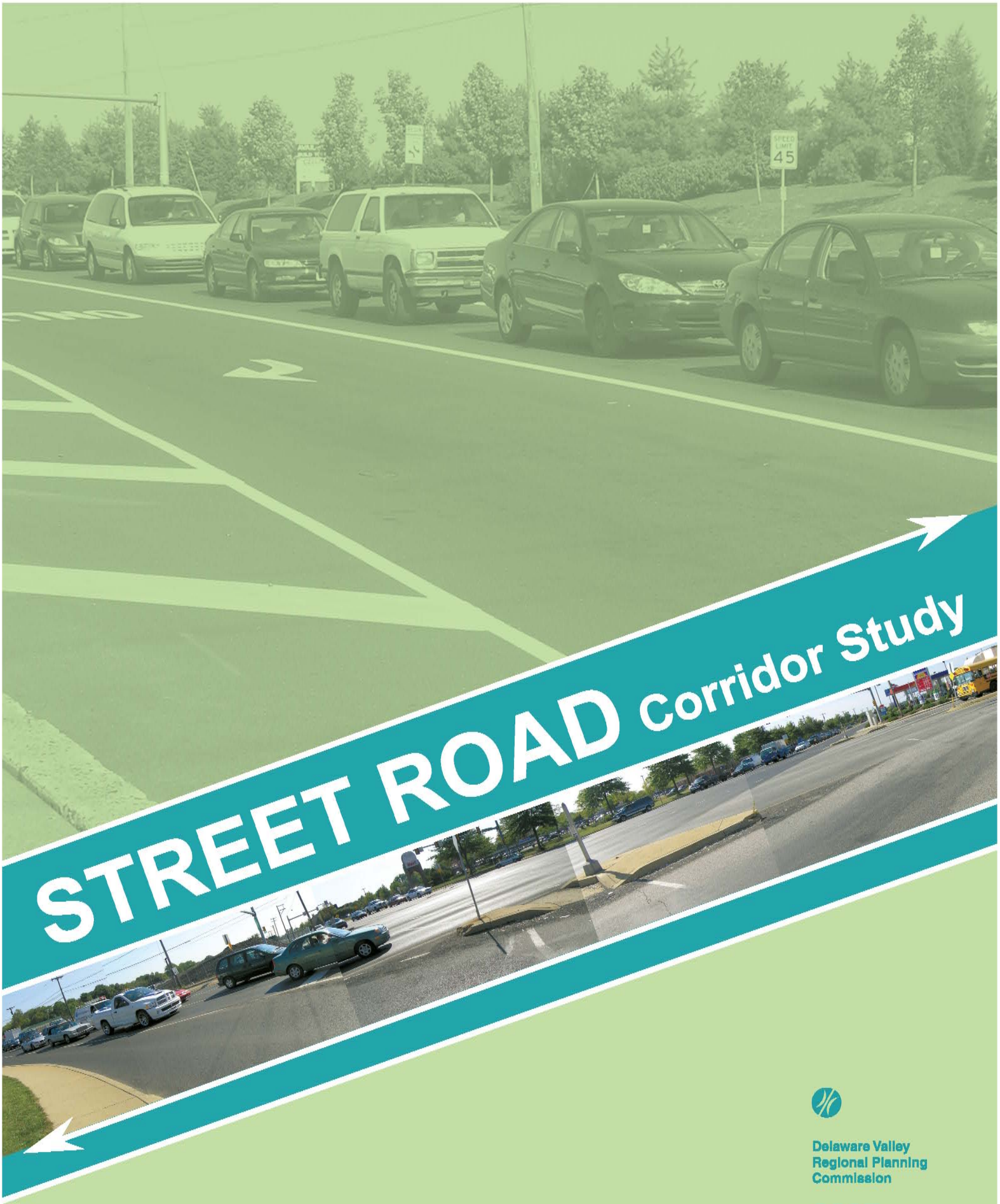
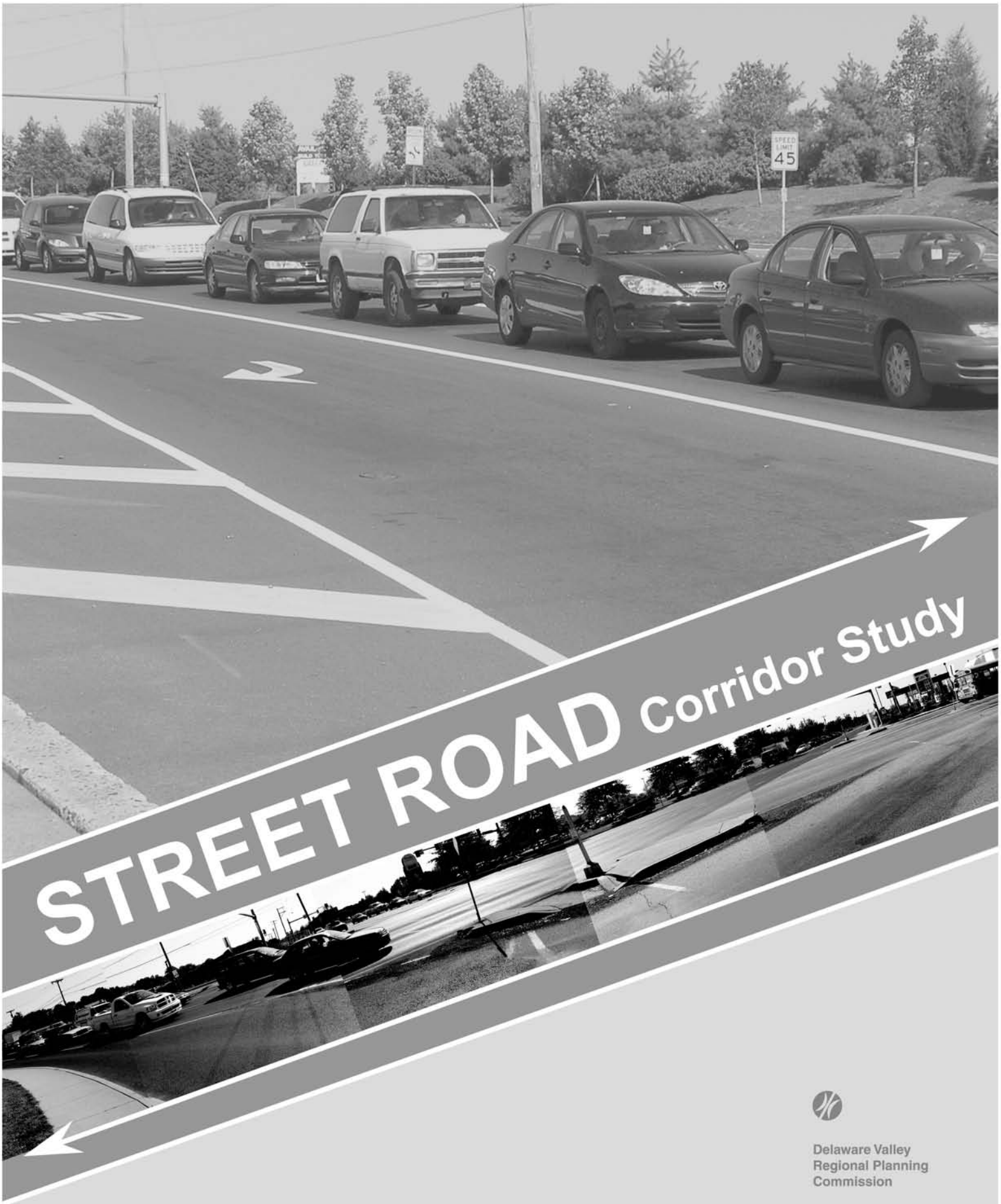


STREET ROAD Corridor Study

Delaware Valley
Regional Planning
Commission

2007



STREET ROAD Corridor Study

Delaware Valley
Regional Planning
Commission

2007

Created in 1965, the Delaware Valley Regional Planning Commission (DVRPC) is an interstate, intercounty, and intercity agency that provides continuing, comprehensive, and coordinated planning to shape a vision for the future growth of the Delaware Valley region. The region includes Bucks, Chester, Delaware, and Montgomery counties, as well as the City of Philadelphia in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer counties in New Jersey. DVRPC provides technical assistance and services; conducts high priority studies that respond to the requests and demands of member state and local governments; fosters cooperation among various constituents to forge a consensus on diverse regional issues; determines and meets the needs of the private sector; and practices public outreach efforts to promote two-way communication and public awareness of regional issues and the Commission.

The DVRPC logo is adapted from the official seal of the Commission and is designed as a stylized image of the Delaware Valley. The outer ring symbolizes the region as a whole while the diagonal bar signifies the Delaware River flowing through it. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey. The logo combines these elements to depict the areas served by DVRPC.

DVRPC is funded by a variety of funding sources including federal grants from the U.S. Department of Transportation's Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) The Pennsylvania and New Jersey departments of transportation, as well as by DVRPC's state and local member governments. The authors, however, are solely responsible for this report's findings and conclusions, which may not represent the official views of policies of the funding agencies.

DVRPC fully complies with Title VI of the Civil Rights Act of 1964 and related statutes and regulations in all programs and activities. DVRPC's website may be translated into Spanish, Russian, and Traditional Chinese online by visiting www.dvrpc.org. Publications and other public documents can be made available in alternative languages or formats, if requested. For more information, please call (215) 238-2871.

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1.0 EXECUTIVE SUMMARY

This report examines traffic safety and mobility within the transportation network of the Street Road (PA 132) corridor in Bucks County, Pennsylvania. The corridor covers an area of approximately 39 square miles and varies between older suburbs to newer suburbs with infill development. The study area includes many parallel, adjacent, and intersecting arterials that are impacted by traffic flow on Street Road. This study evaluated areas with heavy vehicular and pedestrian traffic and developed improvement strategies that would improve the mobility of goods and people.

Several critical issue locations were identified with the assistance of Bucks and Montgomery counties, the five study area municipalities, and the Bucks County TMA. Of these, a total of 16 locations were examined in detail.

The locations analyzed are either on Street Road or are directly impacted by Street Road due to their proximity. Peak-period turning movement counts were taken and analyzed and capacity analyses, such as Level of Service, calculated at critical locations. Of the intersections analyzed, Hulmeville Road and Byberry Road had an overall Level of Service “F” in both AM and PM peaks with greater than 298 seconds of delay in the PM peak. The intersection of County Line Road and Second Street Pike had a Level of Service “F” in both AM and PM peaks with almost 190 seconds of delay in the PM peak.

An inventory of rail and bus transit service providers and routes was compiled to identify the extent and coverage of transit service in the corridor.

Other information provided the basis for identifying measures to improve mobility and reduce delay. These measures include traffic signal optimization, incorporating additional turning lanes, connecting roadways to complete a network, restriping pavement markings, and constructing pedestrian facilities such as crosswalks and sidewalks.

Crash data were analyzed to determine the numbers and types of crashes that occurred at critical segments and intersections from 2001 to 2005. Crash clusters are distributed along Street Road as well as at major approaches to Street Road. Concepts were developed for these locations that would improve their operation and safety. The segment with the highest number of crashes analyzed in the study area is Knights Road between Street Road and Plum Avenue with 97 crashes, 113 injuries and one fatality over the five-year period. The intersection of Old Lincoln Highway and US 1 was next with 87 crashes, 94 injuries and no fatalities over the same period.

An implementation plan was developed that can be used as a dynamic long-range tool for the systematic selection of projects to create a significantly improved transportation system within the study area. Potential breakout projects have been identified and prioritized based on order-of-magnitude costs and benefits.

2.0 BACKGROUND

This study was conducted as part of DVRPC's 2030 long-range plan for the region. The selection of this corridor evolved from a combination of evaluating and ranking the corridors identified by the Congestion Management Process and Long Range Planning corridors in Pennsylvania. Concurrence from both Bucks County and Montgomery County was obtained in the selection process.

The purpose of this study is to identify critical transportation issues within the Street Road corridor and explore potential improvement strategies for addressing these issues. This study has attempted to address these issues by conducting a detailed traffic assessment of the Street Road corridor.

Multiagency meetings and field views were conducted to review potential locations for inclusion in the study. These included representatives from each of the local municipalities, as well as representatives from Bucks and Montgomery counties and the Bucks County TMA. Staff subsequently engaged in detailed follow-up field views and technical analyses to quantify the identified transportation issue areas and document practical solutions.

Street Road, along with Bristol Road and County Line Road, has traditionally carried large volumes of cross-county traffic. There are few other roads in the area providing this function. Extensive residential development has occurred within the corridor in recent years. There has also been a rapid expansion in retail commercial activity, which has led to an increase in vehicular traffic in the area.

Traffic volumes, particularly during the AM and PM peak periods, combined with existing roadway geometrics create congested conditions on certain segments and intersections. Despite well-timed, modern signal equipment in some areas, long queues develop at intersections. Several have been improved or are currently being improved. This study addresses the adequacy of these intersections and arterial segments to accommodate current and future traffic volumes.

3.0 CORRIDOR DESCRIPTION

3.1 Study Area

The Street Road (PA 132) study area extends from I-95 in the east to PA 611 in the west. In the north, it is bounded by Bristol Road, while County Line Road forms the southern boundary (**Map 1**). It encompasses all of the Bucks County municipalities of Lower Southampton Township, Upper Southampton Township and Warminster Township, as well as parts of Bensalem Township and Warrington Township. The study area is 15 miles in length and has an area of 39 square miles.

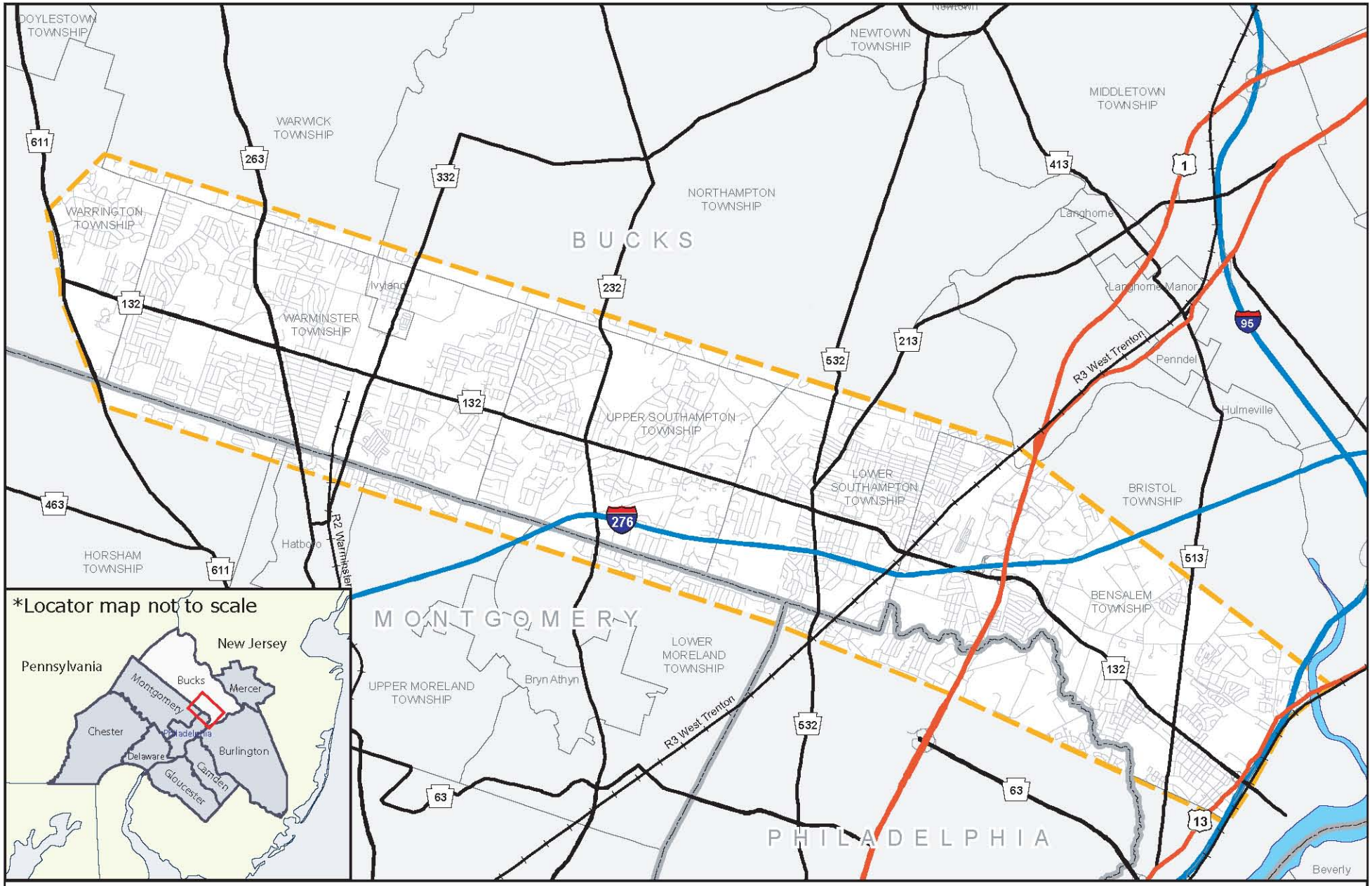
3.2 Land Use

The land use within the Street Road corridor is primarily single-family residential. There are, however, large areas of retail commercial and industrial land use (**Maps 2 and 3**). The corridor is primarily suburban in nature, with low-density housing throughout. There are clusters of residential multifamily housing units in the area. A large percentage consists of age-restricted housing for senior citizens.

Retail commercial uses are concentrated along major arteries such as Street Road, Second Street Pike, York Road, and Bustleton Pike. These are largely strip malls of varying sizes with highway frontage and catering to a mostly local market. Philadelphia Park, the racetrack, located in the eastern section of the corridor, is a major employer and trip generator in the area serving a regional clientele. A “racino” will also be developed in conjunction with the racetrack.

Light industrial uses have developed around areas where there has historically been rail access. Where there is currently no rail access, trucks provide the necessary transportation of goods and services. There are current and former military installations within and adjacent to the study area. The Willow Grove Naval Air Station is located to the immediate south of the study area. The former Naval Air Warfare Center, located at the intersection of Street Road and Jacksonville Road, is being converted to mostly office and residential development, which includes Ann’s Choice, a 103-acre retirement community, which, with full build out, will contain 2,000 units of housing.

Historically, development throughout the corridor evolved westward from Bensalem to Warrington. While there has been some infill development in the eastern section of the corridor, most new construction has taken place in the western and northern sections of the corridor. In most areas, development has intensified over time. **Figure 1** shows the evolution of development within a portion of the corridor (vicinity of Street Road and Hulmeville Road) between 1965 and 2005. Significant residential and commercial development has taken place over time, which has forever altered the landscape.



Street Road Corridor Study - Study Area

MAP : 1

Delaware Valley
Regional Planning Commission
June 2006

0 1 2
Miles

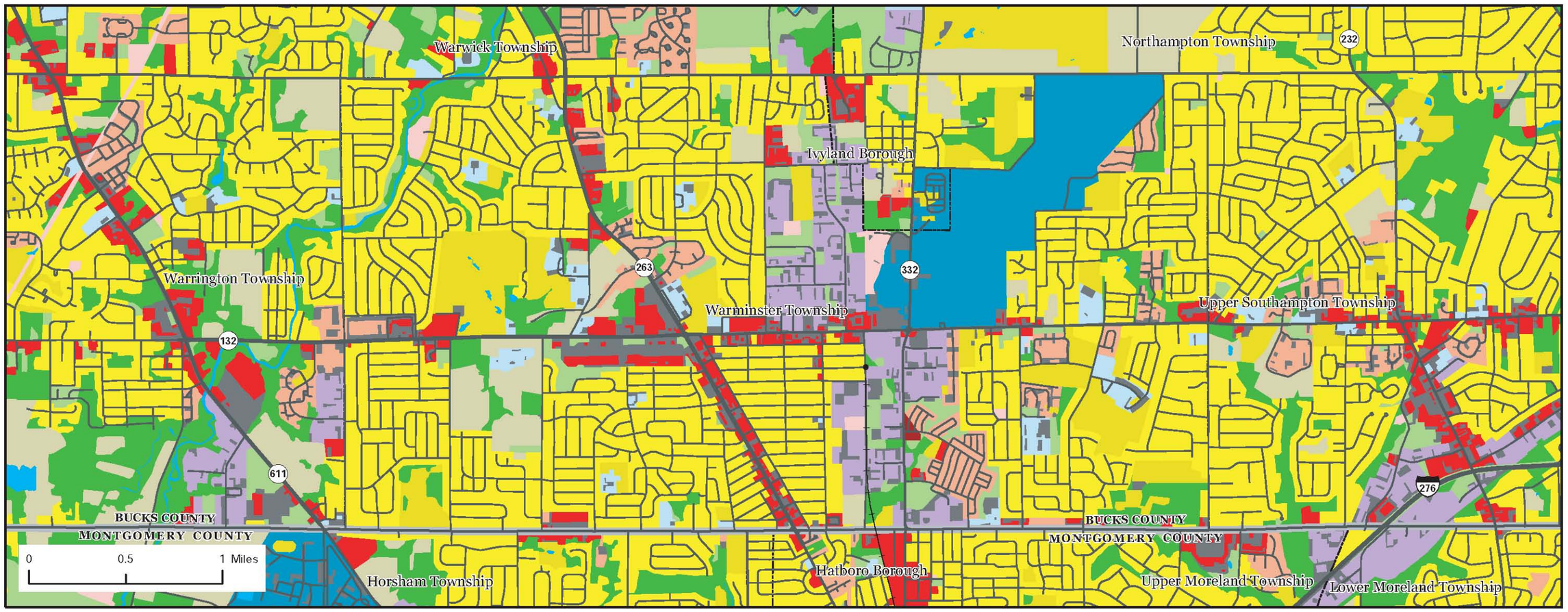
N

MAP : 2

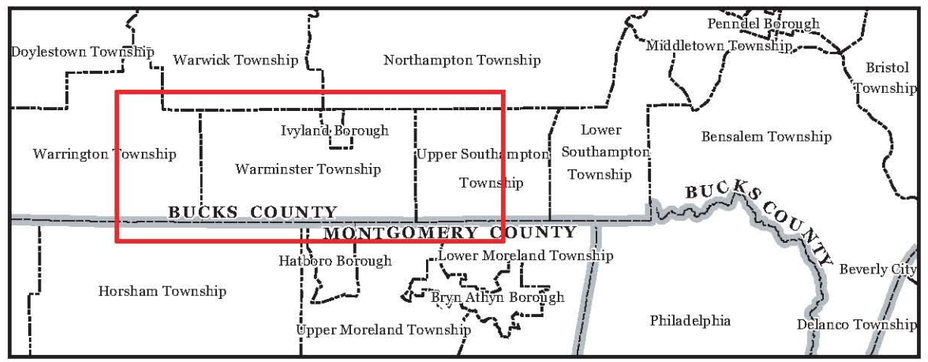
Street Road Corridor Study

Land Use

Study Area West



- Agriculture
- Commercial
- Community Services
- Manufacturing:Heavy Industrial
- Manufacturing:Light Industrial
- Military
- Mining
- Transportation and Parking
- Recreation
- Residential:Mobile Home
- Residential:Multi-Family
- Residential:Row Home
- Residential:Single-Family
- Utility
- Vacant
- Water
- Wooded

