1-95 Interchange Enhancement and Reconstruction

SECTION DOI TRAFFIC STUDY I-95 STREET ROAD (PA 132) INTERCHANGE,





I-95 STREET ROAD (PA 132) INTERCHANGE, SECTION D01 TRAFFIC STUDY

September 2004



Prepared for Pennsylvania Department of Transportation By



By Delaware Valley Regional Planning Commission The Bourse Building, 8th Floor 111 South Independence Mall East Philadelphia, PA 19106-2582 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 request 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.



Our logo is adapted from the official DVRPC seal, 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. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey.

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EXECUTIVE SUMMARY

This report summarizes traffic forecasts for the No-Build Alternative, the No-Build Plus I-95/Pennsylvania Turnpike Interchange Alternative, and two build alternatives for the I-95/Street Road (PA 132) Interchange in Bensalem Township, Bucks County, Pennsylvania. Average daily and peak hour traffic forecasts are prepared for each alternative for 2010 and 2030. Because large portions of I-95 are being rehabilitated over the next several years, detailed studies of several of this and several other interchanges are being conducted as a precursor to any changes.

The limits of the study area run along I-95 from the Woodhaven Road (PA 63) to the PA 413 interchange. In this sections, the alignment of I-95 is approximately northeast/southwest, generally following the alignment of the Delaware River. This section of the I-95 main line is six lanes wide, constructed at-grade, and located immediately west of the AMTRAK Northeast Corridor rail line.

The existing Street Road (PA 132) interchange is a tight diamond design, with significant delays and queues that can spill back onto I-95. To the east of I-95 along Street Road (PA 132) is the I-95 Industrial Park and State Road. This area includes light industrial facilities and truck terminals that generate significant heavy vehicle traffic. Access to Neshaminy State Park is also provided via State Road. Immediately west of I-95 along Street Road (PA 132) is the partial cloverleaf interchange between Street Road (PA 132) and Bristol Pike (US 13). After Bristol Pike (US 13), Street Road (PA 132) is a divided four lane high type arterial serving regional traffic and providing access to the Pennsylvania Turnpike (I-276) via US 1.

Four alternatives were tested for the years 2010 and 2030; the No-Build, the No-Build assuming construction of the proposed I-95/Pennsylvania Turnpike Interchange, and two Street Road (PA 132) interchange improvement alternatives. The first and second alternatives tested assume the existing Street Road (PA 132) interchange. The first alternative, the No-Build, is a "do-nothing" alternative while the second No-Build Plus I-95/Pennsylvania Turnpike Interchange Alternative adds a new interchange between I-95 and the Pennsylvania Turnpike (I-276). The third alternative is a widened diamond interchange, which assumes all approaches are widened by one to two lanes and a new signal introduced to eliminate weave movements on Street Road (PA 132) at the eastbound on-ramp from Bristol Pike (US 13). The fourth build alternative is the Bristol Pike Ramp Alternative. This alternative includes all of the Widened Diamond Alternative plus an additional on-ramp to I-95 southbound located at the existing intersection of Bristol Pike (US 13) with ramps to and from eastbound Street Road (PA 132), and moves traffic bound for the existing Bristol Pike (US 13) to Street Road (PA 132) eastbound on-ramp to a single ramp using the footprint of the existing westbound on-ramp. Neither the third or fourth alternative includes the proposed I-95/Pennsylvania Turnpike Interchange.

Objectives for improvements, which guided the development of the build alternatives, included making improvements to safety and capacity on I-95; improving access to and from I-95; better signage; and implementing incident management technology.

For each alternative, DVRPC's regional travel simulation model was used to forecast future travel patterns. The model utilizes a system of traffic zones that follow Census boundaries and relies on demographic and employment data, land use, and transportation network characteristics to simulate trip-making patterns throughout the study area and region. Projected daily traffic volumes for selected highway links within the study area are presented and analyzed. AM and PM peak-hour volumes at selected intersections are included for each alternative, with an extensive set of peak hour weaving movements also developed. The appendices to this report include current traffic counts of the various roadways and intersections examined in the study area.

I. INTRODUCTION

This report summarizes traffic forecasts for the No-Build Alternative, the No-Build Plus I-95/ Pennsylvania Turnpike Interchange Alternative, and two different build alternatives for the Street Road (PA 132) Interchange with I-95 in Bensalem Township, Bucks County, Pennsylvania (*maps 1 and 2*). It was prepared at the request of the Pennsylvania Department of Transportation (PENNDOT) and its consultants, who are conducting a point of access study for the interchange area. Because large portions of I-95 are being rehabilitated over the next several years, detailed studies of several of the interchanges were conducted as a precursor to any changes. The traffic forecasts in this report are prepared for 2010 and 2030.

