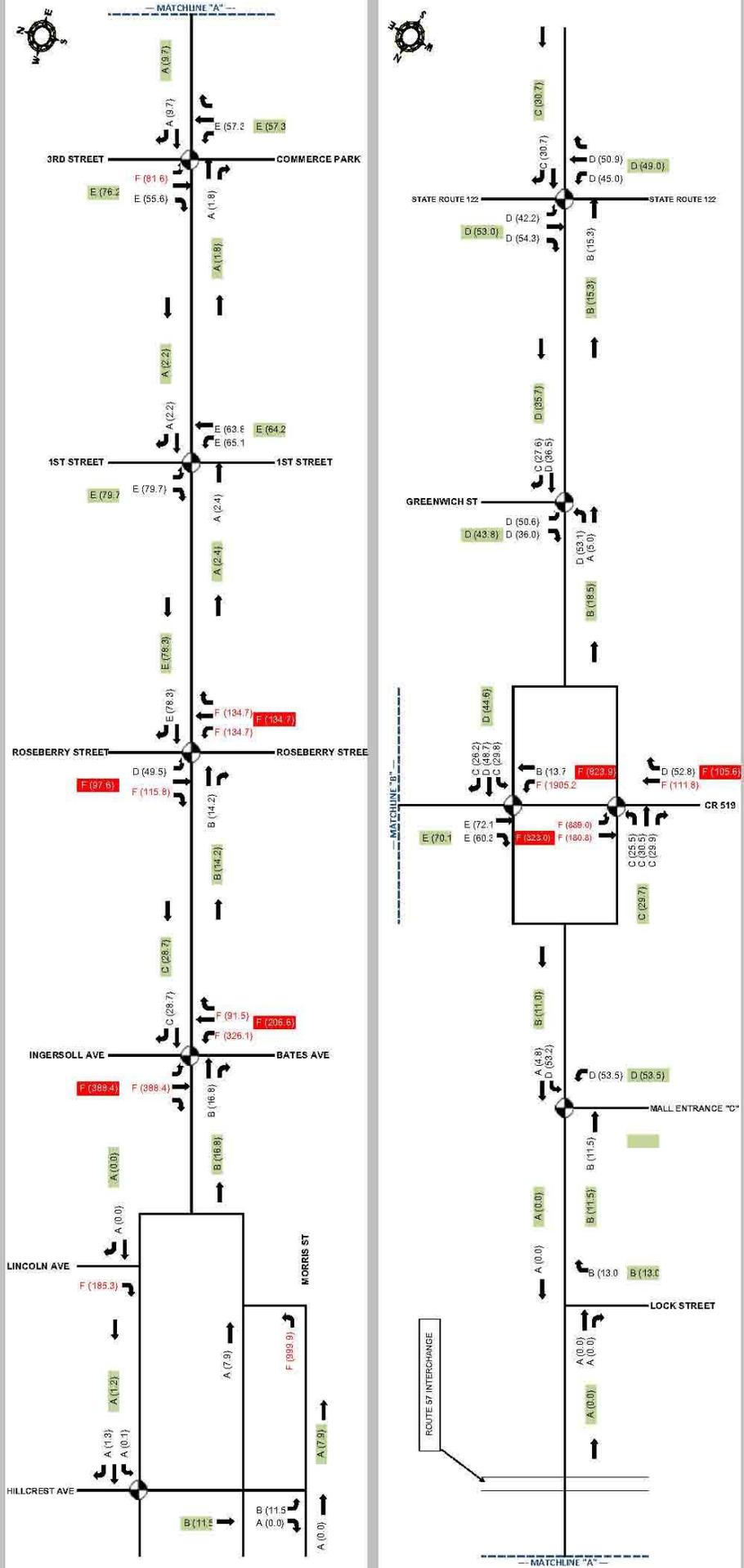
² Transportation Research Board (2000). *Highway Capacity Manual*.



delay and the 95th percentile queue length for the intersection movements and approaches. **Figures 26** and **27** detail the 2008 existing condition LOS and Delay.



FIGURE 26
 2008 EXISTING CONDITIONS - PM PEAK HOUR
 US ROUTE 22 - CAPACITY ANALYSIS



LEGEND

- Signalized Intersection
- Through Movement
- Turning Movement
- Warrant LOS (Delay)
- Approach Totals

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 Civil, Municipal & Environmental Engineers
 Planners • Surveyors • Landscape Architects

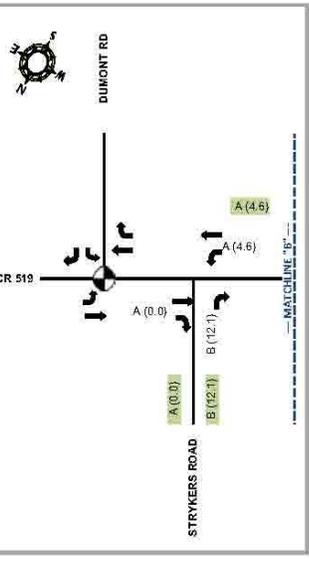
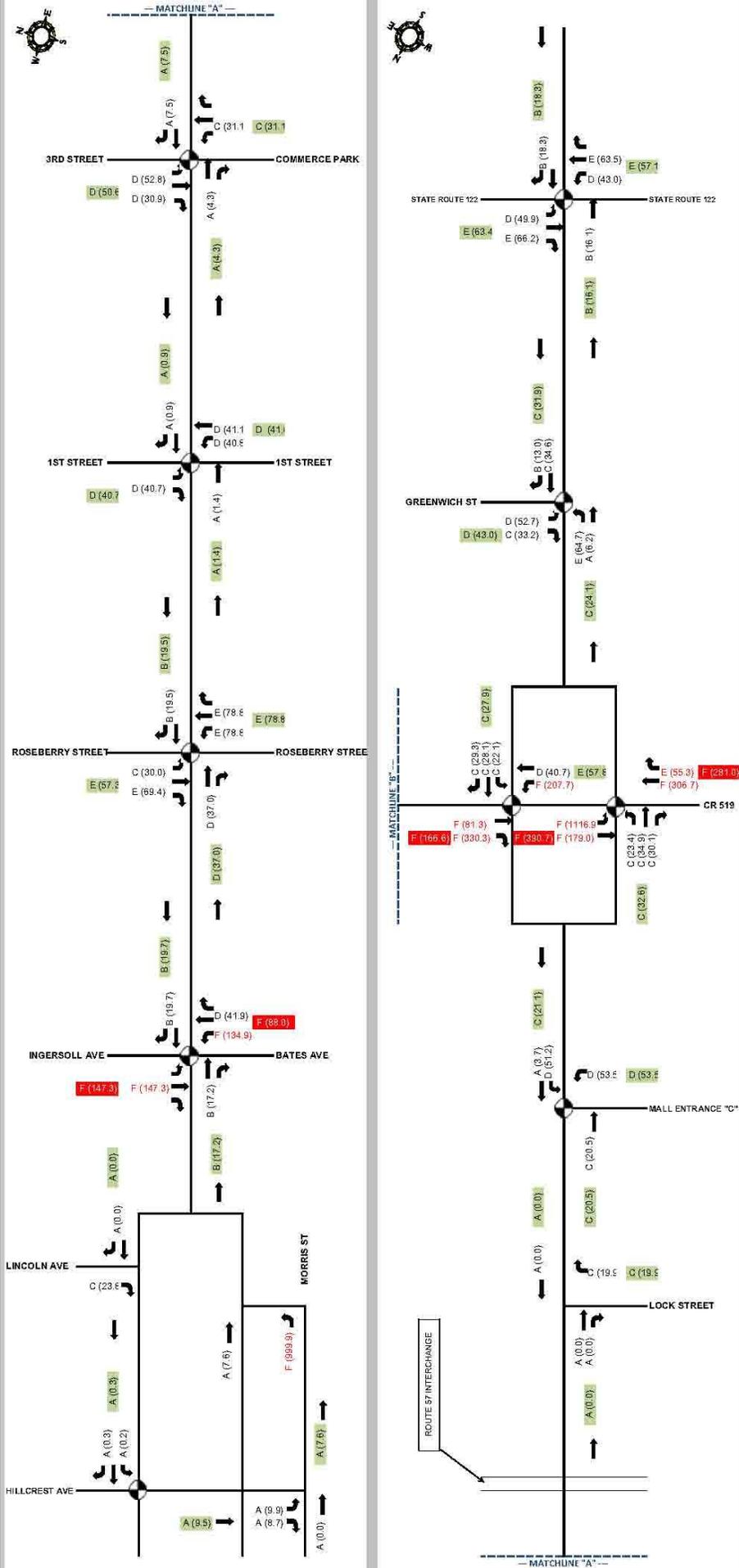


FIGURE 27

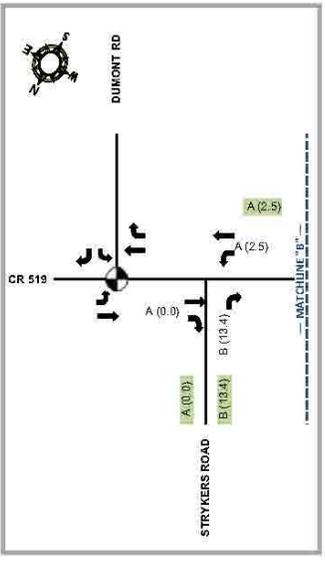
2008 EXISTING CONDITIONS - SATURDAY PEAK HOUR
US ROUTE 22 - CAPACITY ANALYSIS



LEGEND:

- Signalized Intersection
- Through Movement
- Turning Movement
- Mvmt. LOS (Delay)
- Approach Totals

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4.4.2 2008 Existing Traffic Conditions Findings

The following summarizes the findings of the 2008 existing traffic conditions and capacity analysis:

US Route 22 and Route 57 Junction (MP 2.05)

This junction is the principal source of the traffic volumes traveling on US Route 22, west of the Route 57 Junction. The most significant decrease in traffic occurs at the junction of US Route 22 and Route 57, which is located between 3rd Street and Lock Street. At this junction, traffic exits US Route 22 traveling eastbound at a rate of 59% during the PM Peak Hour and 53% during the SAT Peak Hour.

The US Route 22 traffic volumes west of Route 57 are significantly greater during the PM Peak Hour than the SAT Peak Hour. However, east of Route 57, the PM and SAT volumes are comparable. This difference is illustrated in the peak hour capacity analysis.

Additionally, the LOS west of the Route 57 Junction are improved during the SAT Peak Hour when compared to the PM Peak Hour. On Saturday, the LOS improved at most locations, with a significant decrease in delay at Lincoln Avenue. (See **Table 11 - 2008 Existing Conditions Intersection LOS**).

Table 11 – 2008 Existing Conditions Intersection LOS

Intersection	PM Peak Hour		SAT Peak Hour		
	LOS	Delay	LOS	Delay	
Hillcrest Boulevard	A	1.2	A	0.3	West
Morris Street	A	9.6	A	8.6	
Morris St & Us Route 22*	F	*	F	*	
Lincoln Avenue	F	185.3	C	23.8	
Ingersoll/Bates Avenue	D	47.5	C	27.3	
Roseberry Street	E	68.0	D	37.4	
First Street	A	6.0	A	3.2	
Third Street	B	10.6	A	8.7	
<i>Route 57 Junction</i>					↑
Lock Street	B	13.0	C	19.9	East
Shopping Center Dr	B	13.4	C	23.0	
County Route 519 Eastbound	F	131.1	F	170.8	
County Route 519 Westbound	F	194.2	E	61.6	
Greenwich St	C	31.9	C	29.8	
Us Route 122	C	32.3	C	28.8	

*LOS Measurements at Morris St & US Route 22 were immeasurable due to the extreme poor operations.

Table 12 details the LOS at each intersection studied in the corridor. Of the intersections west of the Route 57 junction, all but one (Morris St & US Route 22) improved on Saturday. In comparison, half of the intersection east of Route 57 improved on Saturday when compared to the PM Peak Hour. The final



two intersections, Greenwich Street and Route 122, improved by approximately 2.1 seconds per vehicle (sec/veh) and 3.5 sec/veh respectively. Based on this information, it can be stated that the PM Peak Hour is the critical time hour of operation.

Minor Street Failing Conditions

The capacity analysis determined that the US Route 22 approaches operate between LOS “A” and LOS “D” during the peak hours of operation. While this is acceptable, at intersections where failing conditions did exist, they existed on the minor street approaches. The failing conditions observed during the capacity analysis are detailed in the following table.

Table 12 – 2008 Existing Conditions Intersection Failing Operations on Minor Streets			
Location On Us Route 22		Peak Hour	
Intersection	Approach	PM	SAT
Morris St. & Us Route 22	Northbound	X	X
Lincoln Avenue	Southbound	X	
Ingersoll/Bates Avenue	Northbound	X	X
	Southbound	X	X
Roseberry Street	Northbound	X	
	Southbound	X	
County Route 519 (St James Avenue)	Northbound	X	X
	Southbound	X	X
County Route 519 (Uniontown Road)	Northbound	X	
	Southbound		X

Volume-to-Capacity (v/c) Ratio

The v/c ratio for an intersection represents the adequacy of the intersection geometry and physical design features to sufficiently support the intersection vehicle capacity. An intersection that is operating at capacity is represented by a v/c ratio of 1.00, with v/c ratio less than 1.00 representing operating conditions below capacity and v/c ratios over 1.00 operating beyond capacity.

The US Route 22 corridor intersection volume-to-capacity ratios (v/c ratio) are higher during the PM Peak Hour than the SAT Peak Hour. The results, which are shown on **Table 13**, indicate that the signalized intersections within the corridor have higher v/c ratios during the PM Peak Hour. During the PM Peak Hour, four intersections are operating beyond capacity; while on Saturday only one intersection is operating beyond capacity. The County Route 519 intersection operates at the highest v/c ratios, indicating this intersection is subject to the highest volumes during these peak hours of operation.



The westbound intersection of County Route 519 is the most critical intersection, operating at a v/c ratio of 2.53 during the PM Peak Hour. Conversely, County Route 519 eastbound is the only intersection operating beyond capacity on Saturday, with a v/c ratio of 1.67. The Ingersoll/Bates Avenue and Roseberry Avenue intersections also operate beyond capacity during the PM Peak Hour.

Intersection	V/C Ratios	
	PM	SAT
Hillcrest Boulevard	0.88	0.41
Ingersoll/Bates Avenue	1.19	0.81
Roseberry Street	1.08	0.89
1st Street	0.66	0.46
3rd Street	0.70	0.57
<i>Route 57 Junction</i>		
Shopping Center Dr	0.51	0.65
County Route 519 Eastbound	1.39	1.67
County Route 519 Westbound	2.53	0.94
Greenwich St	0.72	0.59
Route 122	0.79	0.57

4.5 THREE-YEAR ACCIDENT REPORT ANALYSIS

In order to assess the existing safety and operational concerns at the signalized intersections within the corridor, the recent intersection accident history was evaluated. The three-year accident history along US Route 22 in Phillipsburg, Lopatcong and Pohatcong was acquired from the local Police Departments.

4.5.1 Accident Report Results

The accident reports included the three most recent full years: 2005, 2006 and 2007. The accidents in the vicinity of each intersection along US Route 22 were summarized by accident type, lighting condition (day or night) and roadway surface condition (wet or dry). **Table 14** summarizes the top ten accident types considered in this analysis.

Table 14 – Accident Type Definitions

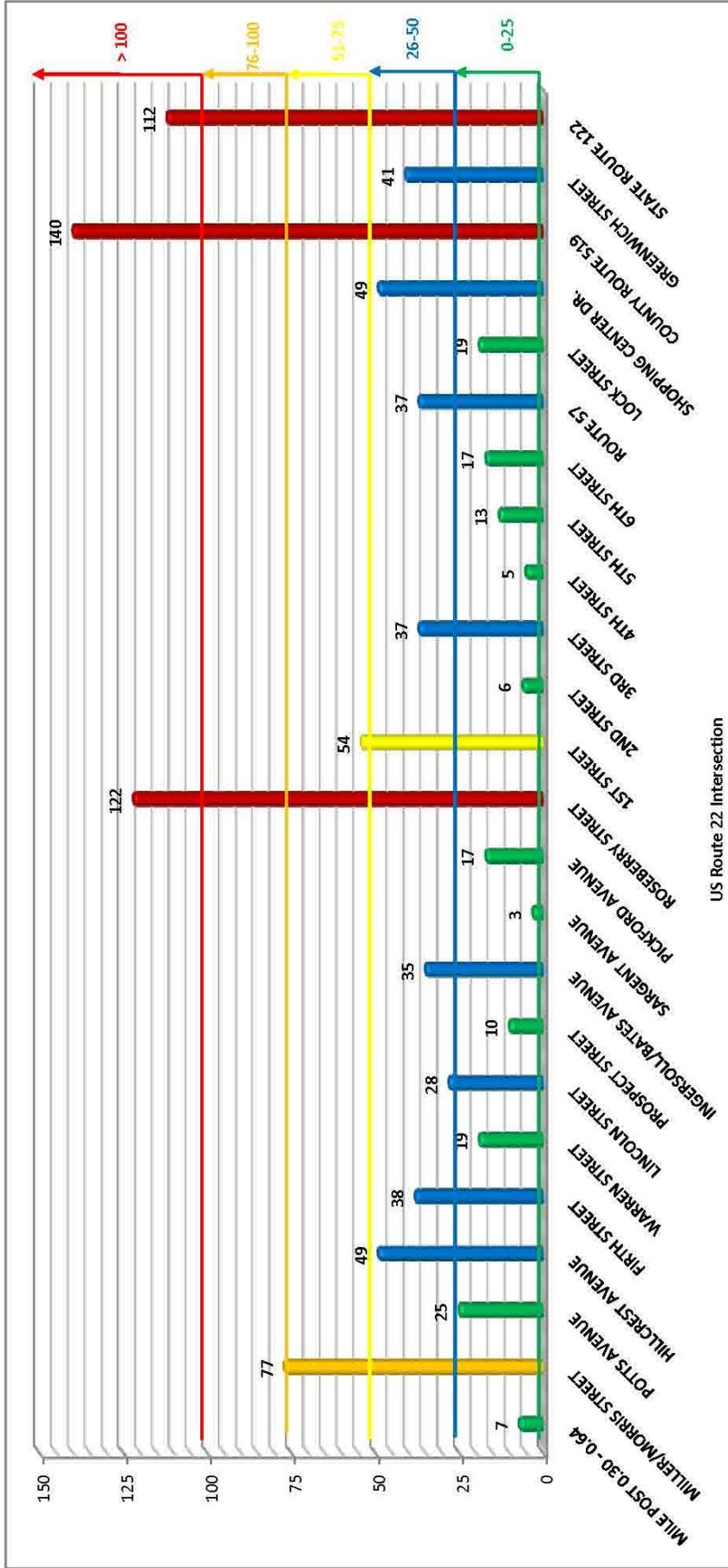
Accident Type	Description
Rear End	the front or bumper of a vehicle impacts the rear bumper or fender of the vehicle ahead of it.
Side Swipe	two vehicles traveling in the same direction collide while changing lanes or performing passing movements.
Right Angle	a vehicle impacts a vehicle traveling in the conflicting lane of traffic at an angle of 90 degrees.
Head On	two vehicles traveling in opposing directions collide so that front ends of the vehicles impact each other.
Left Turn	a vehicle performing a left-turn movement impacts a vehicle traveling in the opposing lane of traffic.
Fixed Object	a vehicle impacts an object, such as a light pole or mailbox, which is affixed along the traveled roadway.
Debris	a moving vehicle impacts any hazard or object present along a roadway.
Pedestrian	a moving vehicle impacts a pedestrian at any point along the roadway or within the crosswalk.
Animal	a vehicle and animal impact each other at any point along the roadway.
Backing	a moving vehicle backs into another vehicle along the roadway which is in a stopped position.

Through this analysis, a determination was made of the intersections with the highest accident rate and the corresponding scale of priority within the corridor. The intersections priority will be designated with colors on a scale of one (green) through five (red). Intersections with fifty (50) or more accidents are considered high priority, with increasing importance for those with over seventy-five (75) and 100

accidents. **Chart 4** summarizes the number of accidents observed at each intersection and the corresponding priority. **Figure 28** illustrates the number of accidents in a color spectrum.



CHART 4 - THREE-YEAR ACCIDENT REPORT SUMMARY



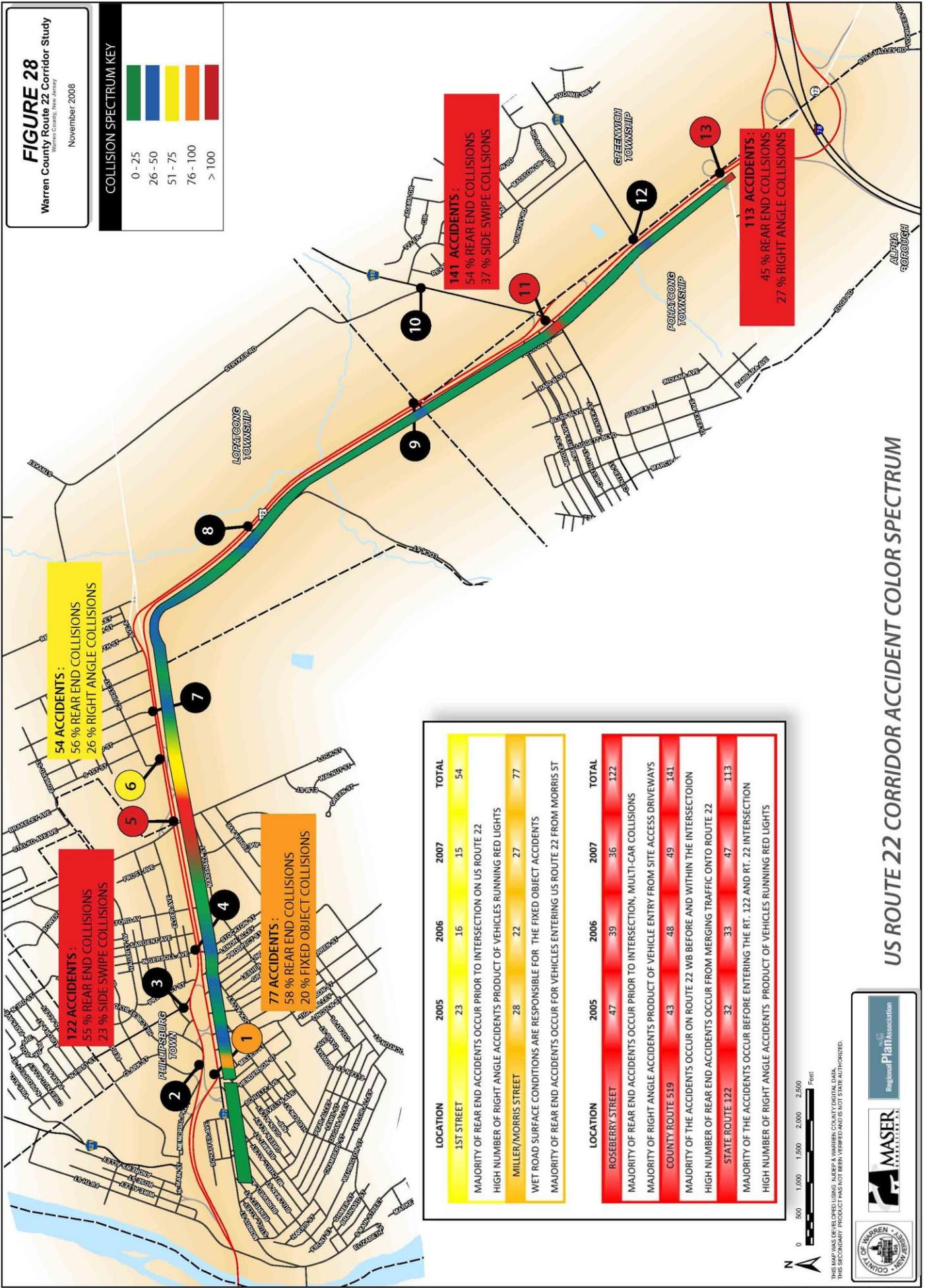
LOCATION	2005	2006	2007	TOTAL
MILE POST 0.30 - 0.64	4	1	2	7
MILLER/MORRIS STREET	28	22	27	77
POTTS AVENUE	6	10	9	25
HILLCREST AVENUE	19	16	14	49
FIRTH STREET	15	12	11	38
WARREN STREET	8	5	6	19
LINCOLN STREET	9	14	5	28
PROSPECT STREET	2	6	2	10
INGERSOLL/BATES AVENUE	11	20	4	35
SARGENT AVENUE	3	0	0	3
PICKFORD AVENUE	8	2	7	17
ROSEBERRY STREET	47	39	36	122
1ST STREET	23	16	15	54
2ND STREET	3	3	0	6
3RD STREET	12	16	9	37
4TH STREET	2	2	1	5
5TH STREET	6	5	2	13
6TH STREET	5	11	1	17
ROUTE 57	9	18	10	37
LOCK STREET	9	6	4	19
SHOPPING CENTER DR.	24	19	6	49
COUNTY ROUTE 519	43	48	49	140
GREENWICH STREET	11	18	12	41
STATE ROUTE 122	32	33	47	112

FIGURE 28

Warren County Route 22 Corridor Study
WARREN COUNTY, NEW JERSEY

November 2008

COLLISION SPECTRUM KEY



LOCATION	2005	2006	2007	TOTAL
1ST STREET	23	16	15	54
MAJORITY OF REAR END ACCIDENTS OCCUR PRIOR TO INTERSECTION ON US ROUTE 22				
HIGH NUMBER OF RIGHT ANGLE ACCIDENTS PRODUCT OF VEHICLES RUNNING RED LIGHTS				
MILLER/MORRIS STREET	28	22	27	77
WET ROAD SURFACE CONDITIONS ARE RESPONSIBLE FOR THE FIXED OBJECT ACCIDENTS				
MAJORITY OF REAR END ACCIDENTS OCCUR FOR VEHICLES ENTERING US ROUTE 22 FROM MORRIS ST				
ROSEBERRY STREET	47	39	36	122
MAJORITY OF REAR END ACCIDENTS OCCUR PRIOR TO INTERSECTION, MULTI-CAR COLLISIONS				
MAJORITY OF RIGHT ANGLE ACCIDENTS PRODUCT OF VEHICLE ENTRY FROM SITE ACCESS DRIVEWAYS				
COUNTY ROUTE 519	43	48	49	141
MAJORITY OF THE ACCIDENTS OCCUR ON ROUTE 22 WB BEFORE AND WITHIN THE INTERSECTION				
HIGH NUMBER OF REAR END ACCIDENTS OCCUR FROM MERGING TRAFFIC ONTO ROUTE 22				
STATE ROUTE 122	32	33	47	113
MAJORITY OF THE ACCIDENTS OCCUR BEFORE ENTERING THE RT. 122 AND RT. 22 INTERSECTION				
HIGH NUMBER OF RIGHT ANGLE ACCIDENTS PRODUCT OF VEHICLES RUNNING RED LIGHTS				



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COUNTY OF WARREN • NEW JERSEY
Regional Planning Association

US ROUTE 22 CORRIDOR ACCIDENT COLOR SPECTRUM

Based on the accident report data, the intersections of high-priority are listed as follows:

- A. Miller Street/Morris Street 77 Accidents Orange (3)
- B. Roseberry Street 122 Accidents Red (5)
- C. 1st Street 54 Accidents Yellow (4)
- D. County Route 519 140 Accidents Red (5)
- E. Route 122/New Brunswick Ave. 112 Accidents Red (5)

For each of these intersections, the critical accident type for each intersection was identified. Since each intersection has individual lane assignments, physical restrictions and operating conditions, the accident type that is considered critical will depend on the intersection characteristics. (See **Table 15 - Accident Summary at High-Priority Intersections**)

Table 15 – Accident Summary at High-Priority Intersections

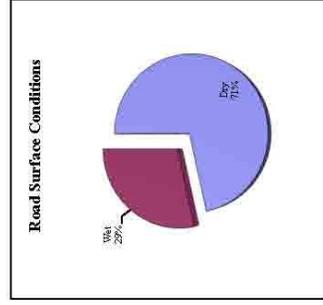
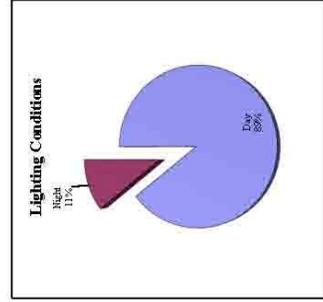
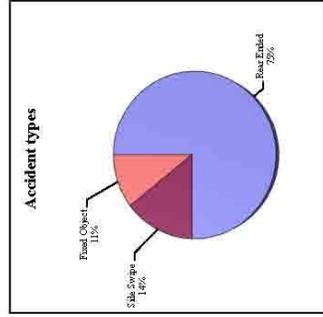
A. Miller/Morris Street	2005	2006	2007	Total
	28	22	27	77
Wet road surface conditions coupled with horizontal/vertical curvature are responsible for the fixed object accidents. The majority of rear end accidents occur when vehicles are entering US Route 22 from Morris St				
B. Roseberry Street	2005	2006	2007	Total
	47	39	36	122
The majority of rear end accidents occur prior to intersection, multi-car collisions. The majority of right angle accidents product of vehicle entry from site access driveways.				
C. 1st Street	2005	2006	2007	TOTAL
	23	16	15	54
The majority of rear end accidents occur prior to intersection on US Route 22. A high number of right angle accidents are products of vehicles running red lights.				
D. County Route 519	2005	2006	2007	Total
	43	48	49	140
The majority of the accidents at the intersection occur traveling on US Route 22 westbound approaching and/or within the intersection. A high number of rear end accidents occur from merging traffic onto US Route 22.				
E. Route 122	2005	2006	2007	Total
	32	33	47	112
The majority of the accidents occur approaching the US Route 22 and Route 122 intersection. A high number of right angle accidents are a product of vehicles running red lights.				

The following pages summarize the accidents recorded at the high-priority intersections, by providing the three-year accident report summary and an intersection accident diagram. The accident report data analysis sheets for the length of the corridor are included in the Appendix.

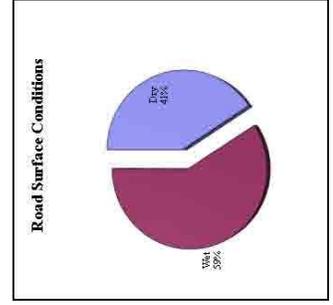
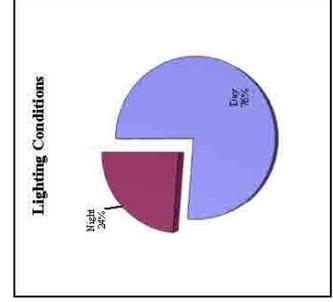
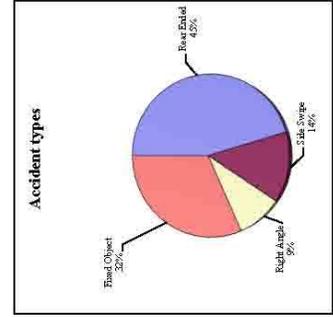


CHART 5 - THREE YEAR ACCIDENT REPORT SUMMARY: US ROUTE 22 AND MILLER STREET/MORRIS STREET

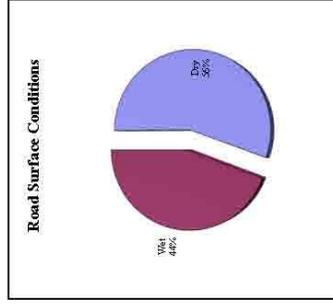
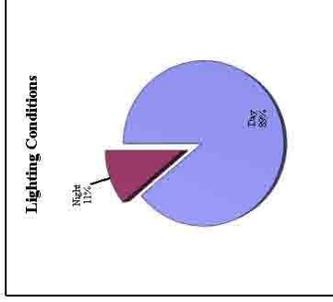
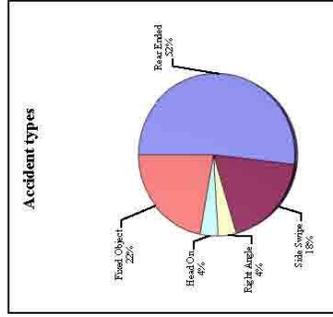
2005	Conditions					
	Accident Type	Count	Roadway Surface		Light Condition	
			Dry	Wet	Day	Night
Rear Ended	21	17	4	19	2	
Side Swipe	4	3	1	4	0	
Right Angle	0					
Head On	0					
Left Turn	0					
Fixed Object	3		3	2	1	
Debris	0					
Pedestrian	0					
Animal	0					
Backing	0					
Total	28	20	8	25	3	



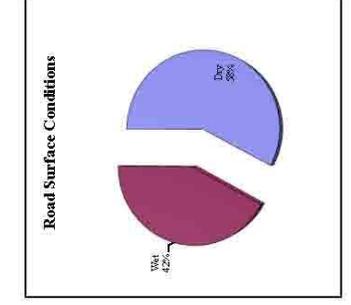
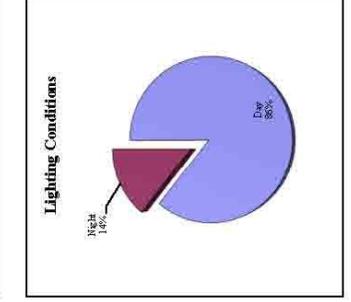
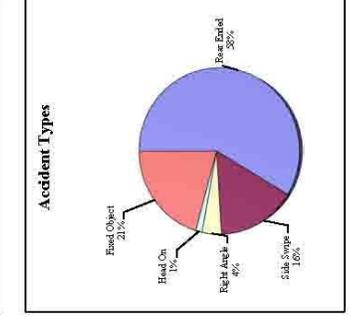
2006	Conditions					
	Accident Type	Count	Roadway Surface		Light Condition	
			Dry	Wet	Day	Night
Rear Ended	10	6	4	8	2	
Side Swipe	3	3	0	3	0	
Right Angle	2		2	2	0	
Head On	0					
Left Turn	0					
Fixed Object	7		7	5	2	
Debris	0					
Pedestrian	0					
Animal	0					
Backing	0					
Total	22	9	13	16	5	

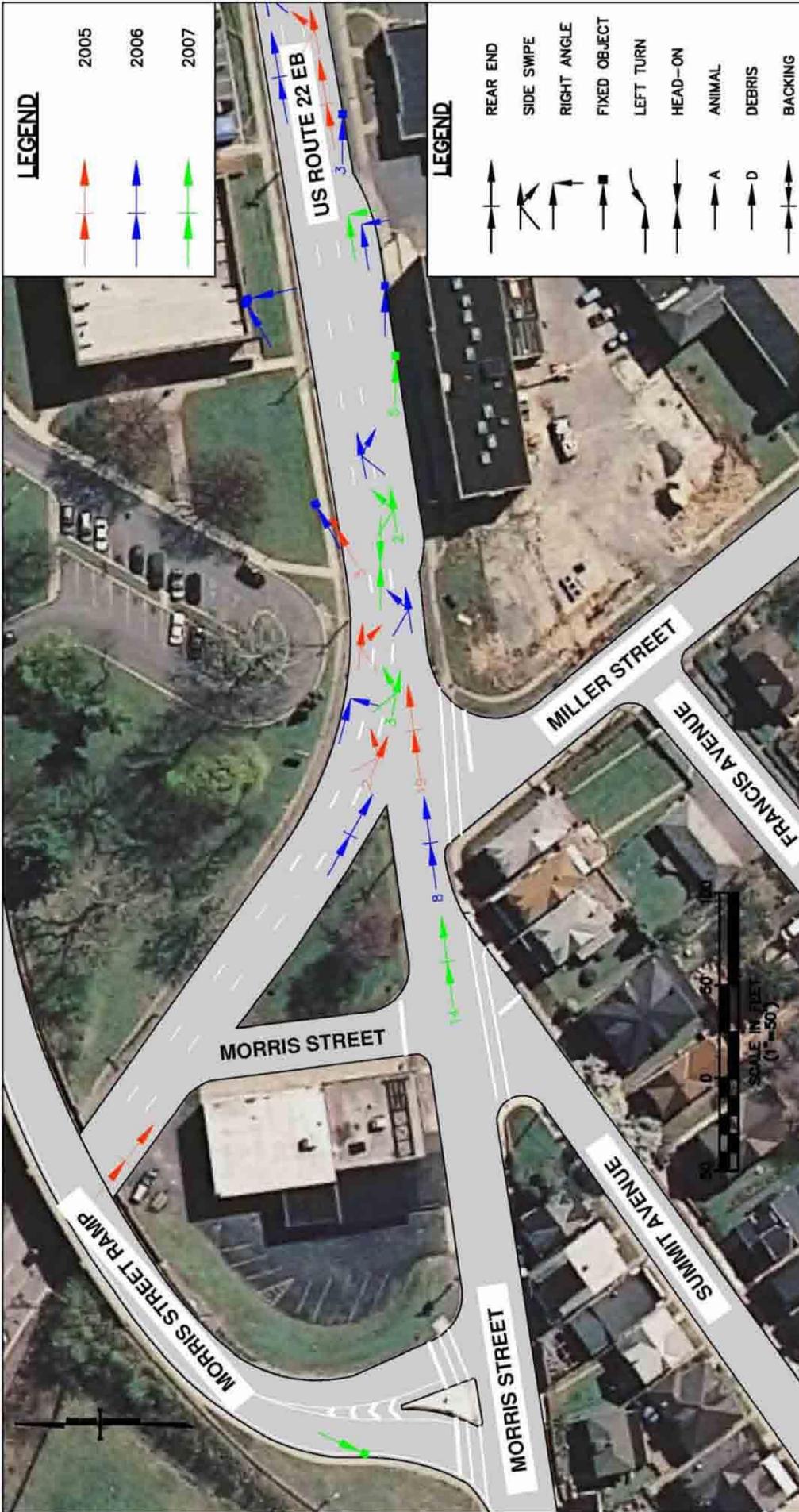


2007	Conditions					
	Accident Type	Count	Roadway Surface		Light Condition	
			Dry	Wet	Day	Night
Rear Ended	14	12	2	14	0	
Side Swipe	5	1	4	4	1	
Right Angle	1	1	0	1	0	
Head On	1		1	1	0	
Left Turn	0					
Fixed Object	6	1	5	4	2	
Debris	0					
Pedestrian	0					
Animal	0					
Backing	0					
Total	27	15	12	24	3	



TOTAL	Conditions					
	Accident Type	Count	Roadway Surface		Light Condition	
			Dry	Wet	Day	Night
Rear Ended	45	35	10	41	4	
Side Swipe	12	7	5	9	2	
Right Angle	3	2	2	4	0	
Head On	1	0	1	1	0	
Left Turn	0	0	0	0	0	
Fixed Object	16	1	15	11	5	
Debris	0	0	0	0	0	
Pedestrian	0	0	0	0	0	
Animal	0	0	0	0	0	
Backing	0	0	0	0	0	
Total	77	45	33	66	11	





LEGEND

- 2005
- 2006
- 2007

LEGEND

- REAR END
- SIDE SWIPE
- RIGHT ANGLE
- FIXED OBJECT
- LEFT TURN
- HEAD-ON
- ANIMAL
- DEBRIS
- BACKING

**US ROUTE 22 CORRIDOR STUDY
2005 - 2007 ACCIDENT ANALYSIS
FOR
MEMORIAL PARKWAY & MORRIS STREET**

TOWN OF PHILLIPSBURG WARREN COUNTY NEW JERSEY

JOB NUMBER:	080007276	DATE:	11/25/08
SCALE:	1" = 50'	LATEST REVISION:	6/3/09
INDEX NUMBER:	HA024655	DESIGN BY:	JJC

FIGURE 29

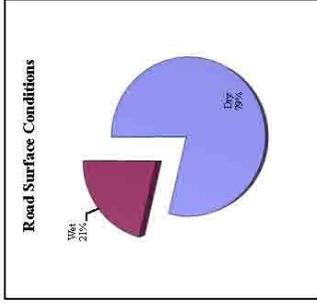
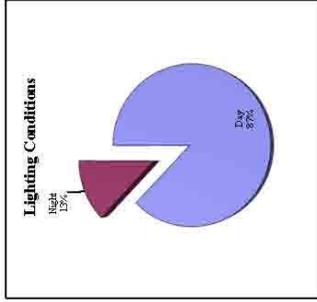
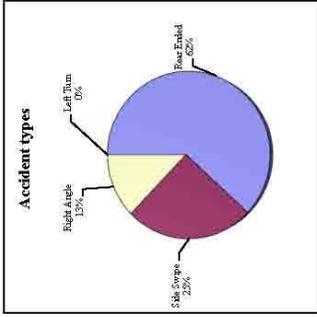
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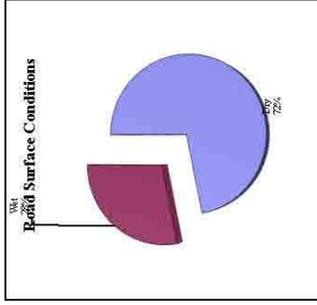
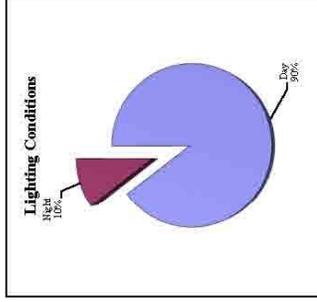
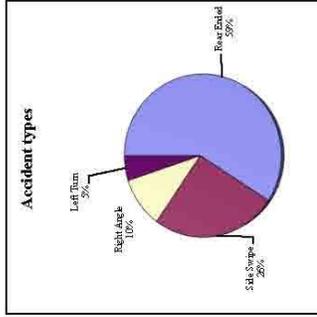
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CHART 6 - THREE YEAR ACCIDENT REPORT SUMMARY: US ROUTE 22 AND ROSBERRY AVENUE