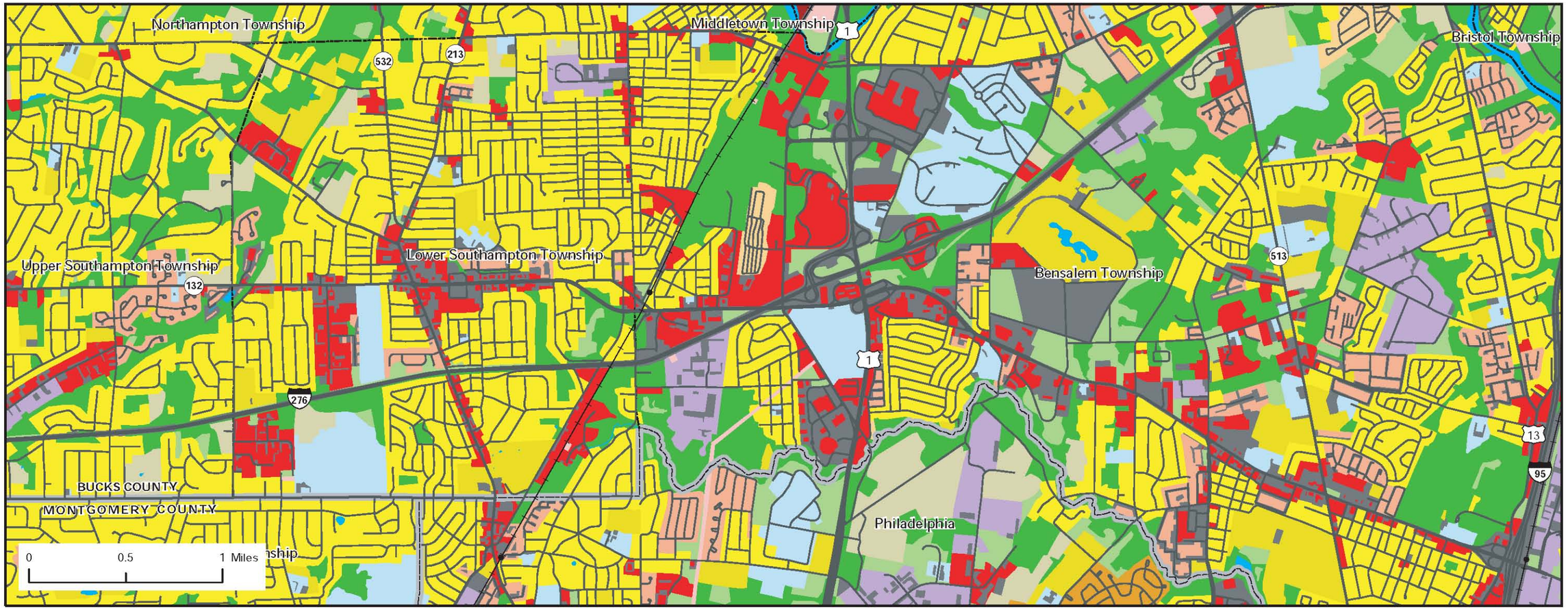


MAP : 3

Street Road Corridor Study

Land Use

Study Area East



- Agriculture
- Commercial
- Community Services
- Manufacturing:Heavy Industrial
- Manufacturing:Light Industrial
- Military
- Mining
- Transportation and Parking
- Recreation
- Residential:Mobile Home
- Residential:Multi-Family
- Residential:Row Home
- Residential:Single-Family
- Utility
- Vacant
- Water
- Wooded

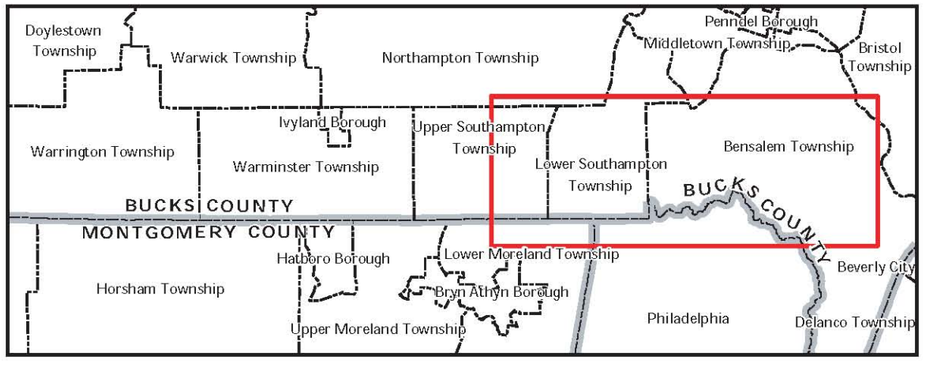


Figure 1: Land Use Comparison 1965/2005

Intersection of PA132 Street Rd. & PA513 Hulmeville Rd. - 1965

Source: DVRPC

Intersection of PA132 Street Rd. & PA513 Hulmeville Rd. - 2005

Source: DVRPC

3.3 Highway Network

A network of highways ranging from interstate highways to local roads has a direct impact on the study area. The following is a brief description of the primary arteries within, or providing direct access to, the study area.

Interstate 95 is a major interstate highway to the east of the study area. It has an interchange in Bensalem Township at Street Road and provides access to Philadelphia in the south and Mercer County, New Jersey, to the north.

Interstate 276 (Pennsylvania Turnpike) is a major interstate highway that crosses through the study area in Upper and Lower Southampton townships and Bensalem Township. It provides access to Burlington County, New Jersey, to the east, and access to Montgomery County and points beyond to the west.

US 1 is a north-south highway located in the eastern half of the study area. It is classified as a Principal Arterial Highway. It connects Philadelphia in the south to Mercer County in the north. Street Road provides access to US 1 in the study corridor.

PA 132 (Street Road) is an east-west Principal Arterial Highway that runs the length of the study area from I-95 in the east to Easton Road (PA 611) in the west. It is a four- to five-lane road with additional turning lanes and, in some points, a central Two Way Left Turning Lane (TWLTL). The posted speed limit is 45 MPH in most sections. This road provides access to municipalities within and to the west of the study area. This road also provides access to three SEPTA Regional Rail stations on the R2 (Warminster), R3 (Trevose) and R7 (Eddington) lines. Street Road is the main artery of this corridor study.

PA 213 (Bridgetown Pike) is a Minor Arterial Highway that runs north-south from Langhorne Borough in the north to Lower Southampton Township in the south. It ends at PA 532 (Buck Road) in Lower Southampton Township and turns into PA 532 (Bustleton Pike).

PA 232 (Second Street Pike) is a Principal Arterial Highway that traverses the study area north to south through Upper Southampton Township. This road provides access to Street Road, Bristol Road and County Line Road.

PA 263 (York Road) is a Principal Arterial Highway that runs north to south through Warminster Township parallel to Jacksonville Road and Davisville Road. It provides access to Street Road, Bristol Road and County Line Road.

PA 332 (Jacksonville Road) alternates between a Minor and Principal Arterial Highway that runs north-south across the study corridor parallel to Davisville Road and York Road. It connects Ivyland Borough to Street Road and Bristol

Road. This road also connects Hatboro Borough and the SEPTA R2 train station to the study corridor.

PA 513 (Hulmeville Road) is a Minor Arterial Highway that runs north-south through Bensalem Township, providing access to Street Road from Penndel, Hulmeville and Langhorne boroughs. This road also connects Street Road to US 13 from the south.

PA 532 (Buck Road) is a Minor Arterial Highway that traverses the study region north-south through Lower Southampton Township. This road connects Newtown to the study corridor and Philadelphia to the south where it merges with Bustleton Pike and Bridgetown Pike in Lower Southampton Township. Like nearby parallel corridors, it intersects with County Line Road and Bristol Road.

PA 611 (Easton Road) is a Principal Arterial Highway that acts as the study area's western boundary. It connects Philadelphia with Bucks County via Abington Township and Upper and Lower Moreland townships.

Bristol Road alternates between a Minor Arterial Highway and an Urban Collector and runs east-west throughout the study area. It acts as an alternative to Street Road and forms the northern boundary of the corridor. It connects York Road, Jacksonville Road, Second Street Pike, Bustleton Pike, Bridgetown Pike and US 1. At the intersection of US 1, it provides access to Neshaminy Mall.

County Line Road is an east-west Principal Arterial Highway that acts as the southern boundary of the corridor.

Davisville Road alternates between a Minor Arterial Highway and an Urban Collector that bisects the study corridor. This road acts as the boundary between Upper Southampton Township and Warminster Township.

Mearns Road is a Minor Arterial Highway that runs north-south from Street Road to Bristol Road. It provides an alternative to Jacksonville Road and York Road.

Knights Road is a Minor Arterial Highway that runs north-south from Street Road and provides access to Dunks Ferry Road and Bristol Pike in Philadelphia.

Galloway Road is a two-lane road that runs from Hulmeville Highway (PA 513) along Philadelphia Park in Bensalem to Bristol Road near Neshaminy Mall.

3.4 Crash Data Analysis

Crash data from the years 2001 - 2005 were analyzed. The most recent available data were provided by PennDOT and selected by the issue locations summarized in **Section 4.0**. The data displayed for intersections were selected based upon a tenth-of-a-mile radius around the intersections and organized by total crashes, injuries, fatalities and predominant crash type. This data set is tabulated in **Table 1**.

Table 1 - Issue Areas Crash Counts
2001 - 2005

Intersection or Segment	Count	Injury	Fatality	Predominant Crash Type
Hulmeville Road from Byberry Road to Brookwood Drive	26	18	0	Rear-end (12), Angle (10)
Hulmeville Road from Byberry Road to Brookwood Drive	69	63	0	Rear-end (40), Angle (24)
Street Road and Knights Road	78	64	1	Angle (47), Rear-end (24)
Knights Road from Street Road to Plum Avenue	97	113	1	Angle (56), Rear-end (26)
Dunks Ferry Road and Knights Road	43	57	0	Angle (17), Rear-end (12)
Street Road and Mechanicsville Road	53	49	2	Angle (32), Rear-end (9)
Old Lincoln Hwy. and US 1	87	94	0	Rear-end (44), Angle (27)
Street Road and Bustleton Pike	73	46	0	Angle (35), Rear-end (30)
Street Road and Second Street Pike	84	64	1	Rear-end (33), Angle (27)
Second Street Pike and County Line Road	45	38	0	Rear-end (29)
Street Road and Davisville Road	56	37	0	Angle (35), Rear-end (12)
Street Road and Louis Drive	17	11	0	Rear-end (8), Angle (8)
Street Road and PA 332	80	74	0	Angle (35), Rear-end (31)
Street Road and Mearns Road	31	23	0	Angle (13), Rear-end (11)
Bristol Road and Mearns Road	19	13	0	Angle (10), Rear-end (7)
Totals	858	764	5	

Source: PennDOT - November 2006

The 15 selected intersections and segments contained a total of 858 crashes, 764 injuries and 5 fatalities. The highest concentration of crashes occurred on the segment of Knights Road from Street Road to Plum Avenue with 97 crashes, 113 injuries, and 1 fatality. The intersection with the highest crash count was US 1 and Old Lincoln Road with a total of 87 crashes, 94 injuries and no fatalities. The intersection of Street Road and Second Street Pike is the third highest crash location with 84 crashes, 64 injuries and 1 fatality.

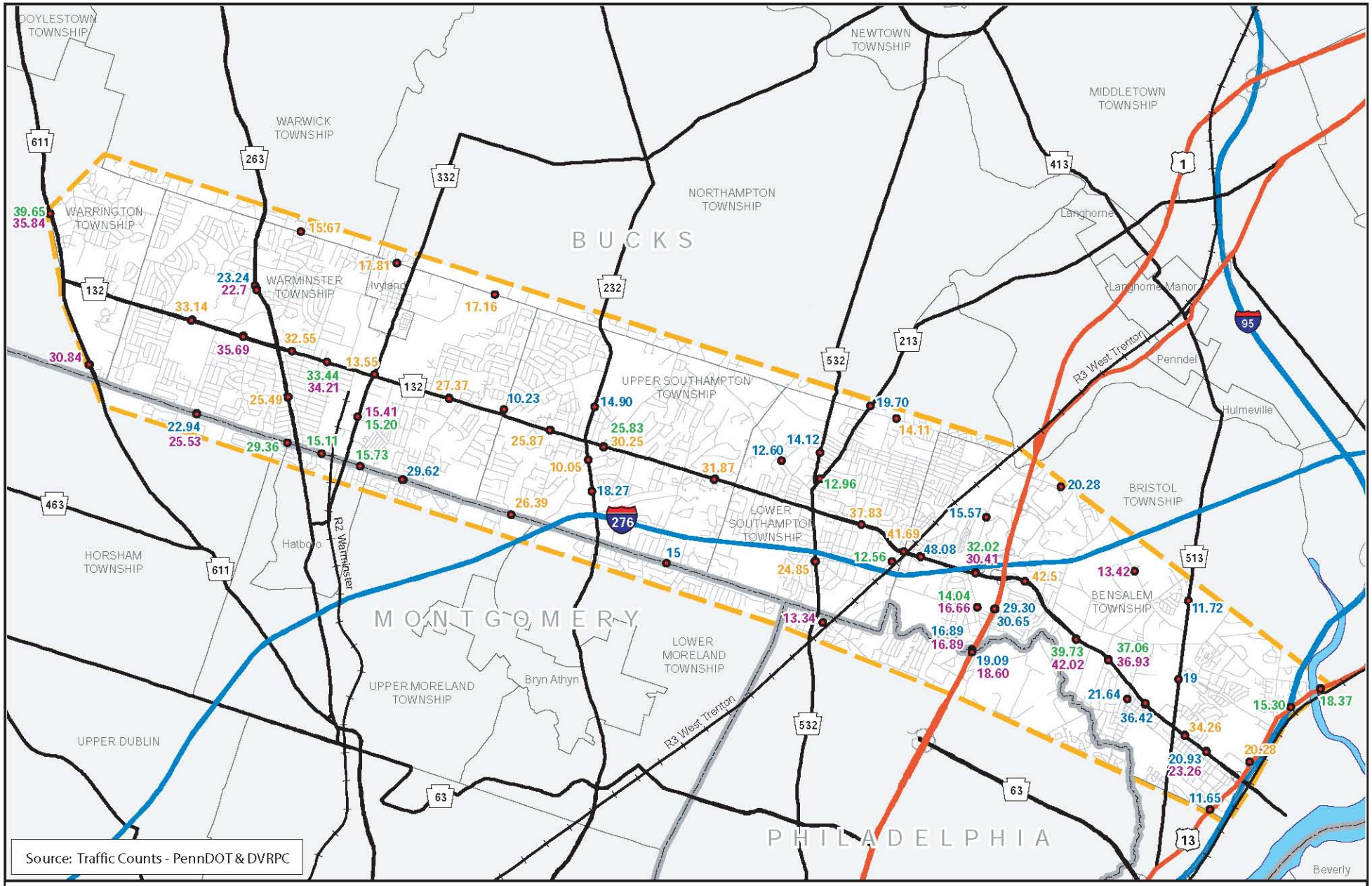
3.5 Traffic Volumes

Map 4 shows the Average Annual Daily Traffic (AADT), recorded by PennDOT for the years 2002 to 2006, in available road segments along Street Road. Complete turning movement counts conducted by DVRPC in 2006 can be seen in **Appendix A**. Volumes increase from 2002 to 2006 as development increased within the corridor. A pattern is observed following Street Road from I-95 to Easton Road. Traveling east to west, volumes begin at 20,933 AADT at the intersection at US 13 and increase westward to US 1 near the I-276 interchange where volumes recorded on Street Road were 48,079 AADT. From the I-276 interchange, the volumes descend to 25,831 AADT at Second Street Pike. Shortly after that, volumes increase as Street Road approaches York Road with 35,693 AADT and decrease as Street Road approaches Easton Road.

Level of Service Analysis

In order to understand the existing conditions of the corridor, DVRPC conducted an analysis of the existing traffic operations, and roadway conditions including safety, geometry, and level of service (LOS) at selected highway locations. The LOS is the standard performance measure for evaluating roadways and is defined by the Highway Capacity Manual (HCM) as a "qualitative measure describing conditions within a traffic stream, and their perception by motorists and/or passengers." LOS is divided into six categories, ranging from LOS A (free flow traffic) to LOS F (traffic flows break down, over capacity conditions).

The performance measures used to determine LOS vary depending on the type of intersection. If signalized, LOS is based on the average control delay for all motorists in each available movement within the intersection. This is correlated with the volume/capacity ratio, derived from the intersection's physical characteristics. At unsignalized, intersections, the LOS is based on the average delay on the controlled movements only and does not include the through lanes. The measure of effectiveness for signalized intersection LOS is the average control delay per vehicle. At each intersection, delay was estimated for each lane group and aggregated for each approach and for the intersection as a whole. This methodology does not take into account the potential impact of downstream congestion on intersection operation.



Street Road Corridor Study - Traffic Counts

MAP : 4

Delaware Valley
Regional Planning Commission
June 2006

Average Annual Daily Traffic Volume in thousands (year)

33.4 (2003) 33.1 (2005)
48.0 (2004) 35.6 (2006)

0 1 2
Miles

N

Signalized Intersections

Level of Service	*Description*	*Control Delay Per Vehicle (Seconds)*
A	Very low delay, high quality flow	≤ 10.0
B	Low delay, good traffic flow	10.1 to 20.0
C	Average delay, stable traffic flow	20.1 to 35.0
D	Longer delay, approach capacity flow	35.1 to 55.0
E	Limit of acceptable delay, capacity flow	55.1 to 80.0
F	Unacceptable delay, forced flow	> 80.0

Unsignalized Intersections

Level of Service	*Description*	*Control Delay Per Vehicle (Seconds)*
A	Little or no delay	≤ 10.0
B	Short traffic delays	10.1 to 20.0
C	Average traffic delays	20.1 to 35.0
D	Long traffic delays	35.1 to 55.0
E	Very long traffic delays	55.1 to 80.0
F	Demand exceeds capacity	> 80.0

LOS analyses were performed at the intersections of Street Road with Delmont Avenue, Jacksonville Road, York Road, Mearns Road and Davisville Road for the AM and PM peak periods (**Appendix B**). Traffic counts were collected during the peak periods in 15-minute increments (**Appendix A**). This data was used to determine the peak-hour traffic volumes. The peak periods for intersections on Street Road were analyzed as generally occurring between 7:00 – 8:30 a.m. and 4:30 – 6:00 p.m. Traffic volume data, along with data from the Traffic Signal Timing & Operation Plan, were analyzed using Highway Capacity Software (HCS) to determine the LOS.

3.6 Transit Service

There are multiple transit lines serving this area, including SEPTA's Regional Rail lines R7, R3, and R2. Many SEPTA bus routes run across the corridor rather than along it, with malls serving as local transfer hubs. Also, the Bucks County Transportation Management Association runs multiple shuttle services called the RUSH. **Appendix C** contains schedules and service areas.

Regional Rail

The R7 passes through the eastern end of the corridor with one station, Eddington, at Street Road and I-95. The R3 has two stations, Trevose, near Street Road and Brownsville Road, and Neshaminy Falls, on Bristol Road near Old Lincoln Highway. The R2 terminates at Warminster station, which is located to the west of the Street Road and Jacksonville Road intersection.

Bus Routes

#1	Philadelphia Park to Wissahickon Transit Center via Roosevelt Boulevard
#14	Oxford Valley Mall and Neshaminy Mall to Frankford Transit Center (FTC) via Old Lincoln Highway and Roosevelt Boulevard
#20	Franklin Mills Mall to FTC via Academy Road
#22	Warminster to Olney Transportation Center via York Road
#24	Southampton to FTC via Second Street Pike
#50	Extension of route 20 to Philadelphia Park via Knights Road
#55	Doylestown to Olney via Easton Road
#58	Neshaminy Mall to FTC via Bristol Road and Bustleton Avenue
#127	Philadelphia Park and Neshaminy Mall to Trenton via Lincoln Highway
#128	Neshaminy Mall to Bristol via Hulmeville Road and Bristol Pike
#129	Bristol to Torresdale via Byberry and Knights roads
#130	Bucks County Community College to Philadelphia Park and Franklin Mills Mall via Street Road

Street Road RUSH

Bucks County TMA provides shuttle service between SEPTA R-3 trains at Trevose Station and locations along the Street Road corridor in Bensalem, Lower Southampton and Upper Southampton townships with the Street Road RUSH service.

Warminster RUSH

This Bucks County TMA shuttle provides morning and evening peak-hour service between SEPTA R-2 trains at Warminster Station and locations in Warminster, Ivyland, Northampton Township, and Richboro via Jacksonville and Almshouse roads.

4.0 CORRIDOR TRANSPORTATION ISSUE AREAS

Street Road (PA 132), extending through five townships, is an important east-west connector in eastern Bucks County. Peak traffic volumes on Street Road have increased as development expands in the area. The number of signalized intersections has also increased while providing access to these new developments, leading to arterial congestion.