The Delaware Expressway, Pennsylvania's portion of I-95, was constructed in sections beginning in the middle 1960s, and it was not until the 1990s that a continuous roadway between the states of Delaware and New Jersey was available to travelers. Traveling north, the highway enters Pennsylvania in Lower Chichester Township, Delaware County, and follows the Delaware River corridor. North of the City of Chester, the Mid-County Expressway (I-476) becomes a spur heading northwest toward the Pennsylvania Turnpike interchange in Plymouth Meeting in Montgomery County. I-95, which is at-grade to this point, continues past the Philadelphia International Airport, where it enters the City of Philadelphia.

Once past the airport, the highway becomes elevated, and passes the Philadelphia stadium complex, the Walt Whitman Bridge, and the Penn's Landing areas. The section within Center City Philadelphia is depressed until just south of the Benjamin Franklin Bridge where it emerges to become elevated once again. The highway remains elevated through Lower Northeast Philadelphia. North of Pennypack Creek, I-95 returns to an at-grade alignment and continues at-grade through the residential and commercial areas of Philadelphia and Bucks County until it crosses over the Delaware River out of Pennsylvania at the Scudder Falls Bridge northwest of Trenton, New Jersey. The interstate provides access to the various port-related industrial and commercial activities, which are the traditional land uses along the Delaware River, as well as to adjacent residential areas.

In recent years, pavement, bridges, and overpasses have begun to deteriorate, and beginning in 2000 PENNDOT began a four-phase reconstruction of I-95 from Center City Philadelphia northward into Bucks County. Planned projects include rebuilding numerous bridges; repaving of all surfaces; expanding the Intelligent Transportation System (ITS) by installing closed-circuit TV cameras, dynamic message signs, and microwave sensors; and upgrading the following interchanges:

- I-676 (Vine Expressway)
- Girard Avenue
- Allegheny/Castor Avenue
- Betsy Ross Bridge
- Bridge Street
- Cottman (PA 73)/Princeton Avenue, and
- PA 132 (Street Road)









This report focuses on the Street Road (PA 132) Interchange study area, which consists of the approaches to the interchange between Street Road (PA 132) and I-95, and impacted local and regional connections. In this study area, I-95 is a three-lane-by-direction limited access highway.

A focused travel simulation was conducted using DVRPC's regional travel forecasting models. The traffic zones in the study area were subdivided into smaller zones to better reflect the highway network and land use characteristics of the study area. The model's highway network within the study area was reviewed and modified as needed to reflect the detailed nature of the traffic improvements to be tested.

Chapter II of this report documents the physical characteristics of the study area. Included are a description of the land uses and surrounding roadway network, along with a discussion of current traffic volumes and levels of service. The four alternatives studied are described in detail in Chapter III. Chapter IV explains the travel forecasting methodology, with a brief discussion of the focused traffic simulation model used to develop the traffic projections. The regional demographic and employment forecasts that form the basis for the forecasts are also presented in this chapter. Chapter V presents an analysis of the travel forecasts for this interchange complex. The forecasts represent projected 2010 and 2030 traffic volumes for I-95, adjacent ramps and surrounding roadways, under each alternative. The appendices contain current traffic counts and intersection turning movements.

II. DESCRIPTION OF THE I-95/STREET ROAD (PA 132) INTERCHANGE AREA

The limits of the study area are from the Woodhaven Road (PA 63) Interchange to the PA 413 Interchange along I-95 and from State Road to Knights Road along Street Road (PA 132). The main line of I-95 in this segment is at-grade immediately west of the AMTRAK Northeast Corridor rail line.

A. Existing Highway Facilities and Land Use

The Street Road (PA 132) Interchange complex connects Bristol Pike (US 13), Street Road (PA 132), and the Delaware Expressway (I-95). I-95 in this area is a freeway serving both regional and interstate travel. Three lanes are provided in each direction, with a wide median and full shoulders. Street Road (PA 132) is a high speed regional highway providing access to Central Bucks County and the Pennsylvania Turnpike (I-276) at US 1. Street Road (PA 132) geometry includes a divided roadway, two lanes per direction, generous shoulders, and limited median openings. Bristol Pike (US 13) is primarily two lanes plus a center turn lane in the study area, but widens to a four lane divided roadway at its interchange with Street Road (PA 132). Bristol Pike (US 13) serves travel within Lower Bucks County between riverfront communities, leading to the US 13 Expressway. These three roadways are connected by a tight diamond interchange between Street Road (PA 132) and I-95, and an adjacent partial cloverleaf interchange between Street Road (PA 132) and Bristol Pike (US 13). The tight diamond includes single lane off-ramps from I-95 that widen to two lanes at Street Road (PA 132), and one lane entrance ramps onto I-95. On Street Road (PA 132), the distance from the Bristol Pike (US 13) ramps to I-95 southbond ramps is approximately three hundred twenty five feet from the I-95 Southbound ramps, creating an operational constraint due to weaving distances. The interchange, including this constraint, is shown *map 3*.