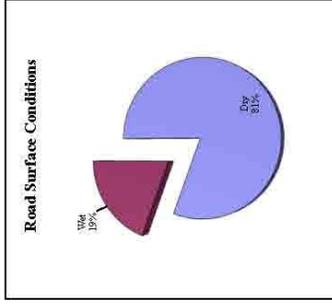
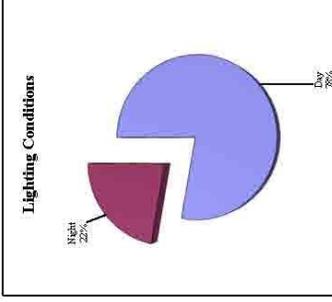
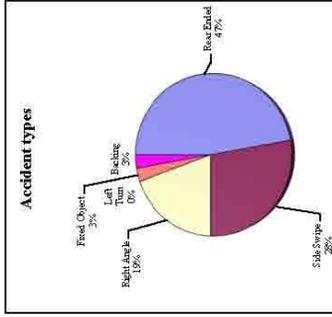
2005	Accident Type	Count	Conditions			
			Roadway Surface		Light Condition	
			Dry	Wet	Day	Night
Rear Ended	29	26	3	27	2	
Side Swipe	12	7	5	8	4	
Right Angle	6	4	2	6	0	
Head On	0					
Left Turn	0					
Fixed Object	0					
Debris	0					
Pedestrian	0					
Animal	0					
Backing	0					
Total	47	37	10	41	6	



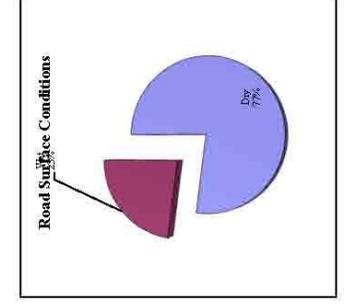
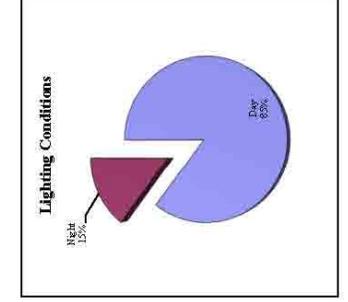
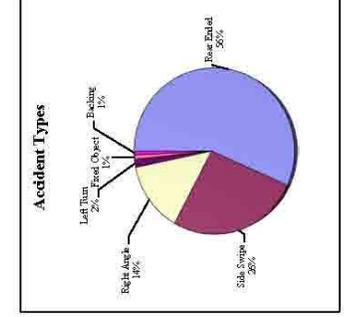
2006	Accident Type	Count	Conditions			
			Roadway Surface		Light Condition	
			Dry	Wet	Day	Night
Rear Ended	23	16	7	20	3	
Side Swipe	10	6	4	10		
Right Angle	4	4		3	1	
Head On	0					
Left Turn	2	2		2		
Fixed Object	0					
Debris	0					
Pedestrian	0					
Animal	0					
Backing	0					
Total	39	28	11	35	4	

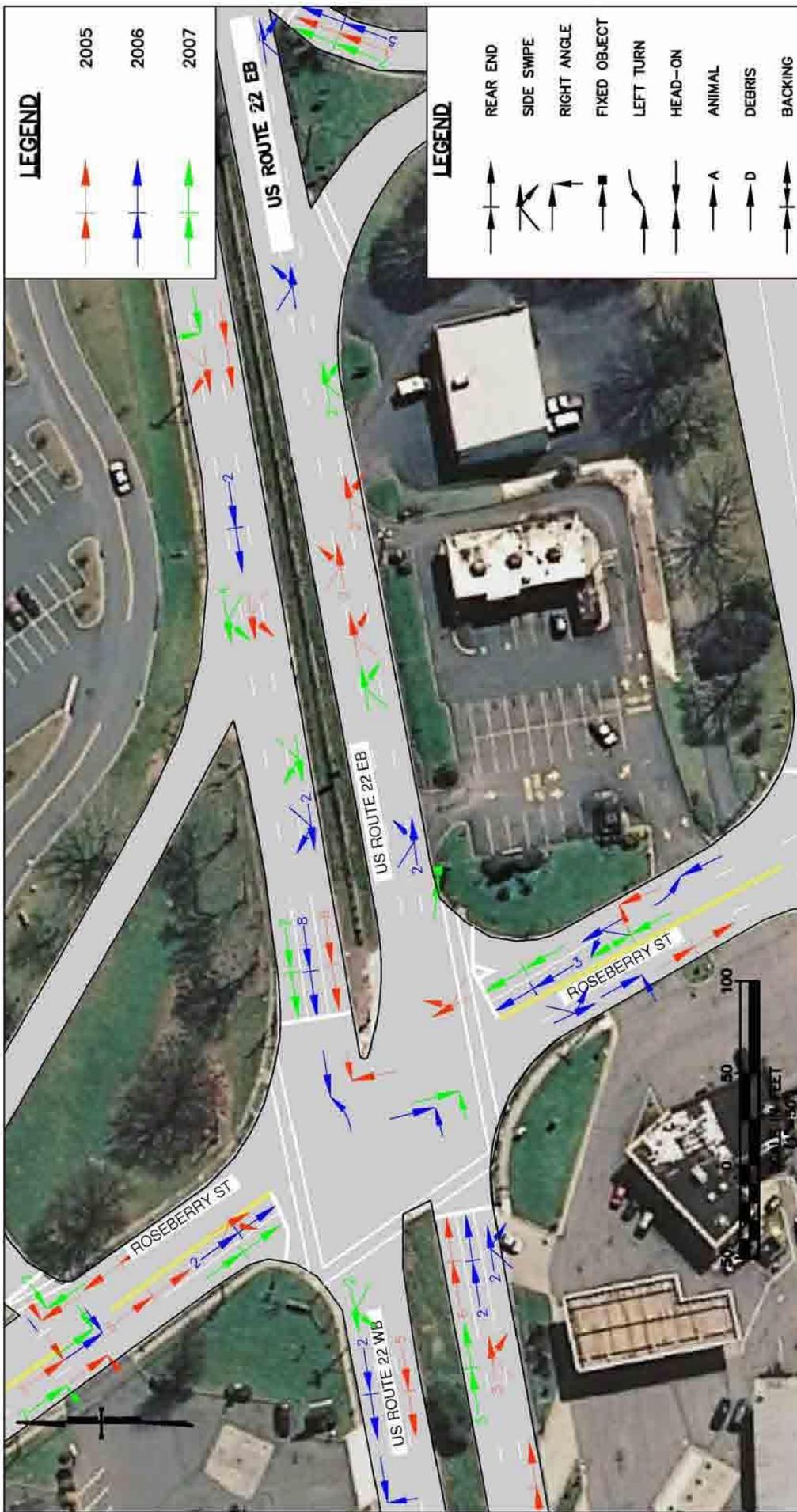


2007	Accident Type	Count	Conditions			
			Roadway Surface		Light Condition	
			Dry	Wet	Day	Night
Rear Ended	17	14	3	15	2	
Side Swipe	10	7	3	6	4	
Right Angle	7	6	1	6	1	
Head On	0					
Left Turn	0					
Fixed Object	1	1		1		
Debris	0					
Pedestrian	0					
Animal	0					
Backing	1	1		1		
Total	36	29	7	28	8	



TOTAL	Accident Type	Count	Conditions			
			Roadway Surface		Light Condition	
			Dry	Wet	Day	Night
Rear Ended	69	56	13	62	7	
Side Swipe	32	20	12	24	8	
Right Angle	17	14	3	15	2	
Head On	0	0	0	0	0	
Left Turn	2	2	0	2	0	
Fixed Object	1	1	0	1	0	
Debris	0	0	0	0	0	
Pedestrian	0	0	0	0	0	
Animal	0	0	0	0	0	
Backing	1	1	0	0	1	
Total	122	94	28	104	18	





LEGEND

- 2005
- 2006
- 2007

LEGEND

- REAR END
- SIDE SWIPE
- RIGHT ANGLE
- FIXED OBJECT
- LEFT TURN
- HEAD-ON
- ANIMAL
- DEBRIS
- BACKING

JOB NUMBER:	09000727G	DATE:	12/23/08
SCALE:	1" = 50'	LATEST REVISION:	6/9/09
INDEX NUMBER:	HA024655	DESIGN BY:	NDA

FIGURE 30

**US ROUTE 22 CORRIDOR STUDY
2005 - 2007 ACCIDENT ANALYSIS
FOR
US ROUTE 22 & ROSEBERRY STREET**

TOWNSHIP OF LOPATCONG WARREN COUNTY NEW JERSEY

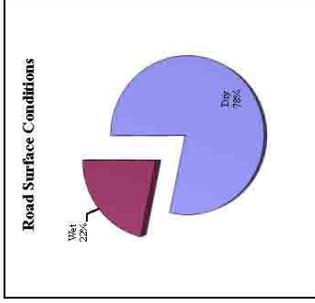
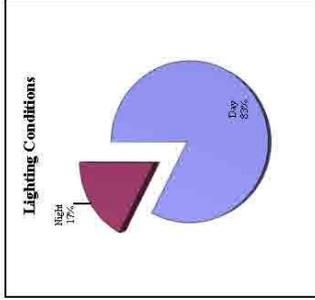
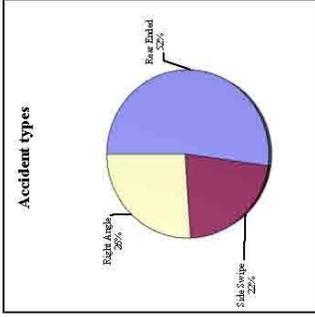
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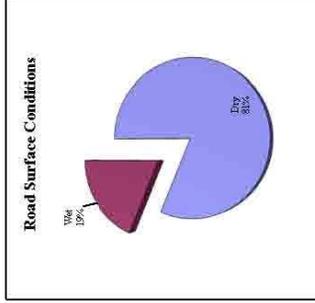
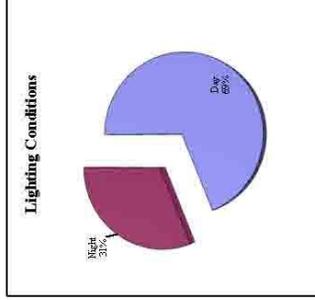
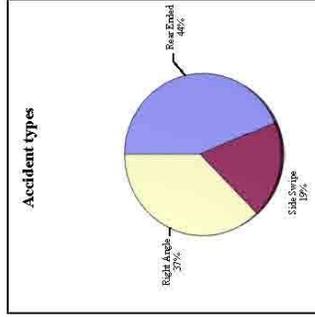
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CHART 7 - THREE YEAR ACCIDENT REPORT SUMMARY: US ROUTE 22 AND 1st STREET

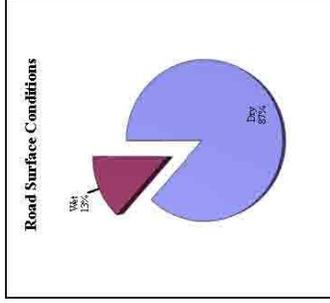
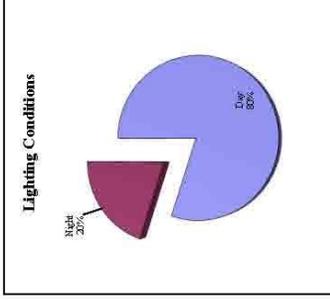
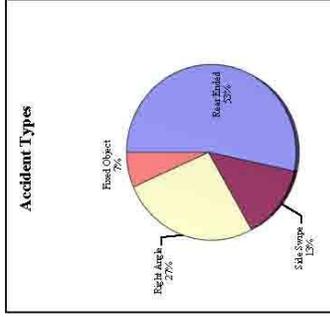
2005	Accident Type	Count	Roadway Surface			Light Condition		
			Dry	Wet		Day	Night	
	Rear Ended	12	9	3	10	2		
	Side Swipe	5	3	2	4	1		
	Right Angle	6	6		5	1		
	Head On	0						
	Left Turn	0						
	Fixed Object	0						
	Debris	0						
	Pedestrian	0						
	Animal	0						
	Backing	0						
	Total	23	18	5	19	4		



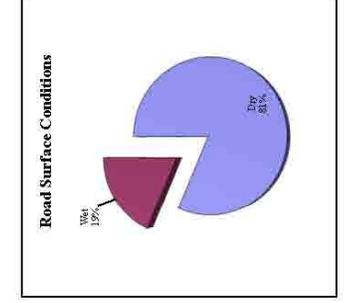
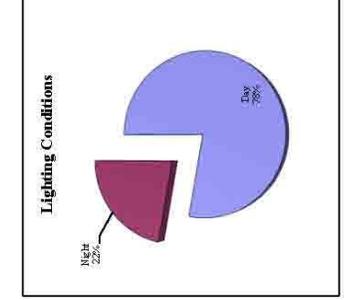
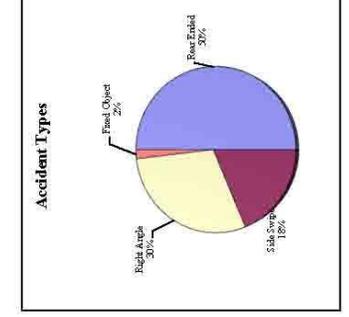
2006	Accident Type	Count	Roadway Surface			Light Condition		
			Dry	Wet		Day	Night	
	Rear Ended	7	7		6	1		
	Side Swipe	3	3		3			
	Right Angle	6	3	3	2	4		
	Head On	0						
	Left Turn	0						
	Fixed Object	0						
	Debris	0						
	Pedestrian	0						
	Animal	0						
	Backing	0						
	Total	16	13	3	11	5		

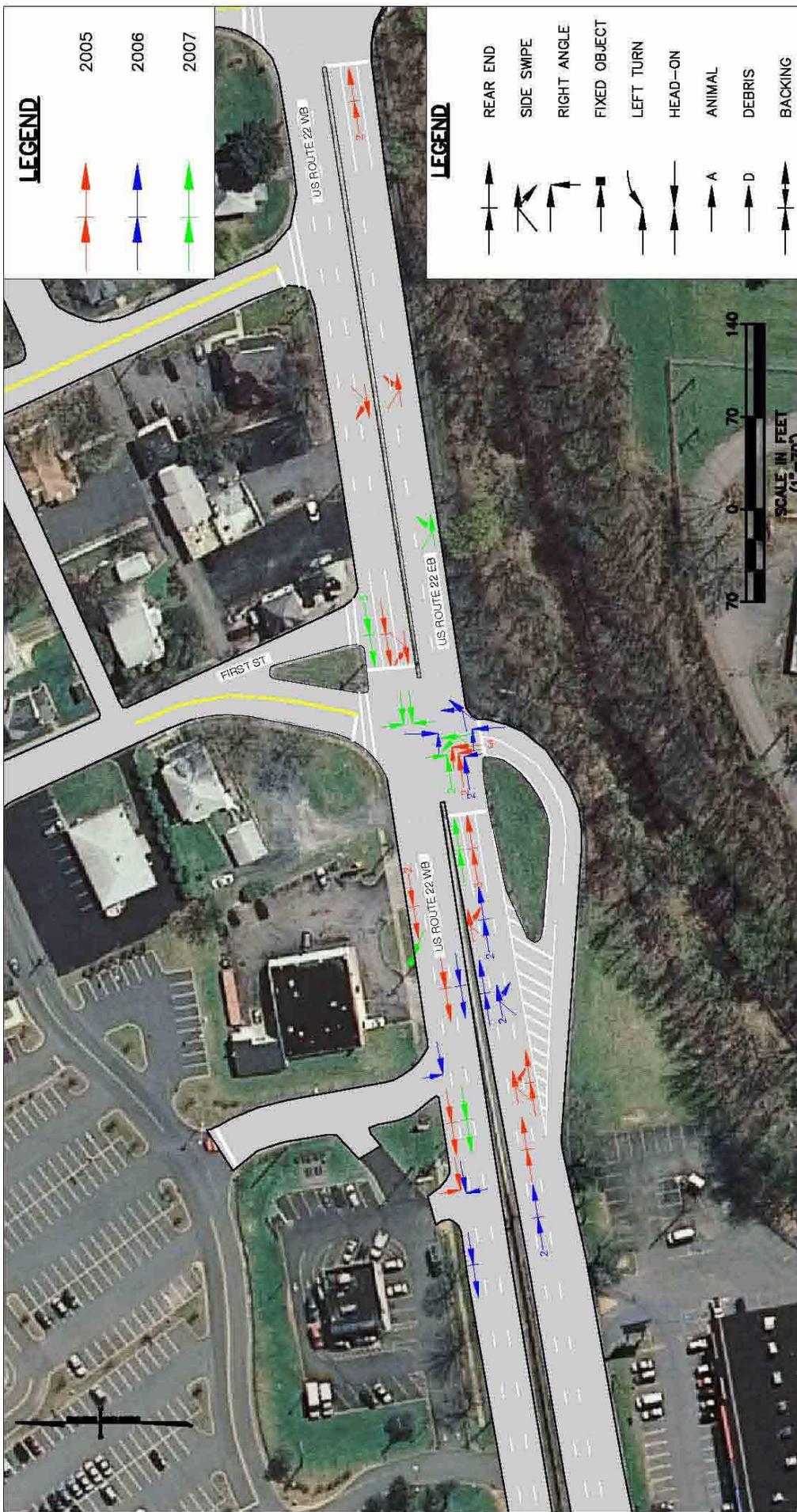


2007	Accident Type	Count	Roadway Surface			Light Condition		
			Dry	Wet		Day	Night	
	Rear Ended	8	6	2	6	2		
	Side Swipe	2	2		2			
	Right Angle	4	4		3	1		
	Head On	0						
	Left Turn	0						
	Fixed Object	1	1		1			
	Debris	0						
	Pedestrian	0						
	Animal	0						
	Backing	0						
	Total	15	13	2	12	3		



TOTAL	Accident Type	Count	Roadway Surface			Light Condition		
			Dry	Wet		Day	Night	
	Rear Ended	27	22	5	22	5		
	Side Swipe	10	8	2	9	1		
	Right Angle	16	13	3	10	6		
	Head On	0	0	0	0	0		
	Left Turn	0	0	0	0	0		
	Fixed Object	1	1	0	1	0		
	Debris	0	0	0	0	0		
	Pedestrian	0	0	0	0	0		
	Animal	0	0	0	0	0		
	Backing	0	0	0	0	0		
	Total	54	44	10	42	12		





JOB NUMBER:	08000727G	DATE:	12/23/08
SCALE:	1" = 70'	LATEST REVISION:	6/9/09
INDEX NUMBER:	HA024655	DESIGN BY:	NDA

**US ROUTE 22 CORRIDOR STUDY
2005 - 2007 ACCIDENT ANALYSIS
FOR
US ROUTE 22 & FIRST STREET**

FIGURE 31

TOWNSHIP OF POHATCONG WARREN COUNTY NEW JERSEY

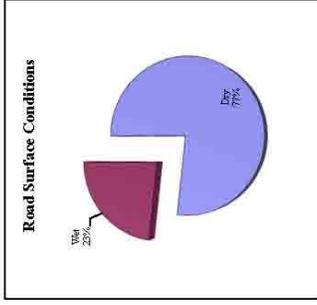
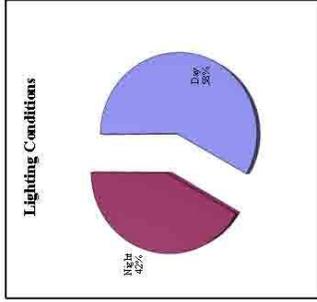
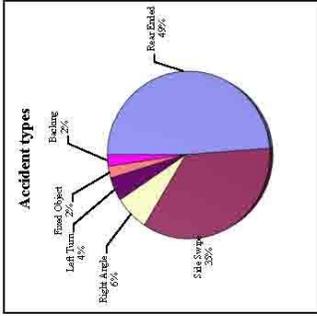
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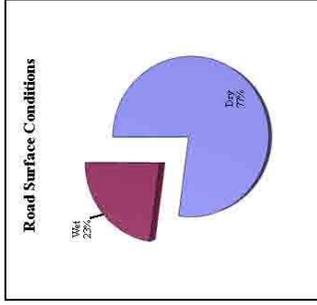
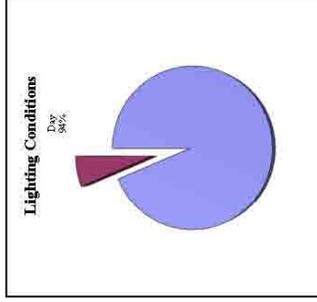
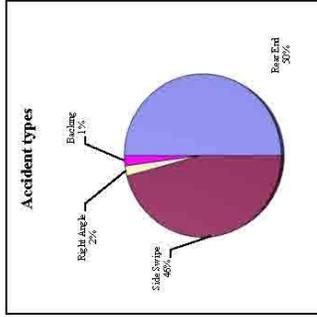
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CHART 8 - THREE YEAR ACCIDENT REPORT SUMMARY: US ROUTE 22 AND COUNTY ROUTE 519

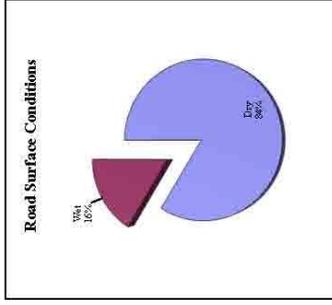
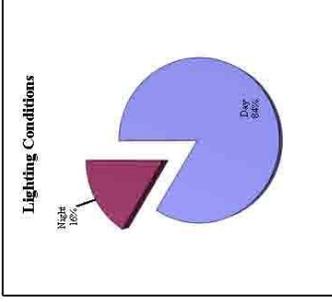
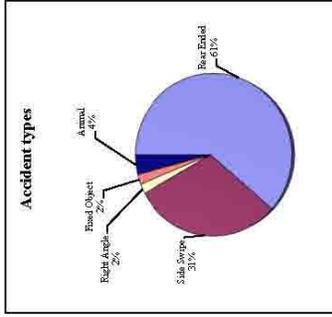
2005	Accident Type	Count	Conditions					
			Roadway Surface			Light Condition		
			Dry	Wet	Day	Night		
Rear Ended	21	17	4	11	10			
Side Swipe	15	13	2	11	4			
Right Angle	3	1	2	2	1			
Head On	0							
Left Turn	2	1	1	0	2			
Fixed Object	1			1	1			
Debris	0							
Pedestrian	0							
Animal	0							
Backing	1	1	1		1			
Total		43	33	10	25	18		



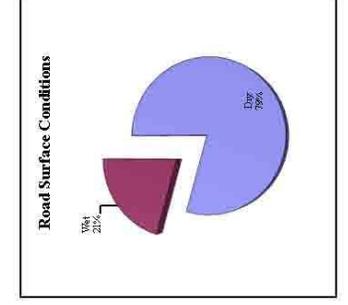
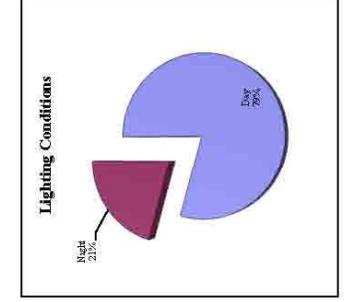
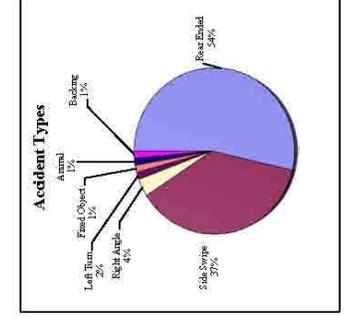
2006	Accident Type	Count	Conditions					
			Roadway Surface			Light Condition		
			Dry	Wet	Day	Night		
Rear Ended	24	19	5	24				
Side Swipe	22	17	5	20	2			
Right Angle	1	1	0	1				
Head On	0							
Left Turn	0							
Fixed Object	0							
Debris	0							
Pedestrian	0							
Animal	0							
Backing	1	1	1	1	1			
Total		48	37	11	45	3		

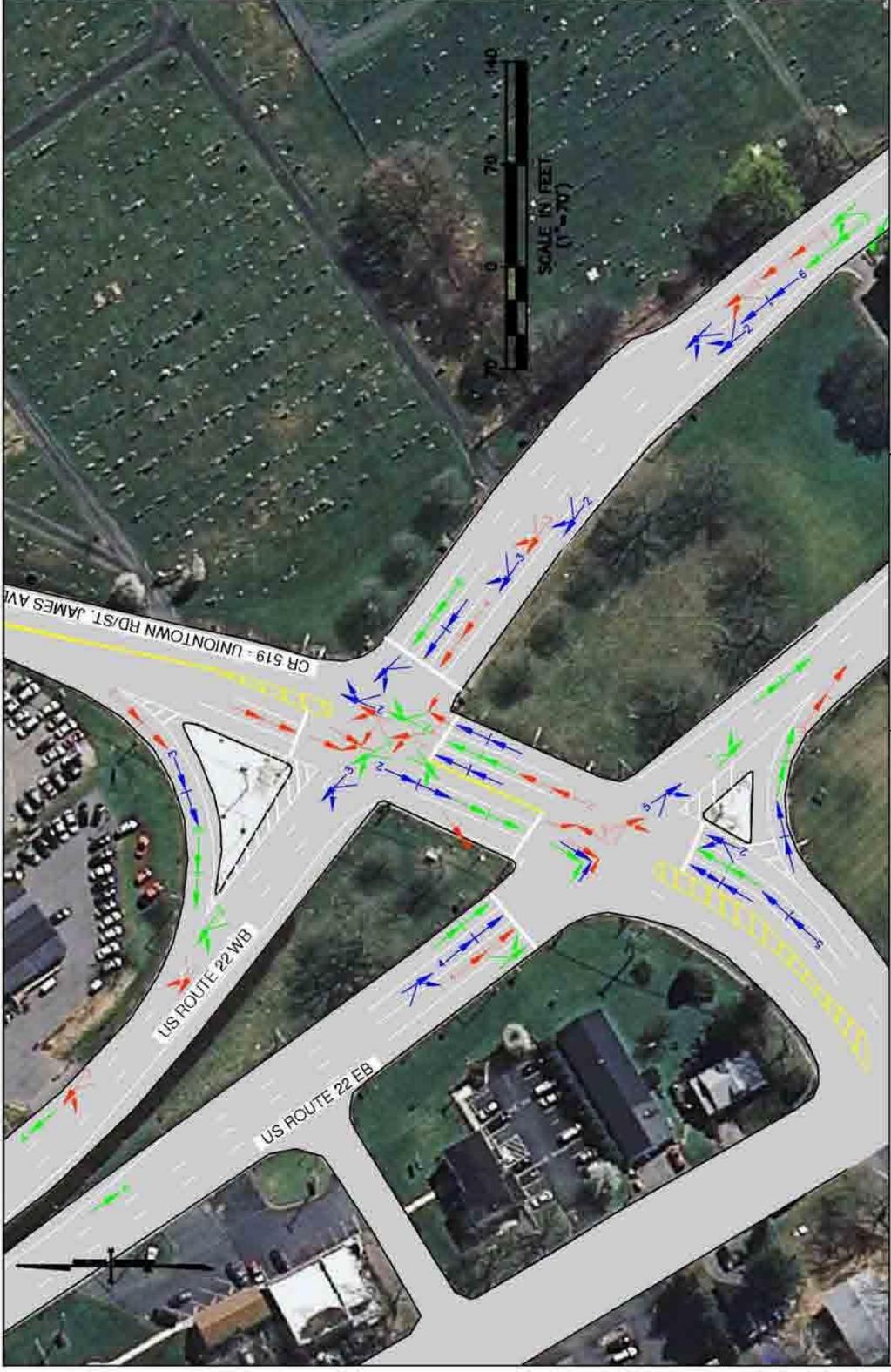


2007	Accident Type	Count	Conditions					
			Roadway Surface			Light Condition		
			Dry	Wet	Day	Night		
Rear Ended	30	25	5	27	3			
Side Swipe	15	14	1	11	4			
Right Angle	1	1		1				
Head On	0							
Left Turn	0							
Fixed Object	1	1			1			
Debris	0							
Pedestrian	0							
Animal	2			2	2			
Backing	0							
Total		49	41	8	41	8		



TOTAL	Accident Type	Count	Conditions					
			Roadway Surface			Light Condition		
			Dry	Wet	Day	Night		
Rear Ended	75	61	14	62	13			
Side Swipe	52	44	8	42	10			
Right Angle	5	3	2	4	1			
Head On	0	0	0	0	0			
Left Turn	2	1	1	0	2			
Fixed Object	2	1	1	1	1			
Debris	0	0	0	0	0			
Pedestrian	0	0	0	0	0			
Animal	2	0	2	2	0			
Backing	2	1	1	1	0		2	
Total		140	111	29	111	29		





LEGEND

- 2005
- 2006
- 2007

NOTE: A RIGHT ANGLE ACCIDENT THAT TOOK PLACE IN 2006 AND A BACK UP ACCIDENT THAT TOOK PLACE IN 2005 BOTH OCCURRED IN THE WALMART PARKING LOT (NEITHER SHOWN IN FIGURE).

LEGEND

- REAR END
- SIDE SWIPE
- RIGHT ANGLE
- FIXED OBJECT
- LEFT TURN
- HEAD-ON
- ANIMAL
- DEBRIS
- BACKING

JOB NUMBER:	08000727G	DATE:	12/23/08
SCALE:	1" = 70'	LATEST REVISION:	6/9/09
INDEX NUMBER:	HA024655	DESIGN BY:	NDA

FIGURE 32

**US ROUTE 22 CORRIDOR STUDY
2005 - 2007 ACCIDENT ANALYSIS
FOR
US ROUTE 22 & COUNTY ROUTE 519**

TOWN OF PHILLIPSBURG WARREN COUNTY NEW JERSEY

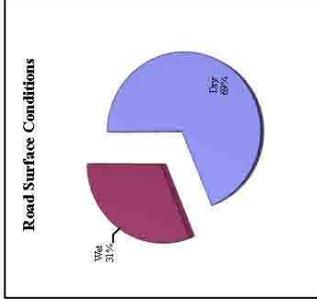
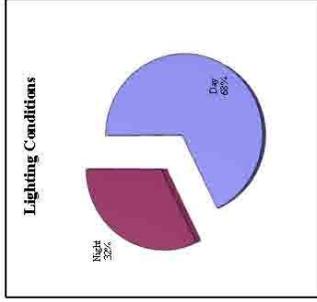
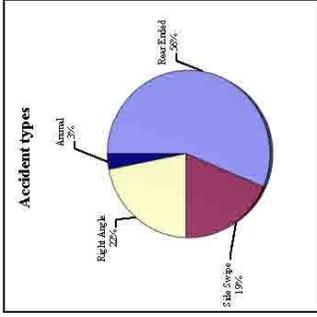
Regional Offices
 Rock Bank, N.J.
 Clinton, N.J.
 Logan, N.J.
 Mt. Arlington, N.J.
 Newburgh, N.Y.
 West Nyack, N.Y.
 Bethlehem, PA.

HAMILTON OFFICE
 American Metro Plaza
 100 American Metro Blvd., Suite 152
 Hamilton, N.J. 08619
 Phone (609) 587-8200
 Fax (609) 587-8280
 E-mail - solutions@maserconsulting.com

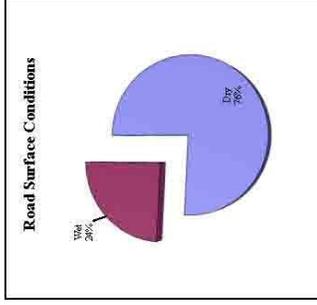
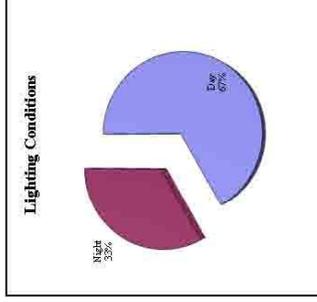
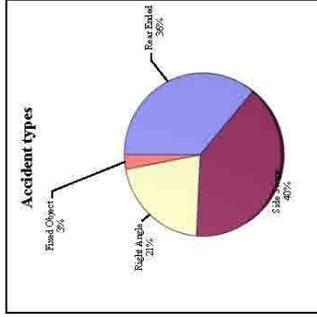
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 CONSULTING P.A.
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 State of N.J. Certificate of Authorization: 24GCA27886500

CHART 9 - THREE YEAR ACCIDENT REPORT SUMMARY: US ROUTE 22 AND ROUTE 122

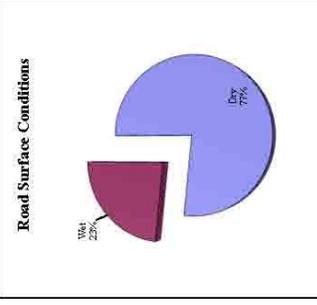
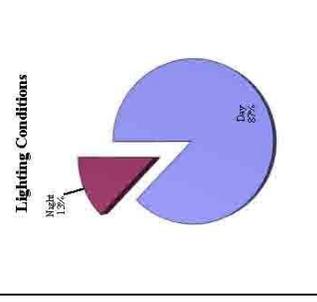
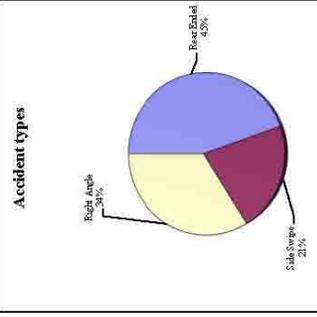
2005	Accident Type	Count	Conditions			
			Roadway Surface		Light Condition	
			Dry	Wet	Day	Night
	Rear Ended	18	10	8	13	5
	Side Swipe	6	4	2	4	2
	Right Angle	7	7		4	3
	Head On	0				
	Left Turn	0	0		2	
	Fixed Object	0				
	Parked	0				
	Pedestrian	0				
	Animal	1	1			1
	Bicycle	0				
	Total	32	22	10	23	11



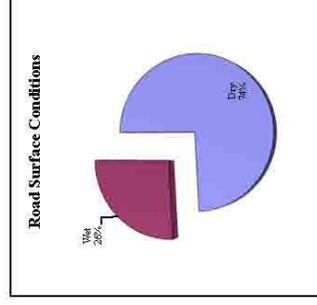
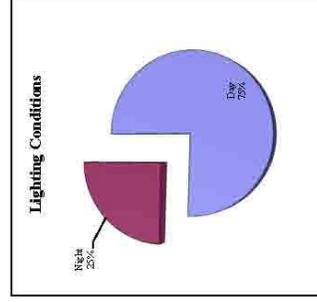
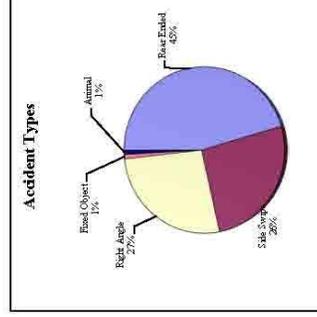
2006	Accident Type	Count	Conditions			
			Roadway Surface		Light Condition	
			Dry	Wet	Day	Night
	Rear Ended	12	8	4	9	3
	Side Swipe	13	10	3	10	3
	Right Angle	7	7		3	4
	Head On	0				
	Left Turn	0				
	Fixed Object	1			1	
	Parked	0				
	Pedestrian	0				
	Animal	0				
	Bicycle	0				
	Total	33	25	8	22	11

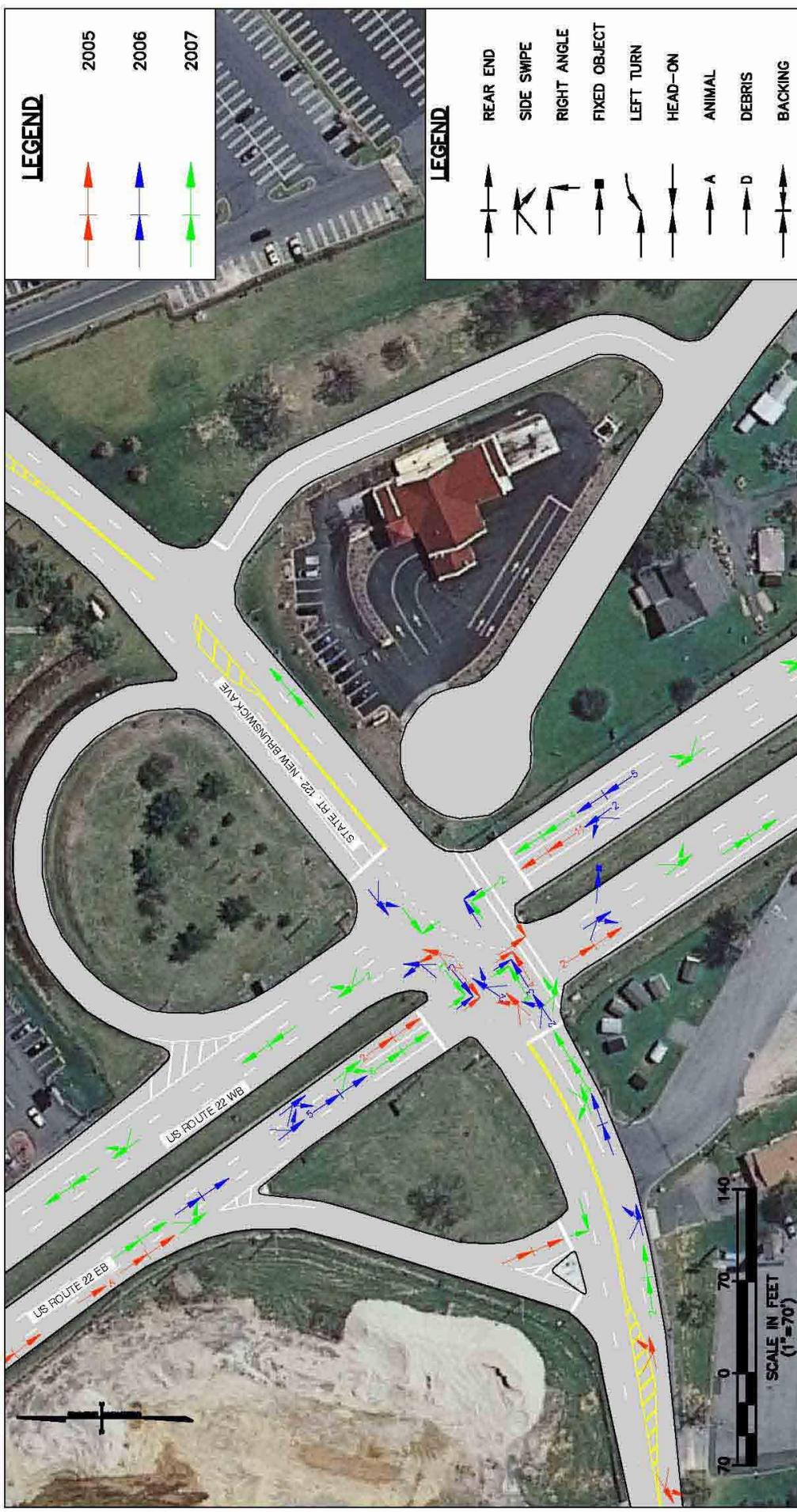


2007	Accident Type	Count	Conditions			
			Roadway Surface		Light Condition	
			Dry	Wet	Day	Night
	Rear Ended	21	16	5	19	2
	Side Swipe	10	9	1	9	1
	Right Angle	16	11	5	13	3
	Head On	0				
	Left Turn	0				
	Fixed Object	0				
	Parked	0				
	Pedestrian	0				
	Animal	0				
	Bicycle	0				
	Total	47	36	11	41	6



TOTAL	Accident Type	Count	Conditions			
			Roadway Surface		Light Condition	
			Dry	Wet	Day	Night
	Rear Ended	51	34	17	41	10
	Side Swipe	29	23	6	23	6
	Right Angle	30	25	5	20	10
	Head On	0	0	0	0	0
	Left Turn	0	0	0	2	0
	Fixed Object	1	0	1	0	1
	Parked	0	0	0	0	0
	Pedestrian	0	0	0	0	0
	Animal	1	1	0	0	1
	Bicycle	0	0	0	0	0
	Total	112	83	29	86	28





LEGEND

- 2005
- 2006
- 2007

LEGEND

- REAR END
- SIDE SWIPE
- RIGHT ANGLE
- FIXED OBJECT
- LEFT TURN
- HEAD-ON
- ANIMAL
- DEBRIS
- BACKING

JOB NUMBER: 080007276	DATE: 12/23/08
SCALE: 1" = 70'	LATEST REVISION: 6/3/09
INDEX NUMBER: HAO24655	DESIGN BY: NDA

FIGURE 33

**US ROUTE 22 CORRIDOR STUDY
2005 - 2007 ACCIDENT ANALYSIS
FOR
US ROUTE 22 & STATE ROUTE 122**

TOWNSHIP OF POHATCONG WARREN COUNTY NEW JERSEY

Regional Offices
 Red Bank, N.J.
 Clinton, N.J.
 Logan, N.J.
 Mt. Arlington, N.J.
 Newark, N.J.
 West Nyack, N.Y.
 Bethelham, PA.

HAMILTON OFFICE
 American Metro Plaza
 100 American Metro Blvd., Suite 152
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MASER CONSULTING P.A.
 Consulting, Municipal & Environmental Engineers
 Planners - Surveyors - Landscape Architects
 State of N.J. Certificate of Authorization: 24GAZ7988500

4.5.2 Accident Report Findings

After examining and organizing the accident data for the intersections within the US Route 22 corridor, the data was studied to determine any similarities the intersections may share. By comparing the results from several intersections, a better understanding of the driving conditions within the corridor can be achieved. The following information summarizes the findings of the accident data:

Based on the results of accident data, rear end (47%), side swipe (27%) and right-angle (13%) accidents are the most prevalent accident types.

The three-year statistical evidence shows the accident types account for eighty-seven percent (87%) of all accidents, with rear end accidents accounting for the largest percentage. These results are not uncommon, as these three accident types represent the most common types nationally.

Over seventy-five percent (75%) of the accidents occurred during daylight, dry roadway conditions.

With a large percentage of accidents occurring during these conditions, it can be stated that the roadway is designed safely and does not create unsafe driving conditions. Rather, driver awareness and decision making within the corridor is the cause of these accidents.

The large percentage of rear-end accidents may be the result of vehicle speed in the corridor.

The majority of rear-end accidents occur as a result of a trailing vehicle in traffic traveling at a speed which does not allow sufficient time to observe and react quickly enough to bring the vehicle to a stop prior to colliding with the lead vehicle. This trend is supported by the large number of rear-end accidents at the stop-controlled merge at Morris Street and US Route 22.

A review of the three-year accident data shows the US Route 22 corridor does not contain any unusual or alarming results. The three most common accident types correspond to national expectations and there are no uncommon accident types which have an exceeding large percentage. The number of rear-end accidents in the corridor may warrant closer examination of vehicle speed and traffic operations. However, the length and variance of traffic control within the corridor will make individual intersection examination a more appropriate approach. The following section provides an analysis of the intersection accident types which occurred at the five intersections highlighted in the previous section.