This study has identified specific transportation issue locations within the corridor and has outlined potential solutions for these areas.

The location descriptions are presented from a general east-west direction through the corridor and the numbering has no relation to project priority. A detailed write-up of the existing conditions, identified issues and potential improvement scenarios is presented for the 16 locations that have been studied. These locations are identified on **Map 5.**

Bensalem Township

4.1 Intersection of Hulmeville Road and Byberry Road

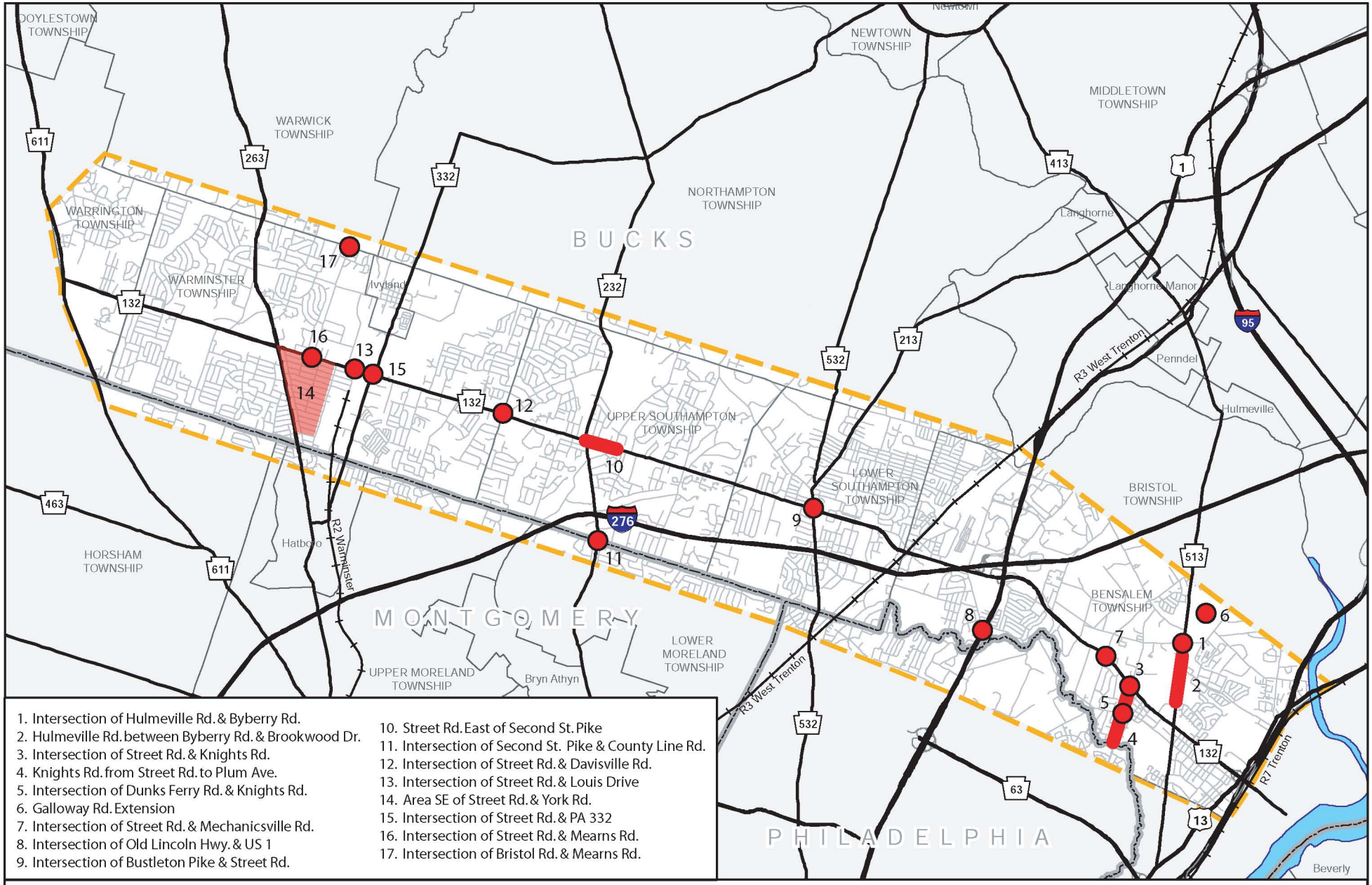
This is a four-leg intersection with dedicated left-turn lanes on all approaches. There are dedicated right-turn lanes on all approach legs except the northbound.

Issue:

A. Failing LOS in both AM and PM peak periods with through movements for all approach legs recording LOS F. The overall LOS at this intersection is F.
B. Faded pedestrian crosswalks and absence of pedestrian signal heads at intersection.

Recommendation:

A. Optimize signal splits to reduce delay.
B. Add a through/right lane to the northbound approach leg of Hulmeville Road, which would increase the capacity of the intersection by permitting shorter cycle lengths and shorter delays (**Figure 2**). The northbound approach leg would then have one through and one through/right lane. With current traffic volumes, creating a through/right lane will reduce delay during the AM peak from 256 to 160 seconds (62.5%) and from 390 to 186 seconds (47.7%) in the PM peak period.
C. Pedestrian crosswalks need restriping. Pedestrian signal heads (man/hand) should be at all legs of the intersection.



Street Road Corridor Study - Issue Areas

MAP : 5

Delaware Valley
Regional Planning Commission
June 2006

0 1 2
Miles

N

Figure 2: Hulmeville Road at Byberry Road

4.2 Hulmeville Road between Byberry Road and Brookwood Drive

This roadway segment has one travel lane in each direction with a Two Way Left Turn Lane (TWLTL) in the center.

Issue:

A. Excessive speeding by motorists due to wide cartway, center turn lane and flat topography.
B. High volume of school traffic due to the presence of several schools — three middle schools and the Bensalem High School.
C. While pedestrian crosswalks exist, some do not have the enhancements, such as protected median refuge, most appropriate for this area.

Recommendation:

A. Reduce the width of travel lanes to 12 feet in an effort to reduce speeds.
B. Widen the shoulder and create a bike lane on both sides of Hulmeville Road. This can be accommodated within the existing right-of-way. This improvement would also increase the buffer for pedestrian traffic (**Figure 3**).
C. Create a mid-block pedestrian refuge at the crosswalk in front of Cecilia Snyder Middle School. This would allow pedestrians to cross one direction of traffic and then evaluate the opposing traffic before completing the crossing. It would also encourage vehicles to slow down.

4.3 Intersection of Street Road and Knights Road

This is a four-leg intersection with channelized right-turn lanes on both approach legs from Knights Road to Street Road.

Issue:

A. High pedestrian volumes with lack of pedestrian facilities. Sidewalks are absent along southbound Knights Road. As a result, pedestrians use the cartway as a pathway.
B. Pedestrian signal heads absent at the intersection.
C. There are weaving issues on Knights Road where the median ends, south of Street Road.

Recommendation:

A. Complete sidewalk network along southbound and northbound sides of Knights Road south of Street Road to link apartment complexes with school and nearby commercial areas (**Figure 4**).
B. Install a protected left-turn signal phase at this intersection.
C. Fully visible crosswalks should be installed at all legs of this intersection.
D. A pedestrian phase to the traffic signal should be installed with appropriate pedestrian signal heads (man/hand, pedestrian countdown) at all legs of the intersection.

Figure 3: Hulmeville Road Between Byberry Road and Brookwood Drive

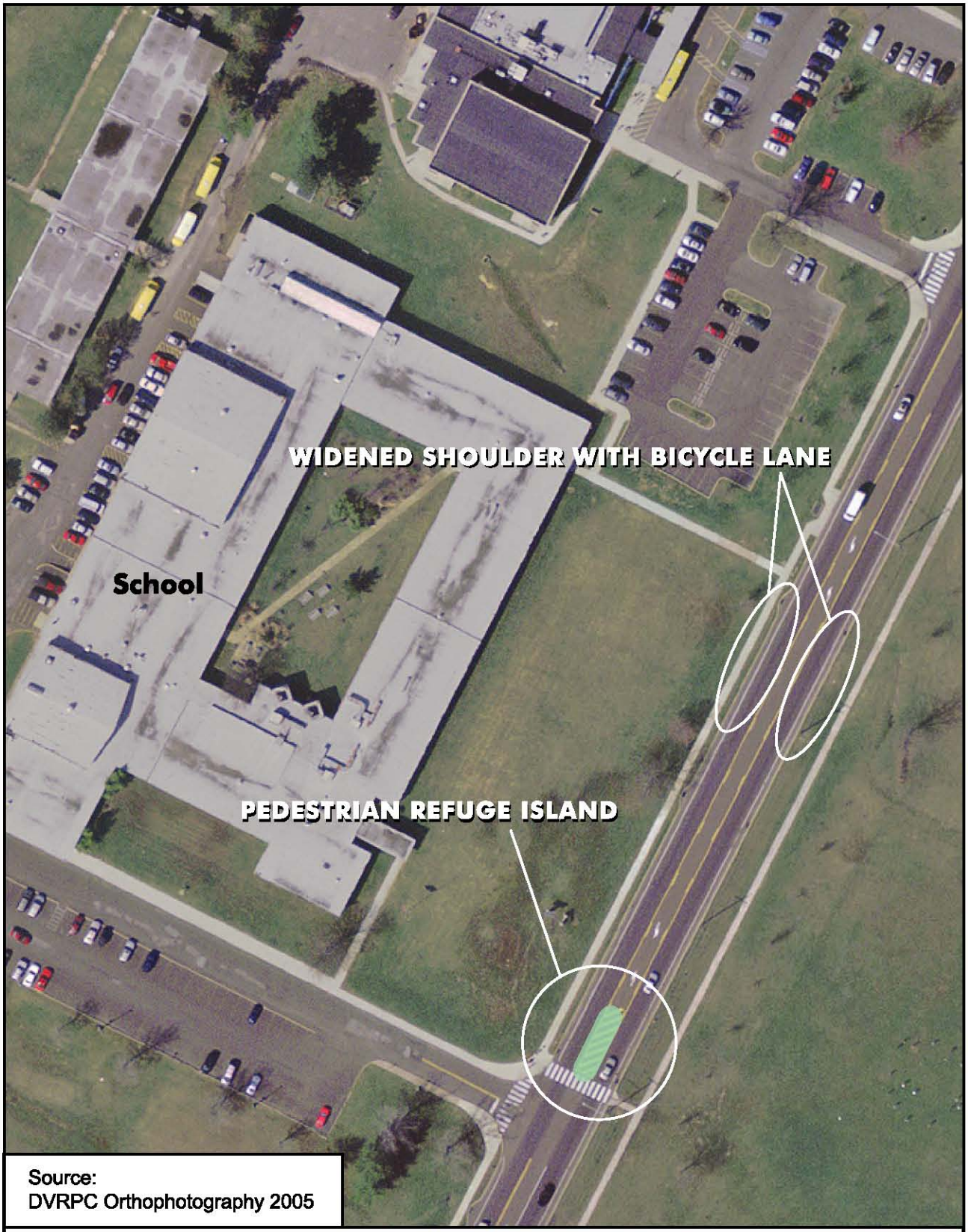
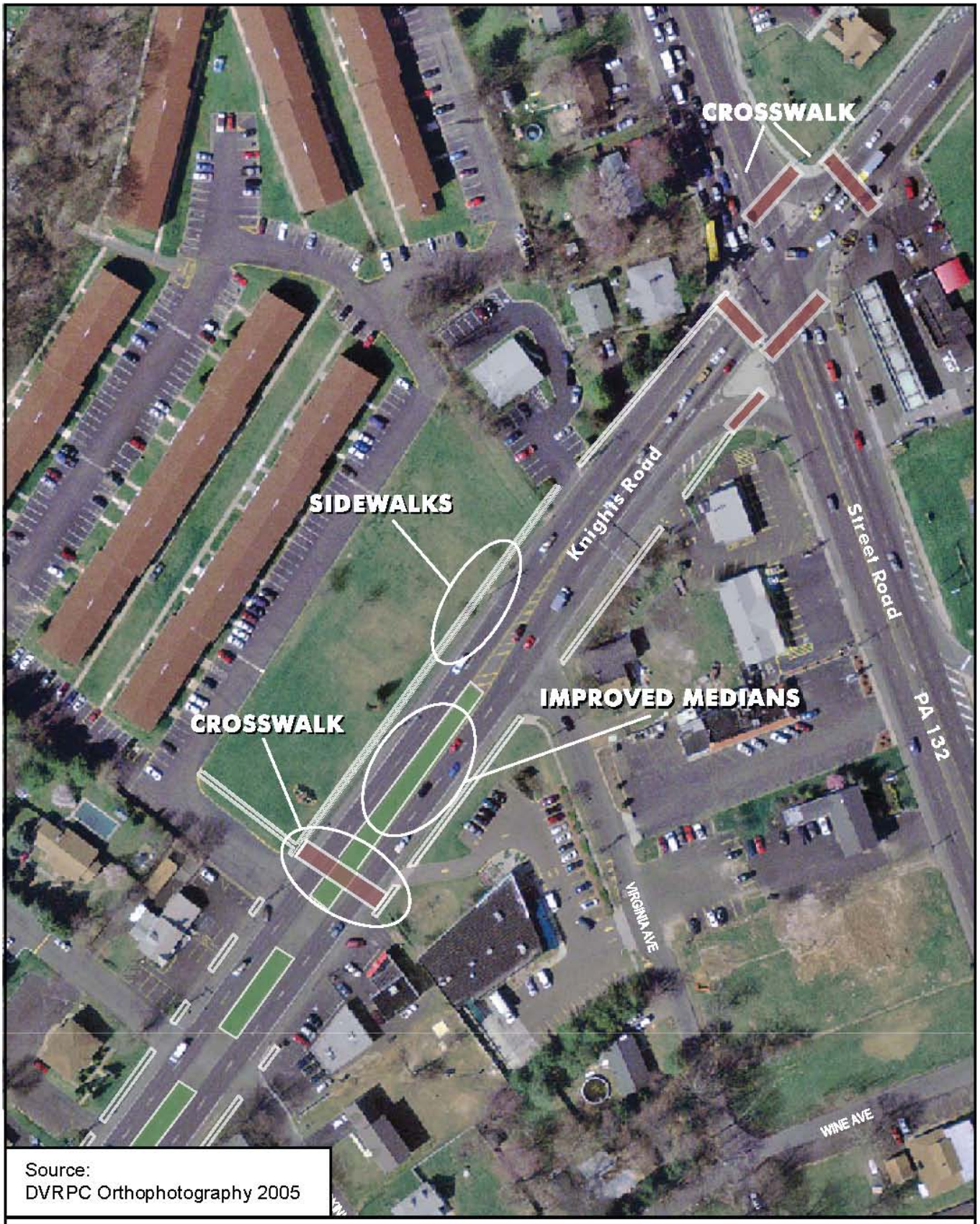


Figure 4: Knights Road Improvement



Source:
DVRPC Orthophotography 2005

Delaware Valley
Regional Planning Commission
June 2006

0 50 100
Feet

N

4.4 Knights Road from Street Road to Plum Avenue

This mid-block segment has two travel lanes in each direction with a center grass median for the most part.

Issue:

A. This is the location with the highest number of crashes with 97 crashes, 113 injuries, and one fatality occurring during the years 2001 - 2005.
B. Heavy vehicular and pedestrian volumes on this segment impact safety.
C. There is an absence of adequate pedestrian crosswalks to accommodate heavy pedestrian traffic in the area.

Recommendation:

A. Traffic calming measures on Knights Road to the south of Street Road should include pavement and median treatments that would reduce vehicle speeds (**Figure 4**).
B. There should be a mid-block crosswalk with a pedestrian median refuge at Knights Road in front of the Shaminy Brook Apartments, to assist pedestrians crossing in that area.
C. There should be sidewalks in front of the Shaminy Brook Apartments to safely accommodate the heavy pedestrian traffic in this area.

4.5 Intersection of Dunks Ferry Road and Knights Road

This intersection has two travel lanes in each direction on Knights Road, while Dunks Ferry Road has one travel lane in each direction. There is heavy pedestrian traffic through this intersection.

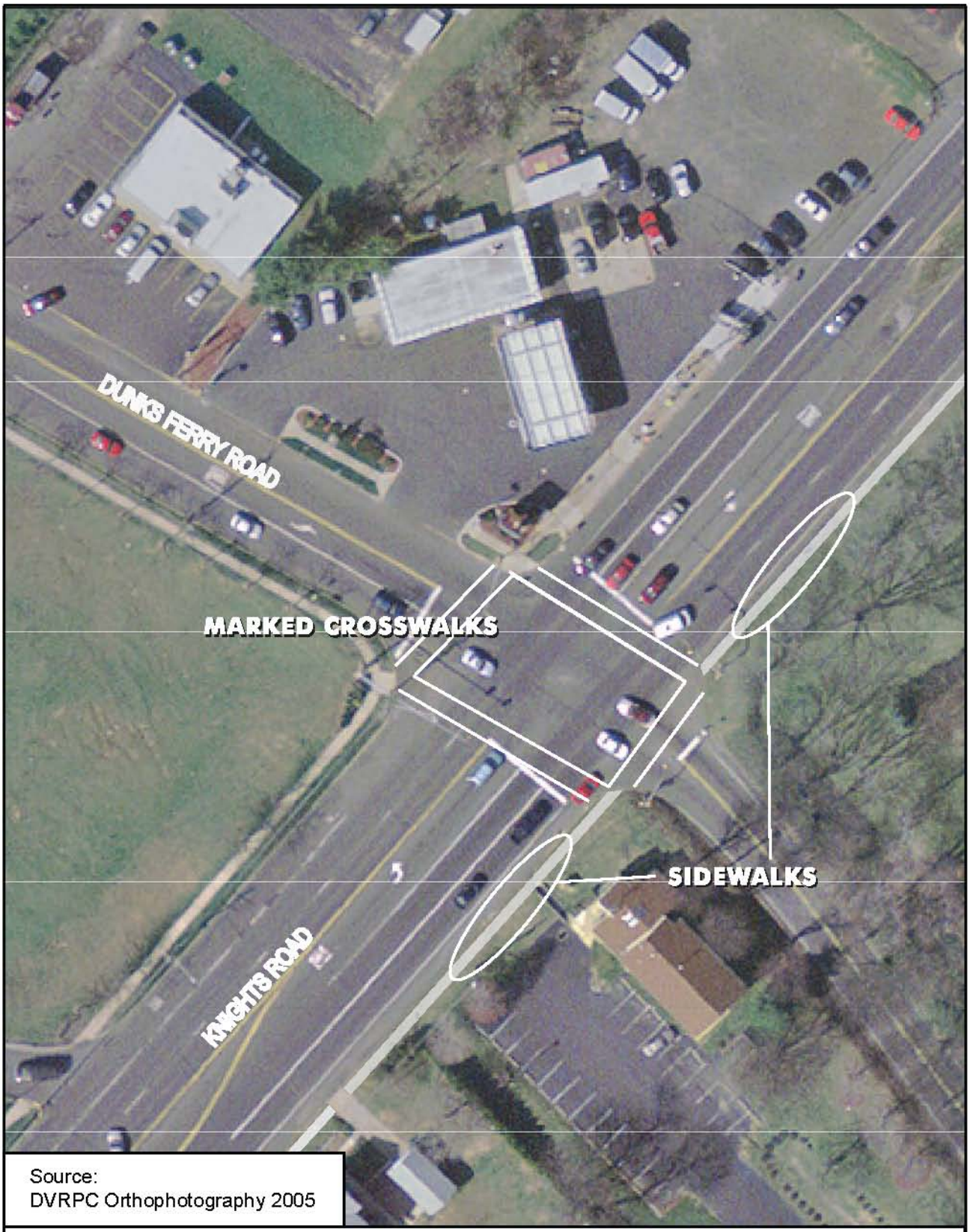
Issue:

A. There are no pedestrian crosswalks at this intersection.
B. The existing pedestrian pushbutton for crosswalks is inaccessible.

Recommendation:

A. Install pedestrian crosswalks at this intersection with accessible pushbuttons.
B. Install sidewalks on the northbound approach and departure legs of Knights Road (**Figure 5**).

Figure 5: Intersection of Dunks Ferry Road and Knights Road



Source:
DVRPC Orthophotography 2005

Delaware Valley
Regional Planning Commission
June 2006

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4.6 Galloway Road Extension

This project seeks to construct an extension of Galloway Road by providing a direct connection with Bridgewater Road.

Issue:

Heavy truck traffic from Bridgewater Road to Galloway Road utilizing Hulmeville Road and Byberry Road as connectors.

Recommendation:

Extend Galloway Road from Hulmeville Road to Bridgewater Road (**Figure 6**) through parcels 02-033-094 and 02-041-022. This would provide a direct connection for trucks traveling from along Bridgewater Road, as well as from US 13 and I-95 to Galloway Road. This project is currently on the Transportation Improvement Program (MPMS-#57617).

4.7 Intersection of Street Road and Mechanicsville Road

This intersection has four approach lanes on Street Road, while Mechanicsville Road has two approach lanes plus a channelized right-turn lane on the southbound approach. The northbound approach has two approach lanes while there is a channelized right-turn lane at the intersection.

Issue:

A. Between 2001 and 2005, 32 angle and 9 rear-end crashes occurred at this intersection.
B. Sidewalks in this area are not continuous.
C. Crosswalks lack visibility to motorists.

Recommendation:

A. Westbound traffic on Street Road has a protected left-turn signal. By installing prominent “Delayed Green Signal” signage for the opposing traffic, potential crashes may be averted (**Figure 7**).
B. Install prominent crosswalks that will provide safety to pedestrians.
C. Provide continuous sidewalk network to accommodate pedestrian traffic.

4.8 Intersection of Old Lincoln Highway and US 1

This intersection has four approach legs. US 1 southbound has three approach lanes plus a southbound left-turn lane at the intersection. Old Lincoln Highway has two approach lanes to the intersection.

Issue:

A. This is the highest crash intersection with 87 crashes, 94 injuries and no fatalities occurring over the years 2001 - 2005.
B. There are heavy truck volumes through this intersection.