There are no significant roads parallel to Street Road (PA 132) in the study area. The closest crossings of I-95 are 1.2 miles south of Street Road (PA 132) at Station Avenue in the vicinity of the Cornwells Heights SEPTA station and one mile north of Street Road (PA 132) at Bristol Pike (US 13) near Neshaminy Creek. However, there are several perpendicular roadways. Knights Road, the western boundary of the study area provides access to Franklin Mills Mall. State Road provides for local travel east of I-95 along the Delaware River. Hulmeville Road (PA 513) runs at a skew relative to I-95; from near the Woodhaven Road/I-95 interchange northwest to Hulmeville and Langhorne. Bensalem Boulevard is on a similar northwest-southeast alignment, originating on Bristol Pike (US 13) north of Street Road (PA 132). Two additional roads heading east from Street Road (PA 513), respectively.

Land uses within the study area tend to be predominately residential on the western side of I-95, with light commercial on Street Road (PA 132) and Bristol Pike (US 13). Heavy and light industrial are dominant to the east of I-95. These land uses tend to occur at low to medium density with small single family homes in residential neighborhoods, and an industrial park east of I-95 for commercial usages. Industrial and commercial land uses in the study area generate high volumes of truck traffic, much of which is destined for I-95.



B. Existing Traffic Volumes

There has been significant new development in the study area since this section of I-95 opened, such as the creation of the Delaware Expressway Industrial Park, new truck terminals, and new commercial activities along Bristol Pike (US 13), State Road, and Street Road (PA 132). In addition intensive developments such as Franklin Mills Mall, Neshaminy Mall, Philadelphia Park Race Track, new hotels, and industrial parks along Street Road (PA 132) have located in the vicinity of the study area. These new activities, combined with total growth in the DVRPC region generate much additional traffic volumes on the arterials at this interchange complex. Also, during the same time, main line traffic volume on I-95 has increased significantly because of development throughout the region. When these factors are added together existing capacity on the interchange complex, access ramps, and surrounding street system is severely taxed.

Traffic counts were collected on main line I-95, Street Road (PA 132), local access ramps within the interchange complex, and also on impacted arterials and local roads within the study area including; State Road, Dunks Ferry Road, Bristol Pike (US 13), Bensalem Boulevard, Brookwood Drive, and Hulmeville Road (PA 513). Current Annual Average Daily Traffic Volumes (AADT) are shown in *figure 1*. Detailed traffic counts for all locations, including hourly counts and turning movements, are included in the two appendices to this report.

On the main line of I-95, 35,900 vehicles per day (vpd) currently approach the interchange from the north and 35,000 depart the interchange to the north during an average day. On the southern side of the interchange, the corresponding volumes are 44,500 vpd departing to the south and 42,600 vpd arriving from the south. Ramp volumes at Street Road (PA 132) are 13,500 vpd for the I-95 southbound on-ramp, with 13,000 vpd for the corresponding I-95 northbound off-ramp. The I-95 southbound off-ramp to Street Road (PA 132) carries 4,900 vpd with 5,400 vpd using the corresponding I-95 northbound off-ramp. Traffic volumes on Street Road (PA 132) range from 11,700 vpd at State Road to 34,300 vpd between the ramps for Bristol Pike (US 13) and for I-95.

Other study area traffic counts range from a high on Bristol Pike (US 13) (14,700 to 22,700 vpd) to a low of 2,700 vpd on Brookwood Drive. Other roadway segments in the area include State Road (12,600 to 15,600 vpd), Bensalem Boulevard at 12,800 vpd, and Hulmeville Road (PA 513) (11,100 to 17,400 vpd).

Peak hour volumes and selected weaving movements have been recorded at key intersections within the study area. Manual AM and PM peak hour turning movement counts were collected at the intersections of Street Road (PA 132) with State Road, Dunks Ferry Road, I-95 northbound ramps, I-95 southbound ramps, Bristol Pike (US 13) ramps, Brookwood Drive, and Hulmeville Road (PA 513). Additional turning movement counts were recorded at Brookwood Drive and Hulmeville Road (PA 513), Dunks Ferry Road and State Road, Bensalem Boulevard and Bristol Pike (US 13), and eastbound and westbound Street Road (PA 132) ramps with Bristol Pike (US 13). Current AM and PM peak hour turning movement volumes are shown in *figure 2*.



Figure 1 I-95 Street Road (PA 132) Interchange



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Figure 2 I-95 Street Road (PA 132) Interchange **Current AM / PM Peak Hour Turning Movements**



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In addition, weaving movement counts (*figures 3, 4*) were recorded manually for the peak hours examining the interchange between Street Road (PA 132) west of I-95 and Bristol Pike (US 13) ramps to each of I-95 northbound and southbound ramps and Street Road (PA 132) east of I-95 in each direction. This resulted in twelve movements being recorded in each of the AM and PM peak periods.