US Route 22 & Miller/Morris Street

This location has a high number of fixed object accidents. The accident reports indicate that the majority of these accidents occurred during wet driving conditions. Due to the wet driving conditions and vehicle speed on US Route 22, an increase in fixed object accidents occurred.



Increased signage prior to the horizontal curve and a reduced recommended speed would decrease the occurrence of this accident type.

The accident diagram also indicates that a large number of the accidents occurred at the merge to US Route 22. This accident type results from the vehicles attempting to enter US Route 22 following too closely at speeds which do not allow sufficient stopping distance, resulting in rear-end accidents. Increased signage and/or striping approaching the merge can be installed to slow vehicle speed and increase driver awareness.

US Route 22 & Roseberry Street

This intersection follows the expected accident type trend, with rear-end, side-swipe and right-angle accidents having the highest percentages. The accident reports show over 50% of the accidents are rear-end accidents, with a high number of multi-car collisions prior to the signalized intersection on US Route 22. These accidents are a product of driver awareness and can be decreased by installing traffic signal head signs (MUTCD Sign W3-3) and possibly increasing the visibility of the traffic signal heads.

US Route 22 & 1st Street

This intersection also has a high percentage of rear-end accidents, but also has an increased percentage of right-angle accidents (30%). The high number of right-angle accidents is a product of vehicles running red-lights. Increasing the minor street yellow time or major street clearance (all-red) time at the intersection may reduce this occurrence.

US Route 22 & County Route 519

With a 37% side-swipe accident occurrence, this intersection exceeds the corridor average. The accident diagrams show that these accidents mostly occur at or within the intersection traveling westbound on County Route 519. The varied lane assignments traveling through this intersection generates a high number of vehicles weaving and merging, which contributes to the high percentage of the side swipe accidents. The installation of signage prior to the intersection to indicate lane assignments is the most likely solution to reduce this occurrence.

US Route 22 & Route 122 (New Brunswick Avenue)

This intersection has a significant number of right-angle accidents, with 27% occurrence over a three-year period. Within the intersection, the occurrence of right-angle accidents is a product of vehicles running red lights and performing turning movements before the intersection is clear. Examining the signal timings revealed that the clearance (all-red) time for east/west movements is only two seconds and is the most likely cause of the accidents occurring within the



intersection. Increasing this time may decrease these accidents. Additionally, generating a lead phase for left-turn movements will allow them to proceed without any conflicting movements, reducing the possibility of accidents.

4.6 PEDESTRIAN & BICYCLE MOBILITY

In order to evaluate the pedestrian and bicycle mobility in the corridor, an inventory of the existing facilities and movements were observed along the corridor. The existing physical condition of the sidewalks and pedestrian equipment was observed and recorded during the field investigation. The volume and intensity of pedestrian and bicycle movements were explored throughout the corridor to determine the areas of peak pedestrian interest.

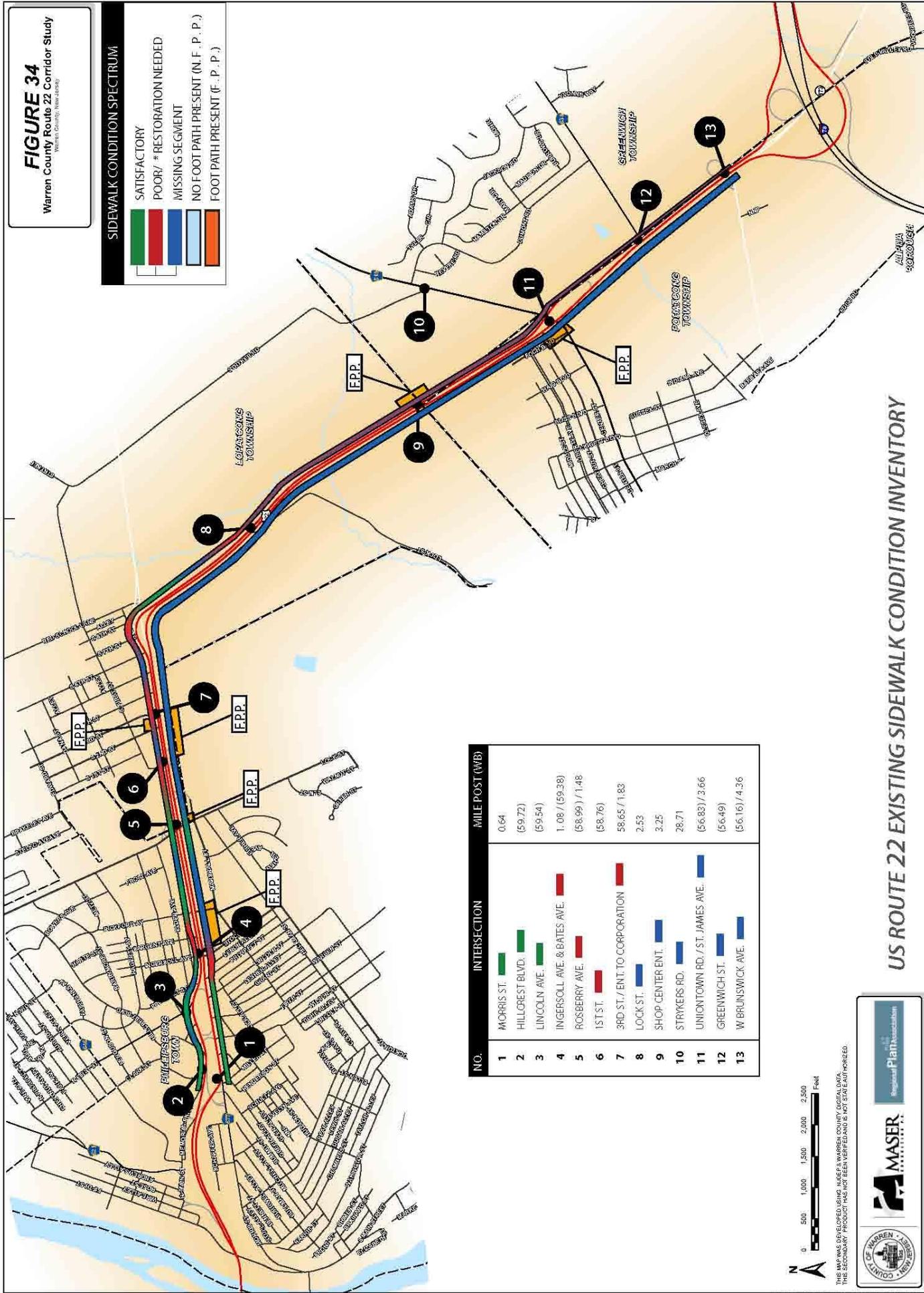
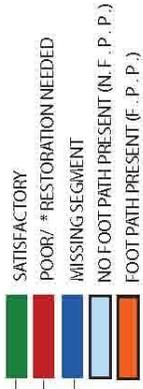
4.6.1 Sidewalk Inventory

The location and condition of the sidewalk in both directions throughout the study corridor were investigated. The inventory determined at which locations sidewalk was presently installed or missing. Where sidewalk was presently installed, the condition was classified as satisfactory or poor/restoration needed. At locations without sidewalk, the presence of pedestrian footpaths was recorded to determine if sidewalk should be installed. (see **Figure 34 - Existing Sidewalk Inventory Map**).

The results of the sidewalk inventory also determined the locations where the existing sidewalk should be restored or the installation of new sidewalk is recommended. **Table 16** details the areas where sidewalk restoration or installation is recommended.

FIGURE 34
Warren County Route 22 Corridor Study
Warren County, New Jersey

SIDEWALK CONDITION SPECTRUM



NO.	INTERSECTION	MILE POST (WB)
1	MORRIS ST.	0.64
2	HILLCREST BLVD.	(59.72)
3	LINCOLN AVE.	(59.54)
4	INGERSOLL AVE. & BATES AVE.	1.08 / (59.38)
5	ROSBERRY AVE.	(58.99) / 1.48
6	1ST ST.	(58.76)
7	3RD ST. / ENT. TO CORPORATION	58.65 / 1.83
8	LOCK ST.	2.53
9	SHOP CENTER ENT.	3.25
10	STRYKERS RD.	28.71
11	UNIONTOWN RD. / ST. JAMES AVE.	(56.83) / 3.66
12	GREENWICH ST.	(56.49)
13	W BRUNSWICK AVE.	(56.16) / 4.36



THE MAP WAS DEVELOPED USING MASER'S WARREN COUNTY DIGITAL DATA. THE SECONDARY PRODUCT HAS NOT BEEN VERIFIED AND IS NOT STATE AUTHORIZED.

US ROUTE 22 EXISTING SIDEWALK CONDITION INVENTORY

Table 16 – US Route 22 Sidewalk Restoration/Installation Recommendations

US ROUTE 22	LOCATIONS	CONDITION	RECOMMENDATION
Westbound	Warren Street to Hillcrest Avenue	Restoration Required	Restore sidewalk. Install depressed curbs and textured accessible ramps.
Eastbound	Lincoln Street, Prospect Street & Bates Street	Restoration Required	Restore sidewalk. Install depressed curbs and textured accessible ramps at Prospect Avenue.
Westbound	Ingersoll to Lincoln Road	Restoration Required, Pedestrian Footpath Present	Restore/Install sidewalk; install depressed curbs and textured accessible ramps as needed.
Westbound	Pickford Avenue, Northeast Approach	Missing/No Facilities Present	Install sidewalk, depressed curbs and textured accessible ramps as needed.
Eastbound	Bates Avenue to Pickford Avenue	Missing, Pedestrian Footpath Present	Install sidewalk with depressed curbs and textured accessible ramps.
Eastbound	Roseberry Street, Southeast Corner	Missing, Pedestrian Footpath & Facilities Present	Install sidewalk with depressed curbs and textured accessible ramps.
Westbound	Roseberry Street, Northeast Corner	Missing/Restoration Required	Restore sidewalk; Install sidewalk, depressed curbs and textured accessible ramps as needed.
Eastbound	1st Street to 3rd Street, Commerce Park	Missing, Pedestrian Footpath Present	Install sidewalk with depressed curbs and textured accessible ramps.
Westbound	4th Street to 1st Street	Pockets of Missing/Damaged Sidewalk	Install/Restore sidewalk; Install depressed curbs and textured accessible ramps as needed.
Intersection	Shopping Center Drive	Missing, Crosswalks & Pedestrian Facilities Present	Install depressed curbs and textured accessible ramps at crossing locations.
Intersection	County Route 519	Missing, Crosswalks & Pedestrian Facilities Present	Install sidewalks, depressed curbs and textured accessible ramps at crossing locations.
Intersection	Greenwich Street	Missing, Crosswalks & Pedestrian Facilities Present	Install sidewalks, depressed curbs and textured accessible ramps at crossing locations.
Intersection	Route 122	Missing, Crosswalks & Pedestrian Facilities Present	Install sidewalks, depressed curbs and textured accessible ramps at crossing locations.

4.6.2 Pedestrian Mobility

In addition to examining the physical condition of the sidewalk, pedestrian movements within the corridor during the PM and SAT Peak Hours were examined to determine the locations of intense pedestrian activity. The MTCs performed in the data collection process were utilized, as well as field



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investigations, during which pedestrian facilities and sidewalk inventory were photographed and the daily pedestrian activity was observed.

To the extent there are pedestrian movements, they are concentrated within the first two miles of the corridor (Morris Street to 3rd Street). Pedestrians were observed crossing US Route 22 at mid-block locations, particularly between Roseberry Street and Morris Street. Again, this is due to the inadequacy of pedestrian facilities and opportunities to cross US Route 22 at marked crosswalks in this area. One pedestrian overpass does exist at Morris Street; however, it is difficult to get access to.

Data collection did indicate that pedestrian movements occur more often during the SAT Peak Hour. However, the increase is not truly significant. The two locations that generated the highest number of pedestrian activity on Saturday were the intersections of Ingersoll/Bates Avenue and Roseberry Street. At Ingersoll/Bates Avenue, nine pedestrian movements occurred during the peak hour time period, and all were traveling southbound. At Roseberry, 23 pedestrian movements occurred, with ten traveling north/south and 13 traveling east/west.

The lack of pedestrians documented in the survey is not the main issue; it is the unsafe conditions for pedestrians crossing US Route 22. Also with the construction of the new High School off Roseberry Street, north of US Route 22, and the conversion of the old High School into a Middle School with younger children then crossing US Route 22 from the Phillipsburg high density residential areas south of US Route 22, the safety problems crossing the US Route 22 will be even more exacerbated.

4.6.3 Pedestrian Facilities

The final aspect of pedestrian mobility along a corridor is an inventory and assessment of the pedestrian facilities present at each intersection. This inventory includes the position and physical condition of pedestrian signal heads, pedestrian push-buttons, signage, textured handicap accessible ramps and striped crosswalks. At most locations, three or more pedestrian facility features are currently installed. Five intersections have complete pedestrian facilities installed and all of the signalized intersections contain pedestrian push-buttons. Some locations will require the existing facilities be upgraded; however, the missing facilities will be the first priority. The signal timings at the pedestrian facilities should be evaluated to ensure adequate time to provide safe passage. Midblock refuge islands should also be considered as these crossings are redesigned. **Table 17** identifies the intersections along the corridor, the condition of the existing pedestrian facilities and the recommended improvements.



Table 17 – US Route 22 Pedestrian Facility Conditions/Recommendations

Intersection	Pedestrian Facilities				
	Ramps	Crosswalks	Signage	Signal Heads	Push-Buttons
Morris Street	X	X	X		
Restore handicap accessible ramps and install crosswalk at existing school crossing location.					
Hillcrest Avenue	X	X	X	X	X
The existing facilities are in good physical and operating condition. No improvements required.					
Lincoln Avenue	X	X			
The existing facilities are in good physical and operating condition. No improvements required.					
Ingersoll/Bates Avenue	X	X	X	X	X
Pedestrian push buttons, signage and signal heads antiquated; install new equipment. Install textured handicap accessible ramps					
Roseberry Street	X	X	X	X	X
The existing facilities are in good physical and operating condition; accessible ramp on southeast corner located outside existing crosswalk.					
1st Street	X	X			X
Install crosswalk, pedestrian signal heads and textured ramps at push-button location for crossing us route 22. Update push-button signs.					
3rd Street	X	X		X	X
Install crosswalk and textured ramps at us route 22 crossing. Pedestrian push buttons, signage and signal heads antiquated; install new equipment.					
Lock Street					
No pedestrian facilities present at this intersection; no improvements recommended.					
Shopping Center Drive		X	X	X	X
Pedestrian push buttons, signage and signal heads antiquated; install new equipment. Install textured handicap accessible ramps					
County Route 519			X	X	X
Remove all pedestrian facilities, install new pedestrian equipment, and provide striped crosswalks with textured handicap accessible ramps.					
Greenwich Street	X	X	X	X	X
Pedestrian push buttons, signage and signal heads antiquated; install new equipment.					
Route 122	X	X	X	X	X
Remove all pedestrian facilities, install new pedestrian equipment, and provide striped crosswalks with textured handicap accessible ramps.					

4.6.4 Bicycle Facilities

Bicycle facilities are needed in the study area. Study participants have indicated that many people bicycle on U.S. Route 22 to get to work, shopping and other uses. They are traveling under unsafe conditions, since there are no bicycle facilities on the corridor. Use of sidewalks is problematic since there are many missing links and the sidewalks are not designed for bicycle traffic.

Within the five Study Area municipalities, three -- Greenwich, Pohatcong and Phillipsburg -- have Bicycle Facilities Master Plan components. However, these plans are not coordinated or linked, which is important to establish an integrated multi-modal network. A needed bike connection was identified to serve the new High School on Roseberry Street. The proposed pedestrian overpasses at Warren Street and Roseberry Street should be designed to accommodate bicyclists. Along the US Route 22 corridor, bicycle facilities will need to be designed as separate lanes or provided as off-road mixed pedestrian/bicycle paths. The use of local streets as alternative bicycle routes connecting major community facilities such as schools, post office, churches, parks, and shopping and employment facilities must be considered.

4.7 ADJACENT LAND USE & ACCESS ANALYSIS

To facilitate the traffic impact analysis on US Route 22, the existing traffic operations at the adjacent land uses within the corridor were examined. This analysis included locating each access point, measuring the distance between driveways and identifying major trip generators. This information allows for the determination of any site access points that can be relocated, eliminated or combined in an attempt to minimize vehicular conflict.

4.7.1 Site Access Evaluation

The *New Jersey State Highway Access Management Code* (N.J.A.C. 16:47-3.8) determines the standards for all access point dimensions, including curblin opening, curb radius, driveway width, access point angle, corner clearance, edge clearance and driveway distance (the distance between two access points). The Access Code requirements applicable to the US Route 22 Corridor Study are listed in **Table 18**.



Table 18 – Highway Access Management Code: Access Point Control Dimensions

Requirement	Access Point Requirement					
	Residential			Non-Residential		
Distance	Minimum	Desirable	Maximum	Minimum	Desirable	Maximum
Curblin Opening	12'	-	30'	24'	-	50'
Driveway Width	One-Way	8'	26'	20'	34'	40'
	Two-Way			20'	-	46'
Access Point Angle	One-Way	45° Minimum				
	Two-Way	60°	90°	90°	60°	90°
Driveway Spacing	24' As Measured between Curblin Openings					

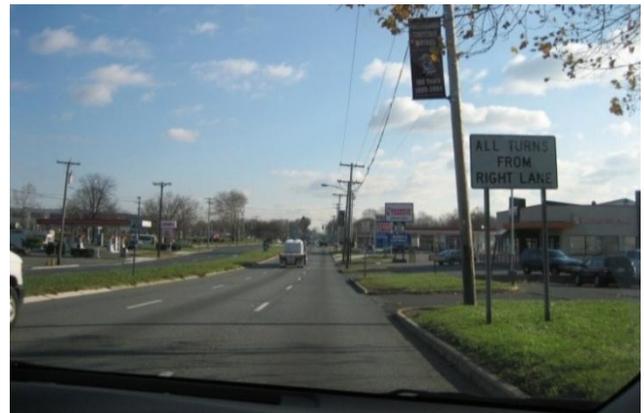
The spacing between the access points was examined with respect to the four criteria listed in **Table 18**. This review identified the most critical areas, where the density or design of access points is hazardous. This included the following areas:

The first is west of the Roseberry Street intersection with US Route 22. The eastbound travel lanes contain six access points in the final 400' of the approach to the signal. All six of the access point service different land uses; however, the land uses at this location operate within a single lot, which enables vehicles to travel freely between the sites. Additionally, on-site measurements show that the NJDOT requirement of 24 feet between curblin openings is violated at this location.

The access points to the Dunkin' Donuts and Rudy's Car Wash are situated in such a manner that the distance between them is approximately 15 feet. The second location is at the entrance to the Exxon Gas Station. Both of these locations are shown in the following photographs.



Exxon Gas Station



Dunkin' Donuts/Rudy's Car Wash

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On the westbound approach of US Route 22, following Roseberry Street, there is a Burger King restaurant which has approximately 270 feet of frontage on US Route 22. This property contains four site access points whereas only one, possibly two, are necessary. Additionally, there is a fifth driveway located adjacent to the Burger King property accessing Warren Lanes Recreation Center. This section of roadway should be redesigned to reduce the number of access points and create safer, more accessible driving conditions. The photograph inset illustrates the condition described above.



Burger King

Traveling east on US Route 22, the next section of roadway that has inadequate access is located on the westbound travel lane east of the intersection with 3rd Street. At this location, the sidewalk and curblineline is damaged, preventing safe vehicle movements into/out of the adjacent land uses. This section of sidewalk and curbing should be replaced to ensure safe vehicle movements. The inset photograph illustrates the section of roadway.



East of 3rd Street

4.7.2 Adjacent Land Use Identification

US Route 22 is a major arterial in New Jersey serving as a link from Pennsylvania to Route 57 and I-78 in New Jersey. This roadway sustains significant traffic volumes on a daily basis, during the average weekday and weekend.

An analysis of the corridor was performed to identify the surrounding land uses and determine the most intense trip generators. The *ITE Trip Generation Manual* was utilized to calculate the daily and peak hour vehicle trips. To qualify the land uses that were the most intense, the classification outlined in the *New Jersey State Highway Access Management Code* (N.J.A.C. 16:47-4.4) was used.

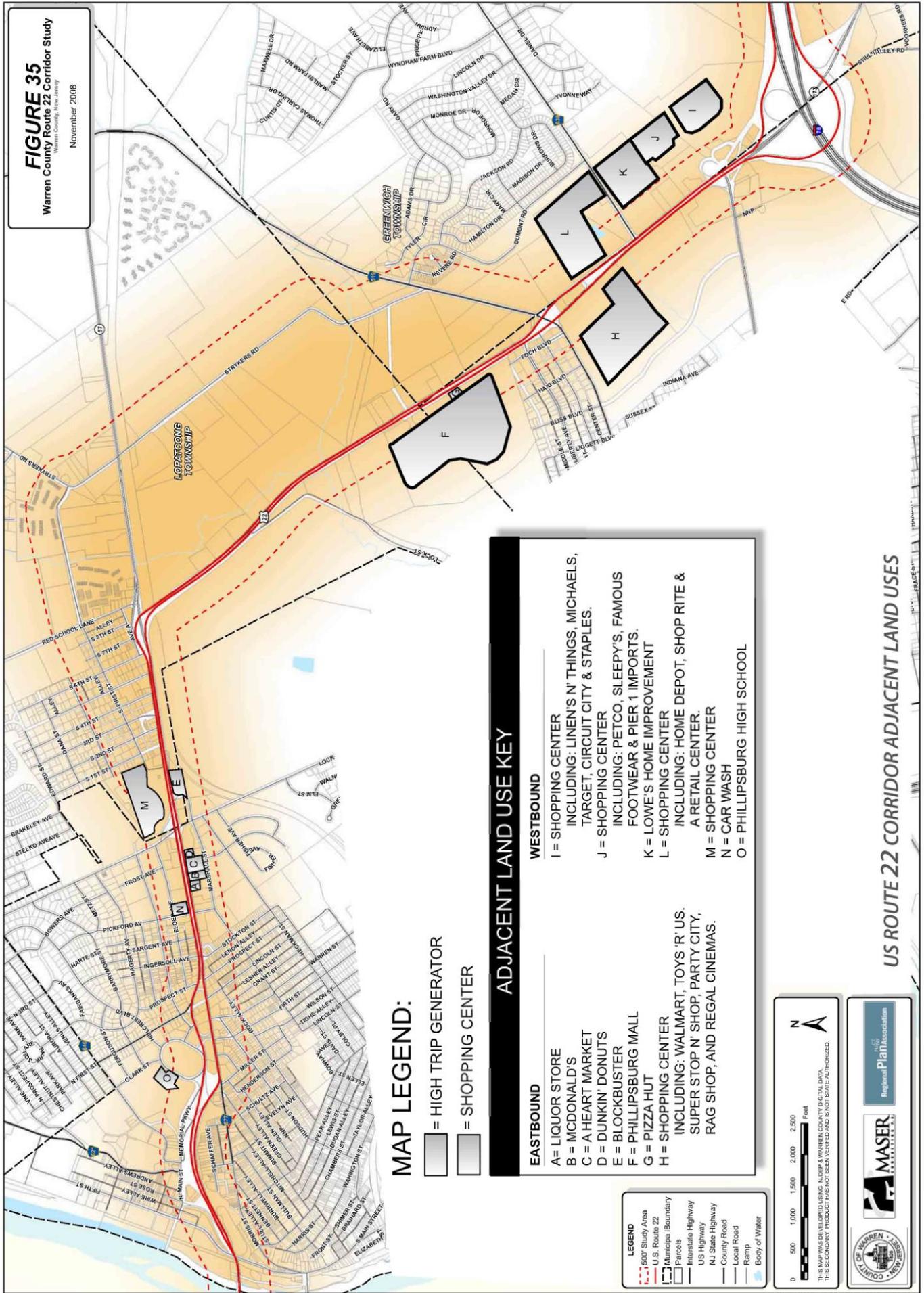
For this project, all land uses that generate under 500 daily trips (minor applications as per the Access Code) are classified as low intensity. All land uses that generate over 500 daily trips but less than 200 peak hour trips (major applications) were classified as moderate intensity. Finally, all land uses

generating over 500 daily trips and more than 200 peak hour trips (major applications with planning) were considered the most-intense and classified as high-intensity land uses. (See **Table 19 – Highway Access Management Code: Land Use Intensity Determination.**)

Table 19 – Highway Access Management Code: Land Use Intensity Determination		
Intensity	Vehicle Trips	
	Vehicles Per Day (VPD)	Peak Hour Trips (VPH)
Low	< 500	N/A
Moderate	> 500	< 200
High	> 500	> 200

Similar to the access point study, this analysis concentrated on the areas which have a high density of land uses. **Figure 35** details the areas of high-intensity land use.

FIGURE 35
Warren County Route 22 Corridor Study
Warren County, New Jersey
November 2008



MAP LEGEND:

- = HIGH TRIP GENERATOR
- = SHOPPING CENTER

ADJACENT LAND USE KEY

EASTBOUND

- A = LIQUOR STORE
- B = MCDONALD'S
- C = A HEART MARKET
- D = DUNKIN' DONUTS
- E = BLOCKBUSTER
- F = PHILLIPSBURG MALL
- G = PIZZA HUT
- H = SHOPPING CENTER
INCLUDING: WALMART, TOYS 'R US,
SUPER STOP N' SHOP, PARTY CITY,
RAG SHOP, AND REGAL CINEMAS.

WESTBOUND

- I = SHOPPING CENTER
INCLUDING: LINEN'S N' THINGS, MICHAELS,
TARGET, CIRCUIT CITY & STAPLES.
- J = SHOPPING CENTER
INCLUDING: PETCO, SLEEPY'S, FAMOUS
FOOTWEAR & PIER 1 IMPORTS.
- K = LOWE'S HOME IMPROVEMENT
- L = SHOPPING CENTER
INCLUDING: HOME DEPOT, SHOP RITE &
A RETAIL CENTER.
- M = SHOPPING CENTER
- N = CAR WASH
- O = PHILLIPSBURG HIGH SCHOOL

LEGEND

- 500' Study Area
- U.S. Route 22
- Municipal Boundary
- Parcels
- Interstate Highway
- U.S. Highway
- NJ State Highway
- County Road
- Local Road
- Ramp
- Body of Water

0 500 1,000 1,500 2,000 2,500 Feet

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US ROUTE 22 CORRIDOR ADJACENT LAND USES

4.8 TRANSIT FACILITIES

4.8.1 Bus Services

In the US Route 22 corridor, two bus routes are operated by Wheels Suburban Transportation Services (Wheels), a system of routes owned and operated by NJTransit in several counties in western New Jersey, including Warren County. Wheels utilizes minibuses and cutaway vans. NJTransit Bus Route 890 and Route 891 provide service from Easton, PA to Pohatcong Plaza in NJ. The service is run by Trans Bridge Lines. Both routes have only one stop in Easton at Northampton Street and Centre Square. After crossing the Delaware River, the lines separate and perform several stops on a variety of local roadways, minor arterials and urban collectors within Phillipsburg. The bus routes operate on a flexible schedule, allowing more stops within Phillipsburg to be made. However, each route contains time-point stops, which are the baseline for scheduling. Eventually, both routes return to US Route 22 and share stops at the following locations:



Wheels Minibus

Transit Stop	Stop Location
1. Hillcrest Mall	Roseberry Street and US Route 22
2. Warren Hospital	Roseberry Street and John Mitchell Avenue
3. Phillipsburg Municipal Building	Frost Avenue and Corliss Avenue
4. Phillipsburg Mall	Rear of the Phillipsburg Mall Access Road
5. Pohatcong Plaza	St. James Avenue and South Main Street

These five shared stops are considered as the most popular destinations, given their designation as time-point stops in the bus schedule. Both bus routes service Phillipsburg High School at Hillcrest Boulevard; however, the service is limited and scheduled around school arrival and dismissal times.

A third transit system serving the US Route 22 corridor is the Route 57 shuttle. Originally initiated in 2001 with Federal Transit funds through the Job Access Reverse Commute Program, the Route 57 shuttle is supported by Warren County. It operates as a flag-down service with two runs from Phillipsburg to Washington, NJ. One shuttle runs from Washington to Hackettstown with a transfer point at the Wheels Minibus facility. The Phillipsburg run operates two vehicles, the first starting at Warren Hospital at 7:00 am and 8:00 am. Each vehicle travels down Roseberry Street to Marshall and Heckman Streets. It continues on the route going south on Roseberry Street. It then travels on Sitgreves Street connecting to South Main Street. The bus then meets US Route 22 eastbound, travelling to the Phillipsburg Mall and then the Wal-Mart Plaza. It then continues on County Route 519 and connects

Promoting Smart Growth

with Route 57, stopping at the Warren County Community College, and other points to the transfer point. (See **Figure 36 - US Route 22 Corridor Transit Facilities**).

4.8.2 Rail Service

Currently, NJTransit provides limited transit services in Warren County, with only one train station located within the County limits. This station is located in Hackettstown, NJ on the M&E Morristown and Montclair-Boonton Line. Hackettstown is located in the northeastern quadrant of Warren County and is not easily accessible from the study corridor, which is in the southwestern section of Warren County.

The train line that provides service closest to the US Route 22 corridor is the Raritan Valley Line, which provides service from Newark Penn Station, Essex County, NJ westbound to the final stop in High Bridge, Hunterdon County, NJ. The train station in High Bridge is located approximately 17.5 miles southeast of the I-78 and US Route 22 interchange and is accessible by traveling eastbound on I-78 to Exit 16 (Route 31 northbound). The estimated time of travel from the interchange to the train station is twenty-two (22) minutes. The train station is located on North Main Street in High Bridge Borough and there is a municipally owned park-and-ride parking lot approximately 300 feet west of the station, which contains 45 parking spaces. There are no fees for parking, except for a \$35 fee for overnight parking. On-street parking is also available in the vicinity.

4.8.3 Park-and-Ride Services

The park-and-ride service provided along the US Route 22 corridor is located in the rear of the Phillipsburg Mall. Surveys were completed in April 2006 at the Phillipsburg Mall park-and-ride as part of the *I-78 Corridor Transit Study*³. When the survey was completed, 88 of the 127 total spaces were occupied and 53 surveys were completed. The results of the survey responses can be summarized as follows:

- 60% of riders were traveling from New Jersey and 40% were traveling from Pennsylvania
- 96% of riders were traveling to New Jersey and 4% were traveling to Pennsylvania
- 98% of drivers drove alone to get to the park-and-ride; 2% carpoled
- 94% were taking the bus and 6% were carpooling or vanpooling to get to their destination from the park-and-ride

The most important statistic from the surveys is the low percent occupancy at the park-and-ride. It should be noted that this facility is not properly identified with signage along the US Route 22 Corridor. Residents who might consider using this service may not even be aware that it exists behind the

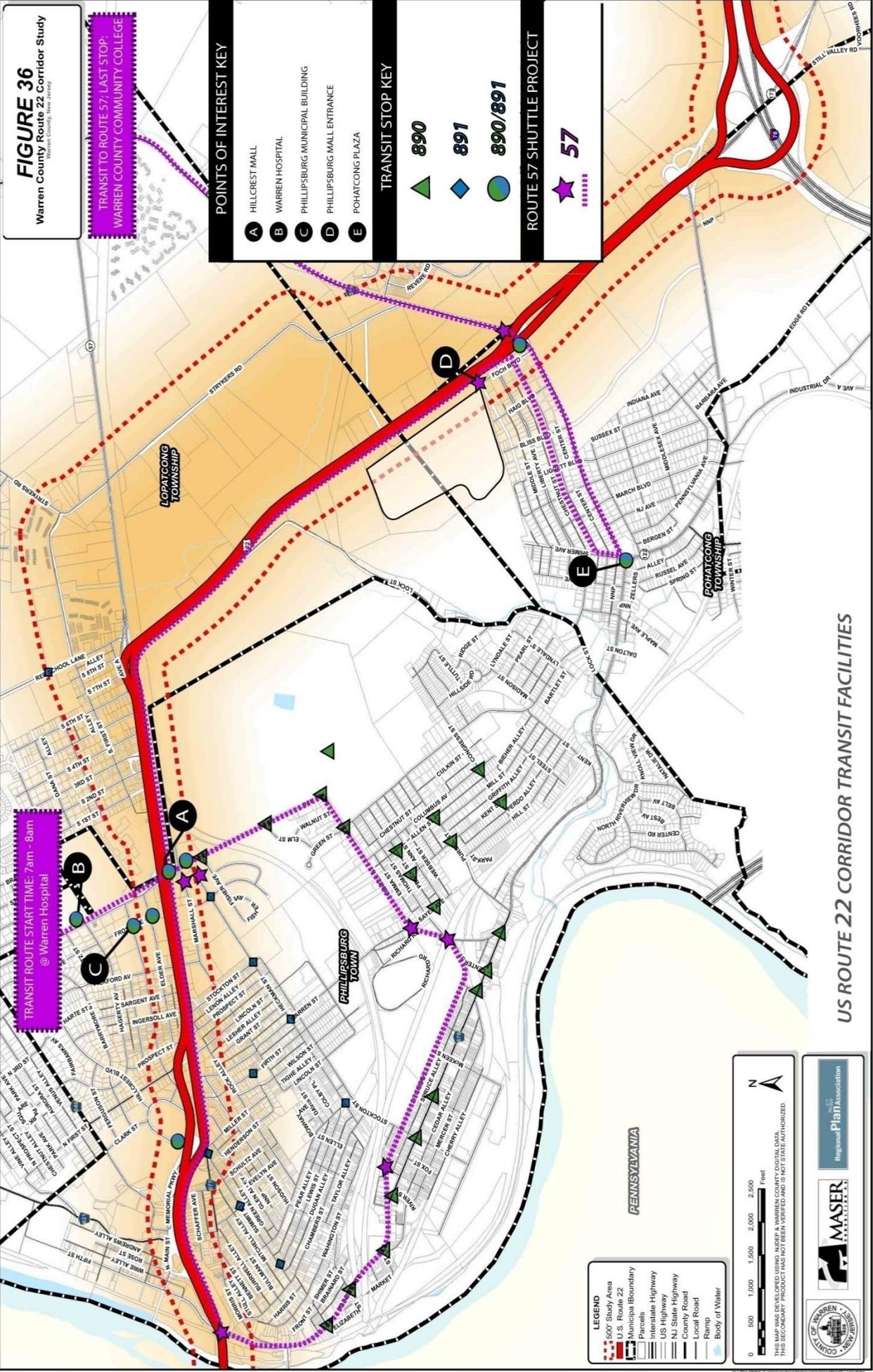
³ North Jersey Transportation Planning Authority, Inc. (2008). *Interstate 78 Corridor Transit Study*.



Phillipsburg Mall. Providing a wayfinding system for motorists on US Route 22 would help to increase park-and-ride use and decrease congestion on US Route 22 and other adjacent highways.



FIGURE 36
Warren County Route 22 Corridor Study
Warren County, New Jersey



TRANSIT ROUTE START TIME: 7am - 8am
@ Warren Hospital

TRANSIT TO ROUTE 57, LAST STOP:
WARREN COUNTY COMMUNITY COLLEGE

POINTS OF INTEREST KEY

- A** HILLCREST MALL
- B** WARREN HOSPITAL
- C** PHILLIPSBURG MUNICIPAL BUILDING
- D** PHILLIPSBURG MALL ENTRANCE
- E** POHATCONG PLAZA

TRANSIT STOP KEY

- 890** (Green Triangle)
- 891** (Blue Diamond)
- 890/891** (Green Circle)

ROUTE 57 SHUTTLE PROJECT

- 57** (Purple Star)

LEGEND

- 500' Study Area
- U.S. Route 22
- Municipal Boundary
- Parcels
- Interstate Highway
- US Highway
- NJ State Highway
- County Road
- Local Road
- Ramp
- Body of Water

0 500 1,000 1,500 2,000 2,500 Feet

WARREN COUNTY, NEW JERSEY

THIS SECONDARY PRODUCT HAS NOT BEEN VERIFIED AND IS NOT STATE AUTHORIZED.

MASER
REGIONAL PLANNING ASSOCIATION

WARREN COUNTY, NEW JERSEY

US ROUTE 22 CORRIDOR TRANSIT FACILITIES

5. FUTURE ROADWAY CONDITIONS

5.1 2035 LAND USE BUILD-OUT & ANALYSIS

A build-out study was performed to compile projected development conditions within the five Study Area municipalities. This build-out was used to evaluate 2035 traffic conditions within the US Route 22 corridor. The build-out data was compiled by the WCPD. Each municipality was contacted to obtain or confirm pending or approved development applications.

The WCPD also compiled a list of all vacant properties within the Study Area. The entire Study Area is within the Highlands Region. Greenwich, Lopatcong and Pohatcong Townships have both preservation and planning area designations. Lands within the Highlands Preservation Areas were excluded from the build-out.

Each vacant property or planned or approved development was included in the build-out analysis. Warren County had previously developed a Traffic Analysis Zone (TAZ) map for the County, which was utilized for the build-out. The Study Area includes 21 TAZs. A spreadsheet was created listing each vacant or planned property within the 21 TAZs. This spreadsheet contained applicable data such as lot size, environmental constraints and zoning designation, which was used to project the build-out potential for each property under the current zoning. Based upon the zoning classification, each proposed land use was classified into one of three categories; office, retail, or residential.

A review of the full build-out indicated that the projected non-residential development far exceeded historic trends. For example, the projected growth of jobs to housing ratio was about eight jobs for every housing unit. The current job to housing ratio is about one job to one housing unit for the Study Area. This high level of projected growth at full build-out was not considered a likely trend given a number of factors including the current high office vacancy where there is a negative absorption of occupied building floor space in the region, the high level of retail development available and planned, such as the 220,000 square foot Wal-Mart facility, and other retail space available for possible renovation. After consultation with Warren County, it was determined that the 2035 build-out should utilize about 33% of the full build-out estimate for non-residential development. The housing projections were determined reasonable as computed under full build-out and were retained. **Table 20** below summarizes the projected 2035 build-out for each municipality.



Municipality	Residential (Units)	Retail (SF)	Office (SF)
Alpha	200	0	352,299
Greenwich	74	182,765	618,242
Lopatcong	96	214,239	151,739
Phillipsburg	342	4359	857,554
Pohatcong	865	245,032	643,017
Total	1577	646,395	2,622,851

The highest build-out of residential and retail uses is within Pohatcong. This includes the approved Regency Residential Development and Wal-Mart Super Center. Also, the highest build-out of office uses are within Phillipsburg, corresponding to the planned redevelopment of the Ingersoll Rand site.

5.1.1 Build-out Trip Generation

The estimated number of trips per vacant buildable lot in the Study Area was calculated using the *Trip Generation Manual*⁴. The trip rates represented in **Table 21** reflect the appropriate ITE calculation applied to the land use type and time of day.

	Residential (X = # of units)	Retail (X = SF/1000)	Office (X = SF/1000)
PM Peak Hour	1.01 * X	3.73 * X	1.49 * X
SAT Peak Hour	0.93 * X	4.89 * X	0.41 * X

The trip rates were reduced by eliminating pass-by trips. A pass-by trip is when a motorist, whose primary purpose for traveling on the adjacent roadway is an alternative destination, stops at other facilities before continuing to their primary destination. Pass-by trips are usually associated with commercial/retail land uses. The *Trip Generation Handbook* provides a pass-by trip percentage of 34% during the PM Peak Hour and 26% during the SAT Peak Hour. These percentages were applied only to the retail lots within the Study Area. **Table 22** displays the volumes generated by each land use per

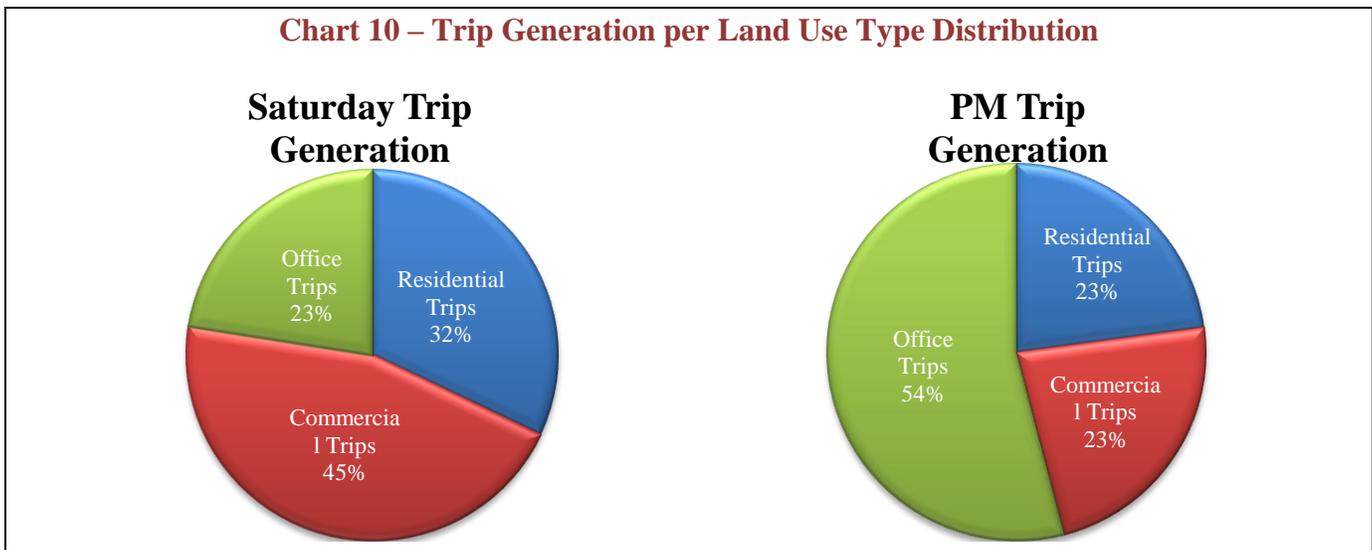
⁴ Institute of Transportation Engineers (2008). *Trip Generation Handbook*, 8th Edition.



municipality. The total build-out volumes yield 5,819 trips during the PM Peak Hour and 3,904 trips during the SAT Peak Hour.