Figure 6: Galloway Road Extension

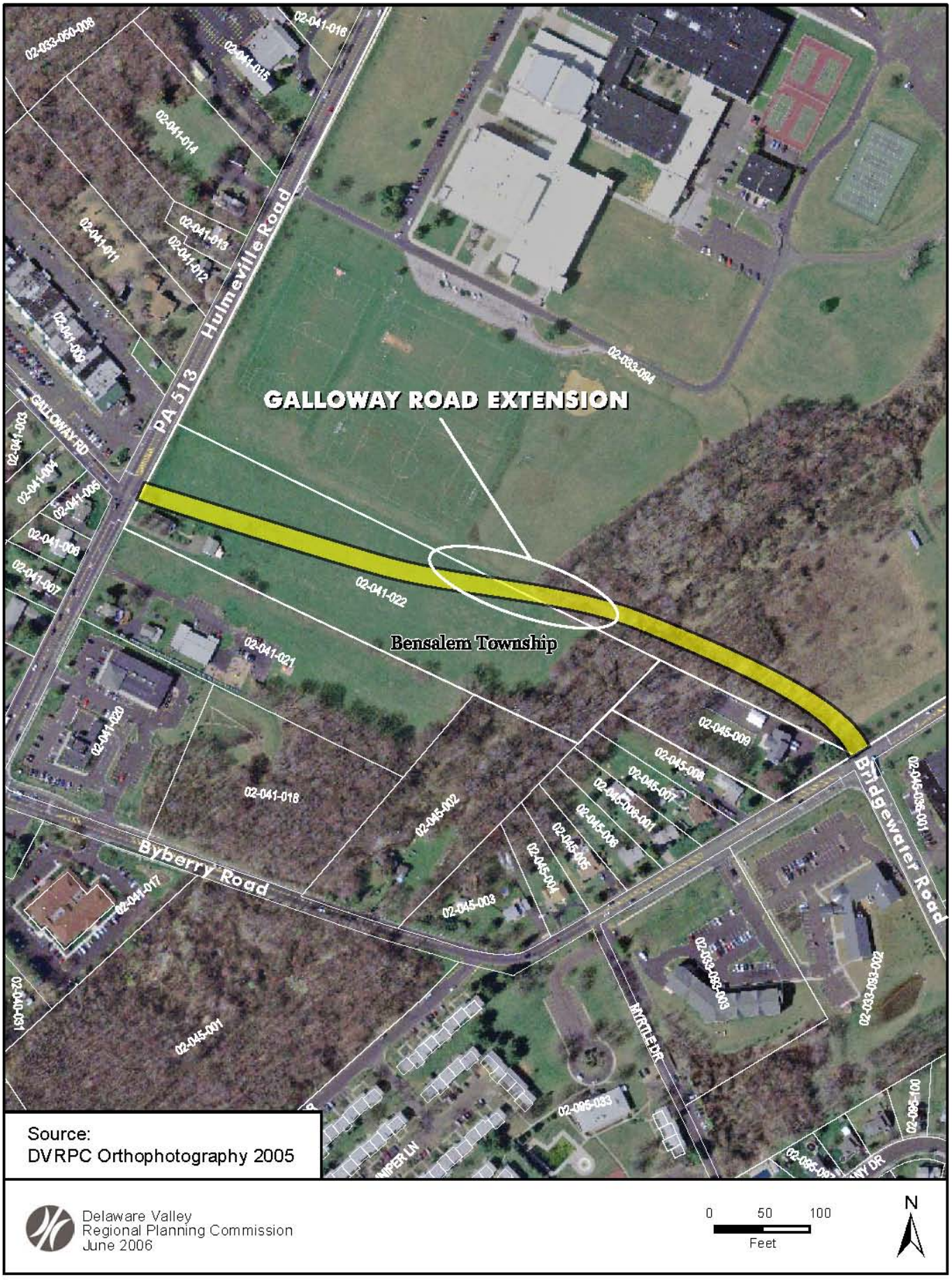
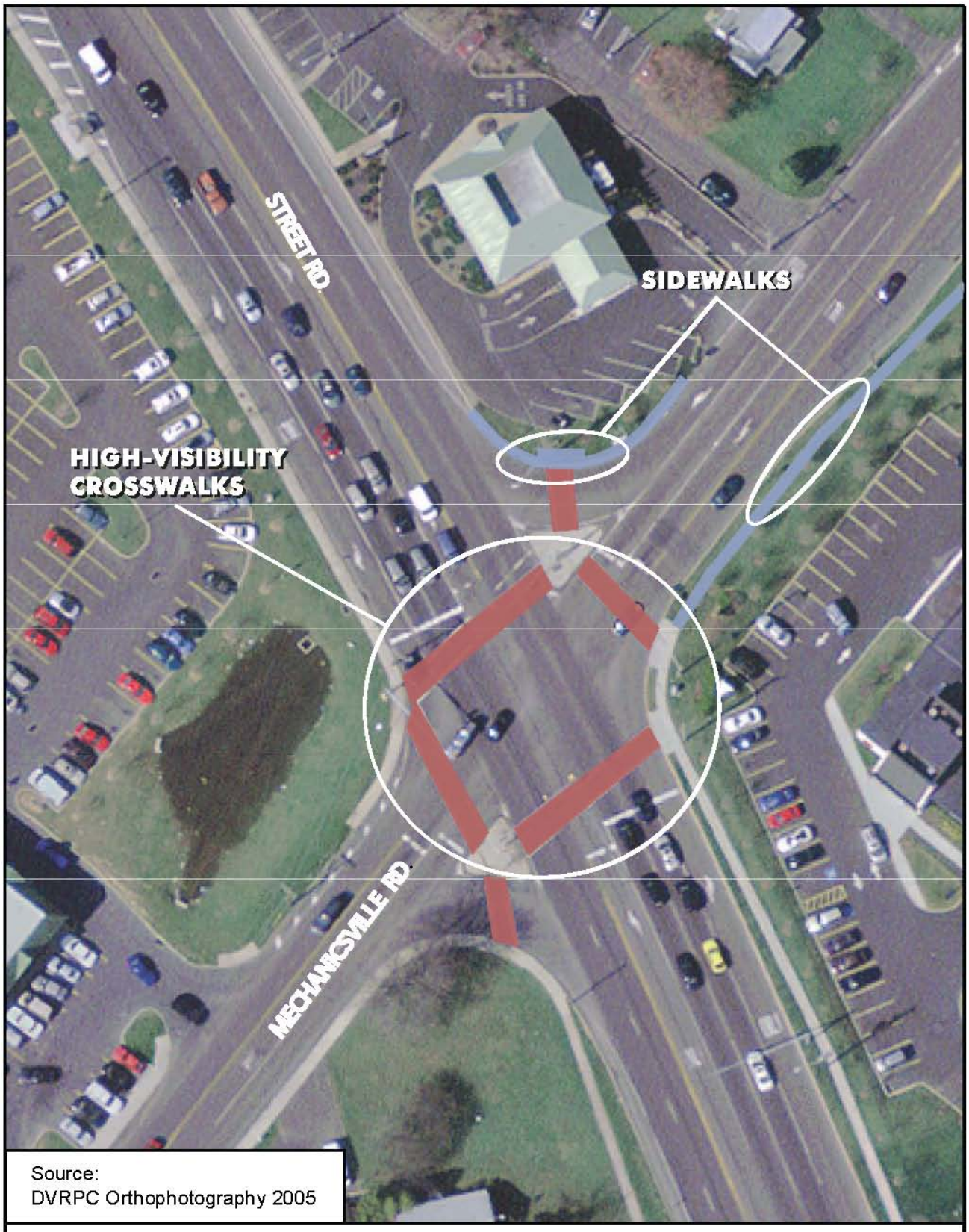


Figure 7: Intersection of Street Road and Mechanicsville Road



C. Inadequate traffic control signage.
D. High volumes result in congestion and delay through the intersection.
E. Several driveways are in close proximity to the intersection, which conflicts with through traffic.

Recommendation:

A. Protected left-turn signals for southbound vehicles turning left from US 1.
B. Channelization of traffic at this intersection to reduce conflict between opposing movements along US 1.
C. Provide signage directing left-turning traffic from US 1 northbound to the jug handle (**Figure 8**).
D. Consolidation of driveway access in close proximity to the intersection. The number of curb cuts should be reduced so as to eliminate conflict with through traffic.

Lower Southampton Township

4.9 Street Road at Bustleton Pike

Street Road intersects with Bustleton Pike at a four-leg intersection. There are channelized right-turn lanes, left-turn lanes, and two through lanes at all approaches (**Figure 9**).

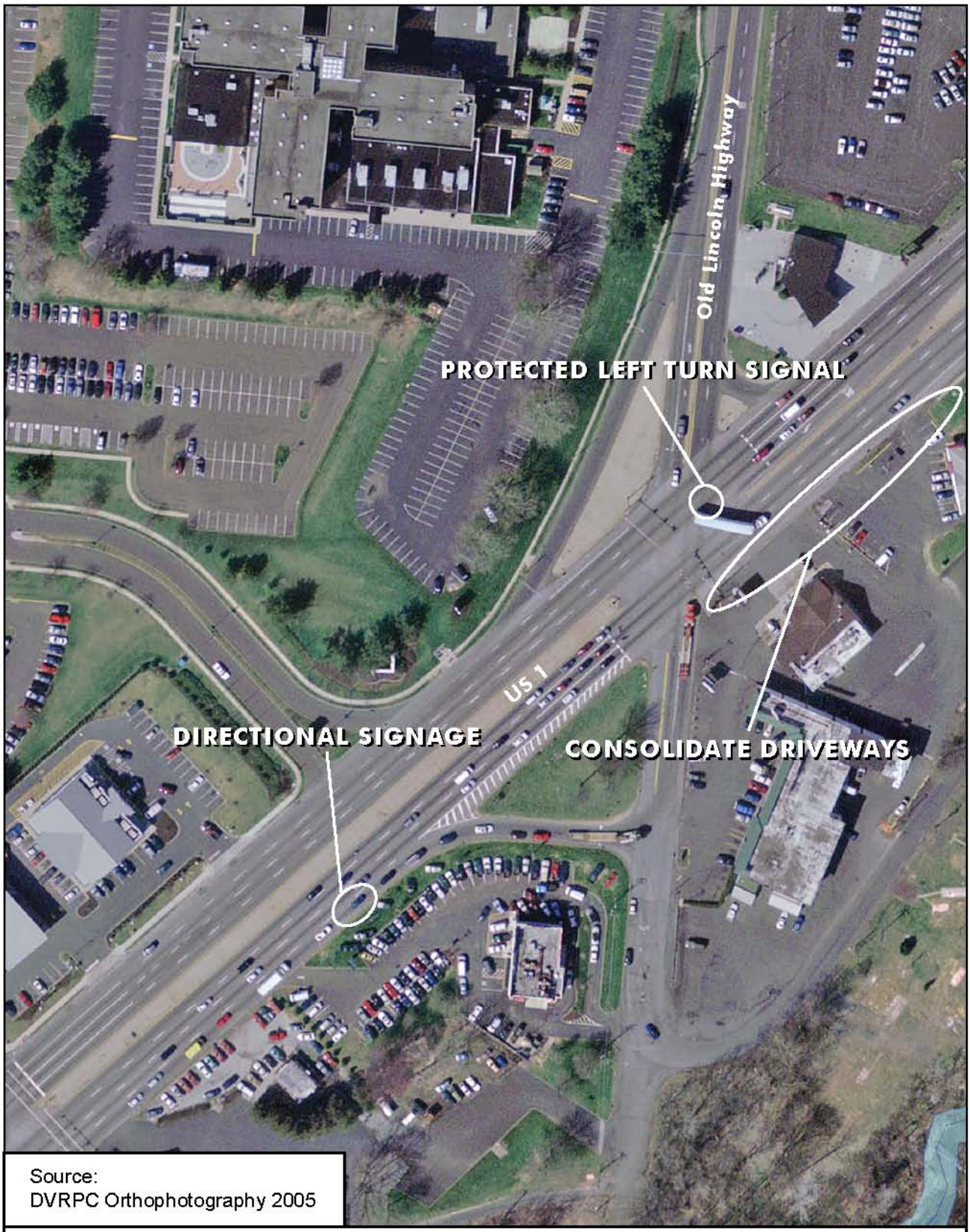
Issue:

Excessive traffic volumes lead to delays throughout the day, with heavy congestion on all approaches during AM and PM peaks. Crash counts at this location show a total of 73 crashes occurring at this location over the period 2000-2005, which is in the mid-range for the corridor.

Recommendations:

No immediate solutions have been identified that would have a significant impact on reducing congestion for this intersection. A more detailed analysis will be required to determine what physical improvements are feasible. A possibility for further study could be whether enhancements elsewhere in the corridor could provide some relief of volumes at this intersection by improving the overall traffic network of the area.

Figure 8: Intersection of Old Lincoln Highway and US 1



Source:
DVRPC Orthophotography 2005

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Regional Planning Commission
June 2006

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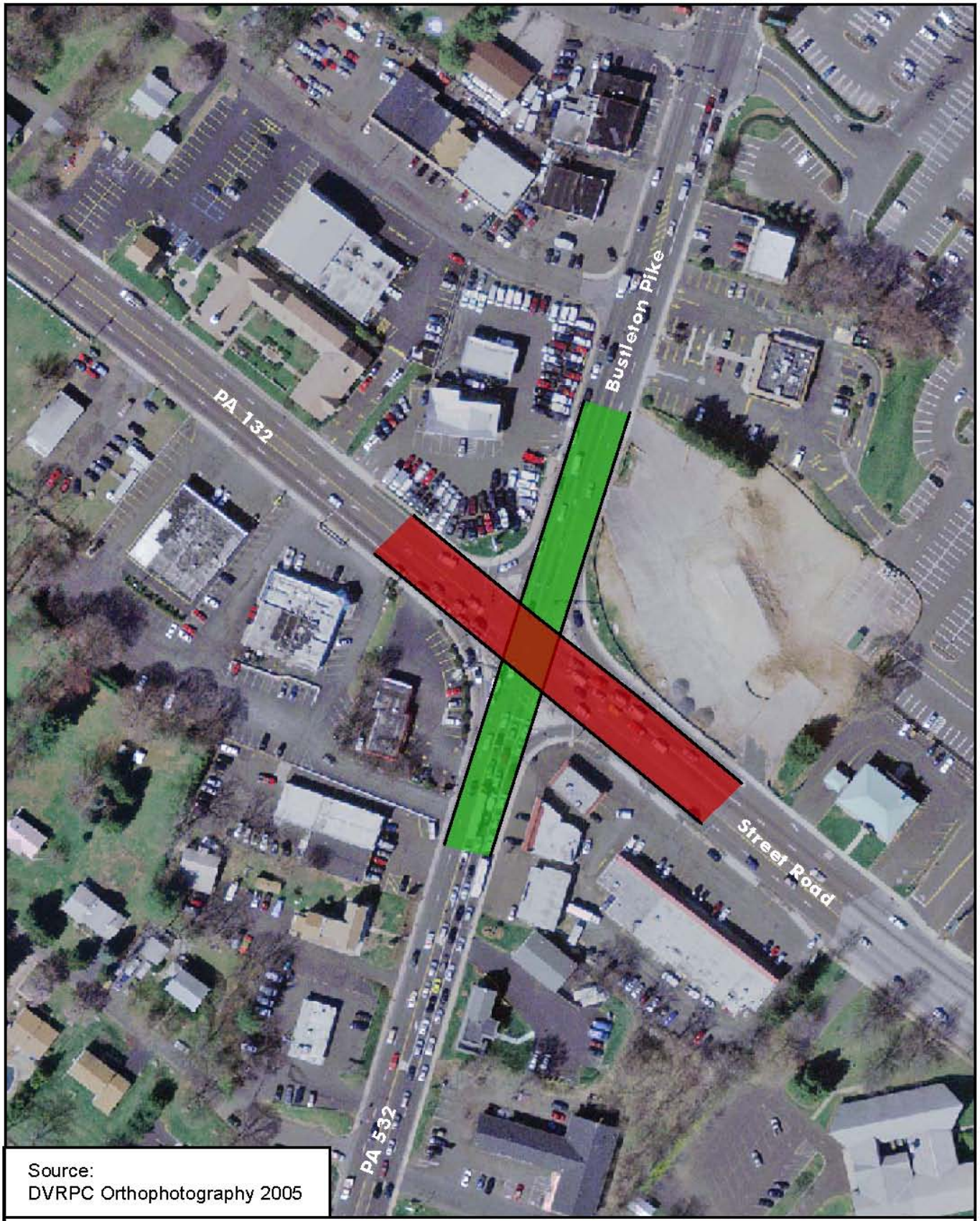
Figure 9: Bustleton Pike at Street Road



Source:
DVRPC Orthophotography 2005

Delaware Valley
Regional Planning Commission
June 2006

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Upper Southampton Township

4.10 Street Road East of Second Street Pike (PA 232)

This segment is proximate to the east of a four-leg intersection with a channelized right-turn lane emptying onto one of two eastbound lanes (**Figure 10**).

Issue:

A. Heavy through volumes on Street Road, the primary facility, results in delays on Second Street Pike.
B. Frequency of curb cuts disrupts traffic flow and increases the potential points of conflict.

Recommendation:

A. Solicit property owner cooperation to voluntarily consolidate some driveways, where feasible, to reduce conflict with through traffic.
B. Examine the feasibility of applying access management code principles to regulate access for future development along arterials in the township.

4.11 Intersection of Second Street Pike and County Line Road

This intersection has one through lane on all approaches as well as a left-turn lane (**Figure 11**).

Issue:

A. This intersection experiences high volumes on all approach legs leading to congestion at the intersection.
B. The overall LOS for this intersection is “F” in both the AM and PM peaks.
C. This is the third highest crash location with 84 crashes, 64 injuries and 1 fatality occurring between 2001 and 2005.

Recommendation:

A. By improving the local road network adjacent to the primary facility (Street Road), alternate routes for travel can be created. By connecting the north and south sections of Gravel Hill Road in the vicinity of Industrial Boulevard (**Figure 12**) via an underpass, a network can be created that would tie together isolated sections of the local road network. This would disperse traffic onto the newly linked relief road that would parallel Second Street Pike.
B. By optimizing the signal timing at this intersection, delays can be reduced (**Appendix B**).

Figure 10: Street Road East of Second Street Pike

Source:
DVRPC Orthophotography 2005

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Figure 11: Intersection of Second Street Pike and County Line Road

Source:
DVRPC Orthophotography 2005

Delaware Valley
Regional Planning Commission
June 2006

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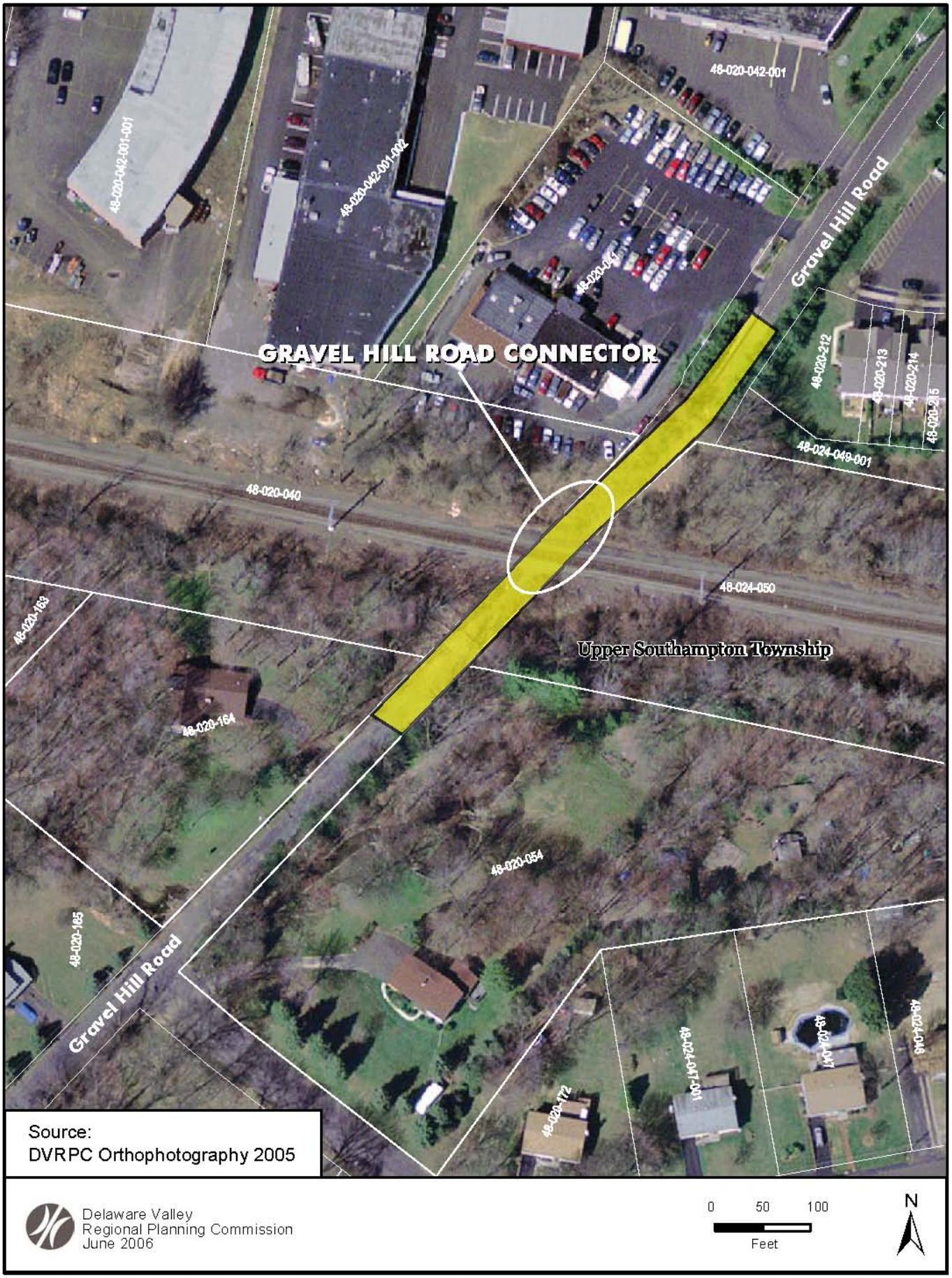
Figure 12: Gravel Hill Road Connector



4.12 Intersection of Street Road and Davisville Road / Maple Avenue

This is a four-leg intersection with Maple Avenue ending at a skew approximately 100 feet southeast. There are two through lanes and one left-turn lane on both approaches of Street Road. Davisville Road has one through lane and one left-turn lane on both approaches. (**Figure 13**)

Issue:

A. Failing LOS on Street Road during peak hours. The AM peak LOS is "D" while the PM peak experience is LOS "F".
B. Heavy left turns from Street Road to Davisville Road.
C. Congestion at the Street Road/Davisville Road intersection impacts the operation of the Maple Avenue intersection.