Generally, the heaviest AM and PM peak hour traffic volumes are at the intersection of I-95 with Street Road (PA 132). Peak hour I-95 main line flows south of Street Road (PA 132) are about 3,500 vehicles per hour, with approximately 3,000 vehicles per hour north of Street Road (PA 132) on I-95. The ramp to I-95 southbound from Street Road (PA 132) carries 908 vehicles during the AM peak hour, and 863 during the PM peak, while the companion I-95 northbound off-ramp carries 990 and 1,067 vehicles, respectively. Most vehicles on the I-95 northbound off-ramp to Street Road (PA 132) turn left, with current conditions frequently causing a queue that extends onto the I-95 northbound mainline. Southbound, 315 vehicles exit I-95 at Street Road (PA 132) during the AM peak and 352 vehicles exit during the PM peak hour. The corresponding northbound on-ramp at Street Road (PA 132) has 492 and 597 vehicles entering I-95, respectively. Street Road (PA 132) at I-95 also carries significant through traffic, with 918 total through vehicles in the AM Peak, and 1150 total through vehicles in the PM peak.

Analysis of current peak hour weaving movements between Street Road (PA 132) west of I-95 and Bristol Pike (US 13) ramps to each of I-95 northbound and southbound ramps and Street Road (PA 132) east of I-95 indicates that most traffic immediately west of I-95 on Street Road (PA 132) uses I-95. This is most pronounced for the ramps to and from Bristol Pike (US 13) with roughly two-thirds of all travel on these ramps being to and from I-95. For Street Road (PA 132) west of I-95, slightly more than half of all eastbound AM peak vehicles and westbound PM peak vehicles are via I-95, with about two-thirds of the opposite direction vehicles using I-95. The most important weave movement is eastbound between Bristol Pike (US 13) and I-95 southbound ramps. The current configuration entails a yield for traffic coming from Bristol Pike (US 13). However, given the level of traffic on Street Road (PA 132), and a distance of just over 300 feet between intersections, the queue from I-95 frequently extends beyond the entrance ramp from Bristol Pike (US 13), causing operational problems. In this distance, during the AM peak hour, 462 vehicle from Bristol Pike (US 13) merge with 1,307 vehicles from Street Road (PA 132). Of particular importance are the 445 vehicles from Street Road (PA 132) that are turning right onto the I-95 southbound on-ramp, combined with 275 vehicles from Bristol Pike (US 13). This total of 720 vehicles represents almost half (42 percent) of the total eastbound flow, meaning that the individual lane utilization is not balanced, with the right lane of Street Road (PA 132) operating primarily as a turning lane at peak periods. An additional concern is the 75 vehicles from Bristol Pike (US 13) that must cross both lanes of Street Road (PA 132) to turn left at the ramp for I-95 northbound.



Figure 3 I-95 Street Road (PA 132) Interchange Current Eastbound AM / PM Peak Hour Weave Movements



Figure 4

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III. IMPROVEMENT ALTERNATIVES

The project objectives that guided the development of the design alternatives included improving traffic flows on I-95 and the supporting arterial system in the study area by eliminating weave disturbances, ramp widening, and improving interchange geometry.

Four alternatives were tested for the years 2010 and 2030; the No-Build, the No-Build assuming construction of the proposed I-95/Pennsylvania Turnpike Interchange, and two Street Road (PA 132) interchange improvement alternatives. The first and second alternatives tested assume the existing Street Road (PA 132) interchange. The first alternative, the No-Build, is a "do-nothing" alternative while the second No-Build Plus I-95/Pennsylvania Turnpike Interchange Alternative adds a new interchange between I-95 and the Pennsylvania Turnpike (I-276). The third alternative is a widened diamond interchange, which assumes all approaches are widened by one to two lanes and a new signal introduced to eliminate weave movements on Street Road (PA 132) at the eastbound on-ramp from Bristol Pike (US 13). The fourth build alternative is the Bristol Pike Ramp Alternative. This alternative includes all of the Widened Diamond Alternative plus an additional on-ramp to I-95 southbound located at the existing intersection of Bristol Pike (US 13) with ramps to and from eastbound Street Road (PA 132), and moves traffic bound for the existing Bristol Pike (US 13) to Street Road (PA 132) eastbound on-ramp to a single ramp using the footprint of the existing westbound on-ramp. Neither the third or fourth alternative includes the proposed I-95/Pennsylvania Turnpike Interchange.

A. No-Build Alternative

The No-Build Alternative assumption assumes that the Street Road (PA 132) intersection and surrounding roads are configured as they currently exist (*see figure 5*). The interchange of Street Road (PA 132) remains a tight diamond, with one lane ramps leading to a right and left turn lane on exit ramps to Street Road (PA 132) from I-95. Traffic control is provided by a single light at the northbound on and off-ramps. Bristol Pike (US 13) and Street Road (PA 132) continue to be connected via a partial cloverleaf interchange. I-95 remains three lanes in each direction. Street Road (PA 132) is configured as two lanes by direction through the study area. State Road is one lane by direction except near Street Road (PA 132) where it is two lanes by direction.