Municipality	Residential (Units)		Retail (SF)		Office (SF)	
	PM	SAT	PM	SAT	PM	SAT
Alpha	193	178	0	0	234	69
Greenwich	48	75	375	550	924	257
Lopatcong	111	93	529	777	227	63
Phillipsburg	365	315	198	94	1129	314
Pohatcong	614	591	240	352	632	176
Total	1331	1252	1342	1773	3146	879

The highest numbers of trips are generated in Phillipsburg during the PM Peak Hour. **Chart 10** highlights the percent makeup of each type of land use per the PM and SAT Peak Hour.



Most of the trip volumes are generated from the office uses during the PM Peak Hour and by retail/commercial uses during the SAT Peak Hour. This matches the build-out calculations of a large office presence having an impact on a weekday evening and retail impacting the SAT Peak Hour.

5.1.2 Build-out Trip Distribution

In order to properly assign the build-out growth, several gravity models were created to ensure trip distribution accuracy. A gravity model can predict the flow of goods, communication, or in this case, people, between any two places. The gravity model determines trip distribution to or from a proposed site based on societal factors, such as population, job availability, travel distance, travel time, etc. By combining several factors into equations, a trip distribution for each individual build-out lot can be determined. Three types of gravity models were utilized:

1. Job availability to distribute the residential trips;
2. Number of households to distribute the retail trips, and
3. Population to distribute the office trips.

A 20-mile market area radius was used for this distribution. The market area or trade area is the geographic area where people will be drawn to the properties which are being developed. The market area included Warren, Morris, Hunterdon and Somerset Counties in New Jersey, as well as Northampton County in Pennsylvania. Overall, the model included 53 municipalities in New Jersey and 41 in Pennsylvania.

In comparison to the existing volumes on US Route 22, traffic is projected to increase from 39% to 75% in the PM Peak Hour and from 39% to 87% during the SAT Peak Hour, depending on the location along the corridor. For both peak hours, the highest volume increase occurs at the intersection of Route 122. **Charts 11 and 12** display the existing volumes along US Route 22 compared to the build-out volumes along US Route 22 at each study intersection during the PM and SAT Peak Hours.

Figures 37 and 38 depict the build-out volumes along the US Route 22 corridor.



Chart 11 – PM Existing vs. Build-out Volumes

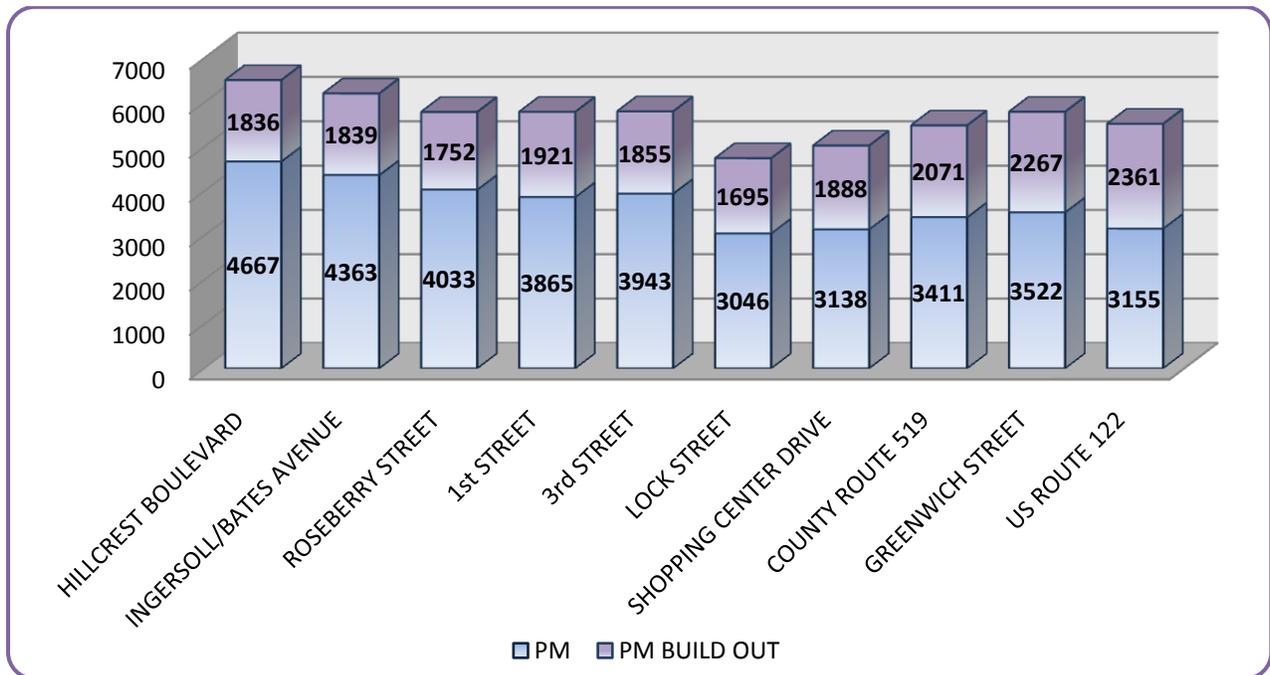


Chart 12 – SAT Existing vs. Build-out Volumes

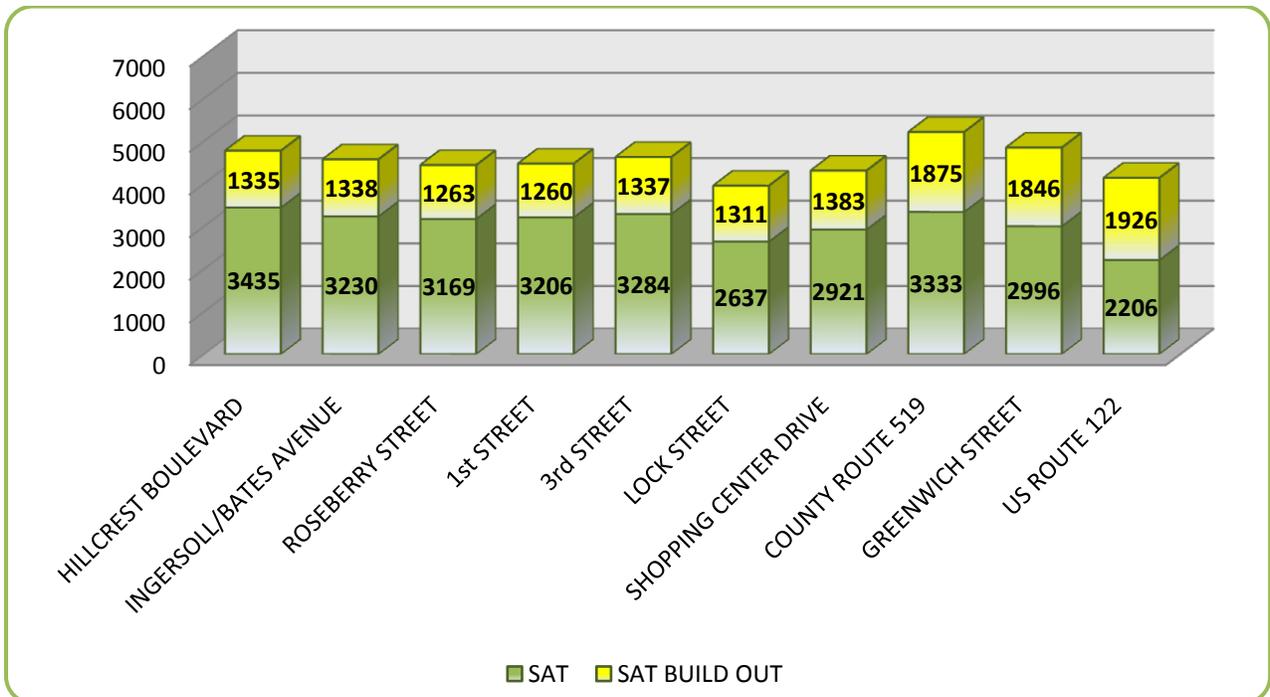
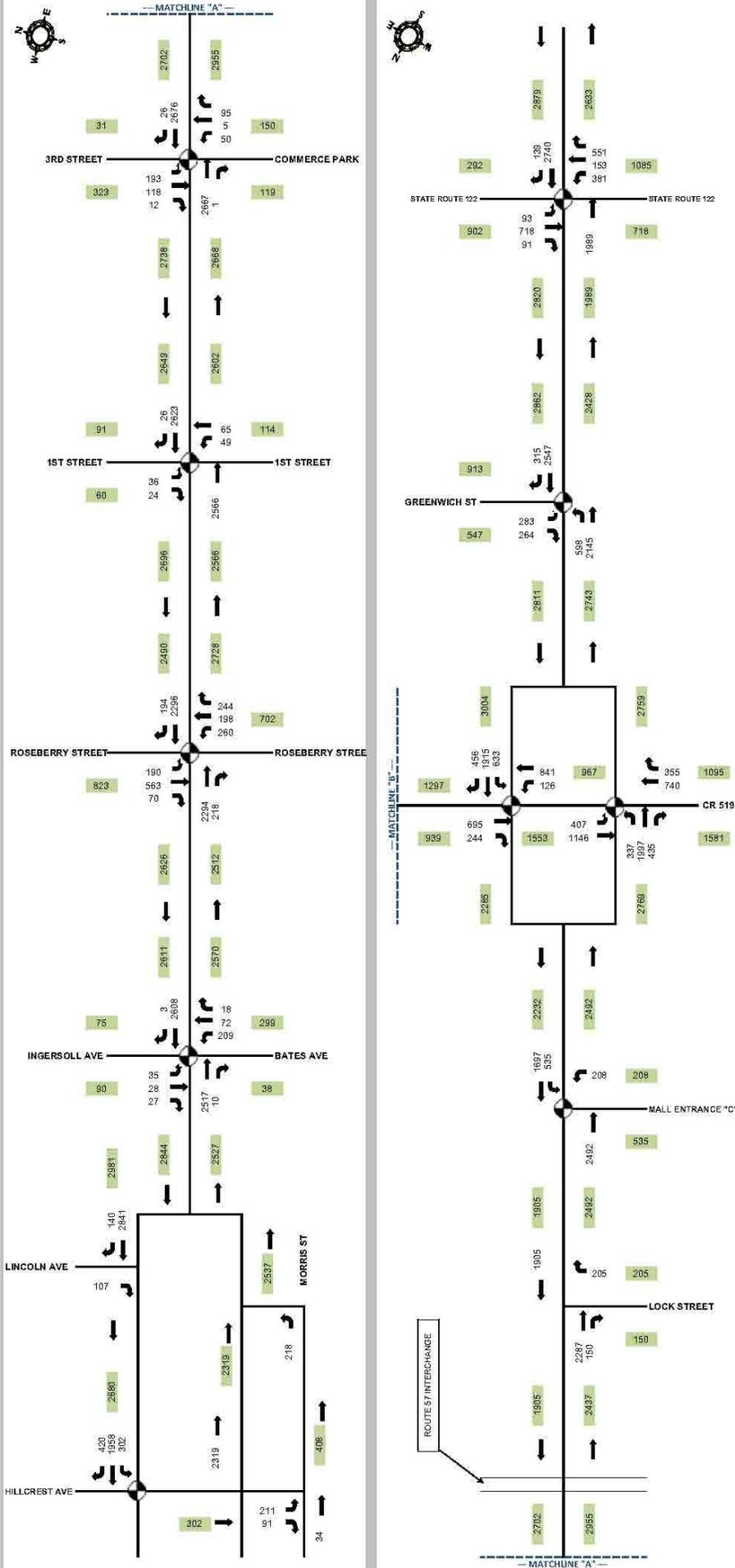


FIGURE 38

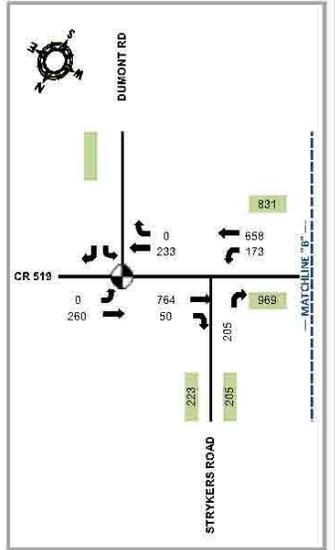
BUILD-OUT CONDITIONS - SAT PEAK HOUR
US ROUTE 22 - TRAFFIC VOLUMES



LEGEND

- Signalized Intersection
- Through Movement
- Turning Movement
- Myomet Traffic Volume
- Approach Totals

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PARTNERS - SURVEYORS - LANDSCAPE ARCHITECTS



5.1.3 2035 Build-out Analysis Results

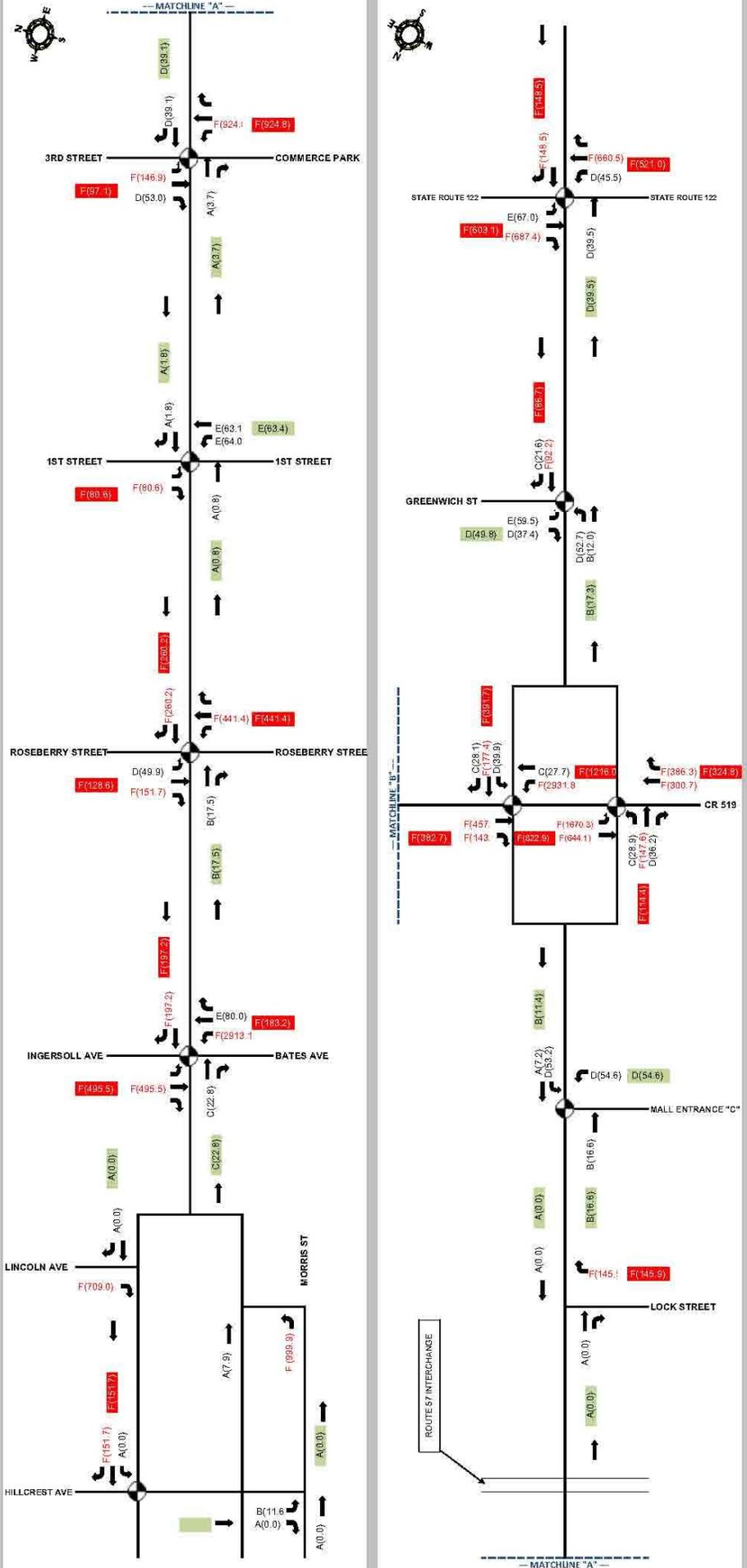
Once the projected site-generated trips were distributed to the existing roadway network, a Synchro analysis was completed to obtain the efficiency results of the US Route 22 corridor with the addition of the build-out volumes. **Table 23** shows the associated LOS for the study intersections at 2035 built-out conditions as compared to the existing LOS.

Table 23 – Comparison of Existing to Build-out LOS				
Intersection	2008 Existing Conditions		2035 Build-Out Conditions	
	PM	SAT	PM	SAT
Hillcrest Boulevard	A	A	F	A
Morris St & US Route 22*	D	F	F	F
Lincoln Avenue*	F	C	F	E
Ingersoll/Bates Avenue	D	C	F	C
Roseberry Street	E	D	F	F
First Street	A	A	C	C
Third Street	B	A	F	B
Lock Street*	B	C	F	F
Shopping Center Dr	B	C	D	D
County Route 519 eastbound	F	F	F	F
County Route 519 westbound	F	E	F	F
Greenwich St	C	C	E	D
Route 122	C	C	F	F
Total Failing	3	2	11	6
Signalized Failing	2	1	6	3
*Unsignalized Failing	1	1	5	2

It is clearly evident that the addition of the build-out volumes would degrade traffic conditions on the US Route 22 corridor to a point of almost gridlock. Seven additional intersections would fail during the PM Peak Hour and four more would fail during the SAT Peak Hour. The existing failing intersections would worsen to a point of immeasurable delay. **Figures 39** and **40** indicate the delay and LOS for the study intersections along the US Route 22 corridor.



FIGURE 39
 BUILD-OUT CONDITIONS - PM PEAK HOUR
 US ROUTE 22 - TRAFFIC VOLUMES



LEGEND

- Signalized Intersection
- Through Movement
- Turning Movement
- X (XX) Mvmt. LOS (Delay)
- X (XX) Approach Totals



6. TRANSPORTATION IMPROVEMENT STRATEGIES

6.1 Intersection Technical Improvements

Each signalized intersection was examined under the 2035 conditions and improvements recommended to achieve the most efficient LOS. The recommended improvements are segregated into short and mid-term recommendations, which vary from roadway widening to increase intersection capacity (where feasible, dependent upon available right-of-way), lane reassignment to decrease queue length and increase traffic progression, and signal timing improvements to optimize green time.

Throughout the corridor, the primary goal is to maintain fluid traffic progression on US Route 22, while improving the minor street service levels, where possible. At most locations, the PM Peak Hour represented the highest peak hour and had the most deficient LOS. Hence, the improvements to the corridor were developed for the PM Peak Hour and then verified to be compatible with the SAT Peak Hour.

In both peak hours, the traffic volumes tend to increase as a vehicle travels eastbound through the corridor. The results of the gravity model shows that 66% of the trips generated in the project vicinity travel to or from the corridor via the roadways east of the corridor, utilizing I-78 and Route 122. The majority of the traffic enters and exits the corridor by traveling through the intersection of US Route 22 and Route 122. As a result, this intersection operated with the highest increase in peak hour traffic during both time periods.

Future commercial development is strongly correlated to the increased trips in the eastbound section of the corridor. The majority of future retail development will be located between Route 57 and I-78. Consequently, this section of the corridor will generate the largest rate of new trips.

In 2035, the LOS at most intersections would degrade to failing conditions. The existing conditions analysis evaluated ten signalized intersections: two operated at LOS “F” in the PM Peak Hour and one operated at LOS “F” in the SAT Peak Hour. In 2035, the number of intersections operating at LOS “F” more than tripled; seven intersections failed during the PM Peak Hour and four failed during the SAT Peak Hour. Additionally, unsignalized intersections, such as Morris Street, Lincoln Avenue and Lock Street, would operate poorly as a result of the increase in corridor traffic. **Figure 41** and **Figure 42** detail the expected LOS and delay.

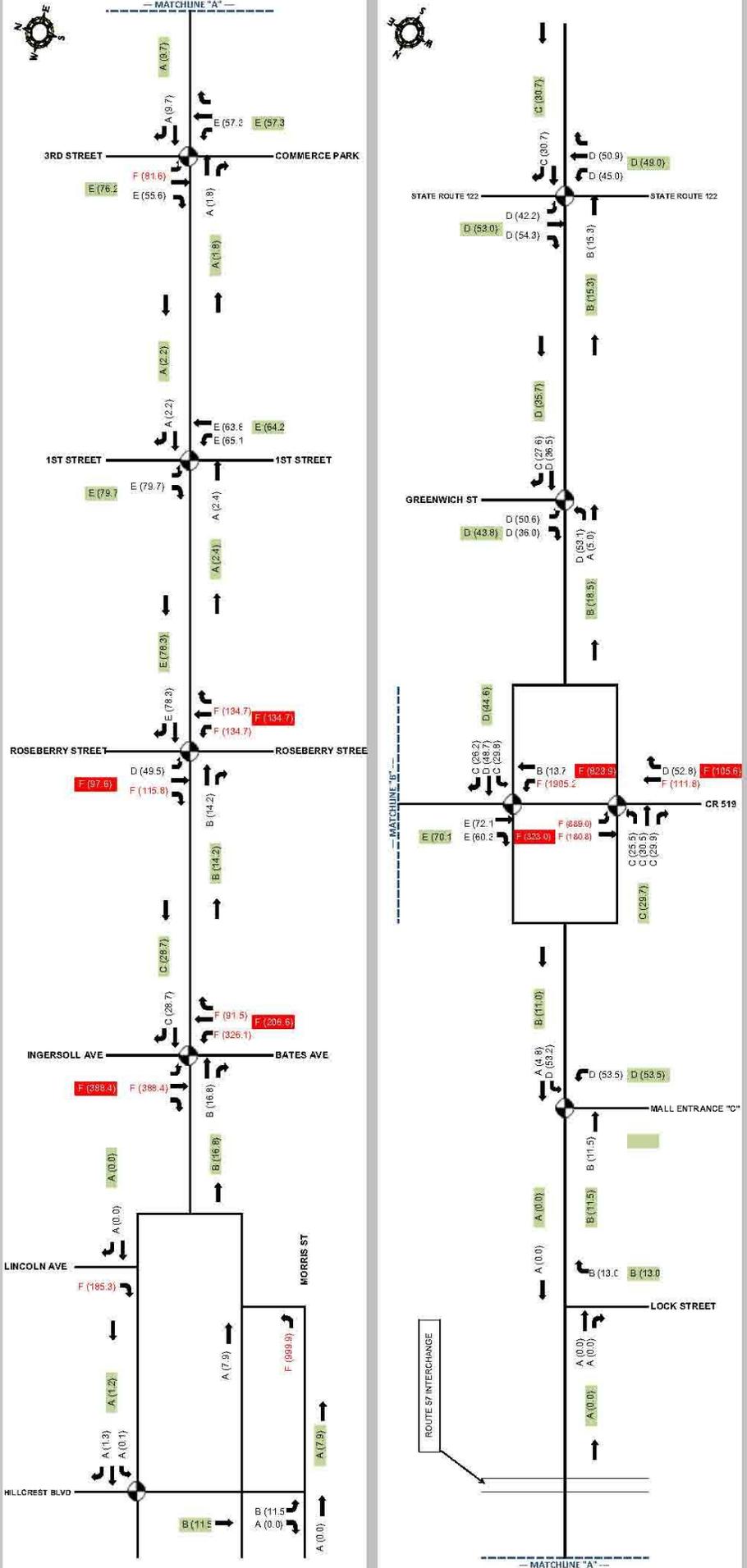
Widening of US Route 22 in the westbound direction of the corridor is necessary at most locations to provide acceptable LOS during the PM Peak Hour for future conditions. However, due to right-of-way restrictions and the associated cost of right-of-way acquisition, full widening improvements may be very

expensive and considered undesirable by the public. On the minor street approaches, the presence of residential housing and businesses, together with the existing geometric constraints, also limits the opportunity for roadway widening. The existing lanes may be reassigned and signal timings revised to decrease delay on the minor approaches.



FIGURE 41

2035 CONDITIONS WITHOUT IMPROVEMENTS - PM PEAK HOUR
US ROUTE 22 CORRIDOR CAPACITY ANALYSIS



LEGEND

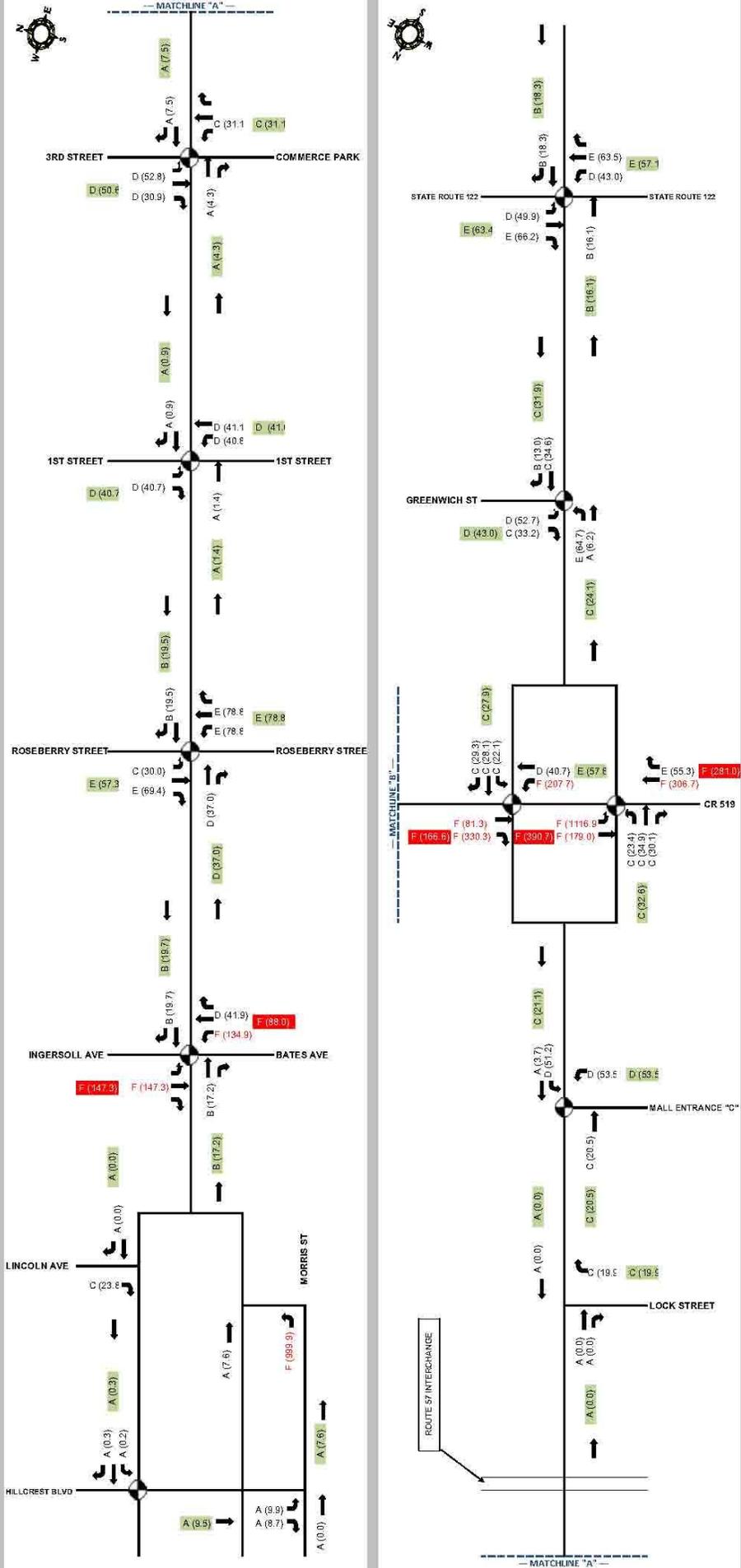
- Signalized Intersection
- Through Movement
- Turning Movement
- Memmt. LOS (Delay)
- Approach Totals

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Traffic and Transportation Engineers
Planners • Surveyors • Landscape Architects



FIGURE 42

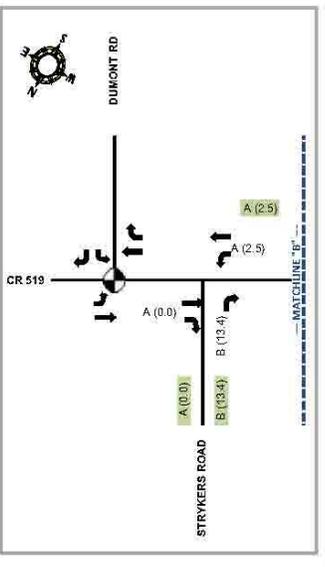
2035 CONDITIONS WITHOUT IMPROVEMENTS- SAT PEAK HOUR
US ROUTE 22 CORRIDOR CAPACITY ANALYSIS



LEGEND

- Signalized Intersection
- Through Movement
- Turning Movement
- Warrant, LOS (Delay)
- Approach Totals

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Consulting, Municipal & Environmental Engineers
Planners - Surveyors - Landscape Architects



US Route 22 & Ingersoll/Bates Avenue

Ingersoll/Bates Avenue is a four-legged signalized intersection, with left-turn restrictions on US Route 22. A jughandle in the southeast quadrant of the intersection provides eastbound left-turn movements.

Existing residential housing along US Route 22 at this intersection limits road widening opportunities without extensive property acquisition. Space is available to add an additional lane within US Route 22 westbound to accommodate through-traffic and right-turn movements. The northbound approach, Bates Avenue, should be revised to have two shared lanes. The intersection signal timings should be optimized and synchronized with the neighboring intersections to achieve the highest LOS.

Table 24 compares the LOS under 2008 existing conditions, 2035 build-out conditions and 2035 build-out conditions with recommended technical improvement applied for the intersection.

Table 24 – US Route 22 & Ingersoll/Bates Avenue LOS/Delay							
LOS & DELAY ANALYSIS		PM			SAT		
		2008 Existing	2035 Build-out	2035 T.I.*	2008 Existing	2035 Build-out	2035 T.I.*
BATES AVENUE	Northbound	F/206.6	F/183.2	E/70.2	F/88.0	F/88.0	D/39.5
	Left Through Right	F/326.1 F/91.5	F/291.1 E/80.0	E/70.2	F/134.9 D/41.9	F/134.9 D/41.9	D/39.5
INGERSOLL AVENUE	Southbound	F/388.4	F/495.5	E/74.5	F/147.3	F/147.3	D/42.1
	Left Through Right	F/388.4	F/495.5	E/74.5	F/147.3	F/147.3	D/42.1
US ROUTE 22	Eastbound	B/16.8	C/22.8	B/17.3	B/17.2	C/30.1	C/25.0
	Left Through Right	B/16.8	C/22.8	B/17.3	B/17.2	C/30.1	C/25.0
	Westbound	C/28.7	F/197.2	C/28.7	B/19.7	C/23.4	A/6.9
	Left Through Right	C/28.7	F/197.2	C/28.7	B/19.7	C/23.4	A/6.9
INTERSECTION		D/47.5	F/148.5	C/27.8	C/27.3	C/32.7	B/18.0

*T.I. – Technical Improvements Applied

The results show that the recommended technical improvements would satisfy the needs of the intersection. The failing movements would be improved to acceptable operating conditions and the overall intersection LOS would be efficient.



US Route 22 & Roseberry Street

Similar to the previous intersection, due to right-of-way restrictions, US Route 22 cannot be widened in the eastbound direction. However, the westbound lanes should be widened to a four-lane cross section to increase the intersection capacity and improve progression. In the northbound and southbound directions, additional lanes should be provided to improve failing conditions. Both approaches would provide an exclusive left-turn lane, a through lane and a shared through/right-turn lane. The intersection signal timings should be optimized and synchronized with the neighboring intersections to achieve the highest LOS.

Table 25 compares the LOS under 2008 existing conditions, 2035 build-out conditions and 2035 build-out conditions with recommended technical improvement applied for the intersection.

Table 25 – US Route 22 & Roseberry Street LOS/Delay							
LOS & DELAY ANALYSIS		PM			SAT		
		2008 Existing	2035 Build-out	2035 T.I.	2008 Existing	2035 Build-out	2035 T.I.
ROSEBERRY AVENUE	Northbound	F/134.7	F/441.4	F/292.2	E/78.8	F/185.7	F/185.7
	Left Through Right	F/134.7	F/441.4	F/292.2	E/78.8	F/185.7	F/185.7
	Southbound	F/97.6	F/128.6	F/90.1	E/57.3	F/86.2	E/78.0
	Left Through Right	D/49.5 F/115.8	D/49.9 F/151.7	F/90.1	C/30.0 E/69.4	C/30.7 F/109.3	E/78.0
US ROUTE 22	Eastbound	B/14.2	B/17.5	B/19.2	D/37.0	F/109.1	D/51.8
	Left Through Right	B/14.2	B/17.5	B/19.2	D/37.0	F/109.1	D/51.8
	Westbound	E/78.3	F/260.2	F/107.5	B/19.5	D/24.6	B/15.2
	Left Through Right	E/78.3	F/260.2	F/107.5	B/19.5	D/24.6	B/15.2
INTERSECTION		E/68.0	F/148.5	F/98.0	D/37.4	F/93.0	D/53.5

Although the recommended technical improvements would be effective at decreasing vehicle delay and increasing service levels, overall the intersection would still operate with failing conditions during the PM Peak Hour. Additionally, the individual intersection approaches, specifically the northbound approach of Roseberry Street, would maintain failing conditions.



The results of this capacity analysis show that the recommended technical improvements would be effective at decreasing the intersection delay and can temporarily improve the intersection operating conditions. However, to avoid long-term LOS deficiencies, long-term improvements will be required.

US Route 22 & 1st Street

The intersection of US Route 22 and 1st Street does not generate much minor street traffic. The northbound approach of the intersection operates as the U-Turn/Left-Turn movements for eastbound movements. The southbound approach volumes are low when compared to the other signalized intersections in the corridor. However, an additional lane should be added to provide exclusive left and right-turn movements. In order to maintain efficient flow at the intersection, the westbound lane should be widened to a four-lane cross section. The intersection signal timings should be optimized and synchronized with the neighboring intersections to achieve the highest LOS.

Table 26 compares the LOS under 2008 existing conditions, 2035 build-out conditions and 2035 build-out conditions with recommended technical improvement applied for the intersection.

Table 26 – US Route 22 & 1st Street LOS/Delay							
LOS & DELAY ANALYSIS		PM			SAT		
		2008 Existing	2035 Build-out	2035 T.I.	2008 Existing	2035 Build-out	2035 T.I.
1ST STREET	Northbound	E/64.2	E/63.4	E/62.9	D/41.0	E/63.4	D/40.8
	Left Through Right	E/65.1 E/63.8	E/64.0 E/63.1	E/63.4 E/62.6	D/40.8 D/41.1	E/64.0 E/63.1	D/40.6 D/41.0
	Southbound	E/79.7	F/80.6	E/77.8	D/40.7	F/80.6	D/41.7
	Left Through Right	E/79.7	F/80.6	E/77.8	D/40.7	F/80.6	D/41.7
US ROUTE 22	Eastbound	A/2.4	A/0.8	A/1.4	A/1.4	A/0.8	A/1.2
	Left Through Right	A/2.4	A/0.8	A/1.4	A/1.4	A/0.8	A/1.2
	Westbound	A/2.2	A/1.8	A/2.4	A/0.9	A/1.8	A/0.5
	Left Through Right	A/2.2	A/1.8	A/2.4	A/0.9	A/1.8	A/0.5
INTERSECTION		A/6.0	A/3.9	A/4.3	A/3.2	A/3.8	A/3.8



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The intersection of US Route 22 and 1st Street would not be subject to a significant increase in minor street traffic volume at build-out. As a result, the recommended technical improvements would be very effective in maintaining traffic progression on US Route 22 while enabling the minor street approaches to operate with acceptable LOS.

Based on these results, the 1st Street intersection will not require additional improvements to achieve efficient LOS following the 2035 build-out.

US Route 22 & 3rd Street

The intersection of US Route 22 and 3rd Street is expected to carry considerably more traffic during the 2035 build-out than the intersection at 1st Street. As a result, the intersection LOS would be impacted to a greater extent than the 1st Street intersection. However, unlike 1st Street, 3rd Street has limited room for improvements. The southbound approach is bounded by residential housing and the northbound approach is connected to US Route 22 via a narrow bridge over the railroad crossing owned by Conrail. The westbound approach should be widened to maintain the four-lane cross section. Due to the intersection alignment, the intersection signal timings should be optimized and synchronized with the 1st Street intersection to achieve the highest LOS and maintain efficient progression on US Route 22.

Table 27 compares the LOS under 2008 existing conditions, 2035 build-out conditions and 2035 build-out conditions with recommended technical improvement applied for the intersection.



Table 27 – US Route 22 & 3rd Street LOS/Delay

LOS & DELAY ANALYSIS		PM			SAT		
		2008 Existing	2035 Build-out	2035 T.I.	2008 Existing	2035 Build-out	2035 T.I.
3RD STREET	Northbound	E/57.3	F/924.8	F/1027.1	C/31.1	D/35.9	D/35.9
	Left Through Right	E/57.3	F/924.8	F/1027.1	C/31.1	D/35.9	D/35.9
	Southbound	E/76.2	F/97.1	F/108.1	D/50.6	E/62.0	E/62.0
	Left Through Right	F/81.6 E/55.6	F/146.9 D/53.0	F/168.5 D/54.6	D/52.8 D/30.9	F/81.7 C/32.6	F/81.7 C/32.6
US ROUTE 22	Eastbound	A/1.8	A/3.7	A/3.1	A/4.3	A/8.4	A/2.1
	Left Through Right	A/1.8	A/3.7	A/3.1	A/4.3	A/8.4	A/2.1
	Westbound	A/9.7	D/39.1	B/15.2	A/7.5	B/10.9	A/8.6
	Left Through Right	A/9.7	D/39.1	B/15.2	A/7.5	B/10.9	A/8.6
INTERSECTION		B/10.6	F/109.7	F/107.2	A/8.7	B/13.8	B/13.8

This intersection LOS will be greatly impacted by the delay created traveling in the northbound direction. The proposed redevelopment of Phillipsburg Commerce Park will significantly increase traffic volumes on both approaches. Additionally, traffic from Route 57, which utilizes the 3rd Street jughandle to travel eastbound on US Route 22, increases the southbound approach volume. Overall, widening of the northbound approach will have to be investigated, as well as a plan to divert traffic from the intersection, to reduce the vehicle delay.

US Route 22 & St. James Avenue/Uniontown Road – County Route 519

In 2035, the intersection of US Route 22 and County Route 519 will result in the highest increase in vehicle delay and LOS degradation along the corridor. To counteract the increase in traffic, widening is recommended along both approaches of US Route 22. In the eastbound direction, the existing alignment should be revised to provide a six-lane cross section (an exclusive left-turn lane, four through lanes and an exclusive right-turn lane). Similarly, a six-lane cross section is provided westbound with a slightly different lane assignment (two exclusive left-turn lanes, three through lanes and a shared through/right-turn lane). The intersection signal timings should be optimized and synchronized with the neighboring intersections to achieve the highest LOS.



Tables 28 and 29 compare the LOS under 2008 existing conditions, 2035 build-out conditions and 2035 build-out conditions with recommended technical improvement applied for the intersection.

LOS & DELAY ANALYSIS		PM			SAT		
		2008 Existing	2035 Build-out	2035 T.I.	2008 Existing	2035 Build-out	2035 T.I.
COUNTY ROUTE 519 (ST. JAMES AVENUE)	Northbound	F/105.6	F/324.8	F/550.8	F/281.0	F/400.5	F/393.9
	Through Right	F/111.8 D/52.8	F/300.7 F/386.3	F/528.1 F/608.6	F/306.7 E/55.3	F/445.2 F/113.6	F/457.5 F/92.7
	Southbound	F/323.0	F/822.9	F/800.9	F/390.7	F/1335.1	F/785.0
	Left	F/889.0	F/1670.3	F/1619.6	F/1116.9	F/1313.2	F/1505.0
	Through	F/180.8	F/644.1	F/613.0	F/179.0	F/1462.0	F/656.4
US ROUTE 22	Eastbound	C/29.7	F/114.4	D/36.2	C/32.6	E/64.0	D/51.0
	Left	C/25.5	C/28.9	C/28.1	C/23.4	C/20.9	C/32.9
	Through Right	C/30.5 C/29.9	F/147.6 D/36.2	D/37.9 D/35.0	C/34.9 C/30.1	F/81.4 C/25.3	E/56.4 D/43.2
INTERSECTION		F/131.1	F/359.1	F/359.6	F/170.8	F/488.3	F/319.3

LOS & DELAY ANALYSIS		PM			SAT		
		2008 Existing	2035 Build-out	2035 T.I.	2008 Existing	2035 Build-out	2035 T.I.
COUNTY ROUTE 519 (UNIONTOWN ROAD)	Northbound	E/70.1	F/1216.0	F/1226.8	F/166.6	F/185.9	F/132.8
	Through Right	E/72.1 E/60.3	F/2931.8 C/27.7	F/2941.1 D/39.5	F/81.3 F/330.3	F/113.6 F/667.7	D/50.1 F/686.8
	Southbound	F/823.9	F/382.7	F/633.1	E/57.8	F/425.5	F/331.0
	Left	F/1905.2	F/457.7	F/696.5	F/207.7	F/395.5	F/290.6
	Through	B/13.7	F/143.1	F/279.8	D/40.7	F/511.0	F/439.4
US ROUTE 22	Westbound	D/44.6	F/145.7	F/84.6	C/27.9	C/25.9	D/47.5
	Left	C/29.8	D/39.9	C/29.6	C/22.1	C/24.1	C/28.6
	Through Right	D/48.7 C/26.2	F/177.4 C/28.1	F/95.3 F/95.3	C/28.1 C/29.3	C/26.3 C/26.1	D/51.6 D/51.6
INTERSECTION		F/194.2	F/391.7	F/401.2	E/61.6	F/142.5	F/122.5

The results of the capacity analysis reveal that the recommended technical improvements would improve operations on US Route 22. However, even with the recommended technical improvements, the roadways would still operate at LOS “F”. Additionally, minor street traffic would not improve following the build-out in 2035 and the technical improvements would not adequately support the minor



street movements. As a result, additional roadway network improvements will be required to fully address the existing needs of the intersection.