Recommendation:

Add a far-side jug handle for westbound left-turning traffic from Street Road to Davisville Road to improve throughput and subsequently reduce congestion at both intersections. This would reduce conflict between left-turning traffic on Street Road and traffic moving off of Maple Avenue.

Warminster Township

4.13 Intersection of Street Road and Louis Drive

This is an area that experiences a high volume of truck activity from Street Road to warehouses on Louis Drive.

Issue:

Turning radius not adequate to accommodate right turns from westbound Street Road.

Recommendation:

Cut back the northeast corner so as to increase the turning radius from Street Road to Louis Drive to accommodate truck traffic (**Figure 14**).

Figure 13: Intersection of Street Road and Davisville Road/Maple Avenue

Source:
DVRPC Orthophotography 2005

Delaware Valley
Regional Planning Commission
June 2006

0 30 60
Feet

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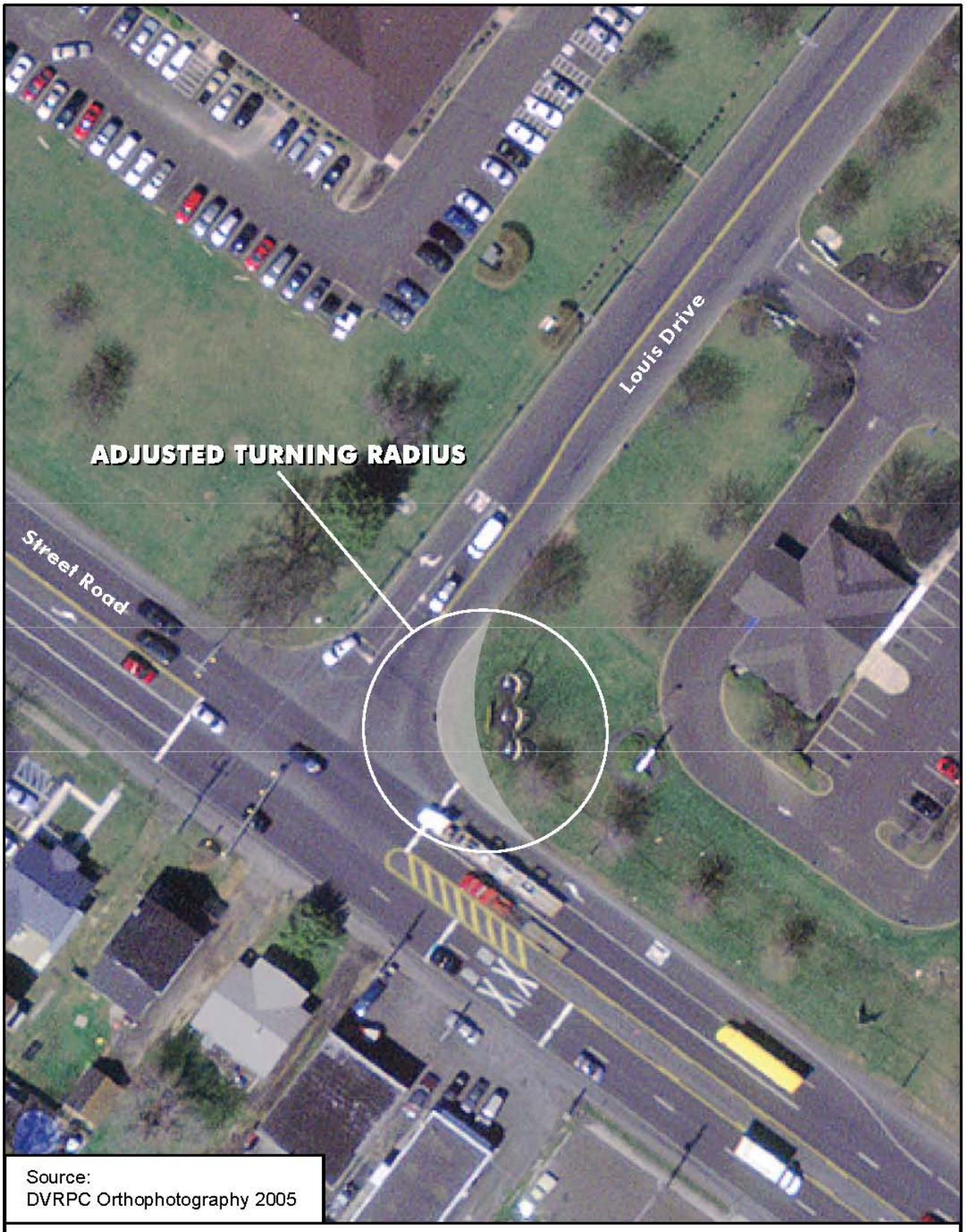
Figure 14: Intersection of Street Road and Louis Drive



4.14 Area southeast of Street Road and York Road intersection

This is an area of dense residential development with several through streets running perpendicular to Street Road. There is an industrial park on Street Road across from the neighborhood (**Figure 15**).

Issue:

A. Although there are four-way stop signs in the neighborhood, there is some speeding due to the layout of the roads.
B. Residential streets such as Madison Avenue serve as alternate routes between Street Road and County Line Road for commercial traffic.

Recommendation:

A. Stripe wider shoulders to narrow width of travel lanes.
B. Install traffic calming devices such as speed tables, raised center islands or rotaries to reduce speeding.

4.15 Intersection of Street Road and Jacksonville Road (PA 332)

This is a four-leg intersection with two through lanes and protected left-turn lanes on all approaches. Street Road has channelized right-turn lanes on both approaches (**Figure 16**).

Issue:

A. Capacity at the northbound approach of Jacksonville Road is inadequate for peak volumes.
B. This intersection provides access for traffic destined to SEPTA's Warminster rail station. Recent expanded parking at the station has seen a near-capacity utilization.
C. Congestion at this intersection is acute, especially during the AM and PM peak periods. This is compounded by traffic entering Jacksonville Road from the adjacent shopping center.

Recommendation:

A. Explore the feasibility of expanding shuttle service from residential and commercial areas to and from the train station by expanding the "RUSH" service provided by the Bucks County TMA (**Appendix C**). This shuttle network currently connects with the Trevose and Warminster train stations as well as SEPTA's bus network.
B. Make the entrance to the shopping center on Jacksonville Road right-in/right-out-only. Left-turning traffic will still be able to use the entrance/exit on Street Road. This will reduce conflict with through movements and enable better progression through the intersection.
C. Create pedestrian and bicycle linkages with residential areas to encourage nonmotorized access and minimize parking demand.

Figure 15: Area South of Street Road, Between Park and Evergreen Avenues

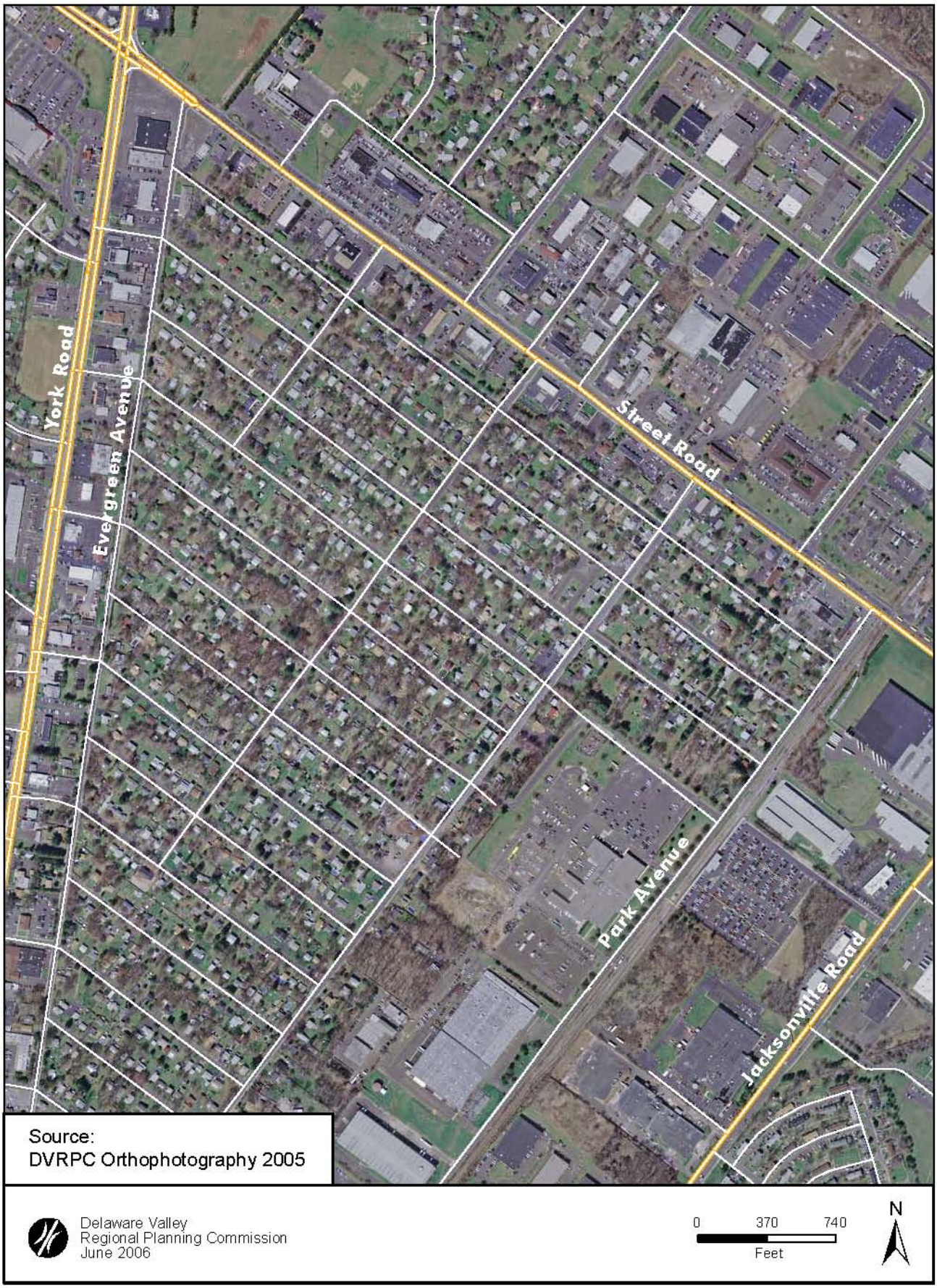
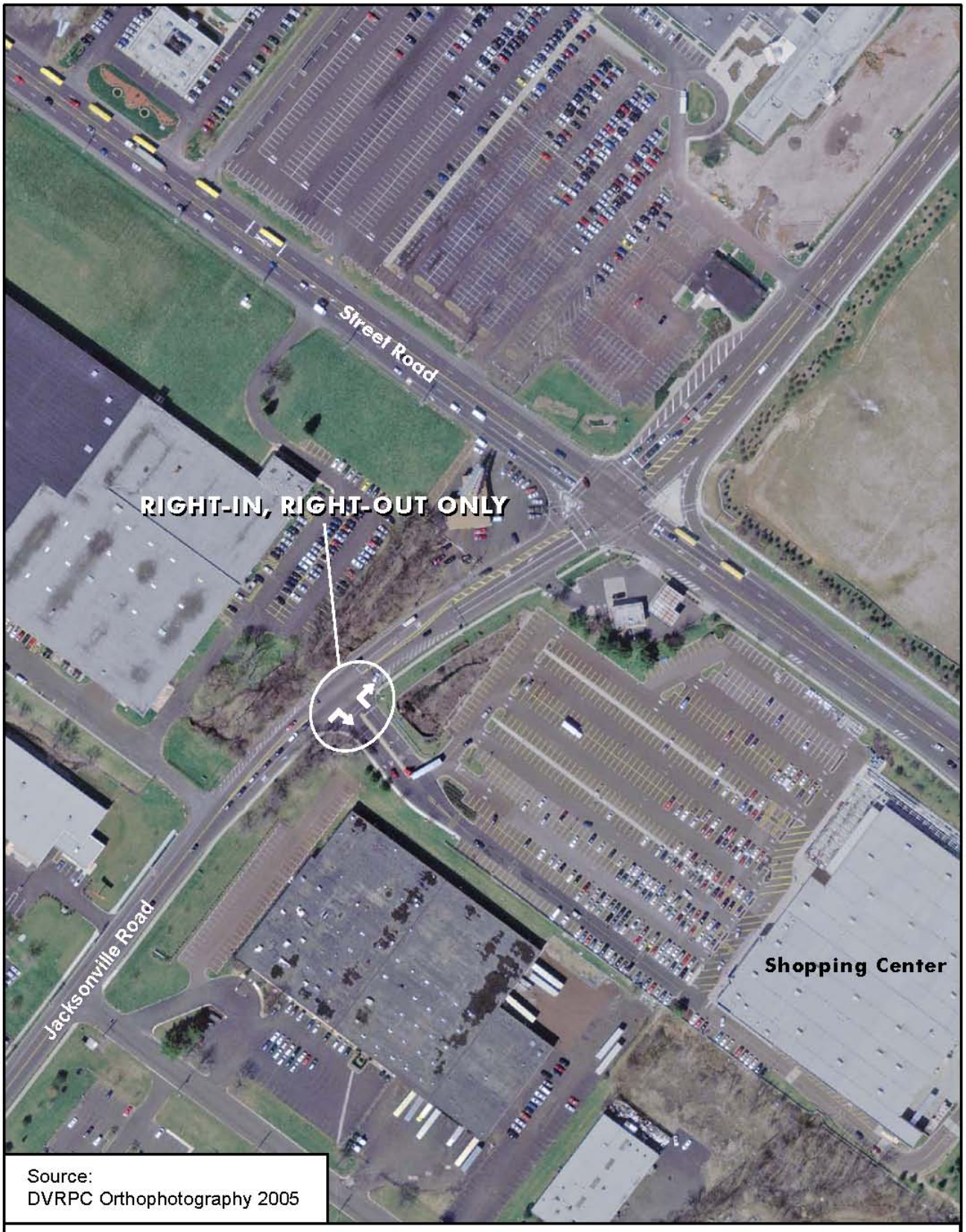


Figure 16: Intersection of Street Road and Jacksonville Road



4.16 Intersection of Street Road and Mearns Road

This is a T-intersection with Mearns Road running perpendicular to Street Road (**Figure 17**).

Issue:

The westbound shoulder of Street Road is clearly demarcated as a non-travel lane. Nonetheless, it is used by right-turning traffic as a turning lane.

Recommendation:

A. Give a protected left turn to eastbound traffic turning from Street Road to Mearns Road so as to prevent conflict with opposing traffic.
B. Convert the westbound shoulder on Street Road to a signalized right-turn-only lane after the commercial driveway.

4.17 Intersection of Bristol Road and Mearns Road

This is a four-leg intersection with one westbound approach lane on Bristol Road. The eastbound approach of Bristol Road has a shared left/through lane and a right-turn lane (**Figure 18**).

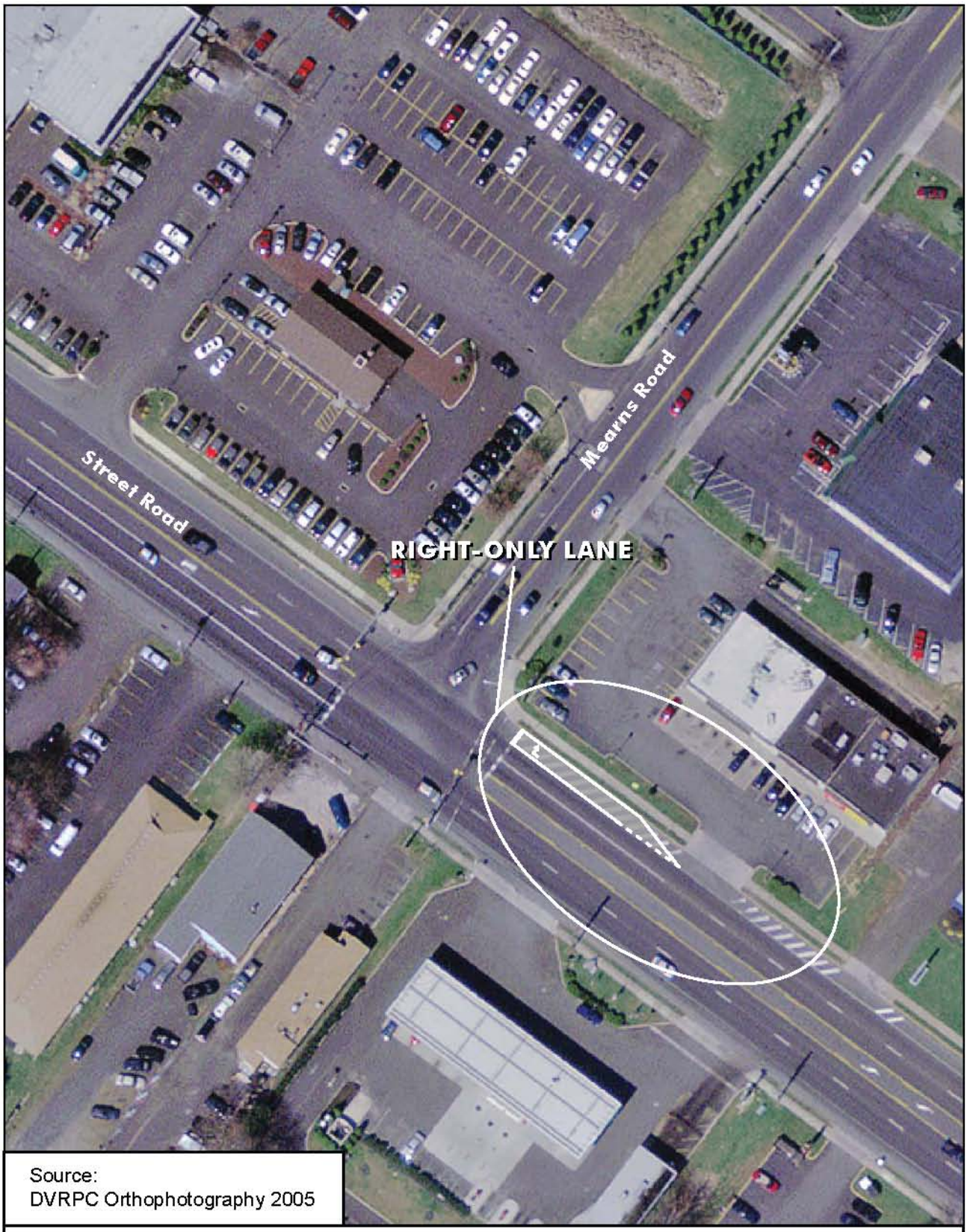
Issue:

The overall LOS for this intersection is E during the AM peak and D during the PM peak. Westbound traffic from Bristol Road to Mearns Road is at LOS F during the AM peak and at LOS E during the PM peak period.

Recommendation:

Widen Bristol Road to provide a westbound left-turn-only lane onto Mearns Road to accommodate current volumes.

Figure 17: Intersection of Street Road and Mearns Road



Source:
DVRPC Orthophotography 2005

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June 2006

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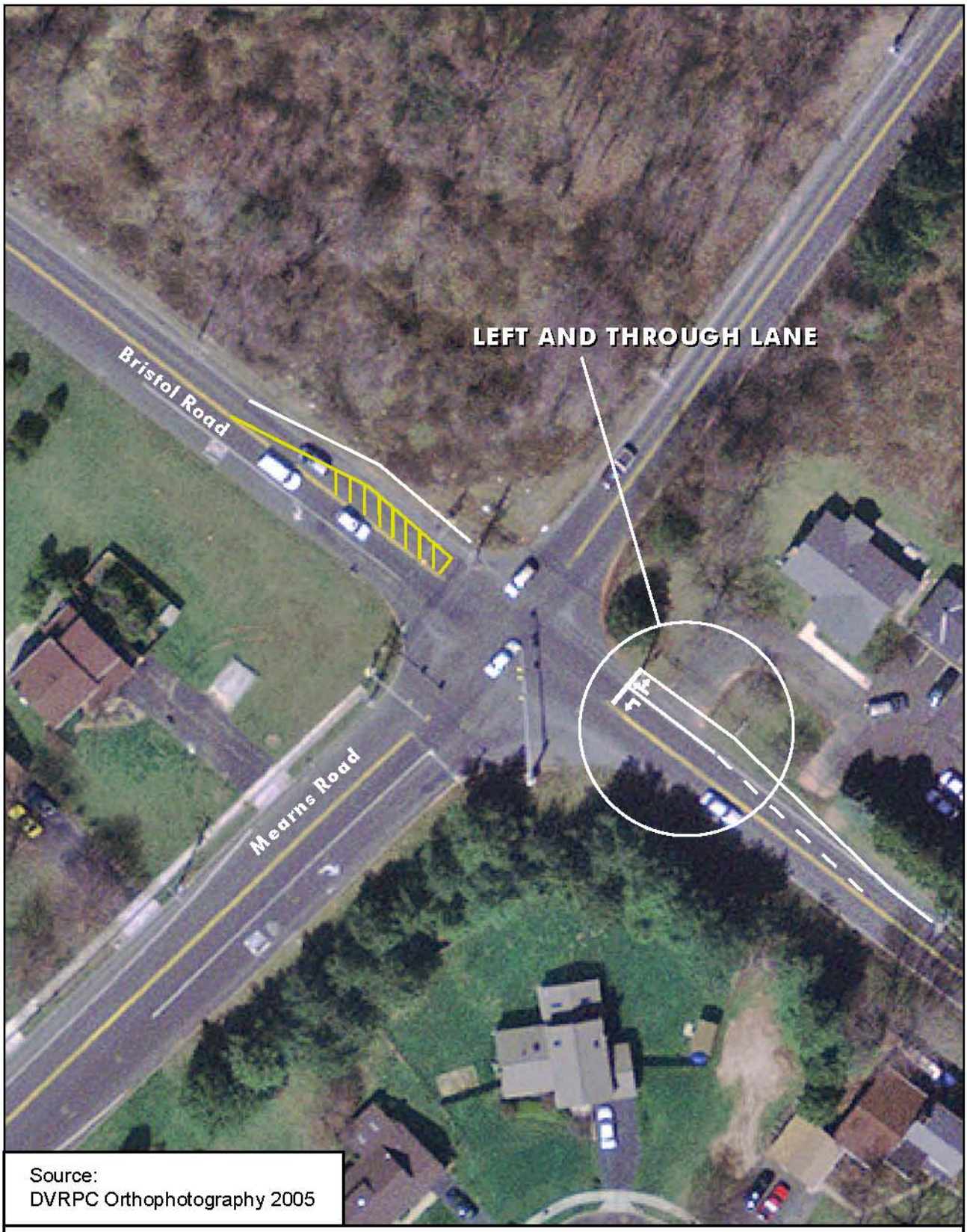
Figure 18: Intersection of Bristol Road and Mearns Road



4.18 Issue Locations Requiring Detailed Study

Two locations were preliminarily evaluated that will require a more detailed study to identify specific improvement strategies that could effectuate improvement to the traffic flow in the corridor.