B. No-Build Plus I-95/Pennsylvania Turnpike Interchange Alternative

This option, consists of the No-Build Alternative at Street Road (PA 132) plus a full interchange between the Pennsylvania Turnpike (I-276) and I-95 in Bensalem Township, Bucks County. This new interchange would be the second interchange north of Street Road (PA 132), after PA 413, with significant impacts to the study area. In the absence of this connection, Street Road (PA 132) is currently an alternate route to the Pennsylvania Turnpike (I-276). With this new interchange, I-95 becomes a more attractive route while Street Road (PA 132) becomes less attractive. This alternative is needed to determine the magnitude of these impacts due to construction of the I-95/Pennsylvania Turnpike Interchange relative to the No-Build. Figure 5 I-95 Street Road (PA 132) Interchange Current Conditions, No-Build, No-Build Plus Pennsylvania Turnpike Interchange Alternatives for Existing Traffic Signals and Through and Turn Lanes



C. Widened Diamond Alternative

The third alternative, Widened Diamond, is a more comprehensive design option (*see figure 6*) including more lanes for most movements through the interchange complex and additional traffic controls this alternative includes only the No-Build, so that the I-95/PA Turnpike Interchange is not included. For through traffic on Street Road (PA 132), three lanes are provided westbound from Dunks Ferry Road to the Bristol Pike (US 13) ramps, while eastbound traffic gets double left turn lanes at Dunks Ferry Road and onto I-95 Northbound beginning at Bristol Pike (US 13) ramps. The northbound off-ramp from I-95 is widened from two to three lanes. Dedicated right turn lanes are provided from Street Road (PA 132) onto I-95 in both directions and from westbound Street Road (PA 132) to the Bristol Pike (US 13) ramp. The last change is introduction of new traffic signals at the southbound I-95 on and off-ramps, and another new traffic signal at the end of the ramp from Bristol Pike (US 13) to eastbound Street Road (PA 132). This signal eliminates dangerous weaving movements, with two lanes feeding from the ramp and three from Street Road (PA 132) itself.

D. Bristol Pike Ramp Alternative

The Bristol Pike Ramp Alternative (*see figure 7*) builds upon the Widened Diamond concept with two alterations; therefore the I-95/Pennsylvania Turnpike Interchange is not included. First, an additional southbound on-ramp to I-95 is added from the intersection of Bristol Pike (US 13) with the existing eastbound Street Road (PA 132) ramps to and from Bristol Pike (PA 132). Second, the existing eastbound on-ramp carrying traffic to Street Road (PA 132) from Bristol Pike (US 13) is eliminated. This existing ramp is removed to simply the intersection of Bristol Pike (US 13) with the existing eastbound off-ramp from Street Road (PA 132) and the new I-95 southbound on-ramp. The movement to eastbound Street Road (PA 132) is instead handled by the existing ramp for vehicles traveling from Bristol Pike (US 13) to westbound Street Road (PA 132). This westbound on ramp is realligned to allow traffic access to Street Road (PA 132) in both directions. At the junction of Street Road (PA 132) with the realligned ramp, the median is opened so that traffic can turn left onto eastbound Street Road (PA 132).

Figure 6 I-95 Street Road (PA 132) Interchange Widened Diamond Alternative for Existing and Proposed Traffic Signals and Through and Turn Lanes



Figure 7 I-95 Street Road (PA 132) Interchange Bristol Pike Ramp Alternative for Existing and Proposed Traffic Signals and Through and Turn Lanes



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IV. TRAVEL FORECASTING PROCEDURES

Regional travel simulation models are used to forecast future travel patterns. They utilize a system of traffic zones that follow Census boundaries and rely on demographic and employment data, land use, and transportation network characteristics to simulate trip making patterns throughout the region.

A. Socioeconomic Projections

DVRPC's long-range population and employment forecasts are revised periodically to reflect changing market trends, development patterns, local and national economic conditions, and available data. The completed forecasts reflect all reasonably known current information and the best professional judgment of predicted future conditions. The revised forecasts adopted by the DVRPC Board on February 24, 2000,¹ reflect an update to municipal forecasts that were last completed in June 1993.

DVRPC uses a multi step, multi source methodology to produce its forecasts at the county level. County forecasts serve as control totals for municipal forecasts, which are disaggregated from county totals. Municipal forecasts are based on an analysis of historical data trends adjusted to account for infrastructure availability, environmental constraints to development, local zoning policy, and development proposals. Municipal population forecasts are constrained using density ceilings and floors. County, and where necessary, municipal input is used throughout the process to derive the most likely population forecasts for all geographic levels.

1. Population Forecasting

Population forecasting at the regional level involves review and analysis of six major components: births, deaths, domestic in-migration, domestic out-migration, international immigration, and changes in group quarters populations (e.g., dormitories, military barracks, prisons, and nursing homes). DVRPC uses both the cohort survival concept to age individuals from one age group to the next, and a modified Markov transition probability model based on the most recent US Census and the US Census' recent Current Population Survey (CPS) research to determine the flow of individuals between the Delaware Valley and the outside world. For movement within the region, Census and IRS migration data coupled with CPS data are used to determine migration rates between counties. DVRPC relies on county planning offices to provide information on any known, expected, or forecasted changes in group quarters populations. These major population components are then aggregated and the resulting population forecasts are reviewed by member counties for final adjustments based on local knowledge.