US Route 22 & Greenwich Street

The Greenwich Street intersection is unique in this corridor as it is expected to generate a significant amount of minor street traffic by 2035. However, the intersection can still address the traffic volumes with more limited improvements. With southbound movements providing four lanes, with two lanes per turning movement, the increase in traffic can be supported by the existing design. However, improvements are required in the eastbound and westbound direction. The westbound approach should be widened to support four through lanes, as compared to the existing three lanes, to increase LOS from “F” to “E”. In the eastbound direction, the left turn lanes are failing and require improvements to meet acceptable LOS criteria. However, with two lanes already provided, increasing the number of turning lanes is not practical. The intersection signal timings should be optimized and synchronized with the neighboring intersections to achieve the highest LOS.

Table 30 compares the LOS under 2008 existing conditions, 2035 build-out conditions and 2035 build-out conditions with recommended technical improvement applied for the intersection.

Table 30 – US Route 22 & Greenwich Street LOS/Delay							
LOS & DELAY ANALYSIS		PM			SAT		
		2008 Existing	2035 Build-out	2035 T.I.	2008 Existing	2035 Build-out	2035 T.I.
GREENWICH STREET	Southbound	D/43.8	D/49.8	D/48.6	D/43.0	D/46.2	D/44.8
	Left	D/50.6	E/59.5	E/59.5	D/52.7	E/57.2	E/57.1
	Right	D/36.0	D/37.4	C/34.5	C/33.2	C/34.5	C/31.6
US ROUTE 22	Eastbound	B/18.5	B/17.3	B/17.3	C/24.1	D/35.4	D/35.2
	Left	D/53.1	D/52.7	D/52.7	E/64.7	F/110.2	F/109.6
	Through	A/5.0	B/12.0	B/12.0	A/6.2	A/9.8	A/9.9
	Westbound	D/35.7	F/86.7	E/55.9	C/31.9	D/42.3	B/13.1
	Through Right	D/36.5 C/27.6	F/92.2 C/21.6	E/60.6 A/0.0	C/34.6 B/13.0	D/45.1 C/22.3	B/14.7 A/1.9
INTERSECTION		C/31.9	E/57.0	D/40.6	C/29.8	D/39.7	C/25.9

Based on the capacity analysis, the existing alignment of the minor street is sufficient to accommodate the build-out traffic and the recommended additional lane in the westbound direction would improve the westbound through-movements to acceptable operating conditions. However, the eastbound left-turn movements would still fail during the SAT Peak Hour. With two turning lanes provided currently,



widening and adding more lanes is not an option. Revision of the intersection and surrounding network is the most appropriate option to improve the LOS and delay.

US Route 22 & Route 122

The final intersection of the US Route 22 corridor is with New Brunswick Avenue (Route 122). Due to the location of the intersection, it is expected to absorb the highest percent increase in corridor traffic volume. Based on the existing corridor and surrounding network, the majority of trips generated in the Study Area vicinity to and from I-78, Route 173 and US Route 22 utilize this intersection at some point during their trip. To support the increase in trips, an additional lane should be added in the westbound direction and the northbound approach should also be widened to accommodate three approach lanes. The intersection signal timings should be optimized and synchronized with the Greenwich Street intersection to achieve the highest LOS.

Table 31 compares the LOS under 2008 existing conditions, 2035 build-out conditions and 2035 build-out conditions with recommended technical improvement applied for the intersection.

Table 31 – US Route 22 & Route 122 LOS/Delay							
LOS & DELAY ANALYSIS		PM			SAT		
		2008 Existing	2035 Build-out	2035 T.I.	2008 Existing	2035 Build-out	2035 T.I.
ROUTE 122	Northbound	D/49.0	F/521.0	F/113.9	E/57.1	F/264.3	E/59.9
	Left Through Right	D/45.0	D/45.5	D/51.1	D/43.0	D/44.1	D/48.1
		D/50.9	F/660.5	F/136.5	E/63.5	F/332.9	E/73.7
	Southbound	D/53.0	F/603.1	F/452.4	E/63.4	F/355.1	F/236.9
	Left Through Right	D/42.2	E/67.0	D/53.5	D/49.9	D/51.4	D/47.6
D/54.3		F/687.4	F/515.1	E/66.2	F/394.3	F/260.9	
US ROUTE 22	Eastbound	B/15.3	D/39.5	C/31.4	B/16.1	C/26.8	B/18.9
	Left Through Right	B/15.3	D/39.5	C/31.4	B/16.1	C/26.8	B/18.9
		Westbound	C/30.7	F/148.5	E/75.9	B/18.3	C/28.0
	Left Through Right	C/30.7	F/148.5	E/75.9	B/18.3	C/28.0	C/24.9
		INTERSECTION	C/32.3	F/240.2	F/126.5	C/28.8	F/101.0



Overall, the US Route 22 corridor still would not operate efficiently following the application of the preceding recommended intersection technical improvements. The coordination of signals and widening of the westbound lanes throughout the corridor would not achieve an increase in LOS. At most locations, failing conditions would still exist and a more in-depth analysis and improvement is required. To this end, a more extensive US Route 22 Corridor Improvement Plan was investigated. In this Plan, the existing travel patterns along US Route 22 were evaluated so a more efficient path of travel could be developed. The following section details the improvements recommended to increase LOS on US Route 22 and improve the progression of traffic on the minor street approaches.

6.2 TRAFFIC SIGNAL COORDINATION

Traffic signal coordination is a method of timing groups of traffic signals along an arterial to provide for the smooth movement of traffic with a minimal number of stops. The goal of signal coordination is to move the greatest number of vehicles through the system with the fewest stops in a comfortable manner. While this is ideal, even a well-spaced roadway system cannot achieve these conditions. As a result, when utilizing signal coordination, the busiest traffic movements are generally given priority. Therefore, on US Route 22, eastbound and westbound through movements should receive the highest priority since these movements contain the largest volumes and command the longest “green” times.

Although traffic signal coordination is utilized to link multiple intersections in a corridor, the distance between intersections is a prime factor in determining when and how to implement signal coordination. As per the *Manual of Uniform Traffic Control Devices*⁵ (MUTCD), traffic control signals located within 0.5 miles of each other along a major route or in a network should be coordinated. Two signal coordination zones were created for the US Route 22 corridor.

Signal Coordination Zone 1 is located west of the US Route 22 and Route 57 interchange. It includes the following intersections:

- US Route 22 & Hillcrest Boulevard
- US Route 22 & Ingersoll/Bates Avenue
- US Route 22 & Roseberry Avenue
- US Route 22 & 1st Street
- US Route 22 & 3rd Street

⁵ Federal Highway Administration (23 CFR, Part 655, Subpart F). *Manual of Uniform Traffic Control Devices*.

Signal Coordination Zone 2 was established between Route 57 and Interstate 78. It includes the following intersections:

- US Route 22 & Shopping Center Drive
- US Route 22 & County Route 519
- US Route 22 & Greenwich Street
- US Route 22 & Route 122

The main disadvantage when implementing traffic signal coordination is that the side street traffic typically experiences a longer wait time. However, the intersection timing splits should be optimized at the intersections to ensure the most efficient flow is achieved.

The application of the signal timing improvements to the signalized intersections along the US Route 22 corridor would provide mixed results. At certain intersections (namely Ingersoll/Bates Avenue and 1st Street) the technical improvements would result in sufficient LOS and efficient traffic flow on the minor streets. However, in most cases, the improvements would not eliminate failing conditions on minor street approaches and would require the widening of US Route 22 in the westbound direction throughout the corridor. While the widening will maintain the flow of traffic on US Route 22, partial and full property takings will be needed if the four-lane cross section is to be implemented. The Signal Coordination Zones were the most efficient method of improving the existing LOS. Unfortunately, these methods alone cannot provide the improvements necessary to sufficiently maintain corridor traffic flow, under 2035 conditions. A broader approach was therefore considered to improve the corridor operation.

6.3 REGIONAL IMPROVEMENT CONCEPTS

To address 2035 conditions and understanding the limitations of the technical improvements previously discussed, a network planning approach is warranted to identify other alternative concepts. The improvements should reflect the following planning objectives:

- More even distribution of traffic throughout the corridor and roadway network;
- Increased vehicular circulation options;
- Creation of a more intuitive roadway network within the Study Area;
- Increased progression efficiency along US Route 22;
- Improved safety; and
- Increased pedestrian, bicycle and transit facilities.

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As a result of the limited existing roadway network surrounding the corridor, US Route 22 absorbs the majority of traffic traveling to and from the five municipalities bordering the corridor. By improving the surrounding roadway network, motorists may utilize secondary roadways when traveling to or from destinations, decreasing traffic volumes along the corridor. Other design improvements can increase the capacity and improve safety at key sections and intersections, such as Memorial Parkway, Route 57 and County Route 519. Improvement concepts presented include:

- Memorial Parkway Improvement Concepts (#1 Roundabouts, #2 Parallel Roads, and #3 Modified Parallel Roads);
- US Route 22 WB ramp to access Route 57 East;
- County Route 519 / US Route 22 realignment;
- Center Street Extension to County Route 519 and realignment of Lock Street;
- Greenwich Street Extension to Bliss Boulevard;
- Bliss Boulevard Extension to the Phillipsburg Mall;
- New Carpentersville Road/I-78 interchange; and
- I-78 Westbound to Route 173 East Ramp.

In addition, other transportation improvements to facilities and services are recommended, including pedestrian and bicycle facilities, bridge improvements, access management tools and transit services.

The revised traffic network and recommended improvements are shown on **Figure 43**.



*Promoting Smart Growth***6.3.1 Memorial Parkway Conceptual Alternatives**

The Memorial Parkway section of the corridor currently consists of several unsignalized intersections, with eastbound and westbound traffic divided by a median that varies from 140 to 225 feet in width. Within the median, an existing post office, funeral home and medical office operate with driveway access on the westbound side. Additionally, three U-Turn ramps are provided between the two directions of travel. Overall, the unsignalized intersections and US Route 22 U-turn ramps within the medians create 23 points of unsignalized traffic control or approximately one every 150 feet. Vehicle speeding from the Easton-Phillipsburg US Route 22 Toll Bridge west towards Morris Street was identified as a significant problem by the Visioning Workshop and through field observations.



US Route 22 eastbound approaching Morris Street Curve

The goal of the conceptual alternatives that were studied is to reduce vehicular conflict, enhance access to local roadways and reduce vehicle speed through this section of roadway.

Of particular importance is the tight radius that exists at Morris Street on US Route 22. The tight horizontal curvature is the primary cause of accidents at this location and proves to be one of the intersections with the highest accident rate along the study corridor. The alternatives studied all include softening the curve at Morris Street.

This section of US Route 22 has several existing geometric constraints that will severely restrict the feasibility of a new design, including the grade of intersecting roadways and US Route 22, the horizontal curvature of US Route 22, short weaving sections and the existing land uses in the US Route 22 median.

Memorial Parkway – Concept #1 – Roundabout

The use of roundabouts along Memorial Parkway to ease traffic congestion was discussed extensively at the Visioning Workshop (see **Figure 7 - Memorial Parkway Proposals from Breakout Sessions**). Roundabouts are circular raised islands in which the traffic flows around the center island of an unsignalized intersection. This design is usually applied in areas of low pedestrian traffic where the goal

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is to reduce speeding. Roundabouts slow traffic by requiring vehicles to yield to traffic already within the roundabout, which subsequently increases vehicle and pedestrian safety.

Roundabouts can have several advantages -- they reduce vehicle speed, improve pedestrian mobility, improve intersection accessibility and minimize weaving. However, the roundabout alternative is severely limited by the geometric constraints and excessive traffic volumes on US Route 22, which make this alternative not viable, for the following reasons:

- A roundabout does not eliminate pedestrian/motorist interaction since it is not signalized;
- The American Association of State Highway and Transportation Officials (AASHTO) recommends a maximum 4% grade for entering and exiting a roundabout, whereas existing grade varies from 6% to 8%;
- Excessive traffic volumes; and
- Not enough cross traffic to slow down through movements.

A traffic analysis performed with the recommended roundabout alignments concluded that the recommended roundabouts would not relieve the existing capacity concerns, as the US Route 22 traffic volumes would exceed capacity and the traffic entering from the local roadways would not enter the traffic stream efficiently. Accordingly, the roundabout alternative was ruled ineffective and is not recommended to be implemented.

Memorial Parkway – Concept #2 – Parallel Roadways

Another concept evaluated the use of parallel roadways to US Route 22 to enhance access to local roads without disrupting traffic flow on US Route 22. (See **Figure 44 – Memorial Parkway Concept #2**).

In this concept, both the eastbound and westbound lanes of US Route 22 are reconfigured to be parallel within the median and local service roads are provided parallel to US Route 22. A service road is a local road that runs parallel to an expressway or interstate highway and provides direct access to the property fronting the roadway.

The Memorial Parkway service roads can be separated from the main roadway via grass medians. As shown, the recommended cartway width of the service roads would provide seven foot wide parking stalls, a twelve foot wide traveled way and a five foot wide bicycle path. A four foot sidewalk would link to a new pedestrian overpass at Warren Street across US Route 22. These improvements would improve service on US Route 22 by eliminating merging traffic and diverting local traffic from US Route 22. Other advantages to this alternative include the following:

- Separate access points from through movements;
- Eliminate pedestrian/motorist interaction by providing a new pedestrian overpass;



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- Eliminate weaving;
- Softened curve at Morris Street;
- Creation of open space (Memorial Park); and,
- Creation of two local roadways with parallel parking and pedestrian facilities.

One of the transportation planning objectives at Memorial Parkway is to reduce speeding. This alternative will not reduce speeding; however, by removing conflicts with the multiple driveways and weaving conditions associated with adjacent land uses, intersections and U-Turns, safety would be improved even with higher vehicular speeds for through traffic.

Concept #2 also includes the addition of a signalized intersection at Lincoln Avenue. This design would help to control vehicle speed while maintaining access across US Route 22 to and from Phillipsburg. If this design is approved, the existing signalized intersection of Ingersoll/Bates Avenue may be removed.

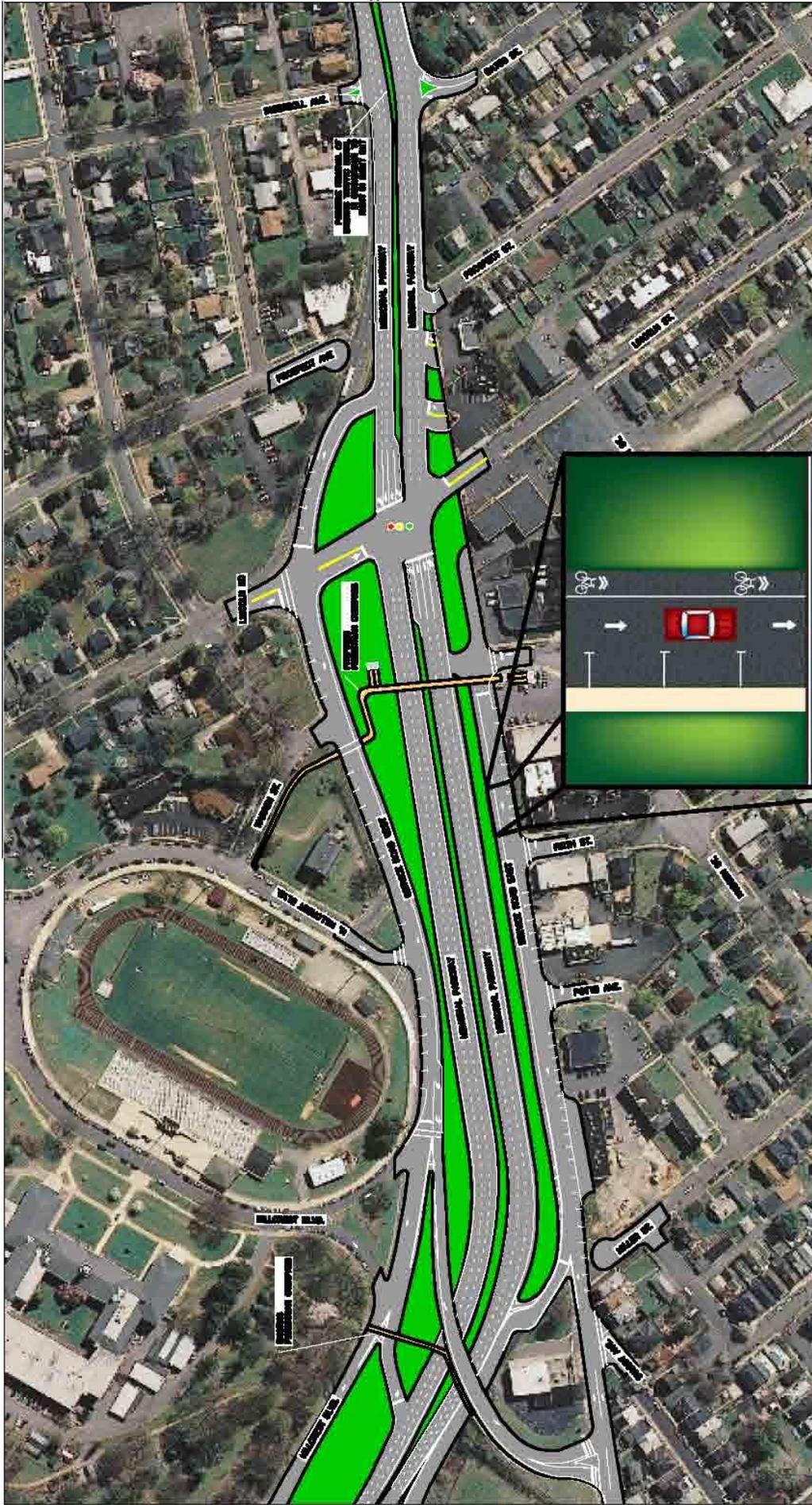
A major hurdle to accomplish this concept would be the removal/relocation of the historic Phillipsburg Post Office. If the removal/relocation of the post office is not feasible, Concept #3 is recommended.

Memorial Parkway – Concept #3 – Modified Parallel Roadways

This alternative is a modification of the Parallel Roadways design, which avoids the removal/relocation of the historic Phillipsburg Post Office. Under this concept, the primary objectives of reducing speeding, enhancing pedestrian safety, softening the curve at Morris Street and reducing weaving would still partially be met. The parallel roadway to the south of US Route 22 would not be feasible with this new concept since it would require significant property acquisition to meet required road design standards. The parallel roadway to the north would remain, although it would be shortened and intersect the US Route 22 corridor before Hillcrest Boulevard.

Under Concept #3, pedestrian and bicyclist accessibility to the Post Office (and any other buildings) within the median would improve with the addition of two other routes to cross US Route 22. Currently, accessing the Post Office from the south requires pedestrians or bicyclists to cross the existing pedestrian overpass at Morris Street and then use the signalized crossing at Hillcrest Boulevard. Comparatively, coming from the north, pedestrians and bicyclists will need to use the Hillcrest Boulevard signalized crossing. With the introduction of the modified parallel roadways, two other routes will be available. The proposed Warren Street Overpass would allow pedestrians and bicyclists to access the median and the possible signalization of Lincoln Street would enable shorter, more efficient routes to the post office. (See **Figure 45 - Memorial Parkway Concept #3**).





SERVICE ROAD EAST CROSS SECTION

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JOB NUMBER	06000727A	DATE	07/10/09
SCALE	1" = 100'	LATEST REVISION	07/10/09
PROJECT NUMBER	NA024970	DESIGN BY	NAB

CONCEPTUAL ALTERNATIVE #2
 FOR
MEMORIAL PARKWAY
 PHILLIPSBURG WARREN COUNTY NEW JERSEY

MASER CONSULTING
 Consulting, Municipal & Environmental Engineers
 Planners - Surveyors - Landscape Architects
 State of N.J. Certificate of Authorization: 24-G-27968500

FIGURE 44



JOB NUMBER:	00000727A	DATE:	07/10/09
SCALE:	1" = 100'	LATEST REVISION:	07/10/09
PROJECT NUMBER:	HA024470	DESIGN BY:	NAB
			FIGURE 45

**CONCEPTUAL ALTERNATIVE #3
FOR
MEMORIAL PARKWAY**
PHILLIPSBURG WARREN COUNTY NEW JERSEY

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 State of N.J. Certificate of Authorization: 246A2796500

6.3.2 US Route 22 & Route 57 Conceptual Alternative

Based upon field investigations and a review of the commuter survey results, it was concluded the existing US Route and 22 Route 57 interchange was in need of improvement. Concerns identified are listed as follows:

- Deteriorating bridge structure
- Missing US Route 22 westbound to Route 57 eastbound Ramp
- Truck circulation problem in the southern section of Warren County
- 6th Street weaving concerns
- Signage deficiencies
- Red School Lane Circle

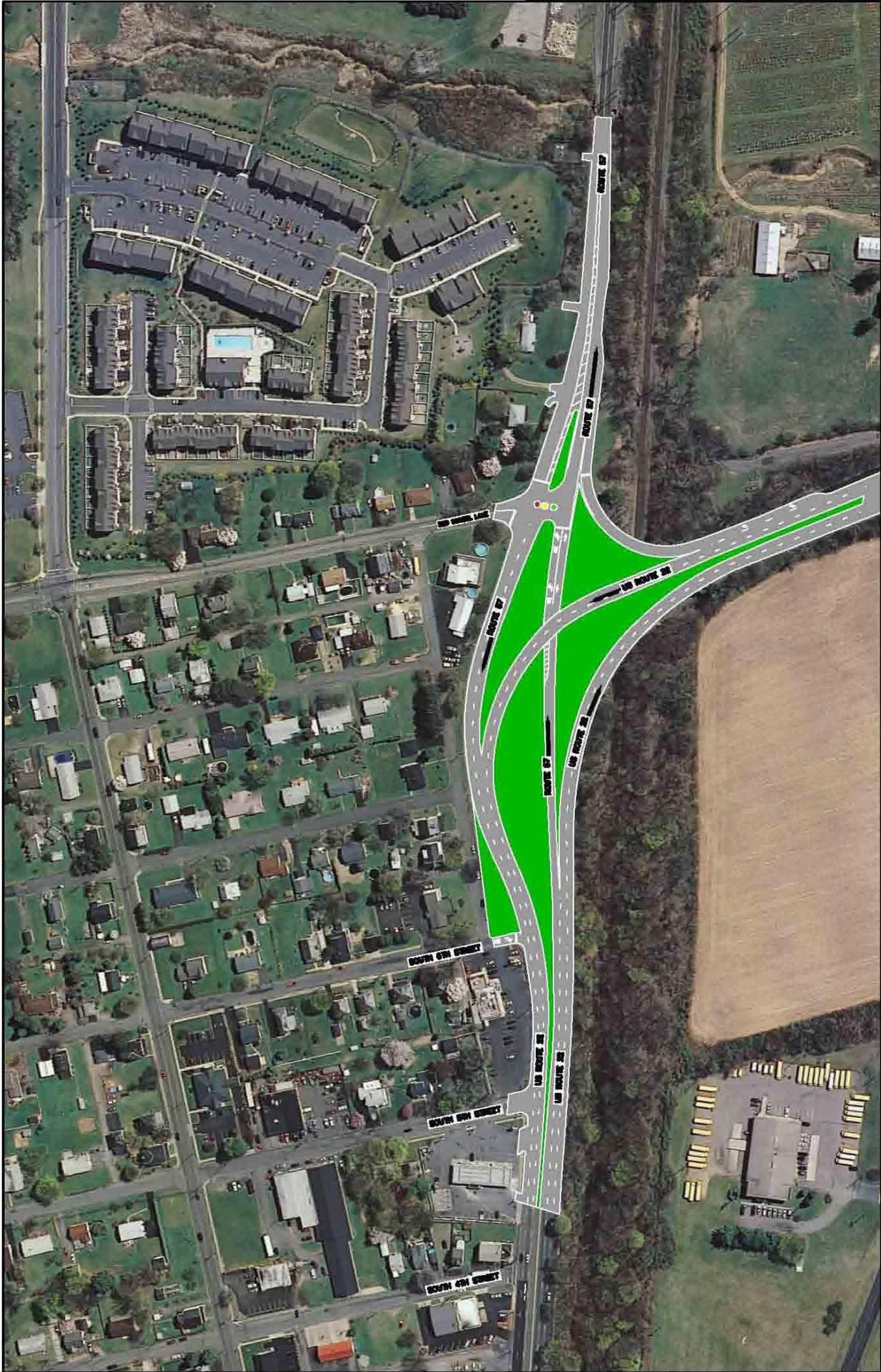
The NJDOT Bridge Sufficiency Inventory included the following appraisal of the bridge structure:

- US Route 22 westbound over Rt. 57 eastbound
 - Last inspected 7/27/07
 - Noted Functionally Obsolete
 - Sufficiency rating of 70.1
- US Route 22 eastbound over Norfolk Southern
 - Last inspected 7/13/05
 - Noted Functionally Obsolete
 - Sufficiency rating of 69.1

The rating of obsolete refers to the functionality of the bridge. Functionally obsolete refers to the poor bridge deck geometry (i.e. narrow lane width, little to no shoulder and no pedestrian facilities).

A US Route 22 westbound to Route 57 eastbound ramp should be implemented. The existing interchange of Route 57 and US Route 22 only provides two movements: the US Route 22 eastbound approach to Route 57 eastbound and Route 57 westbound to the US Route 22 westbound. Without direct access provided for the remaining two movements, motorists must utilize the local roadways (3rd Street, 6th Street, Baltimore Avenue and Red School Lane) to complete these movements. (See **Figure 46 - US Route 22 & Route 57 Conceptual Alternative.**)





JOB NUMBER	08000727A	DATE	08/02/08
SCALE	1" = 150'	LAST REVISION	03/12/08
DRAWING NUMBER	HA024870	ISSUED BY	MJS

FIGURE 46

**CONCEPTUAL ALTERNATIVE
FOR
US ROUTE 22 & ROUTE 57**

PHILLIPSBURG WARREN COUNTY NEW JERSEY

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 State of N.J. Certificate of Authorization: 24GA27866500

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Route 57 is accessible to US Route 22 westbound traffic by traveling north on County Route 519; however, the height restriction of 10'-6" at the Norfolk Southern Rail line overpass, located on County Route 519, just south of Route 57, prevents tractor trailers and other larger vehicles from completing this movement. As a result, all heavy vehicles must travel to the 3rd Street U-turn ramp. According to residents in the area, it is not uncommon to hear a tractor trailer reversing in this area because signage is not provided for this bridge prior to a turnaround or alternate route point. In some instances, the truck has attempted to go through, to no avail. **Figure 47** illustrates the Route 57 and County Route 519 conceptual roadway network.

Figure 47 – Route 57 / County Route 519 Conceptual Roadway Network



The Red School Lane traffic circle is also a concern. Traveling eastbound on US Route 22, Route 57 is signed as the innermost travel lane. However, without warning, a motorist needs to merge into the right lane as the innermost lane travels into the Red School Lane traffic circle. Field investigations observed many vehicles having to stop in this lane while waiting to get into the right lane to continue on Route 57 eastbound. The photos on the right show a motorist stopped at the traffic circle who desires to travel straight onto Route 57; however, two left turning vehicles are blocking the lane and vehicles to their right are blocking the ability to merge.



Red School Lane Traffic Circle

To improve the progression of traffic at this interchange, a slip ramp is recommended to be provided from US Route 22 westbound to Route 57 eastbound. This would reduce the traffic on local roadways, provide a more direct route for heavy vehicles and prevent passenger vehicles from weaving at the 6th Street

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intersection. Furthermore, coupled with the addition of the ramp, the replacement of the existing bridge structure and widening of travel lanes and installation of sidewalk should be constructed.

In addition to revising the access to Route 57, alterations to the 6th Street and Red School Lane intersections are required to optimize the revision of the Route 57 interchange. The eastbound approach of Route 57 at the intersection of Red School Lane should be narrowed to include an exclusive left-turn lane and a through lane. Additionally, signaling the intersection of Route 57 and Red School Lane is recommended to control vehicle movements and provide pedestrian facilities. Further west, 6th Street should be revised to permit right-turn movements only, with no turns permitted onto 6th Street from US Route 22 westbound. This would eliminate weaving in this section of roadway.

6.3.3 US Route 22 & County Route 519 Conceptual Alternatives

The US Route 22 and County Route 519 intersection ranks highest in the accident analysis and the commuter survey conducted in January 2009 identified it as the most inefficient intersection. By 2035, this intersection will experience the highest increase in delay, primarily due to the existing alignment and lane assignments.

Currently, the eastbound and westbound movements are divided by a varied width median (100 to 160 feet). In order to properly control vehicles traveling northbound and southbound through the intersection, dual intersection signal control is required. That is, a vehicle is first controlled by the initial signal on the approach when arriving at the intersection and then by a second signal in the median.

The excessive queue and delay at this intersection is a result of excessive volumes, the signal operations and insufficient stacking length. Currently, the volume of left-turn movements from US Route 22 westbound is too high for the stacking length available. During signal cycles, the queue partially impedes through-traffic and left-turning traffic from US Route 22 westbound and impedes upon the “green” time given to County Route 519 southbound. This creates a substantial amount of lost time in the signal cycle length. Additionally, the vehicles stacked in the median need a clearance interval to make the median stacking lanes available for County Route 519 approaches. This results in excessive “red” time, or lost time, for US Route 22 and County Route 519.

Intersection Narrowing Concept

As shown on **Figure 48**, the intersection at US Route 22 and County Route 519 is recommended to be redesigned. To address the intense queue and delay resulting from the dual signal operation, the dual signal control should be eliminated. As a result, vehicles will no longer queue in the middle of the intersection, which will eliminate the need for a clearance interval to clear the median. In turn, this should increase traffic flow and the number of vehicles that can be processed.



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This intersection also has significant design constraints, as a historic church is located in the median and a cemetery fronts on the westbound side of US Route 22, which eliminates roadway widening as a viable option. This intersection narrowing concept shows the eastbound travel lanes located further south, utilizing already existing NJDOT right-of-way, and the westbound travel lanes would be relocated to the south of the church, aligned parallel with the eastbound lanes. The new alignment would drastically improve LOS and reduce delay.

Intersection Narrowing Concept with Jughandle Turning Movements

A secondary alternative for this intersection was also considered to improve the intersection operation. It applies the same improvements as the Intersection Narrowing Concept with the elimination of the left-turn movements on US Route 22. In place of left-turn lanes, this concept introduces near-side jughandles to complete the turning movements traveling eastbound and westbound. (See **Figure 49 – US Route 22 / County Route 519 Conceptual Alternative #2**).

County Route 519 Truck Access

During field investigations, it was observed that there are five height restricted warning signs placed along County Route 519, south of the height restriction. Additionally, there is a small graveled area which could serve as a U-turn maneuver for some trucks. It is evident from tire tracks, that this area has previously been used for U-turns. However, there are no signs on US Route 22 eastbound prior to turning onto County Route 519 eastbound of the impending height restriction. Furthermore, once a tractor trailer is on County Route 519, there is no alternative route to bypass the height restriction. Signage that indicates the 10'-6" Height Restriction on County Route 519 eastbound should be installed for US Route 22 westbound traffic. This should help to reduce the number of tractor trailers mistakenly turning onto County Route 519 eastbound.





JOB NUMBER	080005727A	DATE	08/04/08
SCALE	1" = 100'	LATEST REVISION	04/05/09
DESIGN NUMBER	HA05-0670	DESIGN BY	MLB

CONCEPTUAL ALTERNATIVE #1
FOR
US ROUTE 22 & ROUTE 519
PHILLIPSBURG WARREN COUNTY NEW JERSEY

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 Planners - Surveyors - Landscape Architects
 State of N.J. Certificate of Authorization: 24CA-2786500

FIGURE 48

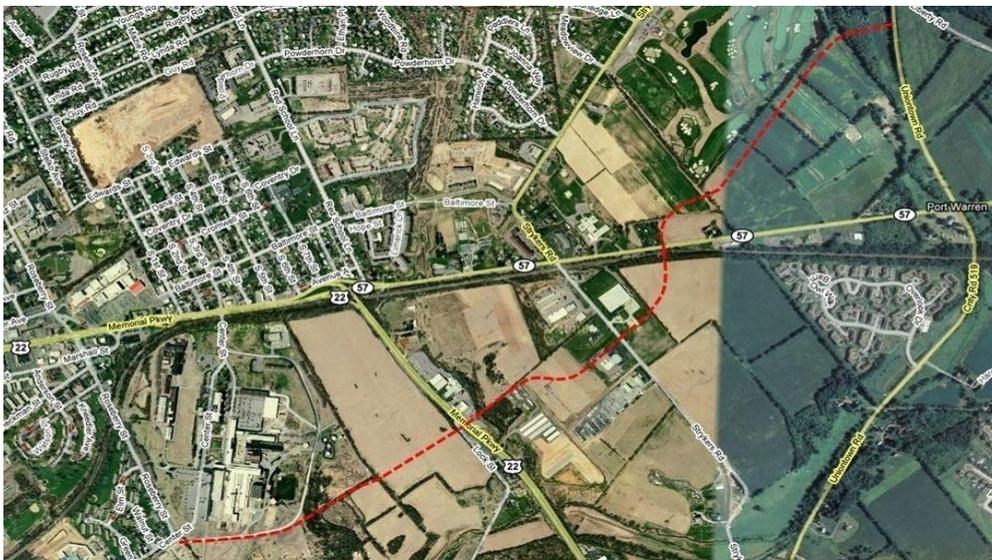
6.3.4 Center Street Extension & Lock Street Realignment

The recommended Center Street Extension was designed to create a link between Roseberry Street and US Route 22, Strykers Road, Route 57 and County Route 519. Currently, motorists attempting to access destinations north and east from Phillipsburg must use US Route 22. This connection will help alleviate traffic from the side streets that intersect the Memorial Parkway section of the corridor. In turn, this will alleviate weaving and improve traffic flow on US Route 22. The Center Street Extension will attract northbound motorists headed for Route 519 from points south of US Route 22 and will reduce left turning traffic onto County Route 519 northbound. This concept is separated into two phases.

Phase 1 includes the extension of Center Street in Phillipsburg to US Route 22 at the existing intersection of Lock Street. Lock Street would also be realigned to intersect the Center Street Extension at a 90 degree angle. Currently, the existing Lock Street intersection only accesses the eastbound travel lanes and vehicular movements are limited to right-turn in/right-turn out movements.

Phase 2 includes the extension of Center Street through US Route 22 to Strykers Road, Route 57 and County Route 519 and implementation of a full movement signalized intersection at the intersection with US Route 22. The westbound approach would be widened to accommodate a shared through/right-turn lane. The eastbound approach will provide exclusive left-turn and through lanes with a channelized right-turn. The southbound approach will accommodate an exclusive left-turn lane, through lane and shared through/right-turn lane.

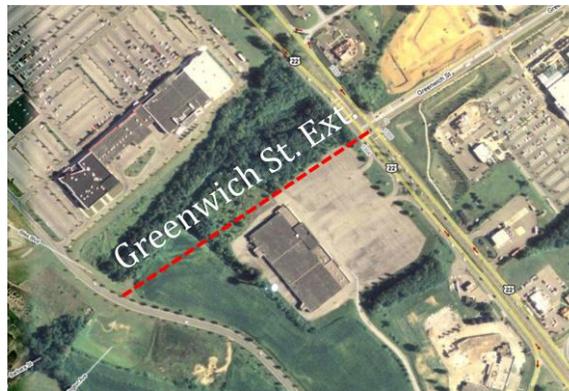
Figure 50 – Center Street Extension



6.3.5 Greenwich Street Extension To Bliss Boulevard

The Greenwich Street Extension from US Route 22 to the realigned Bliss Boulevard should be coordinated with the future Wal-Mart Super Center. The Greenwich Street Extension would serve as a link between Bliss Boulevard and points north of US Route 22, diverting traffic from the neighboring intersections as well as providing access to future development along the eastbound frontage of US Route 22. The Greenwich Street extension to Bliss Boulevard would provide a parallel circulation roadway between Route 122 and Liberty Boulevard, which is discussed in Section 7.5.2. (See **Figure 51 - Greenwich Street Extension**).

Figure 51 – Greenwich Street Extension



6.3.6 Bliss Boulevard Link To Phillipsburg Mall

Bliss Boulevard is a local roadway which runs north/south parallel to US Route 22 from Liberty Boulevard to Route 122. Currently, the roadway is underutilized and does not provide a direct connection to the major roadways in Phillipsburg. Extending Bliss Boulevard north to the Phillipsburg Mall will create an interconnection between several properties fronting US Route 22 eastbound reducing external trips. It would also be linked to the Greenwich Street Extension and Bliss Boulevard realignment, which is discussed in Section 6.3.5. (See **Figure 52 - Bliss Boulevard Extension**).

It is noted that the recommendation to extend Bliss Boulevard to the Phillipsburg Mall was strongly opposed by many Bliss Boulevard area residents who attended the June 22, 2009 public meeting on the Draft US Route 22 Corridor Improvement Plan. Subsequently, on July 10, 2009, a letter was received from the Pohatcong Township Council strongly opposed to the extension of Bliss Boulevard through to the Phillipsburg Mall proposed as part of the Route 22 Corridor Study. This alternative has been retained in the US Route 22 Corridor Improvement Plan with the understanding that it would be subject to municipal support for implementation.

Figure 52 – Bliss Boulevard Extension

6.3.7 I-78 Interchange at Carpentersville Road

In Pohatcong, the Regency at Pohatcong, a 312 -unit mixed single-family and townhouse age-restricted development and EAI Investments, a 448 unit mixed single-family residential development, have been approved. These developments will generate a substantial amount of traffic to the local roadway network within Alpha and Pohatcong. At the Visioning Workshop, a new I-78 interchange was discussed. This possible interchange is located in the southeast quadrant of Pohatcong Township, west of the US Route 22 interchange of I-78. This area of I-78 is under the jurisdiction of the DRJTBC. The interchange would help remove traffic from local roadways and other US Route 22 cross streets, such as Route 122, which are currently experiencing high delays. (See **Figure 53 - Proposed I-78 Interchange**).

Currently, all trips destined for I-78 must utilize the US Route 22 interchange, increasing traffic on US Route 22. Motorists traveling eastbound on US Route 22 to access I-78 could utilize County Route 519 to Main Street to Carpentersville Road to access the new interchange. The existing roadway network should be analyzed to determine the ability to accommodate the increased traffic. Additional study is needed before this interchange can be endorsed.

Figure 53 – Proposed I-78 Interchange



6.3.8 I-78 Westbound Ramp to Route 173 Eastbound Ramp

Currently motorists traveling on I-78 westbound trying to access Route 173 eastbound need to use the Route 122 jughandle. The I-78 westbound to Route 173 eastbound ramp is needed to complete this interchange and help to alleviate congestion at Route 122. Further study and evaluation should be conducted to realize the potential cost to benefit ratio of this improvement (See **Figure 54 - Proposed I-78 Ramp**).

Figure 54 – Proposed I-78 Ramp



6.3.9 US Route 122 & Route 173 Barrier

The Route 173/US Route 22 westbound weave as it approaches Route 122 has been constructed with a design that has become substandard with the increase of traffic volume. Motorists attempting to access Route 122 from Route 173 westbound need to cross over three lanes of heavily traveled, quick moving traffic coming from I-78. A physical barrier is recommended from the merge to the Route 122 intersection to separate the westbound traffic coming from Route 173 and the westbound on traffic US Route 22 coming from I-78. (See **Figure 55 - US Route 22 & Route 173 Jersey Barrier Design**).

Figure 55 – US Route 22 & Route 173 Jersey Barrier Design



This barrier would force the Route 173 westbound motorists to use Greenwich Street and Dumont Road to access the shopping plazas and Route 122. Additionally, vehicles can access Route 122 from Route 173 westbound via local roads (i.e. Springtown Road, Still Valley Road and Edge Road) prior to entering US Route 22. Edge Road improvements are under design and have been funded. Other road improvement may be required to improve the road conditions for this alternative access route. (See **Figure 56 – Local Roads as Alternative Routes from Route 173 Westbound**).

Figure 56 – Local Roads as Alternative Routes from Route 173 Westbound



6.4 ASSESSMENT OF THE REGIONAL ROAD NETWORK IMPROVEMENTS

Based on the recommended improvements to the regional road network, together with short-term technical improvements, the 2035 peak hour traffic operations along the US Route 22 corridor roadway network were reevaluated using the latest version of *Synchro Trafficware*. **Figures 57** and **58** show the 2035 revised network PM Peak Hours and SAT Peak Hour LOS volume/capacity descriptions and average seconds of delay for the intersection movements.

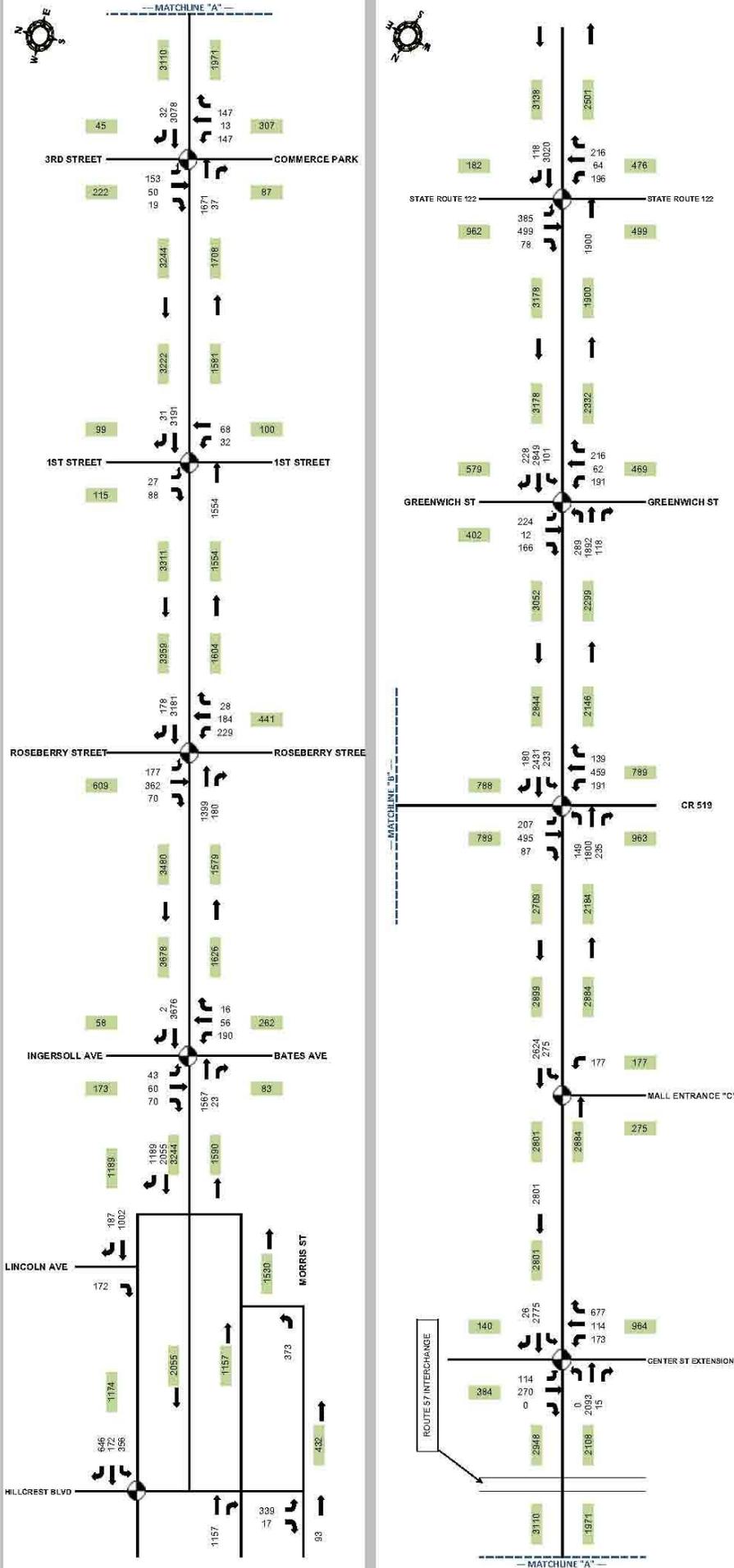
The results of the reevaluated capacity analysis determined that the recommended network revisions are a significant improvement from the short-term technical improvements applied at each intersection and the revised network can sustain the expected growth in traffic to the build-out year of 2035. **Figures 59** and **60** detail the 2035 revised network conditions LOS and delay. The complete results of the capacity analysis can be found within the Appendix.