1. Street Road in the vicinity of Philadelphia Park

This highway segment will be impacted by the expansion of Philadelphia Park, which is constructing an electronic gaming device facility ("racino") at this location. It is estimated that more than 1,000 evening peak-hour trips will be generated by this facility, consisting of 85 percent trips that are regional in origin and 15 percent local trips. The Philadelphia Park Traffic Impact Study (2004) by Pennoni Associates Inc. identifies off-site improvements that are necessary to mitigate the impact of the additional trips. The effectiveness of these improvements should be analyzed in the future and additional measures taken if necessary at that time.

2. The Intersection of Street Road and Old Lincoln Highway

The level of service for this intersection is "F" in both the AM and PM peaks (**Appendix A**). Westbound through and northbound left movements are congested during the AM peak. In the PM peak, the northbound through, southbound left, eastbound left and westbound through experience congestion. The Pennsylvania Turnpike overpass crosses the west and north approaches of this intersection, constraining expansion opportunities. A more detailed engineering analysis will be required of this intersection to determine what physical improvements are feasible.

4.19 Corridor-Wide Issues

Congestion

Issue:

Congestion caused by high volumes exceeding capacity in peak periods.

Recommendation:

A. Establish coordinated traffic signal systems to allow progression along the Street Road corridor.
B. Limit unsignalized left turning to major thoroughfares, where feasible, to control traffic flow disruptions.
C. Rationalize and expand existing transit service in the area to reduce the number of vehicle trips.
D. Road widening is not the panacea to congestion due to costs of right-of-way acquisition and the short-term relief that this alternative provides. A more effective solution is travel demand management. This option identifies opportunities to increase nonmotorized forms of transportation,

such as promotion of bicycling and walking as efficient means of travel, and through providing linkages between origins and destinations for short distance trips.

E. Encourage better utilization of the existing transportation network to distribute traffic; and selectively add road segments where needed.

Multiple Entrances and Exits

Issue:

Multiple curb cuts for driveway access within relatively short distances that disrupt traffic flow and increase the likelihood of crashes.

Numerous traffic signals within close proximity to each other impede traffic progression.

Recommendation:

A. Solicit property owners' cooperation to voluntarily consolidate driveways, where feasible, by creating shared access points between multiple shopping centers.
B. Implement access management code for future development along arterials such as Street Road and Second Street Pike.
C. Encourage utilization of secondary road network for private driveway ingress and egress, minimizing direct arterial access where feasible.

Safety

Issue:

Unsignalized left turns along high volume roads slow the progression of through traffic and increase the potential for crashes.

Recommendation:

A. Construct raised medians along Street Road where continuous Two Way Left Turn Lanes (TWLTL) currently exist. Allow unsignalized left-turns-only at defined median openings.
B. Create jug handles for left turns at signalized intersections where appropriate.

Connectivity

Issue:

Lack of north-south connections in the highway network.

Recommendation:

Construct relief roads and connector roads where feasible, to complete the fragmented local road network and provide better north-south connectors.

5.0 PLAN IMPLEMENTATION

The *Street Road Corridor Study* can be used as a dynamic long-range tool for the systematic selection of projects to create a significantly improved transportation system within the study area. This document can serve as a *punch list* for the government agencies with a stake in the implementation of improvements. Municipal governments are key players in this process. Even though a highway may be maintained by the state or county, it is the welfare of the local residents that is affected the most. Safety and mobility benefits are felt more by those who use the highway frequently. Therefore, a local municipality should assure that the improvements are advanced expediently by being involved in the process no matter which agency has a lead role.

Characteristics

In choosing which projects should advance first, stakeholders can be guided by the information presented in **Table 2 (pages 50 - 51)** *Street Road Corridor Study Transportation Improvements Implementation Matrix.* This easy-to-use matrix suggests the relative importance to stakeholders of the various attributes of each issue location. Each improvement scenario identified is evaluated in terms of project priority, cost range and project benefits. The stakeholders necessary to carry out the plan are also identified.

Priority

Priorities are estimated in terms of three categories: high, moderate and low. Priorities are assigned based on the perception of the extent of the problems they present drivers, with safety being most important, but congestion (or time delay) and mobility also being considered. A higher degree of priority is also assigned if there is an urgency to complete the improvement due to the imminent completion of a nearby major investment (development or transportation improvement). If there is concern that a section of right-of-way needed to complete an improvement is in danger of being developed or used for another use, the priority to act on that improvement is also heightened. If a project is relatively small scale and low cost, yet offers a projected high benefit, it also receives a higher priority ranking.

Cost Range

Costs are also assigned to categories of high, moderate and low. High cost projects usually involve a major commitment from one or more funding sources, lengthy public involvement, and several years lead time in programming the required funds. They are typically large scale, complex or multiphase improvements and can entail the construction of new facilities. In general, a project in this category is estimated to cost between $5 and $35 million, however, some major projects may cost in the hundreds of millions of dollars. An improvement estimated to have a moderate cost could involve a major reconstruction of an intersection, construction of a short connector road, or a widening of an existing road. In general, a project in this category is estimated to

cost between $2 and $5 million. Low cost projects can often be fast-tracked with maintenance, or pool funding. They are often operational type improvements at isolated locations and typically cost less than $2 million. These cost ranges are generalized estimates and could be significantly increased for a specific location due to environmental, right-of-way or other factors uncovered during detailed design of the improvement.

Benefits

Benefits describe the kind of impact the improvement will yield, such as enhancing safety, lessening congestion, improving mobility or encouraging economic development. Economic development benefits are derived from a transportation improvement generally through an increase in the accessibility of affected individual properties or areas. The strategic location and magnitude of the improvement determines the extent of the benefits received by the affected properties. The increased level of access to a property may make it attractive enough to induce new commercial or residential development or entice existing land uses to expand. Increased accessibility can also have a positive effect on property values.

Roles of Agencies

In terms of a hierarchy of agencies, the Pennsylvania Department of Transportation (PennDOT) District 6-0 is primary, both in terms of maintaining Street Road as well as providing much of the design, right-of-way and construction funding for major improvements. Municipalities make land use decisions in the corridor, which ultimately affect traffic levels on Street Road. In addition, many of the cross streets are designed, built and maintained by local and county governments, and these also impact how well Street Road functions. Lastly, developers actually build the housing, commercial and industrial projects, which generate the trips that must be accommodated by a publicly owned transportation infrastructure. In addition, some of the transportation improvements themselves are designed and financed by developers.

Pennsylvania Department of Transportation

PennDOT has jurisdiction over the state highways in the corridor. Improvements to these highways are typically financed by state and/or federal funds. Occasionally, developer contributions are also a source of funding if the project has special impact by a development. The state ultimately makes the decision on what improvements are made to its facilities, but often coordinates with the county or local municipalities when the improvements include facilities under their jurisdiction.

Bucks County

The county has no direct jurisdiction over the network of roads throughout the study area. The county's role is to secure federal or state funding where eligible for improvement.

Metropolitan Planning Organization (MPO)
DVRPC, serving as the MPO for this region, is required to coordinate a comprehensive and continuing transportation planning process. This process results in the development of a Transportation Improvement Program (TIP) that identifies all priority projects for which federal funds will be sought. The TIP represents a consensus among state, county and regional officials as to what regional improvements are to be made. In addition to the TIP, the MPO is required by federal legislation to develop a long-range plan (LRP) to help direct region-wide transportation decision-making over a period of at least 20 years. Long-range plans do not specify the design of actual projects. Rather, they identify future needs to address transportation deficiencies.

Municipalities
Local governments not only have jurisdiction over their local road system, they also control local land use decisions. The decisions made at the local level can affect the traffic on roads at all levels. Therefore, local officials must understand the traffic impacts that could be generated from a particular development, and understand the synergy that exists between land use decisions and transportation needs. Local officials need to be involved in the transportation planning process for all levels of transportation improvements to make sure that the concerns of their residents are addressed, and to assist in the issue identification and improvement recommendations. Municipal officials need to make use of the circulation element of their comprehensive plans to identify important missing links in their highway network and begin to preserve space for these links to be built. The comprehensive plan is an important tool for municipalities to use in addressing their circulation needs.

Developers
As properties are developed or redeveloped, the transportation needs of the properties can change, sometimes drastically. Providing proper transportation access to a new development is often critical to the success of that development. Therefore, developers must work with the transportation providers to assure that the necessary changes are beneficial to both the development and the existing transportation infrastructure. Developers are required to design and construct improvements for traffic attributable to their developments or to provide enhanced access to their sites.

Other
Establish a multi-agency task force comprising PennDOT, Bucks County, municipal representatives, SEPTA and Bucks County TMA, to pursue the implementation of the recommended improvements identified in this study.

TABLE 2
Street Road Corridor Transportation Improvements Implementation Matrix

Location		*Priority*	*Cost Range*	*Benefits*	*Lead Role*	*Assisting Role*
1	Intersection of Hulmeville Road and Byberry Road	H	M	Mobl.	MCD	Co
2	Hulmeville Road between Byberry Road and Brookwood Drive	H	L	Safe	MCD	Co
3	Intersection of Street Road and Knights Road	H	L	Safe	DOT	MCD, Co
4	Knights Road from Street Road to Plum Avenue	H	L	Safe	MCD	Co
5	Intersection of Dunks Ferry Road and Knights Road	M	L	Safe	MCD	Co
6	Galloway Road Extension	H	H	Mobl, ED	MCD	Co, Dev
7	Intersection of Street Road and Mechanicsville Road	H	L	Safe	DOT	MCD
8	Intersection of Old Lincoln Highway and US 1	M	L	Safe, Mobl	DOT	MCD, Co
9	Intersection of Bustleton Pike and Street Road	H	H	Safe, Mobl, Cong, ED	DOT	MCD, Co, Dev
10	Street Road East of Second Street Pike	L	L	Safe, Mobl, Cong	MCD	DOT, Co
11	Intersection of Second Street Pike and County Line Road	H	M	Cong, Mobl	Co	MCD

TABLE 2
Street Road Corridor Transportation Improvements Implementation Matrix

Location		*Priority*	*Cost Range*	*Benefits*	*Lead Role*	*Assisting Role*
12	Intersection of Street Road and Davisville Road	M	L	Cong, Mobl, Safe	DOT	MCD
13	Intersection of Street Road and Louis Drive	H	L	Mobl, Safe	DOT	MCD
14	Residential Neighborhood East of York Road	M	L	Safe	MCD	Co
15	Warminster Rail Station	H	L	Cong, Mobl, Safe	MCD	Co
16	Intersection of Street Road and Mearns Road	H	L	Mobl, Safe	DOT	Co, MCD
17	Intersection of Bristol Road and Mearns Road	M	L	Cong	MCD	CO

Key:

Priority: H = High, M = Moderate, L = Low
Cost Range: H = High, M = Moderate, L = Low
Benefits: Cong = Congestion, ED = Economic Development, Mobl = Mobility, Safe = Safety
Role: MCD = municipality, Co = county, DOT = Pennsylvania Department of Transportation, Dev = Developers

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Appendix A

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OFFICE OF TRAVEL MAM INTERVAL COUNTS

COUNTY: BUCKS
MUNICIPALITY: BENSALEM

INTERSECTION: North-South Street & East-West Street
STREETS: 3RD AVE BRISTOL RD

DATE: 3/15/06
DAY: WEDNESDAY
WEATHER: FAIR

FILE NUMBER: 3AM

AM INTERVAL COUNTS

	3RD AVE									BRISTOL RD									
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:30 6:45	0	0	0	0	6	0	2	8	0	50	0	50	0	99	2	101	8	151	159
6:45 7:00	0	0	0	0	8	0	4	12	3	61	0	64	0	119	0	119	12	183	195
7:00 7:15	0	0	0	0	6	0	1	7	2	54	0	56	0	117	1	118	7	174	181
7:15 7:30	0	0	0	0	7	0	5	12	1	58	0	59	0	115	4	119	12	178	190
7:30 7:45	0	0	0	0	8	0	7	15	2	47	0	49	0	142	2	144	15	193	208
7:45 8:00	0	0	0	0	7	0	5	12	0	38	0	38	0	129	3	132	12	170	182
8:00 8:15	0	0	0	0	2	0	2	4	1	80	0	81	0	130	4	134	4	215	219
8:15 8:30	0	0	0	0	10	0	1	11	1	83	0	84	0	131	3	134	11	218	229
8:30 8:45	0	0	0	0	7	0	4	11	3	69	0	72	0	104	0	104	11	176	187
8:45 9:00	0	0	0	0	9	0	3	12	2	78	0	80	0	125	8	133	12	213	225
9:00 9:15	0	0	0	0	12	0	3	15	1	59	0	60	0	111	3	114	15	174	189
9:15 9:30	0	0	0	0	2	0	1	3	0	82	0	82	0	92	0	92	3	174	177
TOTALS	0	0	0	0	84	0	38	122	16	759	0	775	0	1414	30	1444	122	2219	2341
P.H. am																			
P.H. pm																			

HOURLY VOLUMES

	3RD AVE									BRISTOL RD									
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:00 7:00	0	0	0	0	27	0	12	39	6	223	0	229	0	450	7	457	39	686	725
7:00 8:00	0	0	0	0	27	0	15	42	4	248	0	252	0	532	12	544	42	796	838
8:00 9:00	0	0	0	0	30	0	11	41	6	288	0	294	0	432	11	443	41	737	778
TOTALS	0	0	0	0	84	0	38	122	16	759	0	775	0	1414	30	1444	122	2219	2341

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OFFICE OF TRAVEL MAM INTERVAL COUNTS

COUNTY: BUCKS
MUNICIPALITY: WARMINSTER

INTERSECTION: North-South Street & East-West Street
STREETS: MEARNS RD BRISTOL RD

DATE: 3/23/06
DAY: THURSDAY
WEATHER: FAIR

FILE NUMBER: 9AM

AM INTERVAL COUNTS

	MEARNS RD									BRISTOL RD									
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:30 6:45	4	32	13	49	7	15	8	30	11	120	18	149	8	81	12	101	79	250	329
6:45 7:00	5	25	15	45	3	13	6	22	11	115	31	157	4	120	5	129	67	286	353
7:00 7:15	5	19	10	34	11	25	3	39	13	138	26	177	24	96	3	123	73	300	373
7:15 7:30	12	26	17	55	23	25	3	51	13	158	30	201	8	115	5	128	106	329	435
7:30 7:45	8	18	12	38	14	29	6	49	15	169	44	228	10	81	3	94	87	322	409
7:45 8:00	12	39	28	79	15	30	3	48	16	167	36	219	26	115	13	154	127	373	500
8:00 8:15	29	38	18	85	17	40	7	64	11	170	42	223	21	105	12	138	149	361	510
8:15 8:30	18	55	20	93	17	30	8	55	17	179	32	228	13	143	12	168	148	396	544
8:30 8:45	18	34	19	71	14	43	10	67	20	143	42	205	17	159	16	192	138	397	535
8:45 9:00	18	31	24	73	12	33	4	49	21	127	35	183	23	140	5	168	122	351	473
9:00 9:15	14	24	15	53	11	28	7	46	13	85	16	114	5	96	8	109	99	223	322
9:15 9:30	35	41	11	87	9	27	10	46	13	95	26	134	8	88	7	103	133	237	370
TOTALS	178	382	202	762	153	338	75	566	174	1666	378	2218	167	1339	101	1607	1328	3825	5153
P.H. am																			
P.H. pm																			

HOURLY VOLUMES

	MEARNS RD									BRISTOL RD									
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:00 7:00	26	102	55	183	44	78	20	142	48	531	105	684	44	412	25	481	325	1165	1490
7:00 8:00	67	150	78	295	63	129	24	216	59	685	154	898	70	444	40	554	511	1452	1963
8:00 9:00	85	130	69	284	46	131	31	208	67	450	119	636	53	483	36	572	492	1208	1700
TOTALS	178	382	202	762	153	338	75	566	174	1666	378	2218	167	1339	101	1607	1328	3825	5153

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OFFICE OF TRAVEL MAM INTERVAL COUNTS

COUNTY: BUCKS
MUNICIPALITY: BENSALEM

INTERSECTION: North-South Street & East-West Street
STREETS: RICHLIEU RD BRISTOL RD

DATE: 3/15/06
DAY: WEDNESDAY
WEATHER: FAIR

FILE NUMBER: 2AM

AM INTERVAL COUNTS

	RICHLIEU RD									BRISTOL RD									
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:30 6:45	1	0	3	4	0	0	0	0	0	28	11	39	35	151	0	186	4	225	229
6:45 7:00	2	0	18	20	0	0	0	0	0	59	11	70	56	161	0	217	20	287	307
7:00 7:15	3	0	12	15	0	0	0	0	0	52	7	59	86	167	0	253	15	312	327
7:15 7:30	1	0	16	17	0	0	0	0	0	35	6	41	59	157	0	216	17	257	274
7:30 7:45	4	0	25	29	0	0	0	0	0	30	7	37	50	148	0	198	29	235	264
7:45 8:00	3	0	15	18	0	0	0	0	0	47	14	61	68	132	0	200	18	261	279
8:00 8:15	3	0	20	23	0	0	0	0	0	67	9	76	71	132	0	203	23	279	302
8:15 8:30	1	0	16	17	0	0	0	0	0	44	11	55	48	114	0	162	17	217	234
8:30 8:45	4	0	23	27	0	0	0	0	0	58	10	68	61	151	0	212	27	280	307
8:45 9:00	7	0	17	24	0	0	0	0	0	55	14	69	64	142	0	206	24	275	299
9:00 9:15	1	0	22	23	0	0	0	0	0	35	12	47	30	67	0	97	23	144	167
9:15 9:30	4	0	24	28	0	0	0	0	0	83	5	88	27	109	0	136	28	224	252
TOTALS	34	0	211	245	0	0	0	0	0	593	117	710	655	1631	0	2286	245	2996	3241
P.H. am																			
P.H. pm																			

HOURLY VOLUMES

	RICHLIEU RD									BRISTOL RD									
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:00 7:00	7	0	49	56	0	0	0	0	0	174	35	209	236	636	0	872	56	1081	1137
7:00 8:00	11	0	76	87	0	0	0	0	0	188	41	229	237	526	0	763	87	992	1079
8:00 9:00	16	0	86	102	0	0	0	0	0	231	41	272	182	469	0	651	102	923	1025
TOTALS	34	0	211	245	0	0	0	0	0	593	117	710	655	1631	0	2286	245	2996	3241

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OFFICE OF TRAVEL M AM INTERVAL COUNTS

COUNTY: BUCKS
MUNICIPALITY: UPPER SOUTHAMPTON

INTERSECTION: North-South Street & East-West Street
STREETS: SECOND STREET PIKE COUNTY LINE RD

DATE: 3/15/06
DAY: WEDNESDAY
WEATHER: FAIR

FILE NUMBER: 5PM

PM INTERVAL COUNTS

	SECOND STREET PIKE									COUNTY LINE RD									
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
3:00 3:15	40	148	3	191	43	89	14	146	23	118	25	166	9	111	41	161	337	327	664
3:15 3:30	42	136	8	186	51	108	12	171	25	106	36	167	3	98	44	145	357	312	669
3:30 3:45	40	127	10	177	61	124	14	199	11	144	34	189	3	104	40	147	376	336	712
3:45 4:00	43	171	5	219	50	119	25	194	14	145	27	186	6	124	48	178	413	364	777
4:00 4:15	41	127	4	172	68	136	15	219	15	160	33	208	7	131	52	190	391	398	789
4:15 4:30	38	162	7	207	45	127	13	185	13	157	34	204	6	119	42	167	392	371	763
4:30 4:45	41	143	7	191	53	128	12	193	15	148	25	188	8	117	41	166	384	354	738
4:45 5:00	30	163	8	201	51	128	18	0	16	153	30	199	4	119	49	172	201	371	572
5:00 5:15	39	158	5	202	71	155	41	267	12	149	35	196	1	117	37	155	469	351	820
5:15 5:30	31	173	4	208	75	144	15	234	16	172	36	224	6	153	38	197	442	421	863
5:30 5:45	42	160	9	211	50	145	12	207	14	155	24	193	4	103	49	156	418	349	767
5:45 6:00	30	150	5	185	52	113	14	179	13	136	40	189	7	101	24	132	364	321	685
TOTALS	457	1818	75	2350	670	1516	205	2194	187	1743	379	2309	64	1397	505	1966	4544	4275	8819
P.H. am																			
P.H. pm																			