¹Delaware Valley Regional Planning Commission, *Year 2025 County & Municipal Population & Employment Forecasts*, Philadelphia, PA, April 2000.

For Street Road (PA 132), the primary study areas are Bensalem Township, Bucks County and Far Northeast Philadelphia. The total population was estimated at 213,166 people for the year 2000, increasing to 220,739 in 2025. Bensalem Township and Far Northeast Philadelphia are each forecast to grow by about 4,000 people, an increase of 6.3 percent and 2.6 percent, respectively. Adjacent municipalities in Bucks County west of the primary study area also contribute to traffic flows on Street Road (PA 132). These include Northampton, Upper Southampton, Lower Southampton, Hulmeville, Langhorne, Penndel, Langhorne Manor, Middletown, Bristol Borough, and Bristol Township. Base year population in these municipalities was estimated at 194,292, and this is forecast to increase by 21,568 or 11.1 percent. These totals are shown below:

	2000 Population Forecast	2025 Population Forecast	Chan Absolute	ge Percent
Study Area				
Far Northeast Philadelphia Bensalem Township, Bucks Co.	156,004 57,162	159,998 60,739	3,994 3,577	2.6% 6.3%
Total	213,166	220,737	7,571	3.6%
Adjacent Bucks Co. Municipalities Northampton, Upper Southampton, Lower Southampton	75,406	86,970	11,564	15.3%
Bristol Borough and Bristol Township	68,063	70,579	2,516	3.7%
Hulmeville, Langhorne,Penndel, Langhorne Manor, Middletown	50,823	58,311	7,488	14.7%
Total	194.292	215.860	21.568	11.1%

2. Employment Forecasting

Employment is influenced by local, national, and global political and socioeconomic factors. The Bureau of Economic Analysis provides the most complete and consistent time series data on county employment by sector, and serves as DVRPC's primary data source for employment forecasting. Employment sectors include mining, agriculture, construction, manufacturing, transportation, wholesale, retail, finance/insurance, service, government, and military. Other supplemental sources of data include the US Census, Dun & Bradstreet, Bureau of Labor Statistics, Occupational Privilege tax data, and other public and private sector forecasts. The OBERS shift-share model in combination with the Woods and Poole Economics' sectoral forecasts provides the basis for DVRPC's employment forecasts. As in the population forecasts, county-level total employment is used as a control total for sector distribution and municipal level forecasts. Forecasts are then reviewed by member counties for final adjustments based on local knowledge.

Employment growth in the study area and adjacent municipalities substantially exceeds population growth. Within the study area, employment in Bensalem township is forecast to rise by 6,868 jobs or 19.2 percent from base year to 2025 with an 8,488 or 14.5 percent increase for jobs in Far Northeast Philadelphia. Adjacent municipalities are anticipated to sustain even larger employment increases, averaging 29.4 percent more jobs in 2025 versus the current total of 86,100. These employment figures are as follows:

	2000 Employment Forecast	2025 Employment Forecast	Chan Absolute I	ge Percent
Study Area				
Far Northeast Philadelphia Bensalem Township, Bucks Co.	58,461 35,722	66,949 42,590	8,488 6,868	14.5% 19.2%
Total	94,183	109,539	15,356	16.3%
Adjacent Bucks Co. Municipalities Northampton, Upper Southampton, Lower Southampton	30,322	39,760	9,438	31.1%
Bristol Borough and Bristol Township	28,626	31,719	3,093	10.8%
Hulmeville, Langhorne,Penndel, Langhorne Manor, Middletown	27,152	39,921	12,769	47.0%
Total	86,100	111,400	25,300	29.4%

B. DVRPC's Travel Simulation Process

For the I-95 study, a focused simulation process was employed (*see next page*). A focused simulation process allows the use of DVRPC's regional simulation models but includes a more detailed representation of the study area. Local streets not included in the regional network, but of interest in this study, are added to the highway network. Traffic zones inside the study area are subdivided so that traffic from existing and proposed land use developments may be loaded more precisely on the network. The focusing process increases the accuracy of the travel forecasts within the detailed study area. At the same time, all existing and proposed highways throughout the region, and their impact on both regional and interregional travel patterns, become an integral part of the simulation process.

DVRPC's travel models follow the traditional steps of trip generation, trip distribution, modal split, and traffic assignment. However, an iterative feedback loop is employed from traffic assignment to the trip distribution step. The feedback loop ensures that the congestion levels used by the models when determining trip origins and destinations are equivalent to those that result from the traffic assignment step. Additionally, the iterative model structure allows trip making patterns to change in response to changes in traffic patterns, congestion levels, and improvements to the transportation system.