Figure 61 provides a LOS comparison of 2035 build-out with technical improvements and revised network improvements.



FIGURE 57

2035 CONDITIONS WITH IMPROVEMENTS - PM PEAK HOUR
US ROUTE 22 CORRIDOR TRAFFIC VOLUMES



LEGEND

- Signalized Intersection
- Through Movement
- Turning Movement
- Mvmt: Traffic Volume
- Approach Totals

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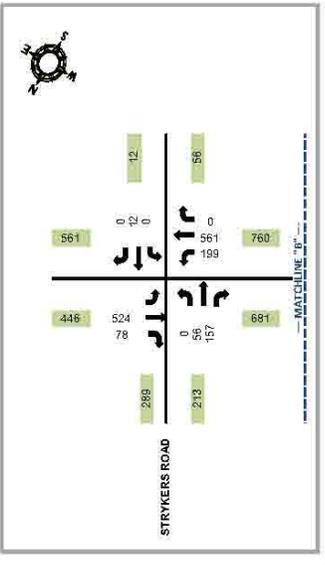
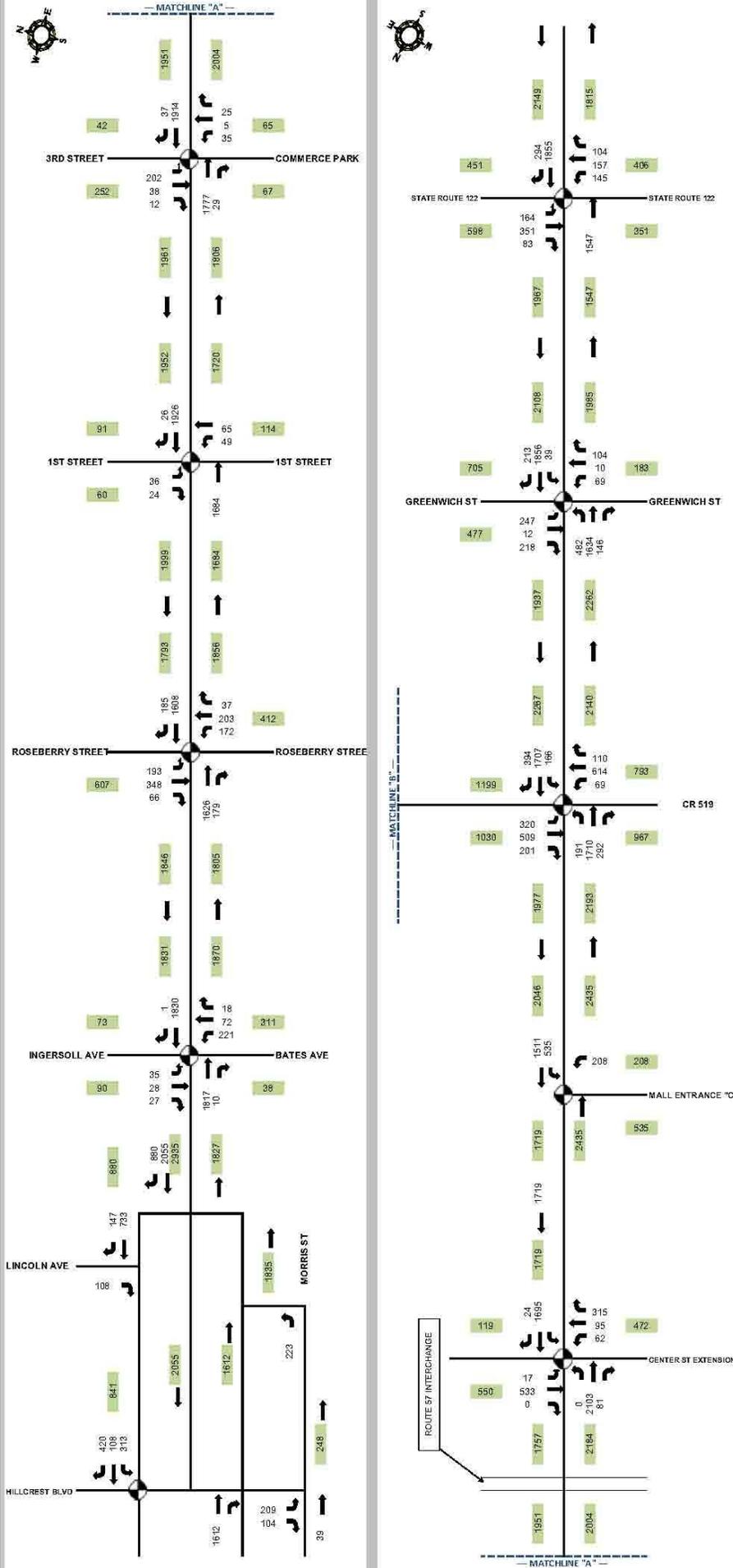


FIGURE 58

2035 CONDITIONS WITH IMPROVEMENTS - SAT PEAK HOUR
 U.S. ROUTE 22 CORRIDOR TRAFFIC VOLUMES



LEGEND

- Signalized Intersection
- Through Movement
- Turning Movement
- Movement Volume
- Approach Totals

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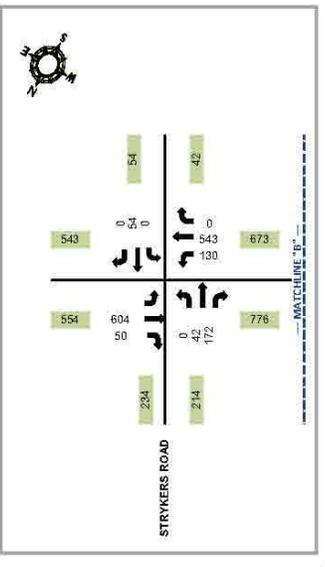
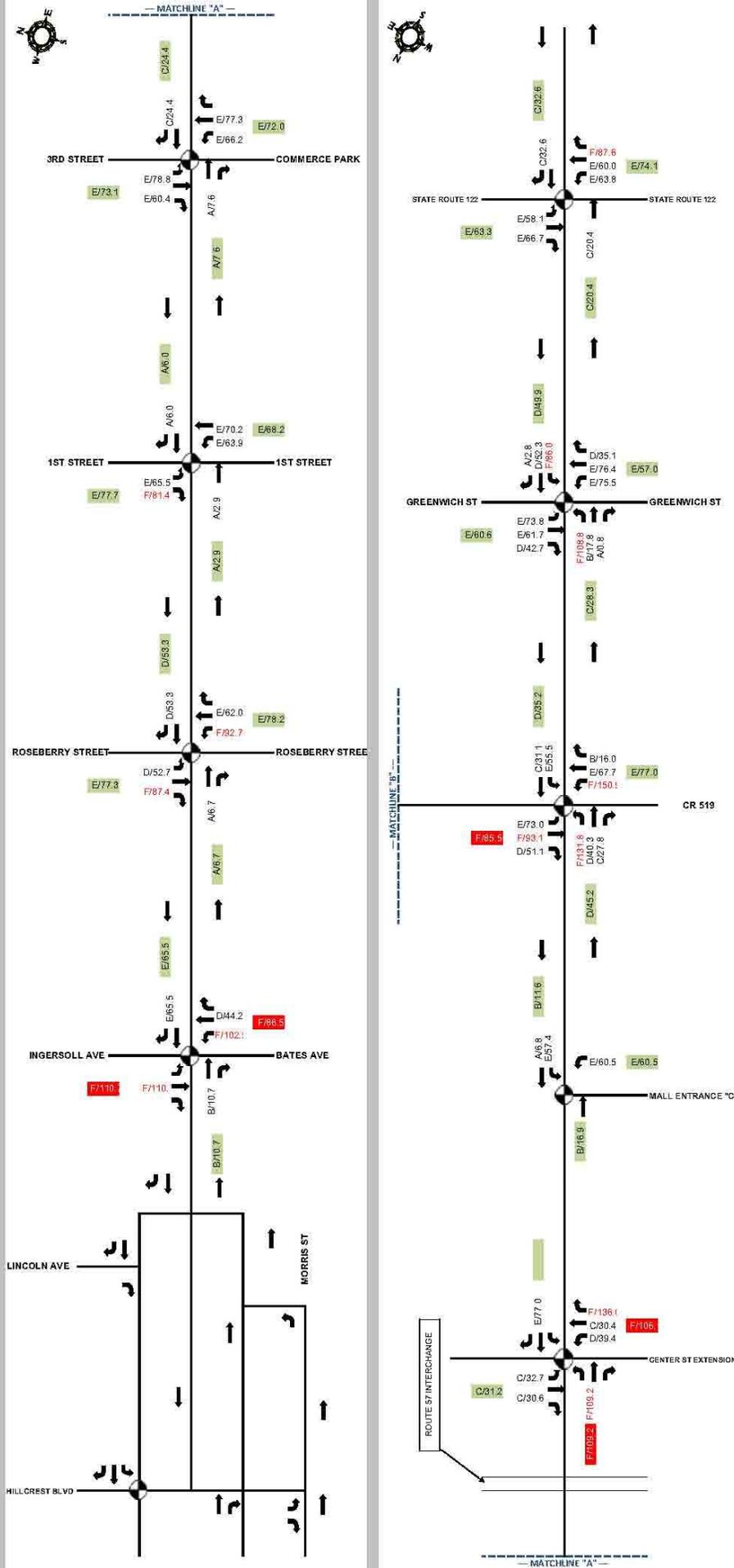


FIGURE 59

2035 CONDITIONS WITH IMPROVEMENTS - PM PEAK HOUR
US ROUTE 22 CORRIDOR CAPACITY ANALYSIS



LEGEND

- Signalized Intersection
- Through Movement
- Turning Movement
- Movement: Traffic Volume
- Approach Totals

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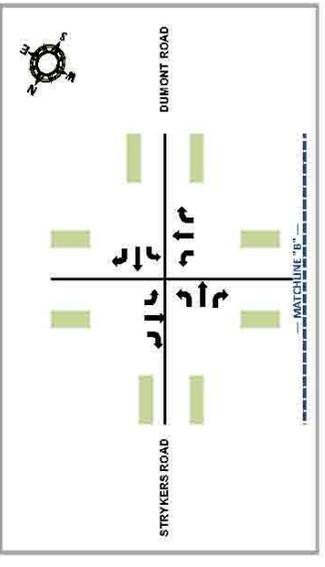
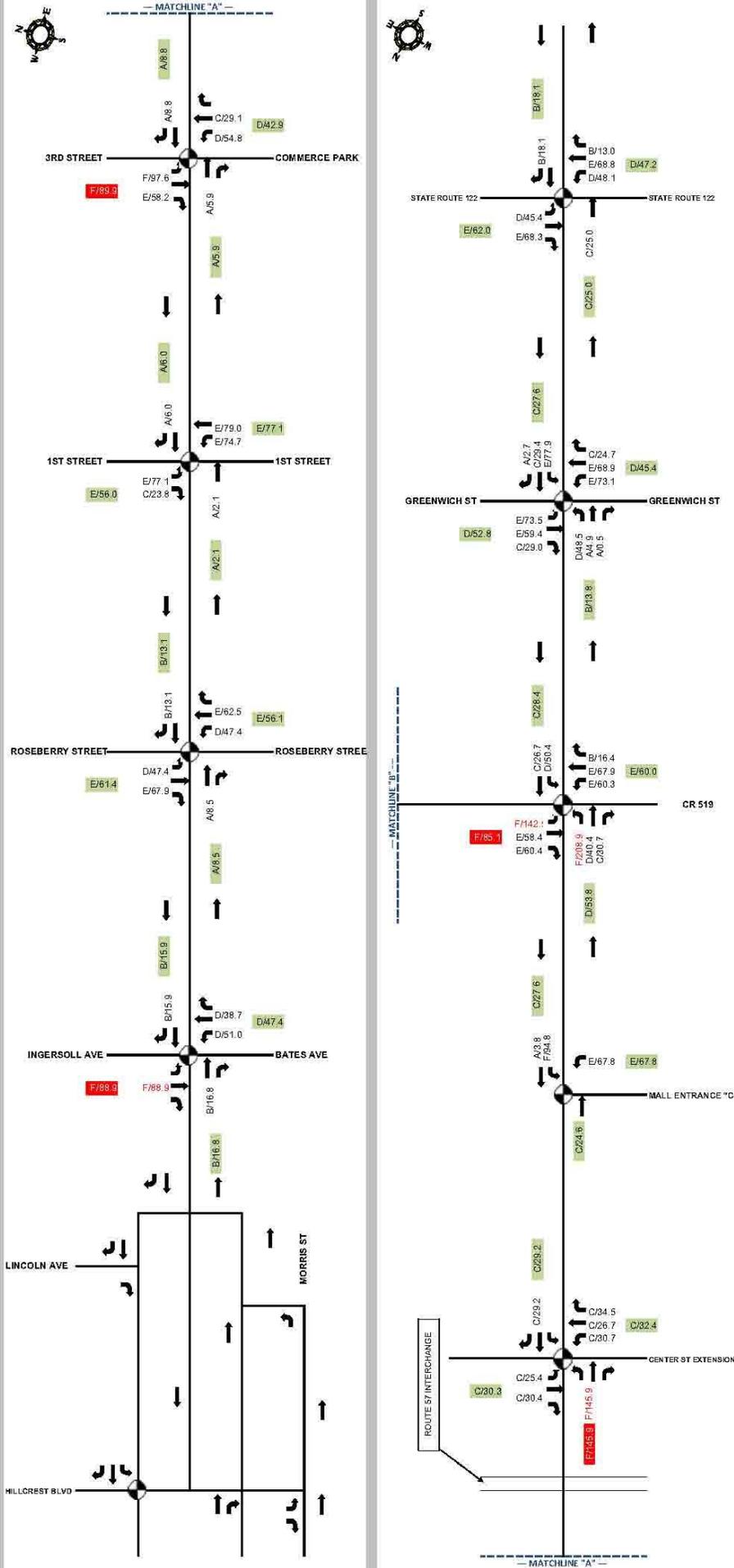


FIGURE 60

2035 CONDITIONS WITH IMPROVEMENTS - SAT PEAK HOUR
US ROUTE 22 CORRIDOR CAPACITY ANALYSIS



LEGEND

- Signalized Intersection
- Through Movement
- Turning Movement
- MVmet. Traffic Volume
- Approach Totals

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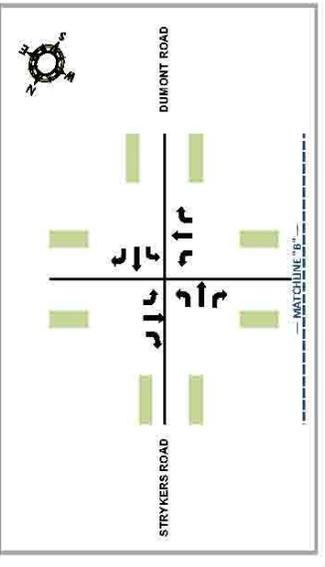


Figure 61 – LOS Comparisons: Build-Out Technical Improvement vs. Revised Network

SYNCHRO CONDITION	2008 EXISTING CONDITIONS		2035 BUILD-OUT CONDITIONS		2035 TECHNICAL IMPROVEMENTS		2035 REVISED NETWORK CONDITIONS	
	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS
INGERSOLL/BATES AVENUE	47.5	D	148.5	F	27.8	C	52.5	D
ROSEBERRY STREET	68.0	E	194.0	F	96.0	F	39.8	D
FIRST STREET	6.0	A	6.0	A	4.3	A	7.9	A
THIRD STREET	10.6	B	109.7	F	107.2	F	23.8	C
CENTER ST./LOCK ST.	13.0	B	145.9	F	145.9	F	89.5	F
SHOPPING CENTER DR	13.4	B	14.9	B	14.9	B	15.4	B
CR 519 EASTBOUND	131.1	F	359.1	F	359.6	F	52.3	D
CR 519 WESTBOUND	194.2	F	391.7	F	401.2	F		
GREENWICH ST	31.9	C	57.0	E	40.6	D	43.3	D
US ROUTE 122	32.3	C	240.2	F	126.5	F	36.6	D

SYNCHRO CONDITION	2008 EXISTING CONDITIONS		2035 BUILD-OUT CONDITIONS		2035 TECHNICAL IMPROVEMENTS		2035 REVISED NETWORK CONDITIONS	
	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS
INGERSOLL/BATES AVENUE	27.3	C	32.7	C	18.0	B	20.3	C
ROSEBERRY STREET	37.4	D	93.0	F	53.5	D	21.9	C
FIRST STREET	3.2	A	3.8	A	3.8	A	7.2	A
THIRD STREET	8.7	A	13.8	B	13.8	B	13.0	B
CENTER ST./LOCK ST.	0.2	A	22.4	C	22.4	C	80.6	F
SHOPPING CENTER DR	24.3	C	26.8	C	25.0	C	27.8	C
CR 519 EASTBOUND	170.8	F	488.3	F	319.3	F	50.6	D
CR 519 WESTBOUND	61.6	E	142.5	F	122.5	F		
GREENWICH ST	29.8	C	39.7	D	25.9	C	24.5	C
US ROUTE 122	28.8	C	101.0	F	55.8	E	28.5	C

7. US ROUTE 22 CORRIDOR IMPROVEMENT PLAN

The US Route 22 Corridor Improvement Plan was developed to address a variety of transportation needs throughout the study corridor. These improvements were categorized by short-term, mid-term and long-term improvements to identify which improvements can be implemented immediately and which will require further engineering.

The following sections detail the improvements for each intersection, highlighting the short, mid and long-term improvements associated with each intersection. An intersection improvement figure accompanies each description.

7.1 RECOMMENDED INTERSECTION IMPROVEMENTS

7.1.1 US Route 22 & Ingersoll/Bates Avenue

Short-Term Improvements

- Coordination Techniques
 - Actuate and coordinate as part of Signal Coordination Zone 1.
 - Background Cycle Length of 150 seconds.
- Pedestrian Facilities Upgrade
 - 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 handicap accessible ramps as described in **Figure 62**.
 - Install sidewalk on the northwest and southeast approaches of the intersection.

Mid-Term Improvements

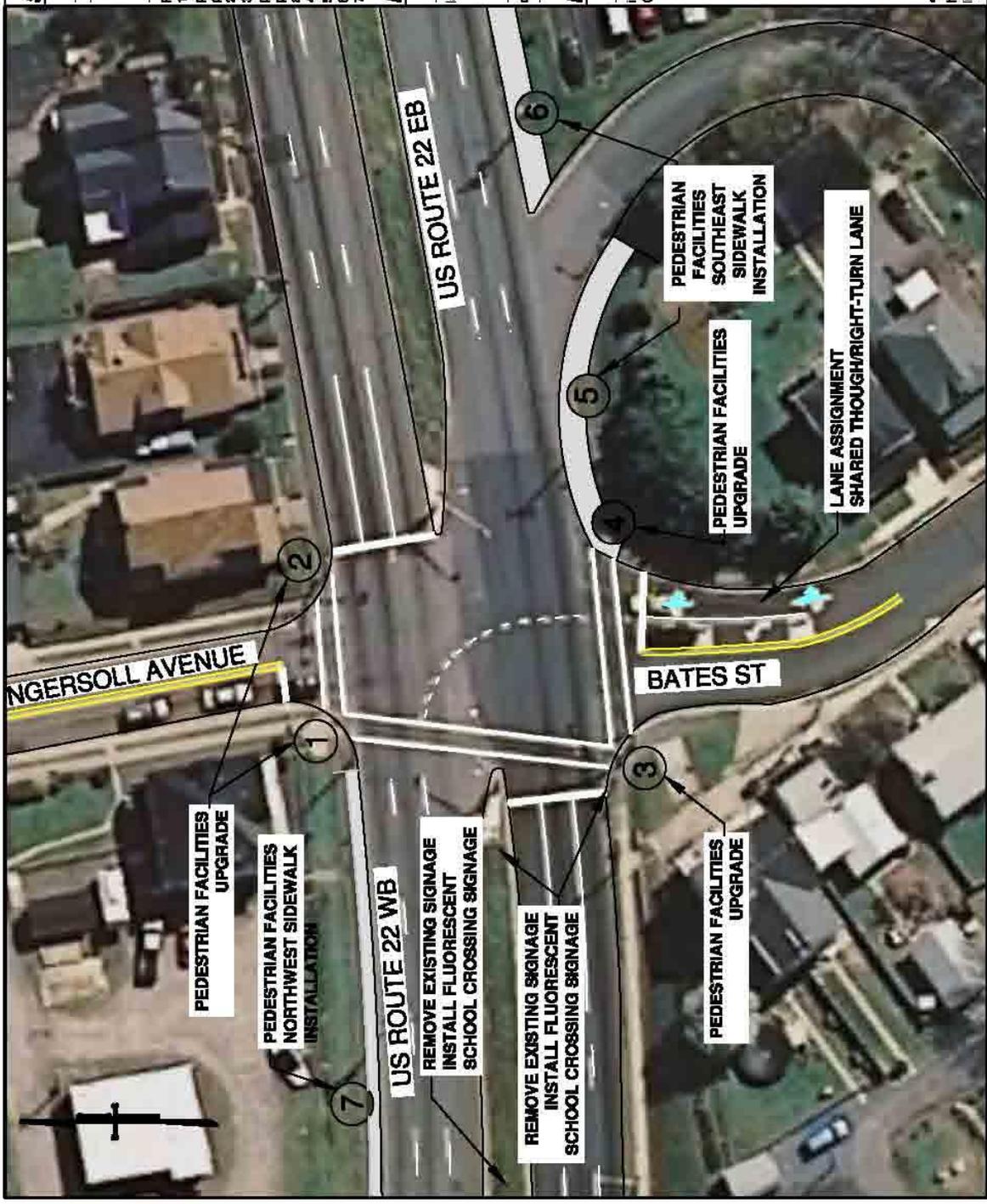
- Lane Assignments
 - Revise northbound approach to accommodate an exclusive left-turn lane and a shared through/right-turn lane.
- Signal Phasing
 - Revise signal phasing to have a northbound and southbound movements run concurrently.
 - Add permitted/protected left-turn advance phase for northbound approach.
- Textured Colored Pavement
 - Install textured colored pavement at the intersection.



Long-Term Improvements

- Removal of the traffic signal and revisions to the geometric alignment of all four (4) intersection approaches may be considered in coordination with the Memorial Parkway Improvements.





Short-Term Improvements

- Coordination Techniques**
- Actuated and Coordinated as Part of Signal Coordination Zone 1
 - Background Cycle Length of 150 seconds.
- Pedestrian Facilities Upgrade**
- Remove existing MUTCD School Crossing Sign (S1-1) and install Fluorescent MUTCD School Crossing Sign
 - 1. Replace existing one (1) ped. signal head and install one (1) new ped. countdown signal head; install one (1) MUTCD compliant ped. push-button for US Route 22 crosswalk.
 - 2. Install one (1) ped. countdown signal head.
 - 3. Replace existing one (1) ped. signal head and install one (1) new ped. countdown signal head; install MUTCD compliant ped. push-button for US Route 22 crosswalk; install (2) textured handicap accessible ramps.
 - 4. Install one (1) ped. countdown signal head.
 - 5. Install sidewalk and textured handicap accessible ramps.
 - 6. Install sidewalk and textured handicap accessible ramps.
 - 7. Install sidewalk and textured handicap accessible ramps.

Mid-Term Improvements

- Lane Assignments**
- Revise NB lane assignment to accommodate an exclusive left-turn lane and shared through/right-turn lane.

Signal Phasing

- Revise signal phasing to have NB and SB movements run concurrently.
- Add permitted/protected left-turn advance phase for NB approach.

Long-Term Improvements

- Roadway Improvements**
- The removal of this signal and revisions to the geometric alignment in coordination with the Memorial Pkwy. Improvements (As per Concept Plans)

*NOTE: For a better visualization, roadway widening/narrowing is hatched in dark gray, installation/restoration of sidewalk is hatched in light gray, and proposed roadway striping appears as cyan.

**CORRIDOR IMPROVEMENTS
US ROUTE 22 & INGERSOLL AVENUE/BATES ST
SHORT-TERM, MID-TERM, & LONG-TERM
IMPROVEMENTS**

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State of N.J. Certificate of Authorization: 24-G427969500

JOB NUMBER:	08000727G	DATE:	APRIL 26, 2009
SCALE:	1" = 50'	LATEST REVISION:	MAY 22, 2009
DRAWN BY:	MACH MANGES	CHECKED BY:	J.C.
PROJECT NUMBER:	HAC24665		

FIGURE 62

7.1.2 US Route 22 & Roseberry Street

Short-Term Improvements

- Coordination Techniques
 - Actuate and coordinate as part of Signal Coordination Zone 1.
 - Background cycle length of 150 seconds.
 - Coordinate Elder Avenue traffic signal on Roseberry Street with US Route 22 traffic signal.
- Pedestrian Facilities Upgrade
 - Realign existing southbound crosswalk with depressed curb at southeast corner.
 - Install pedestrian countdown signal heads, pedestrian push-buttons and textured handicap accessible ramps as described in **Figure 63**.
 - Restore existing sidewalk on the northeast approach of the intersection.

Mid-Term Improvements

- Lane Assignments
 - Convert northbound and southbound shared through/left-turn lanes to exclusive left-turn lanes.
- Signal Phasing
 - Revise signal phasing to have northbound and southbound movements run concurrently.
 - Add permitted/protected left-turn advance phase for northbound approach.

Long-Term Improvements

- Roadway Improvements
 - Northbound/Southbound widening to accommodate three-lane cross section.
 - Reduce median width on east side of intersection to accommodate southbound left-turn movements.
 - Install turning pavement markings within intersection to identify turning lanes.
- Pedestrian Facilities Upgrade
 - Construct pedestrian overpass across US Route 22. (High priority to complete in time for opening of High School in 2012.)

7.1.3 US Route 22 & 1st Street

Short-Term Improvements

- Install one MUTCD “No Right-Turn” Sign (R3-1) on the westbound approach.
- Coordination Techniques
 - Actuate and coordinate as part of Signal Coordination Zone 1.
 - Background cycle length of 150 seconds.
- Pedestrian Facilities Upgrade
 - Install pedestrian countdown signal heads, pedestrian push-buttons and textured handicap accessible ramps as described in **Figure 64**.
 - Install sidewalk from the southeast corner of the 1st Street intersection to the southwest corner of the 3rd Street intersection.
 - Install/Restore sidewalk along the northeast corner of the intersection.

Mid-Term Improvements

- Roadway Improvements
 - Southbound approach widening to accommodate exclusive left-turn and right-turn lanes.



Short-Term Improvements

Coordination Techniques

- Activated and Coordinated as Part of Signal Coordination Zone 1
- Background Cycle Length of 150 seconds.

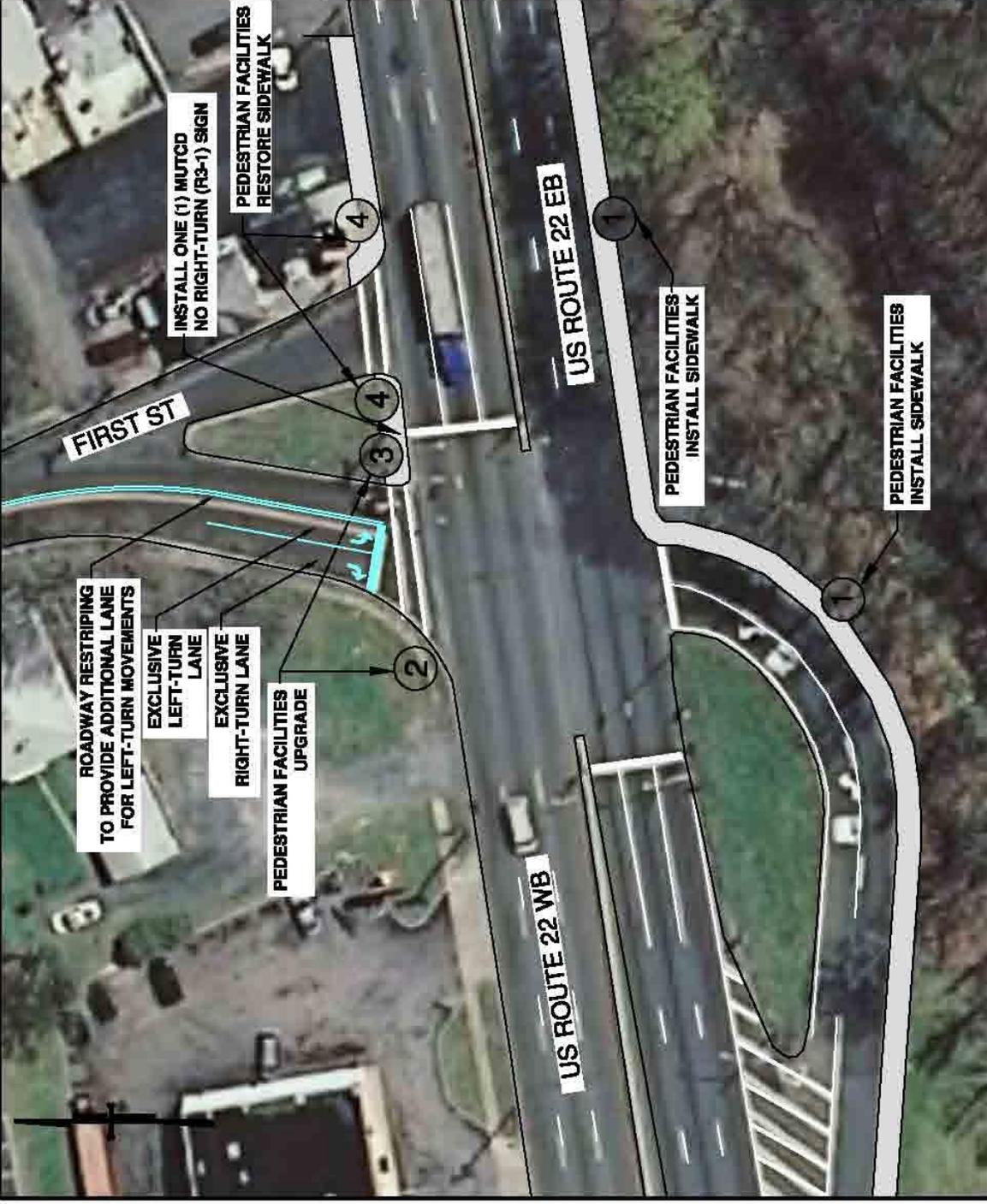
Pedestrian Facilities

- install one (1) MUTCD No right-turn (R3-1) sign at the intersection of First Street on the US Route 22 WB approach.
- 1. install sidewalk along the eastbound approach of Route 22 to the southeast corner of the Third Street intersection.
- 2. install one (1) new ped. countdown signal head; install one (1) textured handicap accessible ramp.
- 3. install two (2) new ped. countdown signal head; install one (1) textured handicap accessible ramp.
- 4. install Restore sidewalk along the northeast corner of the intersection.

Mid-Term Improvements

Roadway Improvements

- Southbound Approach: restriping to accommodate exclusive left-turn and right-turn lane.



*NOTE: For a better visualization, roadway widening/narrowing is hatched in dark gray, installation/restoration of sidewalk is hatched in light gray, and proposed roadway stripage appears as cyan.

JOB NUMBER	DATE
08000727G	APRIL 28, 2009
SCALE	LATEST REVISION
1" = 50'	MAY 22, 2009
FIELD NUMBER	DESIGN BY
H4024655	JJC

FIGURE 64

**US ROUTE 22 CORRIDOR
INTERSECTION: US ROUTE 22 & FIRST STREET
SHORT-TERM, MID-TERM, & LONG-TERM
IMPROVEMENTS**

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7.1.4 US Route 22 & 3rd Street

Short-Term Improvements

- Coordination Techniques
 - Actuate and coordinate as part of Signal Coordination Zone 1.
 - Background cycle length of 150 seconds.
- Pedestrian Facilities Upgrade
 - Install striped crosswalk on west side of the intersection.
 - Install pedestrian countdown signal heads, pedestrian push-buttons and textured handicap accessible ramps as described in **Figure 65**.
 - Install sidewalk from the southeast corner of the 1st Street intersection to the southwest corner of the 3rd Street intersection.
 - Install/Restore sidewalk along the northeast and northwest corners of the intersection.

Mid-Term Improvements

- Signal Phasing
 - Addition of permitted/protected left-turn phase for southbound approach.

Long-Term Improvements

- Roadway Improvements
 - Northbound approach widening to accommodate exclusive left-turn lane and a shared through/right-turn lane.
- Signal Phasing
 - Add a permitted/protected left-turn phase for northbound approach.

Short-Term Improvements Coordination Techniques

- Adjusted and Coordinated as Part of Signal Coordination Zone 1
- Background Cycle Length of 160 seconds.

Pedestrian Facilities

1. Install crosswalk west of intersection for Route 22 pedestrian movements.
2. Replace existing one (1) ped. signal head with a new ped. countdown signal head; Replace existing one (1) ped. push-button with MUTCD compliant ped. push-button for Route 22 crosswalk; Install one (1) textured handicap accessible ramp for Route 22 pedestrian movements.
3. Install sidewalk along southwest corner of the intersection from First Street.
4. Install/Restore sidewalk along the northwest corner of the intersection.
5. Replace existing one (1) ped. signal head and install one (1) new ped. countdown signal head; Replaces one (1) ped. push-button with MUTCD compliant ped. push-button for Route 22 crosswalk; Install one (1) textured handicap accessible ramp for Route 22 pedestrian movements.
6. Replace existing one (1) ped. signal head with a new ped. countdown signal head; Replaces one (1) ped. push-button with MUTCD compliant ped. push-button for Route 22 crosswalk; Replaces existing one (1) textured handicap accessible ramp for Route 22 pedestrian movements.
7. Install/Restore sidewalk along the northeast corner of the intersection.

Mid-Term Improvements

Signal Phasing

- Add permitted/protected left-turn advance phase for SB approach.

Long-Term Improvements

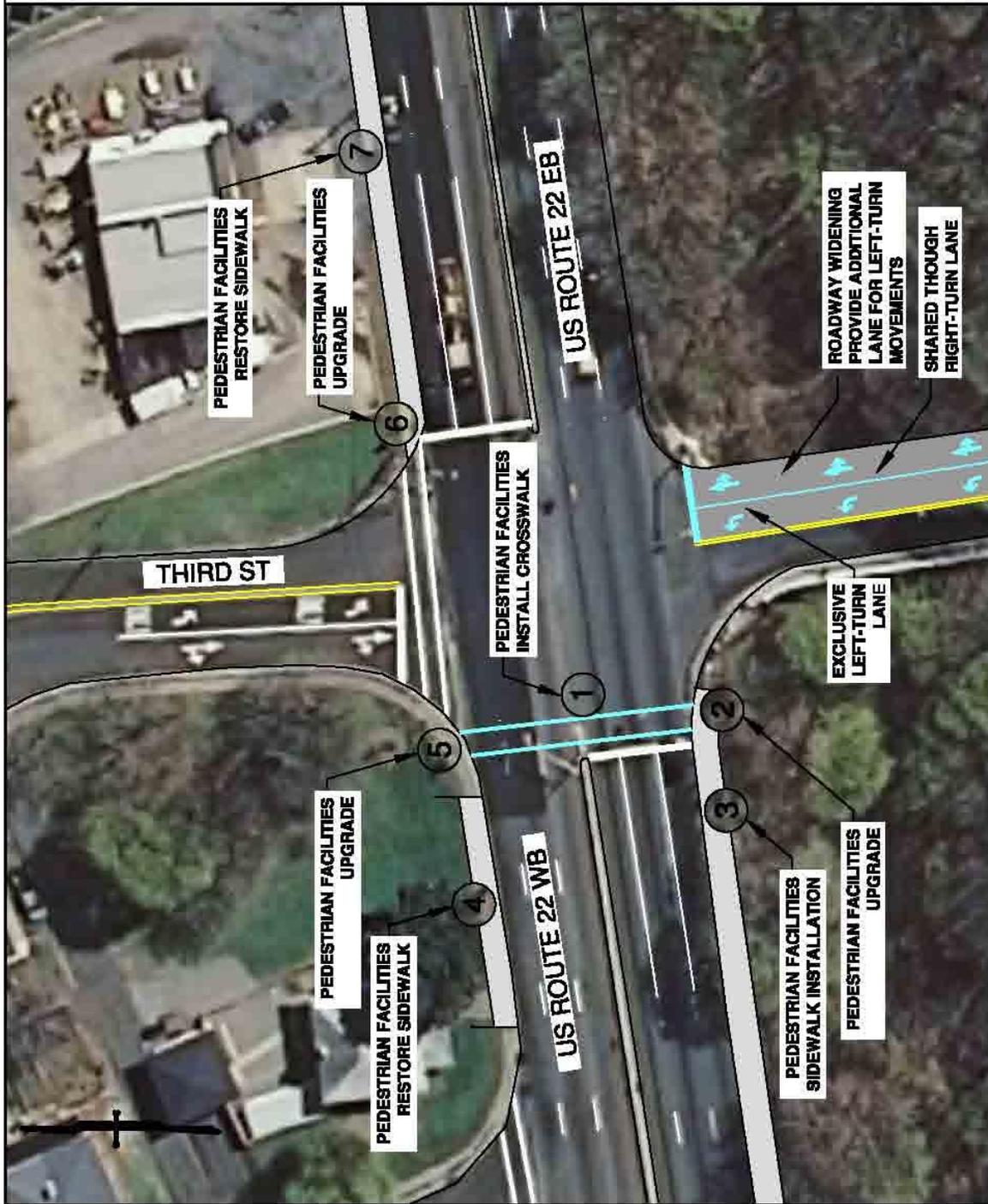
Roadway Improvements

- Northbound Approach: widening to accommodate exclusive left-turn lane and a shared through/right-turn lane.

Signal Phasing:

- Add permitted/protected left-turn advance phase for NB approach.

*NOTE: For a better visualization, roadway widening/narrowing is hatched in dark gray, medial restoration of sidewalk is hatched in light gray, and proposed roadway stripeage appears as cyan.



US ROUTE 22 CORRIDOR INTERSECTION: US ROUTE 22 & THIRD STREET SHORT-TERM, MID-TERM, & LONG-TERM IMPROVEMENTS

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JOB NUMBER	DB000727C	DATE	APRIL 29, 2009
SCALE	1" = 50'	LATEST REVISION	MAY 22, 2009
DRAW NUMBER	HAS24855	DESIGN BY	J.C.

FIGURE 65

7.1.5 US Route 22 & Phillipsburg Mall Entrance

Short-Term Improvements

- Coordination Techniques
 - Actuate and coordinate as part of Signal Coordination Zone 1.
 - Background cycle length of 150 seconds.
- Pedestrian Facilities Upgrade



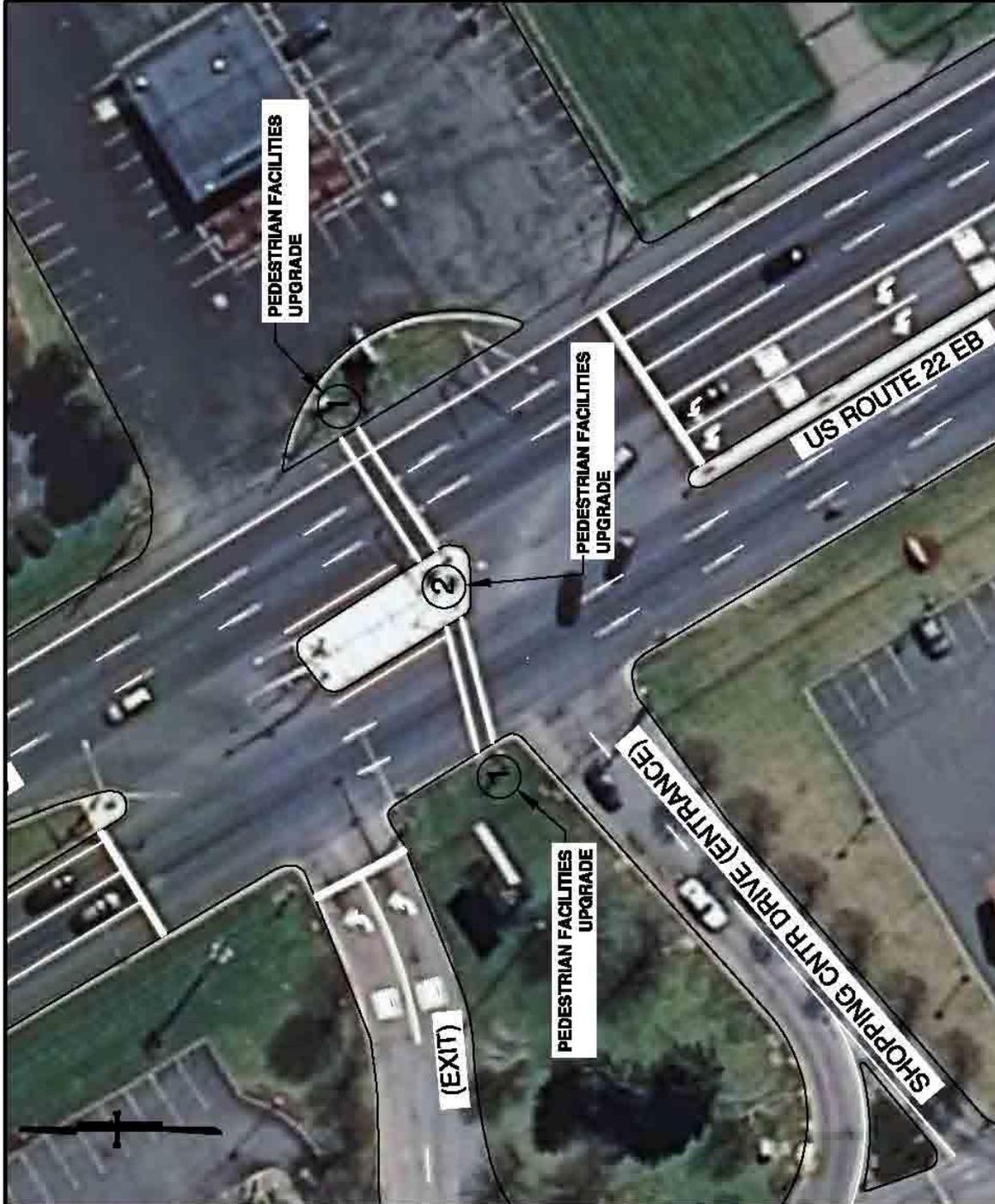
**Short-Term Improvements
Coordination Techniques**

- Actuated and Coordinated as Part of Signal Coordination Zone 1
- Background Cycle Length of 150 seconds.