HOURLY VOLUMES

	SECOND STREET PIKE									COUNTY LINE RD									
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
4:00 5:00	165	582	26	773	205	440	65	710	73	513	122	708	21	437	173	631	1483	1339	2822
5:00 6:00	150	595	26	771	217	519	58	597	59	618	122	799	25	486	184	695	1368	1494	2862
6:00 7:00	142	641	23	806	248	557	82	887	55	612	135	802	18	474	148	640	1693	1442	3135
TOTALS	457	1818	75	2350	670	1516	205	2194	187	1743	379	2309	64	1397	505	1966	4544	4275	8819

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OFFICE OF TRAVEL MAM INTERVAL COUNTS

COUNTY: BUCKS
MUNICIPALITY: BENSALEM

INTERSECTION: North-South Street & East-West Street
STREETS: HULMEVILLE RD BYBERRY RD

DATE: 3/14/06
DAY: TUESDAY
WEATHER: FAIR

FILE NUMBER: 4AM

AM INTERVAL COUNTS

	HULMEVILLE RD												BYBERRY RD						
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:30 6:45	17	181	33	231	93	158	10	261	4	87	6	97	17	102	53	172	492	269	761
6:45 7:00	12	184	30	226	126	198	7	331	16	97	8	121	39	107	56	202	557	323	880
7:00 7:15	15	163	23	201	91	214	21	326	11	82	12	105	27	107	42	176	527	281	808
7:15 7:30	26	180	17	223	81	219	19	319	12	73	11	96	42	108	58	208	542	304	846
7:30 7:45	22	217	26	265	56	252	29	337	22	42	11	75	28	114	67	209	602	284	886
7:45 8:00	23	218	31	272	67	268	24	359	25	88	11	124	45	120	59	224	631	348	979
8:00 8:15	22	250	25	297	77	278	31	386	18	75	13	106	45	106	64	215	683	321	1004
8:15 8:30	21	202	23	246	56	186	12	254	21	65	4	90	23	110	38	171	500	261	761
8:30 8:45	19	256	19	294	98	238	25	361	7	88	9	104	43	101	57	201	655	305	960
8:45 9:00	19	262	23	304	90	261	20	371	21	87	10	118	28	100	61	189	675	307	982
9:00 9:15	23	207	40	270	110	213	19	342	15	96	9	120	39	125	55	219	612	339	951
9:15 9:30	21	215	34	270	88	182	9	279	9	83	10	102	31	109	56	196	549	298	847
TOTALS	240	2535	324	3099	1033	2667	226	3926	181	963	114	1258	407	1309	666	2382	7025	3640	10665
P.H. am																			
P.H. pm																			

HOURLY VOLUMES

	HULMEVILLE RD												BYBERRY RD						
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:00 7:00	70	708	103	881	391	789	57	1237	43	339	37	419	125	424	209	758	2118	1177	3295
7:00 8:00	88	887	105	1080	256	984	96	1336	86	270	39	395	141	450	228	819	2416	1214	3630
8:00 9:00	82	940	116	1138	386	894	73	1353	52	354	38	444	141	435	229	805	2491	1249	3740
TOTALS	240	2535	324	3099	1033	2667	226	3926	181	963	114	1258	407	1309	666	2382	7025	3640	10665

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OFFICE OF TRAVEL MAM INTERVAL COUNTS

COUNTY: BUCKS
MUNICIPALITY: BENSALEM

INTERSECTION: North-South Street & East-West Street
STREETS: OLD LINCOLN HWY STREET RD

DATE: 3/14/06
DAY: TUESDAY
WEATHER: FAIR

FILE NUMBER: 1AM

AM INTERVAL COUNTS

	OLD LINCOLN HWY												STREET RD						
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:30 6:45	46	24	2	72	10	35	72	117	79	151	87	317	14	253	17	284	189	601	790
6:45 7:00	77	72	11	160	9	38	87	134	90	230	126	446	14	291	34	339	294	785	1079
7:00 7:15	66	29	7	102	15	53	98	166	73	240	109	422	35	244	19	298	268	720	988
7:15 7:30	89	26	7	122	10	48	121	179	99	288	132	519	42	378	24	444	301	963	1264
7:30 7:45	77	19	1	97	15	51	135	201	78	280	134	492	19	233	15	267	298	759	1057
7:45 8:00	93	56	7	156	12	52	141	205	95	253	134	482	16	257	17	290	361	772	1133
8:00 8:15	100	50	2	152	11	78	157	246	96	257	120	473	20	246	10	276	398	749	1147
8:15 8:30	106	65	9	180	24	68	147	239	90	268	90	448	36	267	16	319	419	767	1186
8:30 8:45	98	37	11	146	14	48	132	194	90	250	117	457	30	258	22	310	340	767	1107
8:45 9:00	102	32	7	141	17	49	138	204	89	247	118	454	12	269	14	295	345	749	1094
9:00 9:15	143	37	3	183	20	40	115	175	85	187	103	375	17	335	29	381	358	756	1114
9:15 9:30	86	31	3	120	17	34	95	146	66	193	104	363	7	347	20	374	266	737	1003
TOTALS	1083	478	70	1631	174	594	1438	2206	1030	2844	1374	5248	262	3378	237	3877	3837	9125	12962
P.H. am																			
P.H. pm																			

HOURLY VOLUMES

	OLD LINCOLN HWY												STREET RD						
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:00 7:00	278	151	27	456	44	174	378	596	341	909	454	1704	105	1166	94	1365	1052	3069	4121
7:00 8:00	376	190	19	585	62	249	580	891	359	1058	478	1895	91	1003	58	1152	1476	3047	4523
8:00 9:00	429	137	24	590	68	171	480	719	330	877	442	1649	66	1209	85	1360	1309	3009	4318
TOTALS	1083	478	70	1631	174	594	1438	2206	1030	2844	1374	5248	262	3378	237	3877	3837	9125	12962

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OFFICE OF TRAVEL MAM INTERVAL COUNTS

COUNTY: BUCKS
MUNICIPALITY: WARMINSTER

INTERSECTION: North-South Street & East-West Street
STREETS: DAVISVILLE RD PA 132 STREET RD

DATE: 3/21/06
DAY: TUESDAY
WEATHER: FAIR

FILE NUMBER: 6AM

AM INTERVAL COUNTS

	DAVISVILLE RD									PA 132 STREET RD									
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:30 6:45	11	30	21	62	13	50	17	80	2	147	15	164	40	259	5	304	142	468	610
6:45 7:00	19	31	25	75	13	68	31	112	7	168	16	191	29	229	5	263	187	454	641
7:00 7:15	21	36	17	74	16	67	34	117	9	183	16	208	27	216	2	245	191	453	644
7:15 7:30	19	58	12	89	23	86	24	133	6	229	23	258	36	185	3	224	222	482	704
7:30 7:45	29	31	26	86	22	95	19	136	13	205	19	237	28	152	5	185	222	422	644
7:45 8:00	10	44	18	72	25	92	23	140	7	256	24	287	50	234	6	290	212	577	789
8:00 8:15	25	51	27	103	19	83	27	129	9	203	20	232	65	279	9	353	232	585	817
8:15 8:30	17	37	33	87	16	48	21	85	5	161	15	181	56	334	9	399	172	580	752
8:30 8:45	13	28	21	62	11	64	14	89	4	193	16	213	44	266	3	313	151	526	677
8:45 9:00	19	52	22	93	26	57	26	109	14	207	18	239	33	222	2	257	202	496	698
9:00 9:15	24	67	49	140	23	37	16	76	17	220	17	254	60	308	2	370	216	624	840
9:15 9:30	15	33	28	76	29	44	19	92	7	140	11	158	46	193	9	248	168	406	574
TOTALS	222	498	299	1019	236	791	271	1298	100	2312	210	2622	514	2877	60	3451	2317	6073	8390
P.H. am																			
P.H. pm																			

HOURLY VOLUMES

	DAVISVILLE RD									PA 132 STREET RD									
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:00 7:00	70	155	75	300	65	271	106	442	24	727	70	821	132	889	15	1036	742	1857	2599
7:00 8:00	81	163	104	348	82	318	90	490	34	825	78	937	199	999	29	1227	838	2164	3002
8:00 9:00	71	180	120	371	89	202	75	366	42	760	62	864	183	989	16	1188	737	2052	2789
TOTALS	222	498	299	1019	236	791	271	1298	100	2312	210	2622	514	2877	60	3451	2317	6073	8390

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OFFICE OF TRAVEL MAM INTERVAL COUNTS

COUNTY: BUCKS
MUNICIPALITY: SOUTHAMPTON

INTERSECTION: North-South Street & East-West Street
STREETS: MAPLE AVE STREET RD

DATE: DATE
DAY: DAY
WEATHER: FAIR

FILE NUMBER: 10AM

AM INTERVAL COUNTS

	MAPLE AVE												STREET RD						
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:30 6:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
P.H. am																			
P.H. pm																			

HOURLY VOLUMES

	MAPLE AVE												STREET RD						
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:00 7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OFFICE OF TRAVEL MAM INTERVAL COUNTS

COUNTY: BUCKS
MUNICIPALITY: WARMINSTER

INTERSECTION: North-South Street & East-West Street
STREETS: MEARNS RD PA 132 STREET RD

DATE: 3/21/06
DAY: TUESDAY
WEATHER: FAIR

FILE NUMBER: 8AM

AM INTERVAL COUNTS

	MEARNS RD									PA 132 STREET RD								
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:30 6:45	0	0	0	0	56	0	29	85	51	227	0	278	0	190	39	229	85	507	592
6:45 7:00	0	0	0	0	57	0	37	94	71	227	0	298	0	224	26	250	94	548	642
7:00 7:15	0	0	0	0	86	0	40	126	54	326	0	380	0	222	23	245	126	625	751
7:15 7:30	0	0	0	0	64	0	51	115	74	275	0	349	0	304	21	325	115	674	789
7:30 7:45	0	0	0	0	101	0	71	172	63	326	0	389	0	275	26	301	172	690	862
7:45 8:00	0	0	0	0	47	0	45	92	68	260	0	328	0	242	37	279	92	607	699
8:00 8:15	0	0	0	0	66	0	50	116	58	308	0	366	0	255	28	283	116	649	765
8:15 8:30	0	0	0	0	73	0	55	128	69	291	0	360	0	227	28	255	128	615	743
8:30 8:45	0	0	0	0	48	0	63	111	55	309	0	364	0	233	36	269	111	633	744
8:45 9:00	0	0	0	0	53	0	48	101	46	272	0	318	0	261	24	285	101	603	704
9:00 9:15	0	0	0	0	41	0	57	98	49	224	0	273	0	213	25	238	98	511	609
9:15 9:30	0	0	0	0	35	0	43	78	34	200	0	234	0	194	16	210	78	444	522
TOTALS	0	0	0	0	727	0	589	1316	692	3245	0	3937	0	2840	329	3169	1316	7106	8422
P.H. am																			
P.H. pm																			

HOURLY VOLUMES

	MEARNS RD									PA 132 STREET RD								
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:00 7:00	0	0	0	0	263	0	157	420	250	1055	0	1305	0	940	109	1049	420	2354	2774
7:00 8:00	0	0	0	0	287	0	221	508	258	1185	0	1443	0	999	119	1118	508	2561	3069
8:00 9:00	0	0	0	0	177	0	211	388	184	1005	0	1189	0	901	101	1002	388	2191	2579
TOTALS	0	0	0	0	727	0	589	1316	692	3245	0	3937	0	2840	329	3169	1316	7106	8422

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OFFICE OF TRAVEL MAM INTERVAL COUNTS

COUNTY: BUCKS
MUNICIPALITY: WARMINSTER

INTERSECTION: North-South Street & East-West Street
STREETS: SECOND STREET PIKE PA 132 STREET RD

DATE: 3/22/06
DAY: WEDNESDAY
WEATHER: FAIR

FILE NUMBER: 7AM

AM INTERVAL COUNTS

	SECOND STREET PIKE									PA 132 STREET RD									
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:30 6:45	35	40	8	83	19	47	0	66	2	114	19	135	12	143	0	155	149	290	439
6:45 7:00	56	124	3	183	48	80	3	131	2	160	37	199	14	340	13	367	314	566	880
7:00 7:15	62	62	2	126	39	88	2	129	2	191	27	220	31	320	14	365	255	585	840
7:15 7:30	37	37	2	76	51	122	0	173	4	204	36	244	18	270	13	301	249	545	794
7:30 7:45	49	49	3	101	48	88	6	142	11	194	32	237	14	308	17	339	243	576	819
7:45 8:00	88	88	1	177	42	94	6	142	18	219	51	288	68	454	11	533	319	821	1140
8:00 8:15	37	37	7	81	40	102	4	146	15	193	55	263	35	294	12	341	227	604	831
8:15 8:30	56	56	1	113	44	96	6	146	18	178	45	241	32	341	6	379	259	620	879
8:30 8:45	49	41	16	106	27	86	3	116	12	188	34	234	30	395	3	428	222	662	884
8:45 9:00	28	28	9	65	34	94	6	134	15	224	38	277	40	390	3	433	199	710	909
9:00 9:15	46	46	11	103	41	91	8	140	9	164	52	225	20	228	9	257	243	482	725
9:15 9:30	35	35	6	76	29	68	2	99	7	135	28	170	20	221	3	244	175	414	589
TOTALS	578	643	69	1290	462	1056	46	1564	115	2164	454	2733	334	3704	104	4142	2854	6875	9729
P.H. am																			
P.H. pm																			

HOURLY VOLUMES

	SECOND STREET PIKE									PA 132 STREET RD									
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:00 7:00	190	263	15	468	157	337	5	499	10	669	119	798	75	1073	40	1188	967	1986	2953
7:00 8:00	230	230	12	472	174	380	22	576	62	784	183	1029	149	1397	46	1592	1048	2621	3669
8:00 9:00	158	150	42	350	131	339	19	489	43	711	152	906	110	1234	18	1362	839	2268	3107
TOTALS	578	643	69	1290	462	1056	46	1564	115	2164	454	2733	334	3704	104	4142	2854	6875	9729

Appendix B

AM Peak

Intersection		Lane Group	Existing Intersection Configuration			Short-Term Improvement			Long-Term Improvement		
			Current Signal Timing			Optimized Signals (1)			Intersection Reconfiguration (2)		
			v/c	Delay (s)	LOS	v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
Hulmeville Rd and Byberry Rd, Bensalem	Hulmeville Rd	NB-L	0.48	47.9	D	0.68	36.9	D	0.68	37.5	D
		NB-T (3)	1.49	255.6	F	1.40	211.5	F	1.27	160.4	F
		NB-R							0.14	17.1	B
		SB-L	2.02	524.4	F	1.43	259.1	F	1.28	192.9	F
		SB-T	1.22	138.4	F	0.98	44.6	D	1.00	49.8	D
		SB-R	0.11	15.9	B	0.08	10.1	B	0.09	10.5	B
		EB-L	0.38	45.1	D	0.62	57.6	E	0.62	43.1	D
		EB-T	1.00	86.3	F	1.03	95.1	F	1.03	95.1	F
		EB-R	0.03	31.7	C	0.03	32.2	C	0.03	32.2	C
		WB-L	0.63	30.2	C	1.19	175.1	F	1.07	126.7	F
		WB-T	1.15	129.0	F	1.32	199.4	F	1.26	173.6	F
		WB-R	0.36	32.5	C	0.40	35.2	D	0.39	34.3	C
		All	1.61	186.9	F	1.32	139.6	F	1.27	109.3	F
Street Rd and Old Lincoln Hwy, Bensalem	Street Road	EB-L	0.91	67.3	E						
		EB-T	0.81	34.3	C						
		EB-R	0.87	46.2	D						
		WB-L	0.74	37.8	D						
		WB-T	1.54	289.6	F						
		WB-R	0.15	30.8	C						
		NB-L	1.42	242.7	F						
		NB-TR	0.32	23.8	C						
		SB-LT	0.76	46.3	D						
		SB-R	0.41	0.8	A						
		All	1.32	119.3	F						
County Line Rd & Second Street Pike / Huntingdon Pike, Upper Southampton / Lower Moreland	2nd St Pike	NB-L	1.03	123.8	F	1.11	166.2	F			
		NB-T	1.26	174.0	F	1.14	130.6	F			
		NB-R	0.03	28.6	C	0.03	33.7	C			
		SB-L	0.87	81.2	F	1.14	181.0	F			
		SB-TR	1.05	92.1	F	1.00	89.7	F			
		EB-L	0.50	53.7	D	1.24	271.3	F			
		EB-TR	1.07	92.0	F	0.92	56.8	E			
		WB-L	0.23	53.3	D	0.35	35.5	D			
		WB-TR	1.42	237.7	F	1.18	137.8	F			
		All	1.22	146.0	F	1.17	115.7	F			
Street Rd & Maple Ave, Upper Southampton / Warminster (4)	Street Rd	EB-L	0.38	17.1	B	0.37	9.4	A			
		EB-TR	0.47	3.4	A	0.43	2.8	A			
		WB-TR	0.67	25.3	C	0.53	14.6	B			
		SW-LR	0.37	32.3	C	0.51	38.0	D			
		All	0.54	16.4	B	0.51	12.1	B			
Street Rd & Davisville Rd, Upper Southampton / Warminster (4)	Street Road	EB-L	0.46	53.6	D	0.78	106.6	F			
		EB-TR	0.59	15.7	B	0.51	9.7	A			
		WB-L	1.47	251.5	F	1.11	103.6	F			
		WB-TR	0.87	18.8	B	0.72	11.2	B			
		NB-L	0.61	35.4	D	0.67	60.0	E			
		NB-TR	0.60	35.9	D	0.84	55.1	E			
		SB-L	0.44	28.2	C	0.67	44.0	D			
		SB-TR	0.88	52.5	D	1.24	170.6	F			
		All	1.15	40.4	D	1.06	43.9	D			
Street Rd and Mearns Rd, Warminster	Street Rd	EB-L	0.87	49.7	D	0.92	47.5	D			
		EB-T	0.56	8.4	A	0.63	8.8	A			
		WB-TR	0.80	24.7	C	0.91	26.3	C			
		SB-L	1.06	102.1	F	0.95	54.5	D			
		SB-R	0.21	32.2	C	0.33	20.6	C			
		All	0.90	30.1	C	0.91	24.5	C			
Bristol Rd and Mearns Rd, Warminster / Warwick	Bristol Rd	EB-LT	0.86	20.2	C	0.81	19.1	B			
		EB-R	0.12	5.4	A	0.12	6.4	A			
		WB-LTR	1.21	119.4	F	1.12	89.3	F			
		NB-LT	0.95	55.3	E	1.00	82.0	F			
		NB-R	0.07	16.5	B	0.07	24.7	C			
		SB-LTR	0.96	63.1	E	1.06	107.0	F			
		All	1.13	60.5	E	1.11	59.4	E			

Notes:
(1) Optimized signal timings are detailed separately
(2) Intersections reconfigurations are detailed separately; shaded areas were not analyzed
(3) Existing lane group is TR
(4) Intersections operate on single controller. See arterial LOS for more information

AM Peak	Existing Intersection Configuration						Intersection Reconfiguration		
	Current Signal Timing			Optimized Signals					
	Type (2)	Cycle (3)	Offset	Type (2)	Cycle (3)	Offset	Type (2)	Cycle (3)	Offset
Hulmeville Rd and Byberry Rd	AC	100	0	(5)			(5)		
Street Rd and Old Lincoln Hwy	AC	110	48						
County Line Rd & Second Street Pike / Huntingdon Pike	SA	117	N/A	SA	150	N/A			
Street Rd & Maple Ave / Davisville Rd (4)	SA	110	N/A	SA	100	N/A			
Street Rd and Mearns Rd	SA	100	N/A	SA	65	N/A			
Bristol Rd and Mearns Rd	SA	60	N/A	SA	90	N/A			

Notes:
(1) Timings are for cycles without pedestrian actuation
(2) AC = Actuated-Coordinated Controller, SA = Semi-Actuated Controller
(3) Cycle length in seconds
(4) Single controller operates both intersections
(5) Intersection part of coordinated system, but only this intersection analyzed; optimized cycle lengths and offsets were not evaluated