EVANS ITERATVE TRAVEL SIMULATION PROCESS

The DVRPC travel simulation process uses the Evans Algorithm to iterate the model. Evans reexecutes the trip distribution and modal split models, based on updated highway speeds after each iteration of highway assignment, and assigns a weight (λ) to each iteration. This weight is then used to prepare a convex combination of the link volumes and trip tables for the current iteration and a running weighted average of the previous iterations. This algorithm converges rapidly to the equilibrium solution on highway travel speeds and congestion levels. About seven iterations are required for the process to converge to the equilibrium state for I-95 travel patterns. After equilibrium is achieved, the weighted average transit trip tables are assigned to the transit networks to produce link and route passenger volumes.

1. Separate Peak, Midday, and Evening Models

The DVRPC travel simulation models are disaggregated into separate peak period, midday, and evening time periods. This disaggregation begins in trip generation where factors are used to separate daily trips into peak, midday, and evening travel. The enhanced process then utilizes completely separate model chains for peak, midday, and evening travel simulation runs. Time-of-day sensitive inputs to the models, such as highway capacities and transit service levels, are disaggregated to be reflective of time-period specific conditions. Capacity factors are used to allocate daily highway capacity to the peak, midday, and evening time periods. Separate transit networks were required to represent the difference in transit service.

The enhanced model is disaggregated into separate model chains for the peak (combined AM and PM), midday (the period between the AM and PM peaks), and evening (the remainder of the day) periods for the trip distribution, modal split, and travel assignment phases of the process.

The peak period is defined as 7:00 AM to 9:00 AM and 3:00 PM to 6:00 PM. Peak period and midday travel are based on a series of factors that determine the percentage of daily trips that occur during those periods. Evening travel is then defined as the residual after peak and midday travel are removed from daily travel.

External-local productions at the nine-county cordon stations are disaggregated into peak, midday, and evening components using percentages derived from the temporal distribution of traffic counts taken at each cordon station.

2. The Model Chain

The first step in the process involves generating the number of trips that are produced by and destined for each traffic zone and cordon station throughout the nine-county region.

a. Trip Generation

Both internal trips (those made within the DVRPC region) and external trips (those that cross the boundary of the region) must be considered in the simulation of regional travel. For the simulation of current and future travel demand, internal trip generation is based on zonal forecasts of population and employment, whereas external trips are extrapolated from cordon line traffic counts and other sources. The latter also includes trips that pass through the Delaware Valley region. Estimates of internal trip productions and attractions by zone are established on the basis of trip rates applied to the zonal estimates of demographic and employment data. This part of the DVRPC model is not iterated on highway travel speed. Rather, estimates of daily trip making by traffic zone are calculated and then disaggregated into peak and off-peak time period.

b. Evans Iteration

The iterative portion of the Evans forecasting process involves updating the highway network restrained link travel speeds, rebuilding the minimum time paths through the network, and skimming the interzonal travel time for the minimum paths. Then the trip distribution, modal split, and highway assignment models-in sequence for each-pass through the model chain. After convergence is reached, the transit trip tables for each iteration are weighted together and the weighted average table assigned to the transit network. The highway trip tables are loaded onto the network during each Evans iteration. For each time period, seven iterations of the Evans process are performed to ensure that convergence on travel times is reached.

c. Trip Distribution

Trip distribution is the process whereby the zonal trip ends, established in the trip generation analysis, are linked together to form origin-destination patterns in the trip table format. Peak, midday, and evening trip ends are distributed separately. For each Evans iteration, a series of seven gravity-type distribution models are applied at the zonal level. These models follow the trip purpose and vehicle type stratifications established in trip generation.

d. Modal Split

The modal split model is also run separately for the peak, midday, and evening time periods. The modal split model calculates the fraction of each person-trip interchange in the trip table that should be allocated to transit, and then assigns the residual to the highway side. The choice between highway and transit usage is made on the basis of comparative cost, travel time, and frequency of service, with other aspects of modal choice being used to modify this basic relationship. In general, the better the transit service, the higher the fraction assigned to transit, although trip purpose and auto ownership also affect the allocation. The model subdivides highway trips into auto drivers and passengers. Auto driver trips are added to the truck, taxi, and external vehicle trips in preparation for assignment to the highway network.

e. Highway Assignment

For highway trip, the final step in the focused simulation process is the assignment of current or future vehicle trips to the highway network representative of the appropriate scenario. For peak, midday, and evening travel, the assignment model produces the future traffic volumes for individual highway links that are required for the evaluation of the alternatives. The regional nature of the highway network and trip table underlying the focused assignment process allow the diversion of travel into and through the study area to various points of entry and exit in response to the improvements made in the transportation system.