Pedestrian Facilities

1. Replace existing one (1) ped. signal head with a new ped. countdown signal head; Replace existing one (1) ped. push-button with MUTCD compliant ped. push-button for Route 22 crosswalk; install one (1) textured handicap accessible ramp for Route 22 pedestrian movements.
2. Replace existing two (2) ped. signal head with two (2) new ped. countdown signal head; Replace existing two (2) ped. push-button with MUTCD compliant ped. push-button for Route 22 crosswalk; install two (2) textured handicap accessible ramp for Route 22 pedestrian movements.

*NOTE: For a better visualization, roadway widening/narrowing is hatched in dark gray, installation/restoration of sidewalk is hatched in light gray, and proposed roadway stripage appears as cyan.




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**US ROUTE 22 CORRIDOR
INTERSECTION: US ROUTE 22 & SHOPPING CNTR
SHORT-TERM, MID-TERM, & LONG-TERM
IMPROVEMENTS**

JOB NUMBER:	08000727G	DATE:	APRIL 29, 2009
SCALE:	1" = 50'	LATEST REVISION:	MAY 22, 2009
DRAWING NUMBER:	HA024655	DESIGN BY:	NOA

FIGURE 66

7.1.6 US Route 22 & County Route 519

Short-Term Improvements

- Coordination Techniques
 - Actuate and coordinate as part of Signal Coordination Zone 2.
 - Background cycle length of 150 seconds.
- Pedestrian Facilities Upgrade
 - Install striped crosswalks for US Route 22 pedestrian movements.
 - Install pedestrian countdown signal heads, pedestrian push-buttons and textured handicap accessible ramps as described in **Figure 67**.
 - Install sidewalk within grass median on east and west sides of the intersection to support pedestrian movements.
 - Install/Restore sidewalk on all four approaches of the intersection.

Mid-Term Improvements

- Signage/Striping
 - Relocate westbound stopbar to protect pedestrian movements
 - Install yield pavement markings at both channelized right-turn movements.
 - Install turning pavement markings within intersection to identify left-turning lanes.

Long-Term Improvements

- Roadway Improvements
 - Install protected eastbound and westbound left-turn movements.
 - Install eastbound and westbound near-side jughandles
- Signal Phasing
 - Addition of permitted/protected left-turn phase for northbound approach.
 - Install a third eastbound through lane to the Greenwich Street intersection.

Short-Term Improvements

- Coordination Techniques**
- Actuated and Coordinated as Part of Signal Coordination Zone 2
 - Background Cycle Length of 128 seconds.

Pedestrian Facilities

1. install crosswalks for Route 22 pedestrian movements.
2. install one (1) new ped. countdown signal head; install one (1) textured handicap accessible ramp.
3. install one (1) new ped. countdown signal head; install two (2) textured handicap accessible ramp.
4. install one (1) textured handicap accessible ramp.
5. install sidewalk within grass median of the intersection to support crossing movements.
6. install/planture sidewalk along the northeast, northwest, southeast and southwest intersection approaches.

Mid-Term Improvements

Signage/Striping

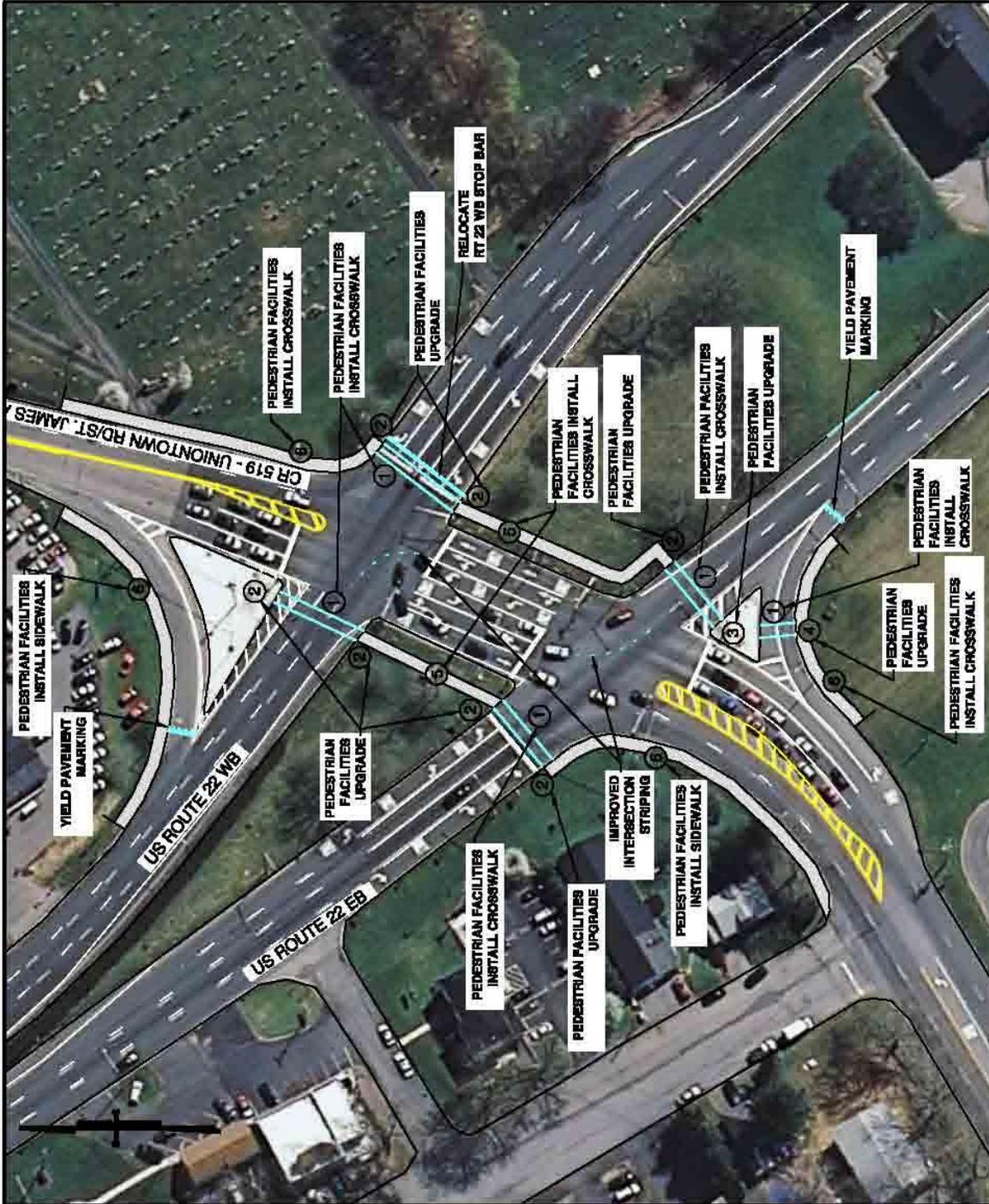
- Relocate Westbound stop bar to protect pedestrian movements.
- install yield pavement markings to both channelized right turns.
- install turning pavement marking within the intersection to identify turning movements.

Long-Term Improvements

Roadway Improvements

- install protected eastbound and westbound left turn lanes (See Concept #1).
- install 100' handlees (See Concept #2).
- install third lane eastbound to Greenwich Street.

*NOTE: For a better visualization, roadway widening/narrowing is hatched in dark gray, installation/restoration of sidewalk is hatched in light gray, and proposed roadway stripage appears as cyan.



US ROUTE 22 CORRIDOR INTERSECTION: US ROUTE 22 & CITY ROUTE 519 SHORT-TERM, MID-TERM, & LONG-TERM IMPROVEMENTS

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State of N.J. Certificate of Authorization: 24G427866500

JOB NUMBER:	080007276	DATE:	APRIL 29, 2008
SCALE:	1" = 100'	LATEST REVISION:	MAY 22, 2009
DRAWN BY:	MASER	CHECKED BY:	BSM/PT
DATE:	HAS24665	DATE:	J.C.

FIGURE 67

7.1.7 US Route 22 & Greenwich Street

Short-Term Improvements

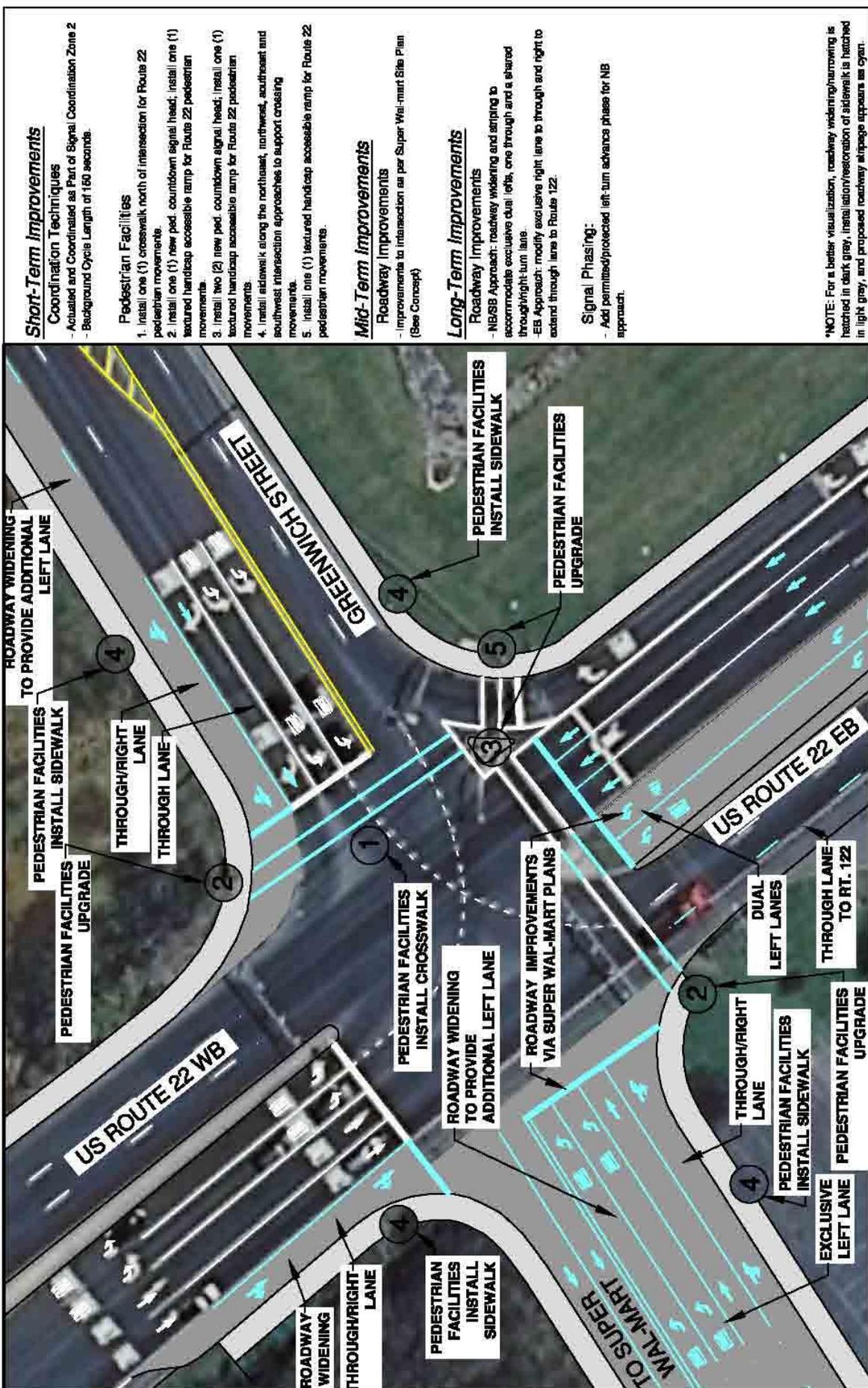
- Coordination Techniques
 - Actuate and coordinate as part of Signal Coordination Zone 2.
 - Background cycle length of 150 seconds.
- Pedestrian Facilities Upgrade
 - Install striped crosswalk on north side for US Route 22 pedestrian movements.
 - Install pedestrian countdown signal heads, pedestrian push-buttons and textured handicap accessible ramps as described in **Figure 68**.
 - Install sidewalks on all four approaches of the intersection.

Mid-Term Improvements

- Roadway Improvements
 - Improvements to the intersection as per Wal-Mart Super Center Site Plan (See Concept Plan).
 - Add two exclusive left-turn lanes on the westbound approach.
 - Add a northbound approach to the intersection.

Long-Term Improvements

- Roadway Improvements
 - Northbound and southbound roadway widening and striping to accommodate exclusive dual left-turn lanes, one through lane, and a shared through/right-turn lane.
 - Eastbound approach modifications. Reassign to include share through/right-turn lane for entering Wal-Mart Super Center Site. Extend eastbound through lane eastbound to US Route 122 intersection.
- Signal Phasing
 - Add a permitted/protected left-turn phase for northbound approach.



Short-Term Improvements

Coordination Techniques
 - Actuated and Coordinated as Part of Signal Coordination Zone 2
 - Background Cycle Length of 160 seconds.

Pedestrian Facilities

1. install one (1) crosswalk north of intersection for Route 22 pedestrian movements.
2. install one (1) new ped. countdown signal head; install one (1) textured handicap accessible ramp for Route 22 pedestrian movements.
3. install two (2) new ped. countdown signal head; install one (1) textured handicap accessible ramp for Route 22 pedestrian movements.
4. install sidewalk along the northeast, northwest, southeast and southwest intersection approaches to support crossing movements.
5. install one (1) textured handicap accessible ramp for Route 22 pedestrian movements.

Mid-Term Improvements

Roadway Improvements
 - Improvements to intersection as per Super Wal-mart Site Plan (See Concept)

Long-Term Improvements

Roadway Improvements
 - NBSB Approach: roadway widening and striping to accommodate exclusive dual lefts, one through and a shared through/right turn lane.
 - EB Approach: modify exclusive right lane to through and right to extend through lane to Route 122.

Signal Phasing:

- Add permitted/protected left-turn advance phase for NB approach.

*NOTE: For a better visualization, roadway widening/narrowing is hatched in dark gray, install/restore of sidewalk is hatched in light gray, and proposed roadway striping appears as cyan.

JOB NUMBER:	080007276	DATE:	APRIL 29, 2008
SCALE:	1" = 50'	LATEST REVISION:	MAY 22, 2009
DRAWN BY:	HAZEL MASER	CHECKED BY:	BOBBI PIV
DATE:	HAZEL MASER	DATE:	BOBBI PIV

FIGURE 68

**US ROUTE 22 CORRIDOR
 INTERSECTION: US ROUTE 22 & GREENWICH ST.
 SHORT-TERM, MID-TERM, & LONG-TERM
 IMPROVEMENTS**

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7.1.8 US Route 22 & Route 122

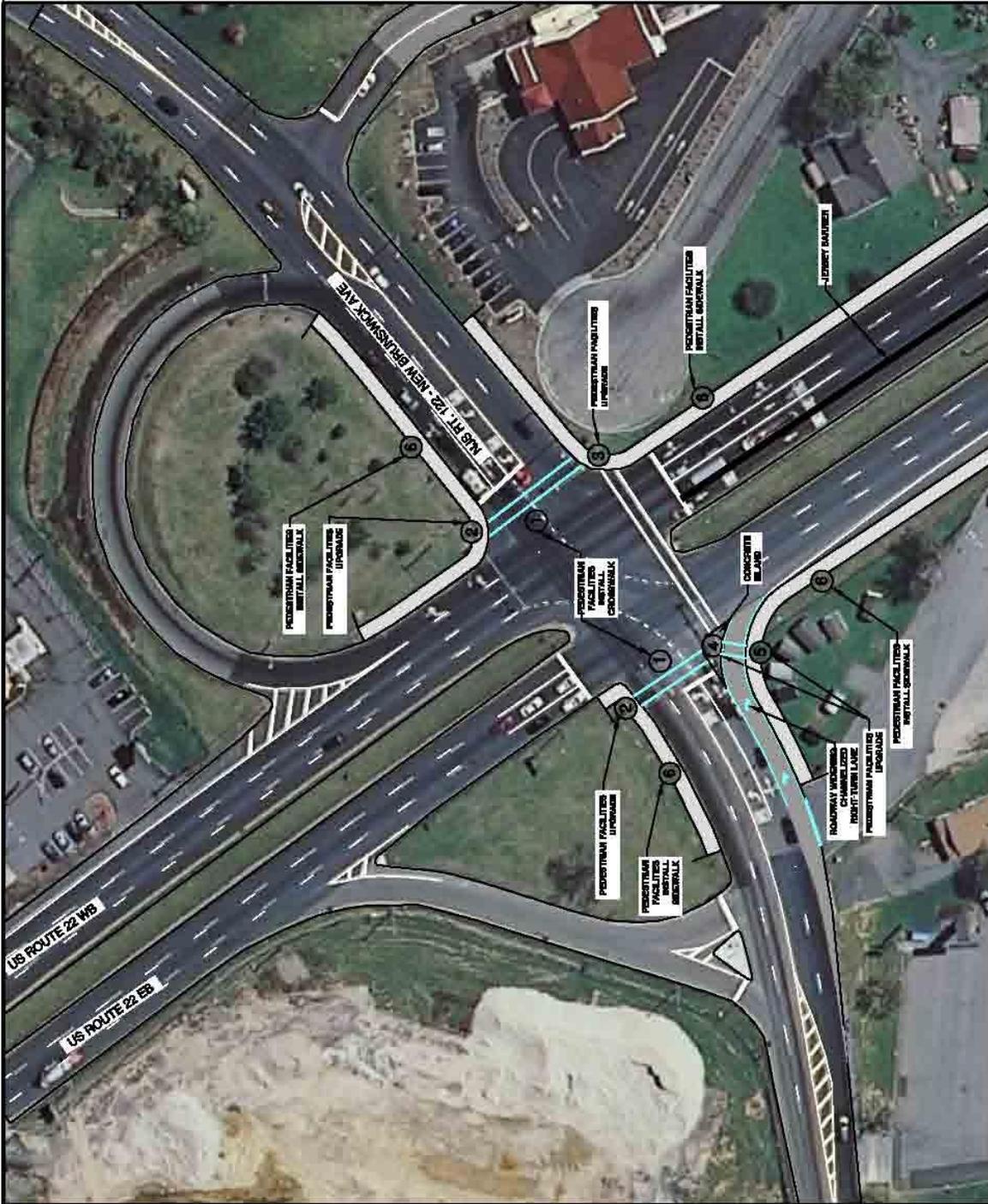
Short-Term Improvements

- Coordination Techniques
 - Actuate and coordinate as part of Signal Coordination Zone 2.
 - Background cycle length of 150 seconds.
- Pedestrian Facilities Upgrade
 - Install striped crosswalk on north and south side for eastbound/westbound crossing movements.
 - Install pedestrian countdown signal heads, pedestrian push-buttons and textured handicap accessible ramps as described in **Figure 69**.
 - Install sidewalk on all four approaches of the intersection.

Long-Term Improvements

- Roadway Improvements
 - Northbound roadway widening to accommodate channelized right-turn lane
- Signal Phasing
 - Revise phasing to have northbound and southbound movements run concurrently.
 - Add a permitted/protected left-turn advance phase for northbound approach.





Short-Term Improvements

Coordination Techniques

- Actuated and Coordinated as Part of Signal Coordination Zone 2
- Background Cycle Length of 160 seconds.

Pedestrian Facilities

1. Install one (1) crosswalk north of intersection and one (1) crosswalk south of intersection for Route 22 pedestrian movements.
2. Install one (1) new ped. countdown signal head; install one (1) MUTCD compliant ped. push-button for Route 22 crosswalk; install one (1) textured handicap accessible ramp for Route 22 pedestrian movements.
3. Replace existing one (1) ped. signal head and install one (1) new ped. countdown signal head; Replace one (1) ped. push-button and install one (1) MUTCD compliant ped. push-button for Route 22 crosswalk; install one (1) textured handicap accessible ramp for Route 22 pedestrian movements.
4. Replace existing one (1) ped. signal head and install one (1) new ped. countdown signal head; Replace one (1) ped. push-button and install one (1) MUTCD compliant ped. push-button for Route 22 crosswalk; install two (2) textured handicap accessible ramps for pedestrian movements.
5. Install one (1) textured handicap accessible ramp for Route 22 pedestrian movements.
6. Install sidewalk along the northeast, northwest, southeast and southwest intersection approaches.

Mid-Term Improvements

Traffic Control

- Install one (1) Jersey Barrier right of the left most lane on Route 22 to the westbound stop bar at the intersection with Route 122.

Long-Term Improvements

Roadway Improvements

- Northbound Approach: roadway widening and the addition of a channelized right-turn lane.

Signal Phasing

- Reverse signal phasing to have NB and SB movements run concurrently.
- Add permitted/protected left-turn advances phase for NB approach.

*NOTE: For a better visualization, roadway widening/narrowing is hatched in dark gray, installation/restoration of sidewalk is hatched in light gray, and proposed roadway stripage appears as cyan.

JOB NUMBER:	090007276	DATE:	APRIL 29, 2008
SCALE:	1" = 50'	LATEST REVISION:	MAY 22, 2008
DRAWN BY:	MASH MANSOUR	CHECKED BY:	MOA
PROJECT NUMBER:	HA024656		

FIGURE 69

**US ROUTE 22 CORRIDOR
INTERSECTION: US ROUTE 22 & US ROUTE 122
SHORT-TERM, MID-TERM, & LONG-TERM
IMPROVEMENTS**

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7.2 RECOMMENDED INTERCHANGE IMPROVEMENTS

In addition to the intersection improvements, a series of short, mid and long-term improvements have been recommended for the Memorial Parkway and Route 57 interchange. The following details the improvements.

7.2.1 Memorial Parkway⁶

Short-Term Improvements

- Traffic Calming Measures
 - Curve warning and speed warning flashing light assemblies.
 - Striping modifications at Morris Street merge to provide an acceleration lane for Morris Street (See detail on the following page).
 - Rumble strips on eastbound US Route 22 prior to entering curve

Mid-Term Improvements

- Traffic Calming Measures
 - Install textured colored pavement at Morris Street.
 - Closure of U-Turn adjacent to the Post Office.
 - Install a North Prospect Avenue cul-de-sac.
 - Convert Firth Street to a 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).

Long-Term Improvements

- Roadway Improvements
 - Soften curve at Morris Street.
 - Move 3rd Street Ramp further west to merge with US Route 22 at top of curve.
 - Create parallel roadways.
 - Consider possible removal of Ingersoll Avenue and Bates Avenue signal and introduction of new signal at Lincoln Avenue.
- Pedestrian Facilities
 - Create pedestrian overpass at Warren Street.

⁶ The short-term and mid-term improvements are detailed in Figure 70; the long-term improvements are detailed in the regional concept plans.

Short-Term Improvements

- Traffic Calming Measures**
- Installation of MUTCD W1-2 (w/ Flashers) combined with W16 2a (500 FT) before the Morris St. curve and MUTCD W1-2 (w/ Flashers) combined with W13-1 (30 MPH) at the Morris St. curve.
 - Installation of rumble strips to Route 22 (Memorial Parkway) EB before the curve at Morris St.

Traffic Operations

- Striping modifications to Morris Street.

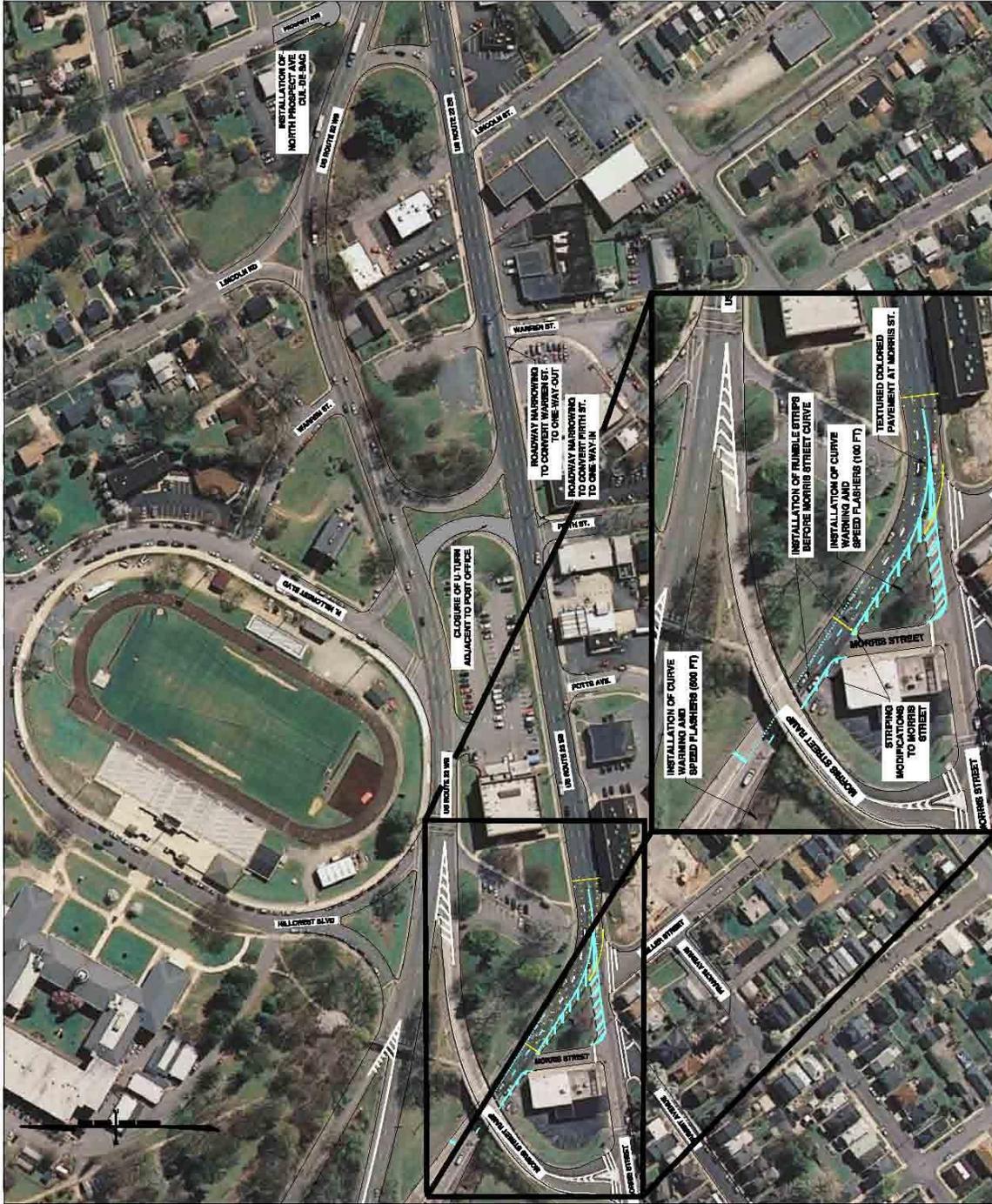
Mid-Term Improvements

- Roadway Improvements**
- Textured colored pavement at Morris Street.
 - Closure of U-Turn adjacent to Post Office.
 - Cui-de-sac North Prospect Avenue.
 - Convert Fifth Street to One-Way in coupled with conversion of Warren Street to One-Way-Out.

Long-Term Improvements

- Roadway Improvements**
- Soften curve at Morris Street.
 - Move 3rd Street Ramp further west to merge with Route 22 at top of curve.
 - Creation of Parallel Roadways.
 - Possible removal of Ingersoll Avenue and Bates Avenue signal and introduction of new signal at Lincoln Avenue.
 - Installation of pedestrian overpass at Warren St.

*NOTE: For a better visualization, roadway widening/harrowing is hatched in dark gray, installation/restoration of sidewalk is hatched in light gray, and proposed roadway stripeage appears as cyan.



JOB NUMBER:	080007276	DATE:	APRIL 29, 2009
SCALE:	1" = 250'	LATEST REVISION:	MAY 22, 2009
INDEX NUMBER:	HA024655	DESIGN BY:	NDA

**CORRIDOR IMPROVEMENTS
US ROUTE 22 (MEMORIAL PARKWAY)
SHORT-TERM, MID-TERM, & LONG-TERM
IMPROVEMENTS**

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7.2.2 US Route 22 & Route 57 Interchange

Short-Term Improvements

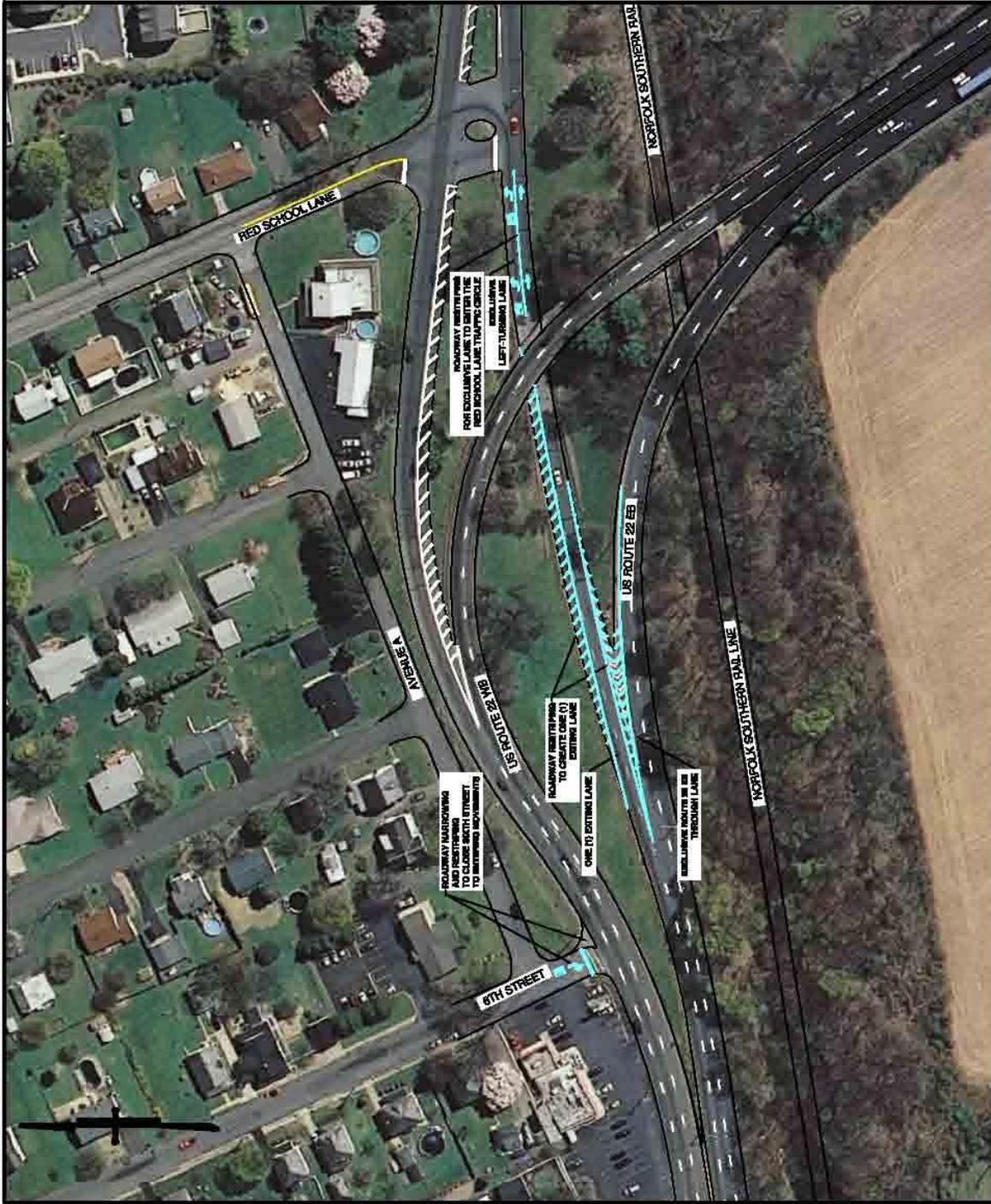
- Traffic Calming Measures
 - New signage program for motorists traveling eastbound on US Route 22 accessing Route 57.

Mid-Term Improvements

- Traffic Calming Measures
 - Stripe eastbound Route 57 ramp to create one exiting lane.
 - Stripe an exclusive lane for entering the Red School Lane Traffic Circle.
 - Close 6th Street to entering movements.

Long-Term Improvements

- Roadway Improvements
 - Add eastbound Route 57 ramp to US Route 22 westbound.
 - Construct new eastbound US Route 22 ramp over the Norfolk Southern Rail line.
 - Add pedestrian facilities, widen lanes and include shoulder.
 - Construct new westbound US Route 22 ramp over Route 57 eastbound.
 - Add pedestrian facilities, widen lanes and include shoulder.
- Traffic Signal Improvements
 - Signalize Red School Lane and Route 57.



Short-Term Improvements

Traffic Calming Measures

- New signage program for motorists traveling eastbound on Route 22 accessing Route 57.

Mid-Term Improvements

Traffic Calming Measures

- Stripe EB Route 57 ramp to create one (1) exiting lane from Route 22 EB.
- Stripe an exclusive lane for entering the Red School Lane Traffic Circle.
- Close Sixth Street (via striping and roadway narrowing) to entering movements from Route 22 WB.

Long-Term Improvements

Roadway Improvements

- Add EB Route 57 Ramp to Route 22 WB (See Route 22/Routes 57 Concept).
- Construct new EB Route 22 ramp over the Norfolk Southern Rail Line. Add pedestrian facilities, widen lanes, and include shoulder (See Route 22/Routes 57 Concept).
- Construct new WB Route 22 ramp over Route 57 EB. Add pedestrian facilities, widen lanes, and include shoulder (See Route 22/Routes 57 Concept).

Signal Phasing:

- Signalize Red School Lane and Route 57 (See Route 22/Routes 57 Concept).

*NOTE: For a better visualization, roadway widening/narrowing is hatched in dark grey, installation of sidewalk is hatched in light grey, and proposed roadway striping appears as cyan.

JOB NUMBER:	080007276	DATE:	APRIL 29, 2009
SCALE:	1" = 150'	LAST REVISION:	MAY 22, 2009
PROJECT NUMBER:	HAG24655	DRAWN BY:	MDA

FIGURE 71

**US ROUTE 22 CORRIDOR
INTERSECTION: US ROUTE 22 & ROUTE 57
SHORT-TERM, MID-TERM, & LONG-TERM
IMPROVEMENTS**

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7.3 RECOMMENDED PEDESTRIAN AND BICYCLE MOBILITY IMPROVEMENTS

7.3.1 Recommended Pedestrian Facility Improvements

The pedestrian facility improvements at each intersection have been detailed. The following lists the improvements recommended at each intersection:

US Route 22 & Morris Street

- Restore handicap accessible ramps and install striped crosswalks at the existing school crossing location.

US Route 22 & Ingersoll/Bates Avenue

- Install pedestrian push-buttons and upgrade equipment.
- Install textured handicap accessible ramps.
- Replace existing signage and signal heads.

US Route 22 & Roseberry Street

- Realign existing handicap accessible ramp with crosswalk on southeast intersection corner.

US Route 22 & 1st Street

- Install pedestrian signal heads and textured handicap accessible ramps.
- Update pedestrian push-button signs.

US Route 22 & 3rd Street

- Install crosswalk and textured handicap accessible ramps for US Route 22.
- Remove existing and install new pedestrian push-buttons, signs and signal heads.

US Route 22 & Shopping Center Drive

- Remove existing and install new pedestrian push-buttons, signs and signal heads.
- Provide striped crosswalks and install textured handicap accessible ramps.

US Route 22 & County Route 519

- Remove existing and install new pedestrian push-buttons, signs and signal heads.
- Provide striped crosswalks and install textured handicap accessible ramps.

US Route 22 & Greenwich Street



- Remove existing and install new pedestrian push-buttons, signs and signal heads.

US Route 22 & Route 122

- Remove existing and install new pedestrian push-buttons, signs and signal heads.
- Provide striped crosswalks and install textured handicap accessible ramps.

7.3.2 Sidewalk Conditions

The existing sidewalk facilities were also examined throughout the corridor. **Table 32** details the locations where sidewalk is recommended to promote pedestrian safety.

Table 32 – Existing Sidewalk Facility Conditions and Recommendations		
US Route 22	Locations	Recommendation
Westbound	Warren Street to Hillcrest Boulevard	Restore sidewalk. Install depressed curbs and textured accessible ramps.
Eastbound	Lincoln Street, Prospect Street & Bates Street	Restore sidewalk. Install depressed curbs and textured accessible ramps at Prospect Avenue.
Westbound	Ingersoll to Lincoln Road	Restore/Install sidewalk; install depressed curbs and textured accessible ramps as needed.
Westbound	Pickford Avenue, Northeast Approach	Install sidewalk, depressed curbs and textured accessible ramps as needed.
Eastbound	Bates Avenue to Pickford Avenue	Install sidewalk with depressed curbs and textured accessible ramps.
Eastbound	Roseberry Street, Southeast Corner	Install sidewalk with depressed curbs and textured accessible ramps.
Westbound	Roseberry Street, Northeast Corner	Restore sidewalk; Install sidewalk, depressed curbs and textured accessible ramps as needed.
Eastbound	1st Street to 3rd Street, Commerce Park	Install sidewalk with depressed curbs and textured accessible ramps.
Westbound	4th Street to 1st Street	Install/Restore sidewalk; Install depressed curbs and textured accessible ramps as needed.
Intersection	Shopping Center Drive	Install depressed curbs and textured accessible ramps at crossing locations.
Intersection	County Route 519	Install sidewalks, depressed curbs and textured accessible ramps at crossing locations.
Intersection	Greenwich Street	Install sidewalks, depressed curbs and textured accessible ramps at crossing locations.
Intersection	Route 122	Install sidewalks, depressed curbs and textured accessible ramps at crossing locations.



*Promoting Smart Growth***7.3.3 Additional Pedestrian Improvement Initiatives**

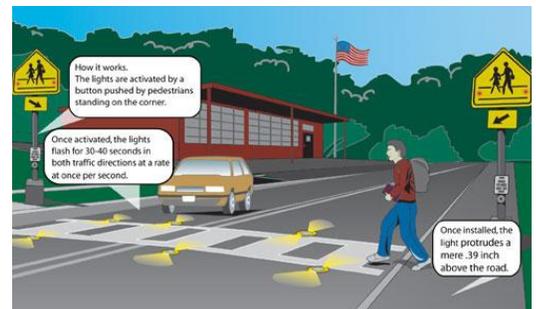
Several intersections along the US Route 22 corridor are deficient in terms of pedestrian facilities available. The lack of adequate pedestrian facilities discourages pedestrian mobility and presents a lack of “walkability” within the corridor. Without sufficient pedestrian crossings, sidewalks and signage, the desire and ability of pedestrians to access the corridor decreases substantially. In addition to upgrading the existing pedestrian facilities, pedestrian access can also be improved by utilizing advanced technologies. Improvements and upgrades that should be explored to increase pedestrian accessibility are:

- Better pedestrian timings;
- Installation of countdown pedestrian signal heads;
- Plan to fix sidewalk where condition is poor and construct sidewalk where footpaths are present;
- In pavement lights for crosswalks traveled by school children –Morris Street and Roseberry Street due to the relocation of the High School;
- High fluorescence signage;
- Warning flashers; and,
- Pedestrian bridge at Warren Street and Roseberry Street across US Route 22.

The benefit of the pedestrian improvements is that they can be implemented in the short to mid-term but provide results over a long-term period. The use of fluorescent signage and striping is increasing in many communities, with traditional warning signs for schools and pedestrians becoming antiquated.

Roseberry Street to Belvidere Road

With the relocation of the High School to Roseberry Street, pedestrian accommodations along Roseberry Street were reviewed. Sidewalks are present along the western side of Roseberry Street from US Route 22 to Belvidere Road. However, crosswalks and signage are missing at Barrymore Street, Metz Avenue and John Mitchell Avenue. Ladder-type crosswalks are recommended for each north-south crossing, including all unsignalized intersections and the signalized intersections of US Route 22, Elder Avenue and Belvidere Road (which will be signalized with the introduction of school traffic).

***Ladder-Type Lighted Crosswalk***

Also, fluorescent pedestrian school crossing signs should be installed at the US Route 22 approaches and wherever crosswalks are present at each intersection along Roseberry Street. At Belvidere Road, a series of raised crosswalks or lighted

***Fluorescent Signage***

crosswalks would aid in improving safety for school children.