PM Peak

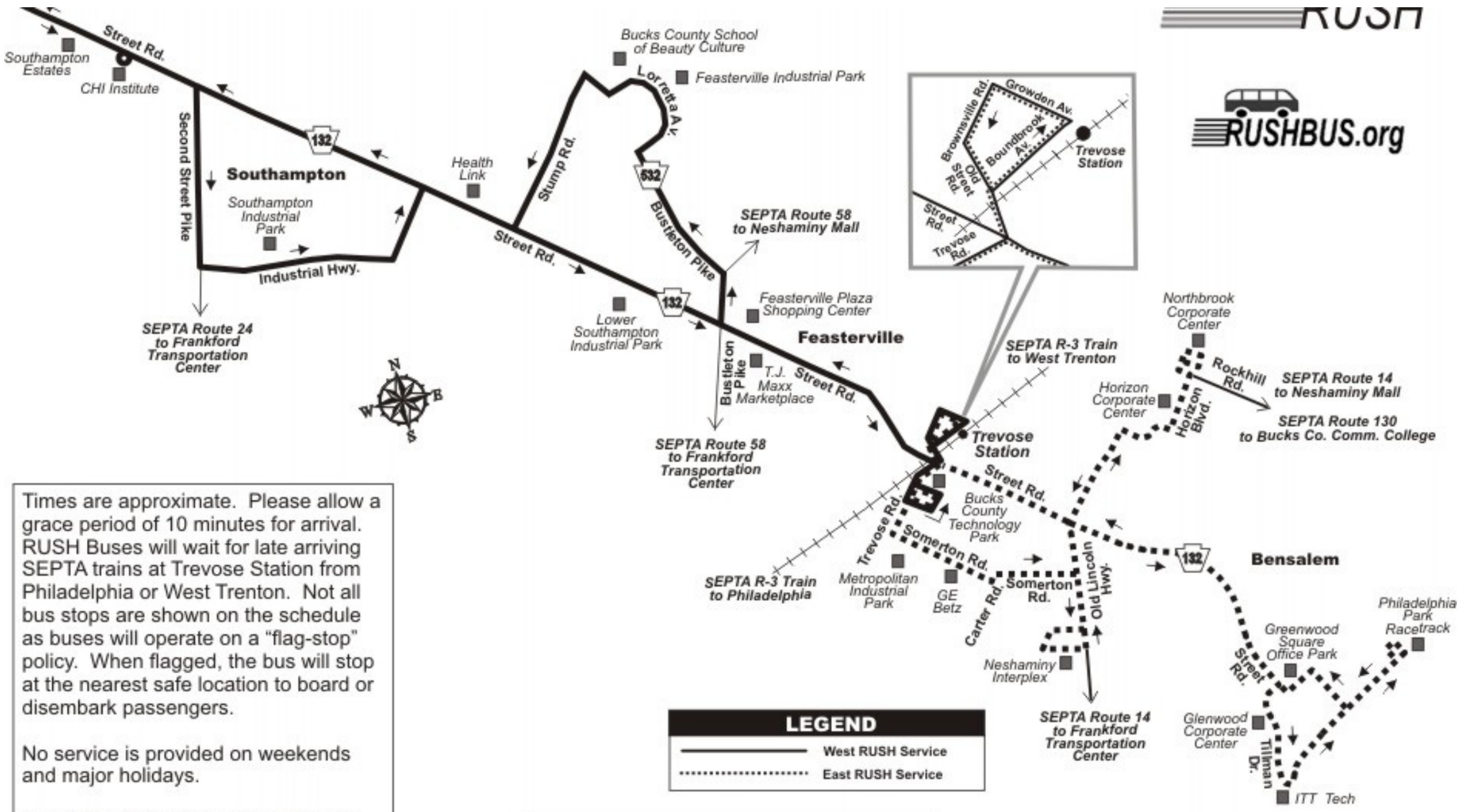
Intersection		Lane Group	Existing Intersection Configuration			Short-Term Improvement			Long-Term Improvement		
			Current Signal Timing			Optimized Signals (1)			Intersection Reconfiguration (2)		
			v/c	Delay (s)	LOS	v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
Hulmeville Rd and Byberry Rd, Bensalem	Hulmeville Rd	NB-L	0.71	68.8	E	1.06	158.4	F	1.06	158.4	F
		NB-T (3)	1.78	390.9	F	1.43	230.5	F	1.33	186.1	F
		NB-R							0.11	16.2	B
		SB-L	2.55	772.8	F	1.47	282.4	F	1.40	252.5	F
		SB-T	1.68	345.8	F	1.12	87.8	F	1.13	94.6	F
		SB-R	0.16	22.4	C	0.11	9.3	A	0.11	9.7	A
		EB-L	0.37	30.4	C	0.66	71.5	E	0.66	71.5	E
		EB-T	0.65	42.0	D	1.08	127.4	F	1.08	127.4	F
		EB-R	0.04	32.8	C	0.04	42.9	D	0.04	42.9	D
		WB-L	0.48	25.4	C	1.13	157.7	F	1.02	120.7	F
		WB-T	0.83	47.9	D	1.47	276.1	F	1.40	247.0	F
		WB-R	0.26	31.3	C	0.43	45.3	D	0.41	44.3	D
		All	1.77	298.8	F	1.46	169.5	F	1.39	146.8	F
Street Rd and Old Lincoln Hwy, Bensalem	Street Road	EB-L	1.12	124.6	F						
		EB-T	0.69	23.8	C						
		EB-R	0.48	20.8	C						
		WB-L	1.00	125.2	F						
		WB-T	1.49	258.9	F						
		WB-R	0.50	31.2	C						
		NB-L	1.89	443.7	F						
		NB-TR	1.15	123.7	F						
		SB-LT	1.15	123.7	F						
		SB-R	0.42	0.9	A						
		All	2.25	256.7	F						
County Line Rd & Second Street Pike / Huntingdon Pike, Upper Southampton / Lower Moreland	2nd St Pike	NB-L	0.83	53.5	D	1.15	189.3	F			
		NB-T	1.30	162.0	F	1.20	155.4	F			
		NB-R	0.04	28.3	C	0.04	34.5	C			
		SB-L	1.43	184.5	F	1.24	204.6	F			
		SB-TR	1.42	73.7	E	1.14	125.6	F			
		EB-L	0.47	190.1	F	1.16	245.9	F			
		EB-TR	1.25	28.6	C	1.18	142.8	F			
		WB-L	0.19	268.1	F	0.33	76.9	E			
		WB-TR	1.30	241.9	F	1.19	144.2	F			
		All	1.19	189.5	F	1.17	149.2	F			
Street Rd & Maple Ave, Upper Southampton (4)	Street Rd	EB-L	0.64	27.5	C	0.62	14.8	B			
		EB-TR	0.61	6.0	A	0.53	5.1	A			
		WB-TR	0.75	31.4	C	0.53	16.7	B			
		SW-LR	0.30	29.9	C	0.44	42.2	D			
		All	0.57	19.1	B	0.57	13.2	B			
Street Rd & Davisville Rd, Upper Southampton / Warminster (4)	Street Road	EB-L	1.09	159.9	F	1.58	366.9	F			
		EB-TR	0.70	21.3	C	0.57	12.4	B			
		WB-L	2.31	624.7	F	1.39	218.4	F			
		WB-TR	0.84	16.0	B	0.62	10.0	A			
		NB-L	0.46	25.6	C	0.93	93.0	F			
		NB-TR	1.20	145.4	F	1.74	388.8	F			
		SB-L	0.39	50.8	D	0.51	59.7	E			
		SB-TR	0.53	32.9	C	0.76	52.6	D			
		All	1.66	88.8	F	1.46	112.9	F			
Street Rd and Mearns Rd, Warminster	Street Rd	EB-L	1.19	155.6	F	1.13	145.6	F			
		EB-T	0.54	7.8	A	0.48	5.8	A			
		WB-TR	1.25	140.6	F	1.10	83.6	F			
		SB-L	0.85	53.8	D	1.15	160.6	F			
		SB-R	0.81	50.9	D	0.98	112.2	F			
		All	1.09	90.6	F	1.12	76.0	E			
Bristol Rd and Mearns Rd, Warminster/Warwick	Bristol Rd	EB-LT	0.64	11.0	B	0.61	11.2	B			
		EB-R	0.04	5.0	A	0.04	5.5	A			
		WB-LTR	1.09	69.1	E	1.05	58.7	E			
		NB-LT	0.77	30.9	C	0.79	37.6	D			
		NB-R	0.05	16.4	B	0.05	20.5	C			
		SB-LTR	0.92	49.7	D	0.97	68.3	E			
		All	1.04	43.0	D	1.03	42.3	D			

Notes:
(1) Optimized signal timings for each intersection are detailed separately
(2) Intersections reconfigurations are detailed separately; shaded areas were not analyzed
(3) Existing lane group is TR
(4) Intersections operate on single controller; see arterial LOS for more information

PM Peak	Existing Intersection Configuration						Intersection Reconfiguration		
	Current Signal Timing			Optimized Signals					
	Type (2)	Cycle (3)	Offset	Type (2)	Cycle (3)	Offset	Type (2)	Cycle (3)	Offset
Hulmeville Rd and Byberry Rd	AC	120	0	(5)			(5)		
Street Rd and Old Lincoln Hwy	AC	110	10						
County Line Rd & Second Street Pike / Huntingdon Pike	SA	117	N/A	SA	150	N/A			
Street Rd & Maple Ave / Davisville Rd (4)	SA	110	N/A	SA	120	N/A			
Street Rd and Mearns Rd	SA	100	N/A	SA	140	N/A			
Bristol Rd and Mearns Rd	SA	60	N/A	SA	75	N/A			

Notes:
(1) Timings are for cycles without pedestrian actuation
(2) AC = Actuated-Coordinated Controller, SA = Semi-Actuated Controller
(3) Cycle length in seconds
(4) Single controller operates both intersections
(5) Intersection part of coordinated system, but only this intersection analyzed; optimized cycle lengths and offsets were not evaluated

Appendix C



Times are approximate. Please allow a grace period of 10 minutes for arrival. RUSH Buses will wait for late arriving SEPTA trains at Trevose Station from Philadelphia or West Trenton. Not all bus stops are shown on the schedule as buses will operate on a "flag-stop" policy. When flagged, the bus will stop at the nearest safe location to board or disembark passengers.

No service is provided on weekends and major holidays.

For further information regarding the Street Road RUSH please call the Bucks County Transportation Management Association (BCTMA) at 1-866-TMA-RIDE [1-866-862-7433] or check our website at www.rushbus.org

Street Road RUSH Fares

Base Fare – $1.00, Bucks County TMA Token, or SEPTA TransPass/TrailPass

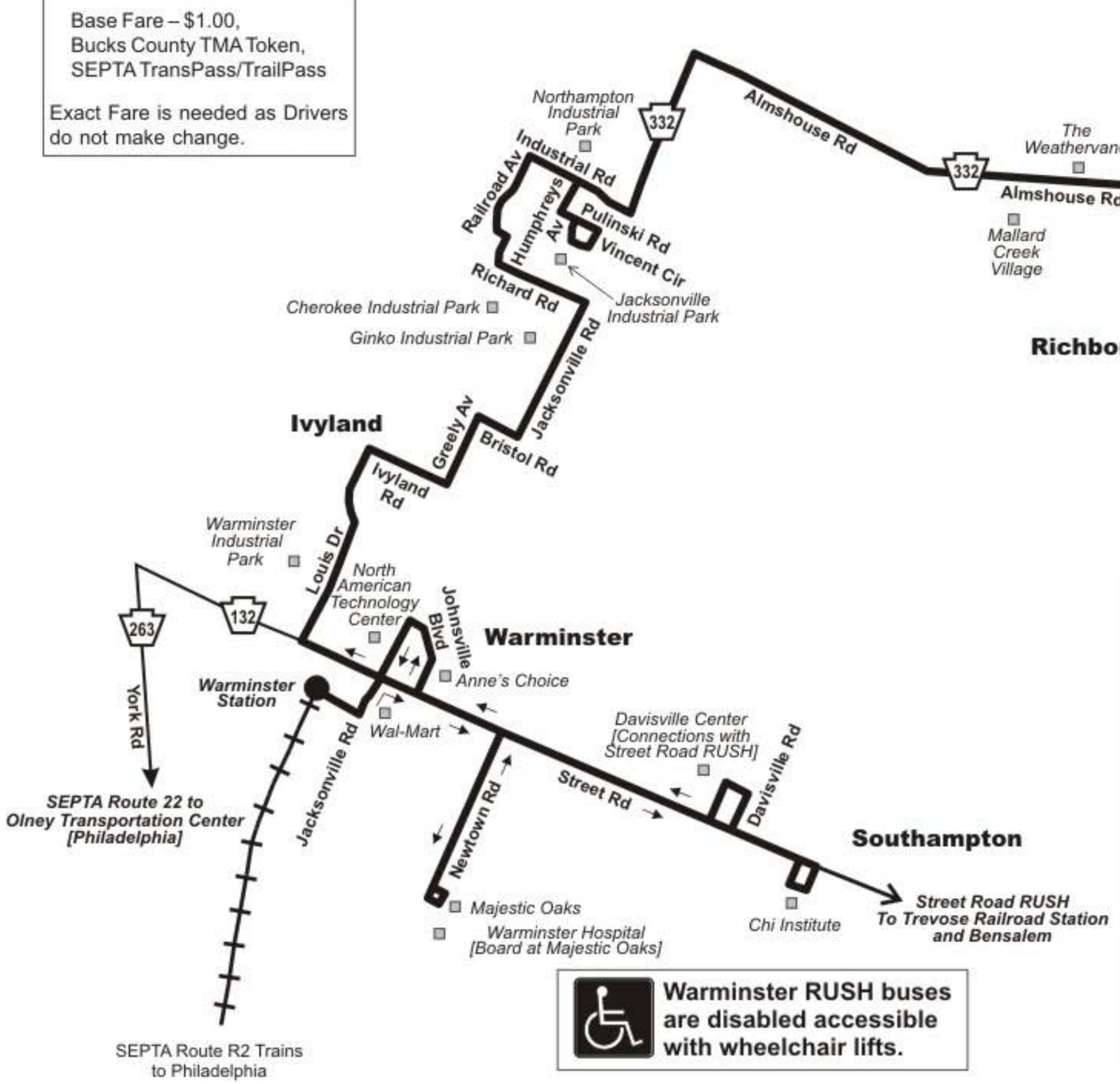
Exact Fare is needed as Drivers do not make change.

Street Road RUSH buses are disabled accessible with wheelchair lifts.

Warminster RUSH Fares

Base Fare – $1.00,
Bucks County TMA Token,
SEPTA TransPass/TrailPass

Exact Fare is needed as Drivers do not make change.



WARMINSTER RUSH

Times are approximate. Please allow a grace period of 10 minutes for arrival. RUSH Buses will wait for late arriving SEPTA trains at Warminster Station from Philadelphia. Not all bus stops are shown on the schedule as buses will operate on a "flag-stop" policy. When flagged, the bus will stop at the nearest safe location to board or disembark passengers.

No service is provided on weekends and major holidays.

For further information regarding the Warminster RUSH please call the Bucks County Transportation Management Association (BCTMA) at 1-866-TMA-RIDE
[1-866-862-7433] or check our website at www.rushbus.org

Warminster RUSH buses are disabled accessible with wheelchair lifts.

Title of Report: *Street Road Corridor Study*

Publication No.: 07012

Date Published: June 2007

Geographic Area Covered:
The study area includes portions of the Bucks County municipalities of Bensalem Township, Lower Southampton Township, Upper Southampton Township, Warminster Township and Warrington Township.

Key Words:
traffic counts, intersection analysis, level of service, pedestrian facilities, crash analysis, linkages

ABSTRACT: *This study was developed using a consensus-based approach with input from the corridor communities as well as state, county and regional agencies in the identification of transportation problems. Detailed field views and technical analyses were conducted to identify and quantify the transportation problem areas and document practical solutions. A detailed write-up of the existing conditions, identified problems and potential improvement scenarios is presented. Crash clusters were identified and analyzed, bicycle and pedestrian improvements recommended, and land-use policy improvements suggested.*

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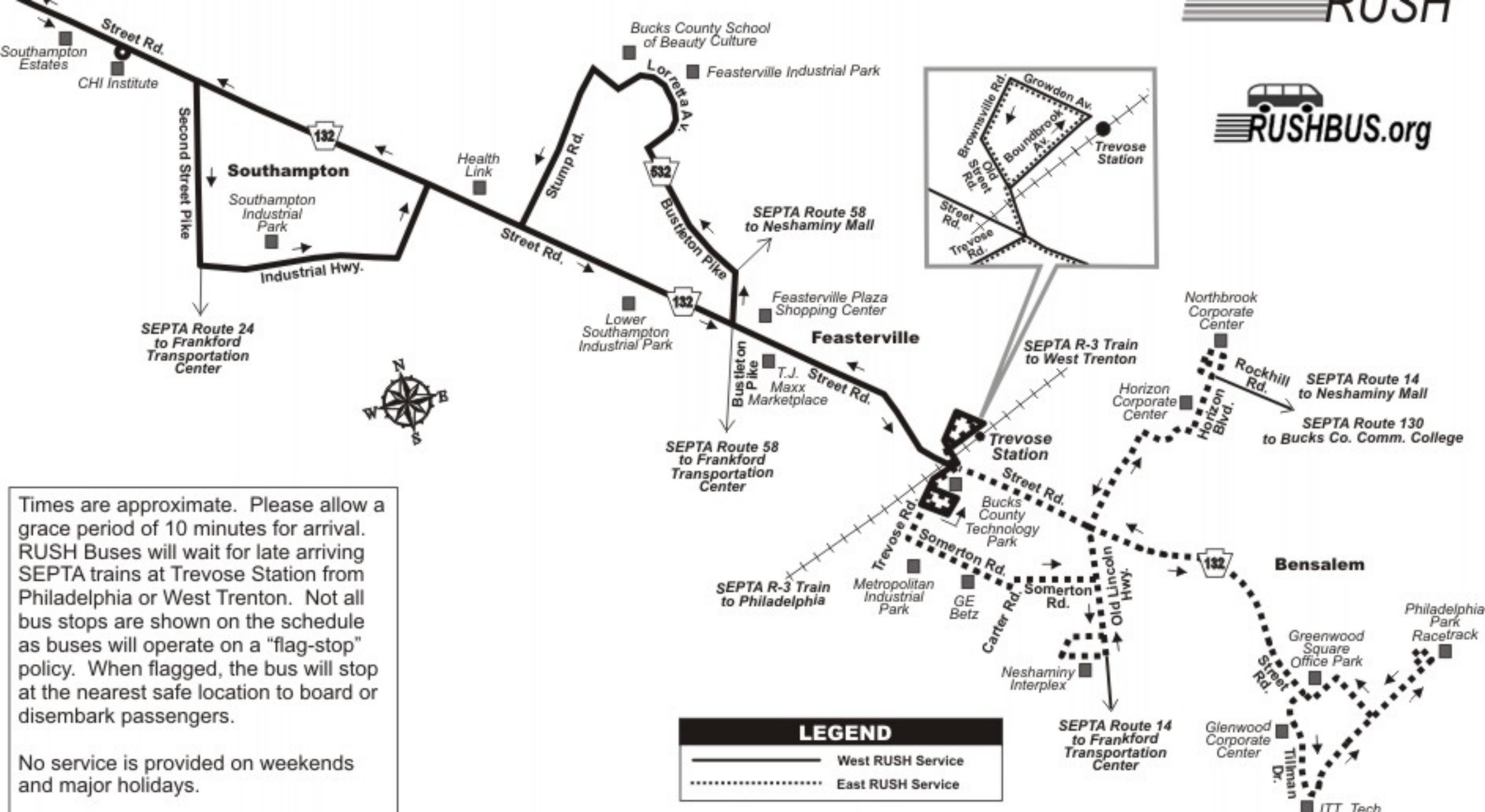

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Street Road RUSH Fares

Base Fare – $1.00, Bucks County TMA Token, or SEPTA TransPass/TrailPass

Exact Fare is needed as Drivers do not make change.

Street Road RUSH buses are disabled accessible with wheelchair lifts.

Warminster RUSH Fares

Base Fare – $1.00,
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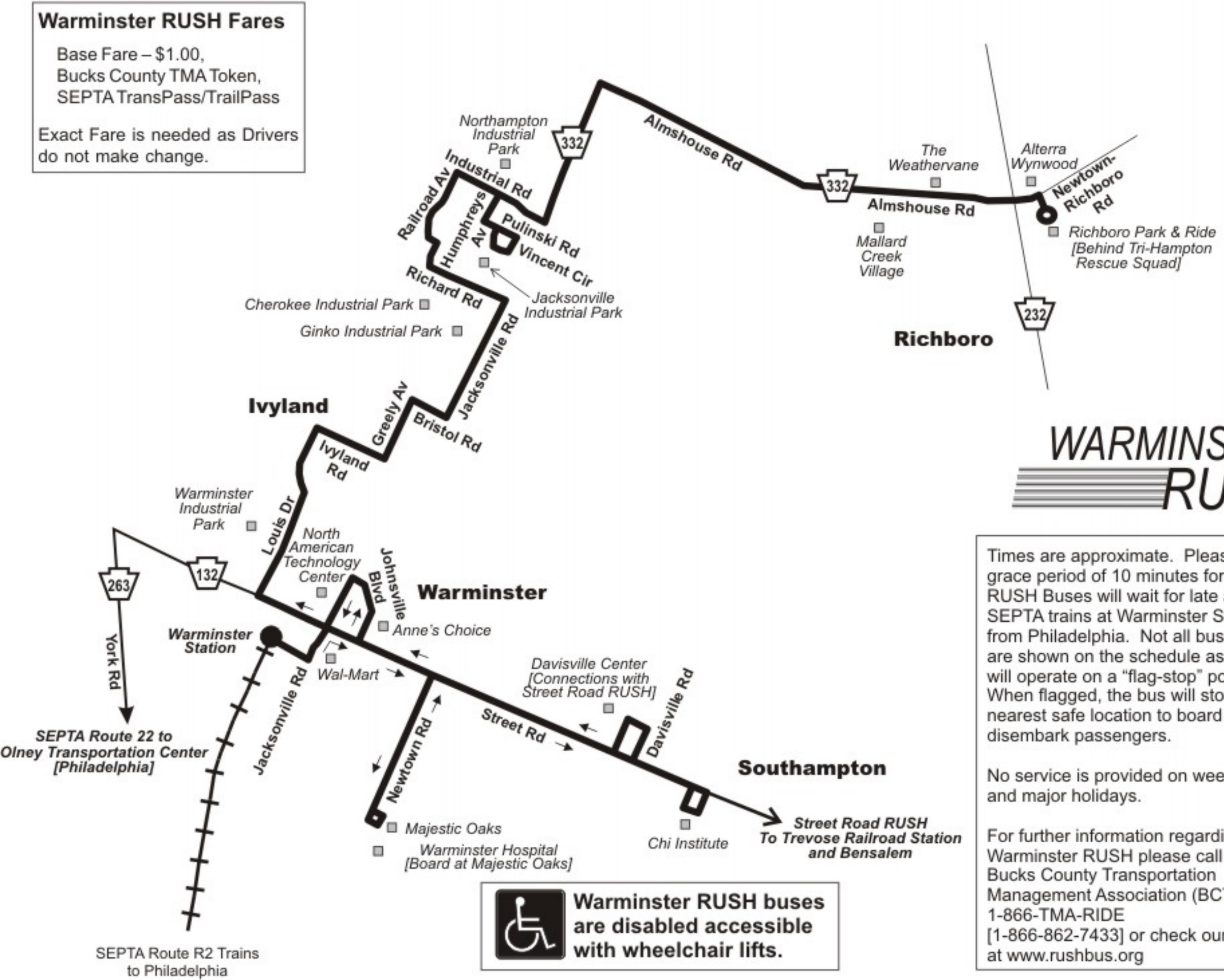
Exact Fare is needed as Drivers do not make change.



WARMINSTER RUSH

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