7.3.4 Recommended Bicycle Facility Improvements

Currently there are no bicycle facilities along the US Route 22 corridor. However, opportunities should be considered to develop “Complete Streets” for all future improvements, which would include both bicycle and pedestrian improvements. This Plan identifies the immediate need to provide bicycle access to the new High School on Roseberry Street. Opportunities should consider using Roseberry Street, Center Street, Third Street and other connections crossing US Route 22 for bicycle facilities. Depending upon road conditions, road widths and vehicle volumes, these bicycle facilities may consist of separate bicycle lanes, shared lanes or off-street bicycle paths. Also, the proposed pedestrian overpasses at Warren Street and Roseberry Street should be designed to accommodate bicyclists as well as pedestrians.

The rights-of-way along the Memorial Parkway section of US Route 22 limit the ability to accommodate on-street bike lanes in this section of the US Route 22 corridor. However, the wider right-of-way along the corridor, east of the Route 57 interchange, may provide the opportunity to construct on-road bike lanes or off-road bike paths. Development of a comprehensive bicycle network should be evaluated for the Study Area. Funding for a comprehensive bicycle facilities study should be pursued. (See **Figure 72 – Alternative Bicycle Pathways**).



7.4 RECOMMENDED BRIDGE IMPROVEMENTS

7.4.1 Delaware Toll Bridge Traffic Volumes

Tables 33, 34, 35, and 36 and Chart 13 below detail the Average Annual Daily Traffic (AADT) for the three Delaware River crossings controlled and operated by the Delaware River Joint Toll Bridge Commission in the project vicinity between the years of 2004 and 2008. Over the five year period, two of the crossings, the Easton-Phillipsburg Bridge (Route 22) and the I-78 Bridge Crossing had an increase in annual traffic. The least traveled crossing, the Northampton Street Bridge, underwent a decrease in AADT of 1,200 vehicles between 2004 and 2008. The Easton-Phillipsburg Bridge was the only bridge to experience an increase in traffic each of the five years studied. Overall, the Easton-Phillipsburg Bridge and I-78 Bridge each experienced a 3.7% increase in AADT, while the Northampton Street Bridge experienced a decrease of 2.23%.

Table 33 - Easton –Phillipsburg Bridge Traffic Volumes							
Traffic Volumes						Volume Change	
Year	2004	2005	2006	2007	2008	2004 to 2008	Annual
Route 22	37,500	38,300	38,300	38,400	38,800	1,300	325
% Increase	-	2.13%	0.00%	0.26%	1.04%	3.67%	0.92%
% Increase	-	2.13%	2.13%	2.40%	3.47%		

Table 34 - I-78 Bridge Traffic Volumes							
Traffic Volumes						Volume Change	
Year	2004	2005	2006	2007	2008	2004 to 2008	Annual
Route 22	54,200	55,500	57,900	57,600	56,200	2,000	500
% Increase	-	2.40%	4.32%	-0.52%	-2.43%	3.71%	0.93%
% Increase	-	2.40%	6.83%	6.27%	3.69%		

Table 35 – Northampton Street Bridge							
Traffic Volumes						Volume Change	
Year	2004	2005	2006	2007	2008	2004 to 2008	Annual
Route 22	22,800	22,300	22,900	23,000	21,600	-1,200	-300
% Increase	-	-2.19%	2.69%	0.44%	-6.09%	-2.23%	-0.56%



Chart 13 – Delaware River Toll Crossing AADT Summary

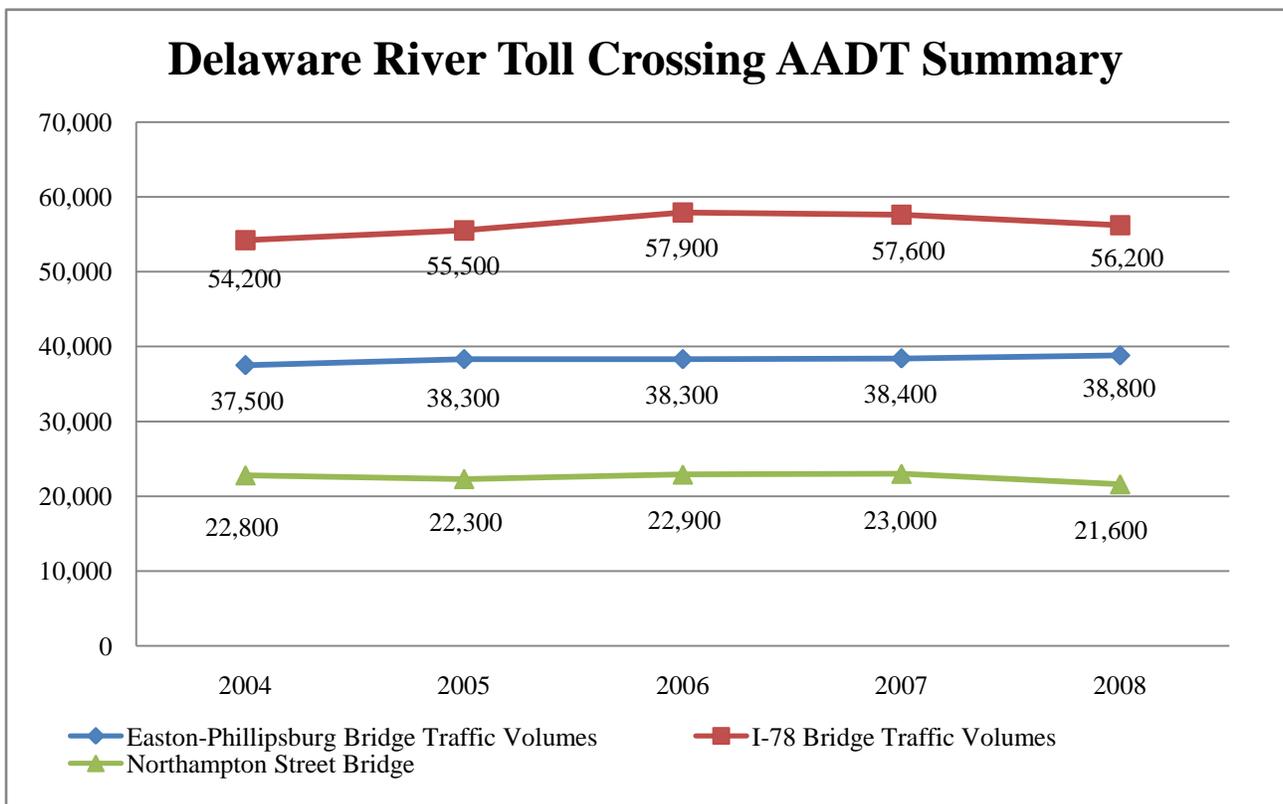
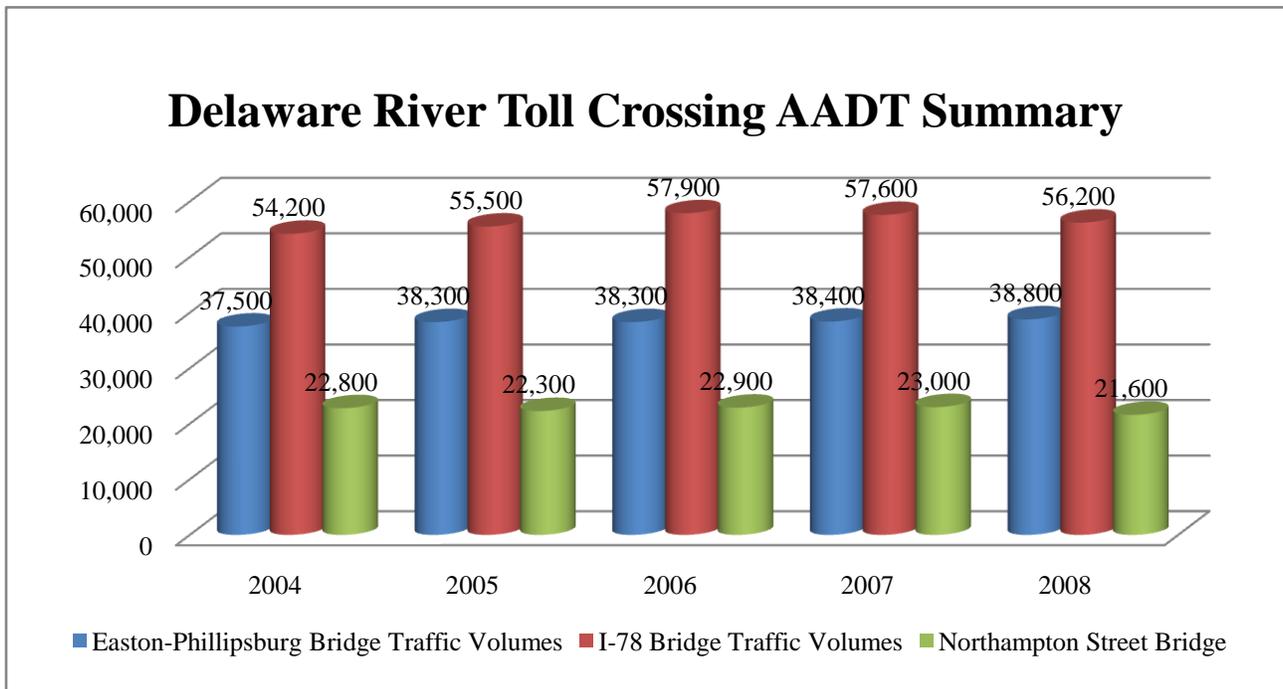


Table 36 - AADT Crossing Summary

Crossing	2004	2005	2006	2007	2008
Easton-Phillipsburg Bridge Traffic Volumes	37,500	38,300	38,300	38,400	38,800
I-78 Bridge Traffic Volumes	54,200	55,500	57,900	57,600	56,200
Northampton Street Bridge	22,800	22,300	22,900	23,000	21,600

A review of the 2008 Peak Hour Volumes shows that at all three crossings, the westbound traffic volume exceeds the eastbound traffic volume in both the PM and SAT Peak Hour of Operation. The Northampton Street Bridge and I-78 Bridge each have relatively consistent peak hour volumes when compared to the Easton-Phillipsburg Traffic Volumes. In the PM Peak Hour, the Easton-Phillipsburg Bridge has the highest total volume, with 4,195 total trips. However, on Saturday, this number decreases significantly, dropping to 3,094. This decrease in trips allows the I-78 Bridge to have the largest Saturday Peak Hour Volume, with 3,527 trips.

7.4.2 Easton-Phillipsburg US Route 22 Toll Bridge

The Easton-Phillipsburg US Route 22 Toll Bridge is owned and operated by the DRJTBC and transports vehicles from New Jersey to Pennsylvania over the Delaware River via US Route 22. The one-way toll plaza has five (5) lanes and is located on the New Jersey side of the Delaware River. The toll currently charges a \$0.75 base automobile fare to travel in the westbound direction into Pennsylvania. A 40% daily discount (\$0.30) is offered to commuter vehicles (20 or more trips in a 35-day period) utilizing EZ-Pass, reducing the toll to \$0.45. Trucks are charged per axle and receive a 10% EZ-Pass discount per trip.

The one-way toll plaza has five toll booths, some operating with EZ-Pass. Currently, the DRJTBC estimates that the EZ-Pass can process approximately 1,200 cars per hour. This value is three times greater than the hourly operation of a manual operated cash-collection lane (400 cars per hour). These statistics support the fact that EZ-Pass lanes reduce travel time, decrease motor-vehicle emissions, and help motorists cut down on gasoline costs.

While the existing operation is efficient, EZ-Pass toll efficiency could be increased if the gates operating at the EZ-Pass lanes were removed. Currently, the gates lower completely before allowing a car in the toll booth queue to proceed. As a result, the approach speed of vehicles is reduced and the toll booth queue does not move as fluidly as it would without gates. By removing the gates, vehicle speed could be maintained when traveling through the toll and would increase the number of cars serviced per hour. The DRJTBC anticipates these improvements to occur during the 2010 calendar year.

*Promoting Smart Growth***7.4.3 Northampton Street Free Bridge**

The Northampton Street Free Bridge (Free Bridge), which is positioned just south of the Easton-Phillipsburg US Route 22 Toll Bridge, also connects Easton, Pennsylvania to Phillipsburg, New Jersey. The Free Bridge is a toll-supported as it does not charge motorists a toll to use the bridge and the costs of operating and maintaining the bridge are supported by the tolls collected on other bridges by the DRJTBC. The bridge currently operates with three lanes, one in each direction and a center lane that alternates direction during peak hours. The bridge has a posted speed limit of 15 m.p.h.

During investigations, it was determined that a high percentage of motorists traveling west of US Route 22 into Pennsylvania use the Hillcrest Boulevard exit to access Broad Street, ultimately using the Free Bridge to cross the Delaware River. Motorists use this circuitous route to bypass the toll on the US Route 22 Toll Bridge. This causes severe congestion along South Main Street. In order to counteract this congestion, the Town of Phillipsburg has prepared a proposal to the Delaware River Joint Toll Bridge Commission to move vehicular traffic more efficiently across the Free Bridge by creating an alternate route for Pennsylvania bound travelers. The alternate route would begin at the Broad Street/South Main Street ramp from US Route 22 westbound, continuing westerly across 3rd Street to Riverside Way and then continuing southerly along Riverside Way to the entrance to the Free Bridge. The intent of the proposal is to alleviate congestion along South Main Street at Union Square. This proposal is subject to further study.

7.5 TRANSPORTATION DEMAND MANAGEMENT STRATEGIES

Transportation Demand Management (TDM) strategies tend to be particularly effective at reducing traffic congestion. The following sections discuss how these various TDM strategies can be applied to the US Route 22 Corridor Improvement Plan to achieve the desired traffic conditions.

7.5.1 Access Management

Access Management can be defined as the systematic control of the location, spacing, design and operation of driveways or the application of design techniques to ease driveway accessibility. It is a vital element to corridor improvement, as it maintains traffic flow and minimizes the occurrence of accidents along the corridor. Access Management involves changing land use planning and roadway design practices to limit the number of driveways and intersections on arterials and highways, constructing medians to control turning movements, encouraging clustered development, and creating more pedestrian-oriented street designs. This reduces “friction” along the roadway, which tends to increase traffic speeds, reduce congestion delays and reduce accidents.

A large number of commercial, retail and service developments front along the US Route 22 corridor, most of which require access to or from US Route 22. Access management techniques should be

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implemented by the local municipalities. Because the US Route 22 corridor is predominately developed, new construction will likely result in removal of underutilized structures and new construction, rehabilitation and upgrading of older structures to meet new market conditions, in addition to new construction on vacant properties.

As these properties go through the site plan review process, there is the opportunity to review site access, driveway locations, parking needs and other related site design issues. As noted below under Section 7.5.3, there are opportunities for existing development to be upgraded to provide shared driveways, shared parking and to limit access into Route 22 by utilizing rear access roads and side streets. Municipalities should review their development ordinances to specifically provide standards for these measures. In addition, sidewalks should be a requirement for all new non-residential construction project to ensure pedestrian travel is supported.

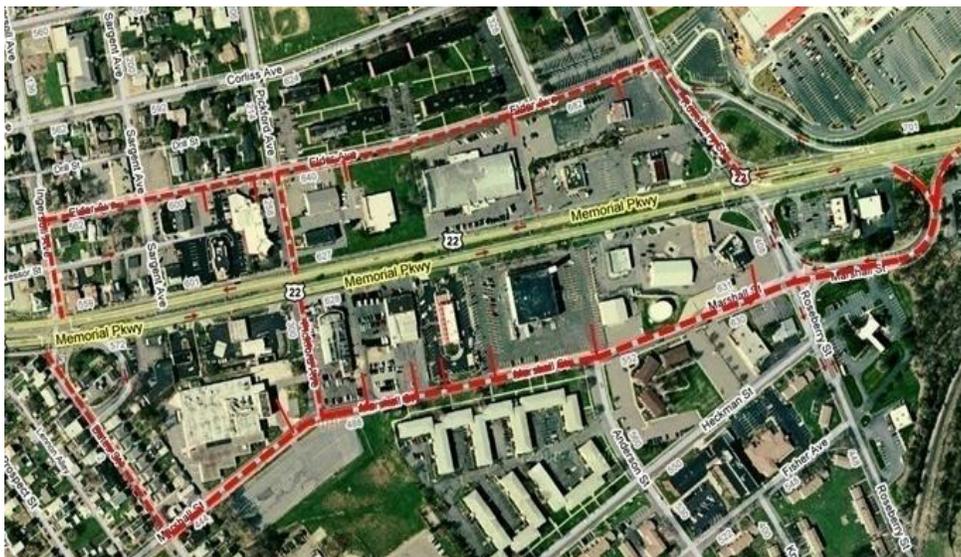
7.5.2 Parallel Roadways

In locations where several land uses share access points or fail to meet NJDOT spacing requirements, parallel roadways can be used to divert local traffic from the major access points to the sites.

Elder Avenue/Marshall Street

As shown in the **Figure 73**, the parallel roadways of Elder Avenue (North of US Route 22) and Marshall Street (South of US Route 22) provide access to the land uses where several driveways are positioned in close proximity. Promoting the use of these access points will divert traffic from entering/exiting on US Route 22, creating a more efficient access management system in the project vicinity.

Figure 73 – Elder Avenue/Marshall Street Access Points

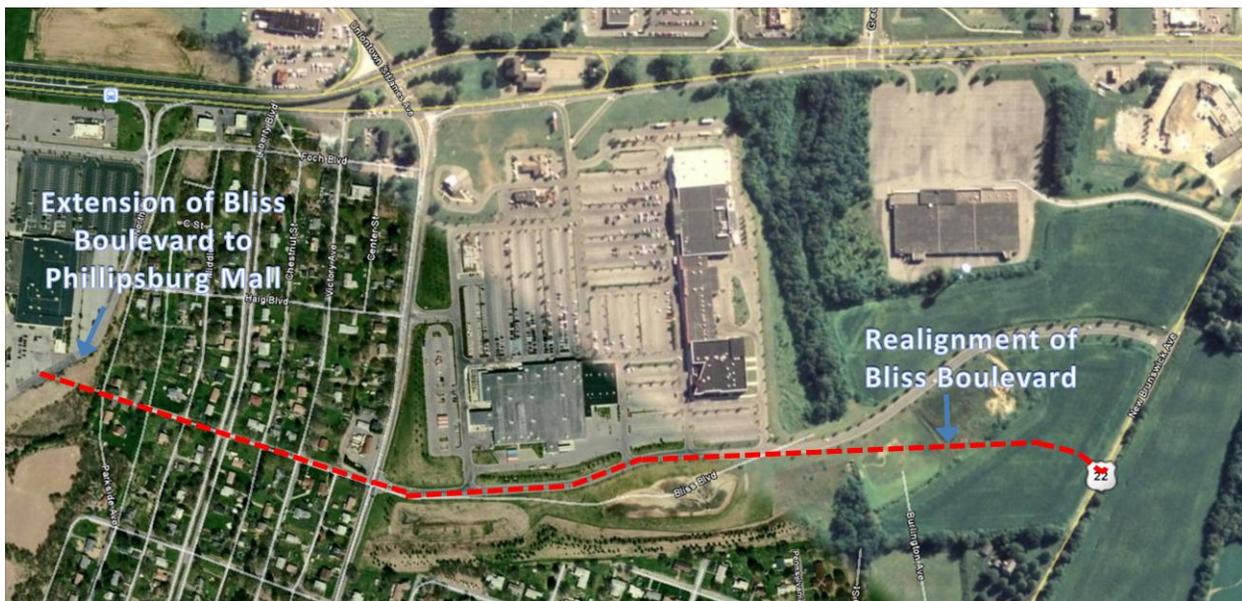


*Promoting Smart Growth*Bliss Boulevard

Bliss Boulevard is another parallel roadway that currently connects Route 122 to County Route 519. Bliss Boulevard is recommended to be extended to North Avenue, which accesses the Phillipsburg Mall. This extension will allow vehicles exiting the Mall to access neighboring sites without travelling on US Route 22. Bliss Boulevard is also planned to be realigned in the vicinity of Route 122, in connection with the planned Wal-Mart Super Center, which is slated to begin construction in September of 2009. This road would provide a secondary route when exiting the Mall and may allow vehicles to circumvent US Route 22 when traveling to or from their destinations. It could also be part of a future bicycle and pedestrian system serving this area.

It is noted that the recommendation to extend Bliss Boulevard to the Phillipsburg Mall was strongly opposed by many Bliss Boulevard area residents and the Pohatcong Township Council. This is discussed in Section 6.3.6. (See **Figure 75 – Bliss Boulevard Realignment and Extension to Phillipsburg Mall**)

Figure 75 – Bliss Boulevard Realignment and Extension to Phillipsburg Mall



7.5.3 Removal & Sharing of Access Points

Field investigation of the US Route 22 corridor determined that there are several commercial land uses in the vicinity of Roseberry Street, each with individual access points that fail to meet NJDOT spacing requirements. The excessive number of access points can be reduced in these locations by combining and/or eliminating access points to reduce the number of access points and optimize the available access

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points. In coordination with the elimination of access points, cross access between lots should be coordinated. Signage should be installed that would direct access to parallel roadways.

These improvements can be implemented in several ways. Specifically should any of these properties file a site plan, these recommendations can be addressed through the municipal site plan review process. As NJDOT undertakes the design process for the recommended US Route 22 road improvements, improved driveway and curb cut standards should be implemented working with property owners and the municipality through the process.

At a minimum, access management guidance should be included within the municipal Land Development Ordinance site design regulations. Also the municipal Master Plan Circulation Plan Element should reference the US Route 22 Improvement Plan recommendations in addition to overall access management guidance. The recommendations should include the following:

- Limit number of driveways along major arterials
- Require that side streets or rear access streets be utilized to reduce driveway conflicts.
- Require coordination between adjoining properties to link parking areas and provide cross access.
- Accommodate shared parking.

Advance Auto Parts

The Advance Auto Parts location is accessible east of Roseberry Street via US Route 22 westbound. The site has two access points separated by a grass median. These two access points are located adjacent to the access driveway for the adjoining Hillcrest Plaza, creating three access points. The location of the driveways creates a significant number of conflicting ingress/egress movements. To counteract this condition, the Advance Auto Parts driveways should be closed and cross access should be created from the rear of the site to the shopping center parking lot. This improvement will result in a single access for the land uses.

Burger King / Lukoil Gas Station

West of Roseberry Street and accessible from US Route 22 westbound, two land uses (a Burger King and Lukoil Gas Station) are present with each having multiple access points. Additionally, cross-access is available between the sites. Overall, five access points are provided when two access points would be sufficient. The excessive number of access points, specifically for the Burger King establishment, does not promote safe operating conditions. Access should be reconfigured and shared between the two uses.



Figure 76 – Advance Auto Parts Access Points



Figure 77 – Burger King / Lukoil Access Points



Dunkin' Donuts / Rudy's Car Wash / Exxon Gas Station

Along eastbound US Route 22, west of Roseberry Street, there are six access points for three land uses (Dunkin' Donuts, Rudy's Car Wash and Exxon Gas Station). Cross access exists between the three sites, which eliminates the need for each land use to provide individual access points. In this case, two access points, (preferably the third and fourth driveways from the west) are not necessary and should be eliminated.

Figure 78 – Dunkin' Donuts / Rudy's Car Wash / Exxon Access Points



*Promoting Smart Growth*Parkway Appliance / Wendy's

East of Roseberry Street, an existing Parkway Appliance store and vacant Wendy's restaurant are accessible from US Route 22 eastbound. Each site provides two access points, creating a total of four access points. Since no cross access is provided, elimination of site driveways is the most suitable alternative. Due to the distance between the Roseberry Street jughandle and the Parkway Appliance egress access point, the access point should be eliminated, reducing the total number of access points to three.

Figure 79 – Parkway Appliance / Wendy's Access Points



7.5.4 Shared Parking

Another access management technique that can be applied at these locations is permitting shared parking in mixed-use developments. The developments discussed in this section have multiple land uses with cross access available. By removing some of the access points along the US Route 22 frontage and installing curb, the developments can install shared parking stalls along the curb to increase parking.

A municipality's land development ordinance may provide regulations to permit shared parking. The regulations would consider type of land use and its peak parking periods. Shared parking between two or more uses that have different parking needs and peak hours of operations may allow for a reduced overall parking requirement. This would be subject to traffic study documentation as new or replacement uses are implemented along the US Route 22 corridor.

7.5.5 Intersection Traffic Operations

To improve traffic progression along the US Route 22 corridor, a number of unsignalized access points should be converted to allow one-way movement. The following details these improvements:

US Route 22 & 2nd Street

Modify existing traffic flow to permit one-way northbound (right-turn from US Route 22) movements.

US Route 22 & 4th Street

Modify existing traffic flow to permit one-way southbound (right-turn onto US Route 22) movements.

US Route 22 & 5th Street

Modify existing traffic flow to permit one-way northbound (right-turn from US Route 22) movements.

US Route 22 & 6th Street

Modify existing traffic flow to permit one-way southbound (right-turn from US Route 22) movements.

US Route 22 & Warren Street

Modify existing traffic flow to permit one-way northbound (right-turn onto US Route 22) movements.

US Route 22 & North Prospect Avenue

Cul-de-sac North Prospect Avenue

7.5.6 Travel Demand Management Strategies

There are a number of travel demand management strategies that can reduce single occupancy vehicles on the roadways and reduce congestion. These strategies are supported by TransOptions, the Northwestern New Jersey Transportation Management Agency. TransOptions assists employers interested in providing trip reduction options for their employees. They also provide assistance to commuters such as providing an interactive website with information on transit facilities and other commuter services. The following summarizes some relevant travel demand management strategies that should be considered in the study area to reduce vehicular trips. These include car pooling and van pooling, flex-time and teleworking.



Municipalities can encourage employers to implement these strategies, especially when larger developments are planned (exceeding 100 employees). As part of the traffic analysis for these development projects, strategies to encourage trip reduction efforts should be considered. The municipal site plan review ordinances should require this evaluation as part of the traffic analysis for larger developments. For example, these strategies may include the following:

- Provide transit friendly site design with bus shelters and walkways.
- Provide bicycle storage facilities that are convenient and have visibility.
- Require bicycle facilities be provided for all non-residential development projects.
- Provide sidewalks within the development convenient to off-site sidewalks and bus routes.
- Designing parking lots with carpool and vanpool spaces in the ‘most desirable’ locations.

Although employer trip reduction is not now mandated by the State of New Jersey, it is still an appropriate strategy to address congested travel corridors.

Ridesharing

Carpooling and vanpooling programs can be set up by employers to encourage workers to rideshare. By promoting these programs, helping match interested employees by zip code or location will help to encourage these programs. Special incentives can be established to promote ride sharing such as providing financial assistance to operate and purchase vans or gas purchase incentives have been provided by some employers. New Jersey has a statewide ride-match service to encourage carpooling.

Flextime

Flextime means that employees are allowed some flexibility in their daily work schedules. For example, rather than all employees working 8:00 to 4:30, some might work 7:30 to 4:00, and others 9:00 to 5:30. This shifts travel from peak to off-peak periods, which can reduce traffic congestion directly; and can assist commuters in matching transit and rideshare schedules, allowing mode shifts.

Telework

Telework involves the use of telecommunications to substitute for physical travel. It includes telecommuting, employees with mobile work (e.g., sales staff or field workers who rely heavily on telecommunications), and people who are self-employed and able to work from a home office due to efficient communications. This gives people a way to avoid traveling under congested conditions.



7.6 RECOMMENDED TRANSIT IMPROVEMENTS

To reduce congestion on US Route 22, other strategies besides increasing capacity and optimizing signal timings should be explored. US Route 22 is a prime candidate for multi-modal travel and travel demand management initiatives. Multi-modal planning refers to various transportation modes (walking, cycling, automobile, public transit, etc.) and their interconnections so each mode can have an optimal role in the overall transportation system. In the case of US Route 22, it is possible to create seamless interconnections between vehicle, rail and bus. Transportation demand management is a general term for strategies that result in more efficient use of transportation resources.

As part of the *I-78 Corridor Transit Study*⁷, an integrated bus/rail/travel demand management concept is currently being considered that will play a strong role in reducing congestion on the US Route 22 corridor. The concepts being considered include the following:

- Extension of the NJTransit Raritan Valley Rail Line
- Express bus system
- Shuttle bus services at select rail stations and activity centers
- A Special Purpose Interchange - Transit Hub

Urban traffic congestion tends to maintain equilibrium. If congestion increases, people change destinations, routes, travel time and modes to avoid delays, and if it declines they take additional peak-period trips. Reducing this point of equilibrium is the only way to reduce congestion over the long run. The quality of travel alternatives has a significant effect on the point of congestion equilibrium: If alternatives are inferior, few motorists will shift mode and the level of equilibrium will be relatively high. If travel alternatives are relatively attractive, motorists are more likely to shift modes, resulting in a lower equilibrium.

The actual number of motorists who shift from driving to transit may be relatively small, just a few percent of total travelers on the corridor, but that is enough to reduce roadway congestion delays. Congestion does not disappear, but it never gets as bad as would occur if quality transit service did not exist.

To attract discretionary riders (travelers who have the option of driving), public transit must be fast, comfortable, convenient and affordable. When transit is faster than driving, a portion of travelers shift mode until the highway reaches a new congestion equilibrium (that is, until congestion declines to the

⁷ North Jersey Transportation Planning Authority, Inc. (2008). *Interstate 78 Corridor Transit Study*.

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point that transit is no longer faster). As a result, the faster the transit service, the faster the traffic speeds on parallel highways.

Shifting traffic from automobile to transit on a particular highway not only reduces congestion on that facility, it also reduces the amount of vehicle traffic discharged onto local streets, providing “downstream” congestion reduction benefits. For example, when comparing the congestion reduction benefits of a highway widening project with some sort of transit service improvement, the analysis should not be limited to just the highway that is expanded. It is important to also account for the additional congestion on local streets where highway traffic discharges resulting from increased traffic volumes, and the reduction in local street traffic congestion that would result if the transit improvement attracts highway drivers out of their cars.

Improving travel options can therefore benefit all travelers on a corridor, both those who shift modes and those who continue to drive. The following sections detail improvements under consideration as part of the *I-78 Corridor Transit Study* and other improvements identified through the US Route 22 study process.

It should be noted that NJTransit has continued the refinements and investigations of the concepts in the *I-78 Corridor Transit Study* as part of the *Central New Jersey /Raritan Valley Line Transit Study*. The concepts presented in the earlier study are therefore subject to further changes as work continues on the later study.

7.6.1 NJTransit Raritan Valley Rail Line Extension

Due to declining ridership and tight budgets in the early 1980’s, the western end of the Raritan Valley Line (between High Bridge and Phillipsburg) was discontinued. Currently, the Raritan Valley Line is a passenger/commuter rail line that runs between High Bridge in Hunterdon County and Newark Penn Station. One of the most important strategies for transit in this area is the reactivation of the commuter rail service through the NJTransit Raritan Valley Line. In addition, stations and a yard site at the westernmost terminus would need to be constructed. According to NJTransit, the Phillipsburg extension was examined as part of the *I-78 Corridor Transit Study*⁸. The rail service, if implemented, would be coordinated with the proposed park-and-ride transit hubs. The stations along the line could include Phillipsburg, Alpha, Bloomsbury, Hampton and Clinton. Each of the rail stations are near I-78, US Route 22 or Route 31 allowing easy access from the region’s highways.

⁸ Ibid.



*Promoting Smart Growth***7.6.2 Express Bus System**

As indicated in the *I-78 Corridor Transit Study*⁹, an express bus system can also be implemented from the park-and-ride, then eastward along I-78 to Clinton Township, then follow US Route 22 to Branchburg in Somerset County. The express bus system would be designed to intercept commuters as far west as possible, before entering the congested areas along I-78 and US Route 22. It is estimated that this express bus will have 615 riders per day. The bus system will reduce eastbound commuter traffic on the US Route 22 corridor. In addition, enhanced bus stop amenities, transit information, pedestrian sidewalks and pedestrian crosswalks should be provided at each bus stop location.

7.6.3 Shuttle Bus Service

The *I-78 Corridor Transit Study* recommended shuttle bus services running at Phillipsburg, Alpha, Pohatcong and Greenwich stations. The cost would be low in investment for a high rate of return. These buses will improve access and minimize walking distance to and from bus and rail lines to the employment or activity site. The Phillipsburg shuttle buses would link the proposed downtown rail station and residential areas in the vicinity. They would also serve the commercial development at the Ingersoll Rand redevelopment tract. The services at this shuttle stop would be primarily rail-oriented; therefore, timing would be dependent on the rail service. The Alpha shuttle buses, as proposed in the *I-78 Corridor Transit Study*, would link the proposed transit hub on I-78 with nearby residential areas in Alpha Borough and Greenwich Township. As noted previously in this report, the *I-78 Corridor Transit Study* is being refined by on-going studies by NJTransit. This recent work, when completed, may change the transit recommendations.

TransOptions is currently assessing ridership feasibility for expanded bus service. TransOptions has proposed a new shuttle service along the US Route 22 corridor. Funding is available for this effort but it is still in the preliminary stages. TransOptions expects to survey the businesses/stores in the area to assess the demand for this service. This added service could be used to bring riders to the major retail developments or employment location in the US Route 22 corridor.

7.6.4 Special Purpose Interchange

As described in the *I-78 Corridor Transit Study*, direct access from I-78 to a transit hub / park-and-ride will require a new interchange on I-78, located between the Delaware River and Exit three (US Route 22 / NJ Route 173). It would be a special purpose interchange serving only the transit hub / park-and-ride (and possible Welcome Center). Coordination would be needed with the DRJTBC, NJDOT and FHWA to implement the improvement.

⁹ Ibid.

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The previously mentioned improvements could significantly lower the peak hour traffic volume on the US Route 22 corridor. The improvements should be coordinated with each other to create a multi-modal transit system that will aid in the infrastructure of the surrounding areas.

7.6.5 Public Education

For a multimodal transportation system to be effective, priority should be given to providing the public with the tools to use the system. *Multi-modal Navigation Tools* can include signs, maps, guidebooks, website and electronic devices that provide information on travel options to a particular destination, including pedestrian access, routes, schedules, fares, connections, services, real time arrival information and key contact information. They can include *Travel-time Maps* that indicate the time needed to travel to a particular destination by different modes. Navigation Tools can be tailored for specific types of users or trips, such as commuters, tourists and other visitors, and people with disabilities. To be effective, these tools should anticipate travelers' needs, providing desired information when users need it in formats that are easy to access and understand. For example, travelers should be easily able to:

- Find transportation service providers' customer service website and telephone numbers.
- Plan a route from a particular origin to a destination.
- Read route maps, schedules, fares and contact information in printed materials and signs.
- Find guidance for walking to and from bus stops and train stations.
- Determine when the next bus or train will arrive.
- Navigate within a bus or train station, including finding the correct platform and services such as washrooms, refreshments and telephones.

Public information tools could be implemented collaboratively with the NJDOT, County, local municipalities and other transportation providers, such as TransOptions. Also providing local tools, such as improved wayfinding signage is very important. For example, the need for improved signage to identify the Phillipsburg Mall Park-and-Ride lot has been noted previously. An improved wayfinding signage program could greatly increase ridership numbers at the park-and-ride.



8. PLAN IMPLEMENTATION

8.1 SUMMARY OF RECOMMENDED IMPROVEMENTS

As part of the US Route 22 Corridor Improvement 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:

Interchange Improvements

- Memorial Parkway
- US Route 22 & Route 57 Interchange
- I-78 Carpentersville Road Interchange

Intersection Improvements

- | | |
|---|---|
| <ul style="list-style-type: none"> • US Route 22 and Morris Street /Miller Street • US Route 22 and Ingersoll /Bates Avenue • US Route 22 and Roseberry Street • US Route 22 and 1st Street | <ul style="list-style-type: none"> • US Route 22 and 3rd Street • US Route 22 and Phillipsburg Mall Entrance • US Route 22 and CR 519 • US Route 22 and Greenwich Street • US Route 22 and Route 122 |
|---|---|

Pedestrian Improvements

- | | |
|---|--|
| <ul style="list-style-type: none"> • US Route 22 and Morris Street • US Route 22 and Ingersoll/Bates Avenue • US Route 22 and Roseberry Street • US Route 22 and 1st Street • US Route 22 and 3rd Street | <ul style="list-style-type: none"> • US Route 22 and Shopping Center Drive • US Route 22 and County Route 519 • US Route 22 and Greenwich Street • US Route 22 and Route 122 |
|---|--|
-
- 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.



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- Install in-pavement lights for crosswalks on Morris Street and Roseberry Street.
- Install pedestrian improvements and upgrades to increase pedestrian accessibility such as better pedestrian timings, countdown pedestrian signal heads, high fluorescence signage and warning flashers.

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.

Bridge Improvements

- Easton-Phillipsburg US Route 22 Toll Bridge - Remove EZ Pass toll gates.

Transportation Demand Management Strategies

- Promote access management strategies
 - Reduce driveways, shared parking and linked parking between developments.
 - Amend municipal Circulation Element of Master Plan and Land Development Ordinance regulations to support access management and travel demand management strategies.
- Promote development and use of parallel roadways.
 - Elder Avenue/Marshall Street.
 - Dumont Road/Strykers Road Linkage.
 - Bliss Boulevard Extensions.
 - Edge Road link to Route 122/New Brunswick Ave.
- Promote travel demand management strategies.
 - Encourage employer supported ridesharing - car and van pooling.
 - Supportive facilities such as bicycle storage and bus shelters.
 - Promote flextime.
 - Promote telework.



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.

8.2 PRIORITIZED INTERSECTION IMPROVEMENTS

While the majority of planning operations recommended in this report will require time to implement, the intersection improvement plans recommended can be executed more quickly. With a number of intersections proposed for improvement in the US Route 22 corridor, a method for prioritizing the improvements should be established. It is recommended that the existing corridor accident statistics be the basis to determine the intersection priority. **Table 37** details the intersection priority, listing the intersections from highest priority to lowest based on accident history.

Implementation of the traffic congestion mitigations identified in this report, along with the transit alternatives and the access management techniques, should improve operational capability to levels that can adequately support the 2035 traffic volumes.



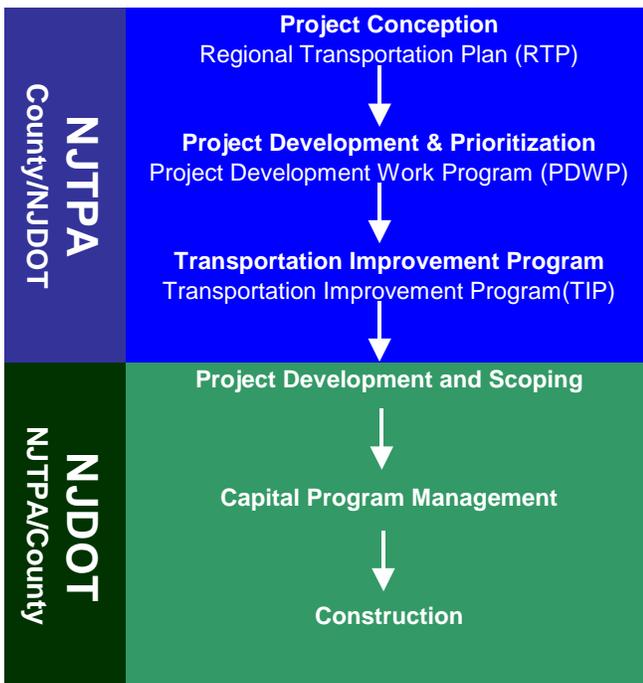
Table 37 – Intersection Improvement Priority List

Priority	Intersection	Three-Year Accident Total	Percent of Total	Priority Rating
1	County Route 519	140	14.6%	HIGH
2	Roseberry Street (including Center Street Extension)	122	12.7%	HIGH
3	Route 122	112	11.7%	HIGH
4	Miller/Morris Street	77	8.0%	HIGH
5	1st Street	54	5.6%	MEDIUM
6	Hillcrest Avenue	49	5.1%	MEDIUM
7	Shopping Center Dr.	49	5.1%	MEDIUM
8	Greenwich Street	41	4.3%	MEDIUM
9	Firth Street	38	4.0%	MEDIUM
10	3rd Street	37	3.9%	MEDIUM
11	Route 57	37	3.9%	MEDIUM
12	Ingersoll/Bates Avenue	35	3.6%	MEDIUM
13	Lincoln Street	28	2.9%	MEDIUM
14	Potts Avenue	25	2.6%	LOW
15	Warren Street	19	2.0%	LOW
16	Lock Street	19	2.0%	LOW
17	Pickford Avenue	17	1.8%	LOW
18	6th Street	17	1.8%	LOW
19	5th Street	13	1.4%	LOW
20	Prospect Street	10	1.0%	LOW
21	Bridge Improvements	7	0.7%	LOW
22	2nd Street	6	0.6%	LOW
23	4th Street	5	0.5%	LOW
24	Sargent Avenue	3	0.3%	LOW

8.3 PROJECT IMPLEMENTATION PROCESS

The project pipeline from inception to completion is very complicated and involves many agencies. To help understand the process, provided below is a simplified flowchart:

The project development process involves the North Jersey Transportation Planning Authority (NJTPA), the New Jersey Department of Transportation (NJDOT), and Warren County. In the first three phases, the NJTPA and the County have stronger input into the process, while in the last three phases the NJDOT assume the lead role in materializing the project. Based on available information, the subject municipality needs to take various steps to include the necessary transportation components in the Regional Transportation Plan (RTP) and the Project Development Work Program (PDWP) to help include this project in the Transportation Improvement Program (TIP). This will require engineering and planning support, agency coordination and lobbying efforts.



With the completion of this report, the first step in the chart has been completed. The immediate step for the municipalities is to submit Problem Statements concerning the improvements the individual municipality believes are needed. The Problem Statement should be submitted to the Division of Capital Programming of the NJDOT. The Problem Statement should provide route & section number, milepost, township and county. The nature of the problem should be well defined and described. It should indicate whether it is related to planning, operational capacity, congestion, safety, bridge replacement, transit, or park-and-ride problem.

After the NJDOT has had a chance to review the Problem Statement, one of three avenues will be chosen to advance the project. If the request is small in nature, such as timing changes, striping or signage modifications, etc., they may choose to use their own forces or roll the project into an ongoing construction program. Otherwise, if the request requires more exploration and investigations, the improvement will be prioritized based upon the NJDOT Management System.

APPENDICES

See Appendices under separate cover.