For each Evans iteration, highway trips are assigned to the network representative of a given alternative by determining the best (minimum time) route through the highway network for each zonal interchange, and then allocating the interzonal highway travel to the highway facilities along that route. This assignment model is "capacity restrained" in that congestion levels are considered when determining the best route. The Evans equilibrium assignment method is used to implement the capacity constraint. When the assignment and associated trip table reach equilibrium, no path faster than the one actually assigned can be found through the network, given the capacity-restrained travel times on each link.

f. Transit Assignment

After equilibrium is achieved, the weighted average transit trip tables (using the λ s calculated from the overall Evans process as weights) are assigned to the transit network to produce link and route passenger volumes. The transit person trips produced by the modal split model are "linked" in that they do not include any transfers that occur either between transit trips or between auto approaches and transit lines. The transit assignment procedure accomplishes two major tasks. First, the transit trips are "unlinked" to include transfers, and second, the unlinked transit trips are associated with specific transit facilities to produce link, line, and station volumes. These tasks are accomplished simultaneously within the transit assignment model, which assigns the transit trip matrix to minimum impedance paths built through the transit network. There is no capacity-restraining procedure in the transit assignment model.

C. Traffic Assignment Validation

Before a focused simulation model can be used to predict future trip-making patterns, its ability to replicate existing conditions is validated. The simulated highway assignment outputs are compared to current traffic counts taken on roadways serving the study area. The focused simulation model was executed with current conditions, and the results compared with recent traffic counts collected by DVRPC. Based on this analysis, the focused model produced accurate traffic volumes. The validated model was then executed for each alternative with socioeconomic and land use inputs reflective of future conditions.

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V. PROJECTED TRAFFIC VOLUMES

Projected average daily traffic volumes for selected highway links within the study area are presented and analyzed for the No-Build and three build alternatives within this chapter. Forecasts were prepared for 2010 as an opening year estimate. Forecasts were also produced for the horizon year, 2030, which is twenty years after the anticipated opening year.

A. No-Build and No-Build Plus I-95/Pennsylvania Turnpike Interchange Alternatives

Figure 8 shows the current and 2030 daily traffic volumes for the No-Build Alternative and No-Build Plus I-95/Pennsylvania Turnpike Interchange Alternative. Current year volumes are shown in black, below or to the left of streets in the diagram, while 2030 volumes for the No-Build Plus I-95/Pennsylvania Turnpike Interchange Alternative are shown in red, above or to the right of the streets in the diagram. Blue numbers above or to the right of the 2030 No-Build Plus I-95/Pennsylvania Turnpike Interchange Alternative numbers are the forecast 2030 volumes for the No-Build or "do-nothing" Alternative. Also, *figure 9*, shows the same data but for 2010 forecasts.

Generally, the increase in I-95 main line traffic volumes north of Street Road (PA 132) is greater than to the south, reflecting that population, employment, and related land uses in areas north of Street Road (PA 132) are anticipated to grow at a faster rate than those south of this interchange. A comparison of 2030 projected daily traffic volumes under the No-Build Alternative, and No-Build Plus I-95/Pennsylvania Turnpike Interchange Alternative is given table 1. This same comparison with 2010 forecasts is given in table 2. Under the No-Build scenario, I-95 north of the Street Road (PA 132) interchange is projected to increase by 27.0 percent northbound over current counts to 44,445 vehicles per day (vpd) and by 25.3 percent southbound to 45,009 vpd. South of the Street Road (PA 132) Interchange, I-95 main line is projected to grow at lower rates, 20 percent southbound (to 53,409 vpd) and 21.1 percent northbound (to 51,536 vpd). For the No-Build Plus I-95/Pennsylvania Turnpike Interchange Alternative north of Street Road (PA 132), I-95 mainline traffic volume is substantially larger than for the No-Build Alternative. Construction of the I-95/Pennsylvania Turnpike Interchange adds 6,302 additional vpd southbound (to 51,311 vpd) and 6,165 vpd northbound (to 50,610 vpd) in 2030 compared against the No-Build Alternative. This increase in I-95 mainline volume continues also occuring on the south side of the Street Road (PA 132) interchange. However, it is slightly smaller in magnitude at 4,933 additional vpd southbound (to 58,342) and 5,179 additional vpd northbound (to 56,715).

2030 traffic projections are also provided for six links on Street Road (PA 132), four ramps between Bristol Pike (US 13) and Street Road (PA 132), and also for State Road, Bristol Pike (US 13), Brookwood Drive, Hulmeville Road (PA 513), Bensalem Boulevard and Dunks Ferry Road. Volumes on Street Road (PA 132) west of I-95 for the No-Build Alternative grow by 13,000 vpd from the current to the 2030. The maximum forecast 2030 volume for Street Road (PA 132) is 44,899 vpd from Bristol Pike (US 13) to I-95. Introduction of the I-95/ Pennsylvania Turnpike Interchange lowers all forecasted volumes on Street Road (PA 132) west of I-95 by roughly 4,000 vpd, with the maximum volume being 40,856 vpd. Ramps between

Street Road (PA 132) and Bristol Pike (US 13) experience growth between 1,461 and 2,666 vpd from current to 2030 under the No-Build Alternative. Ramps to and from Street Road (PA 132) to the east are forecast to experience the lowest change in volume (27.7 percent and 28.1 percent), while those ramps to and from Street Road (PA 132) to the west grow most (68.5 percent and 74.1 percent). With introduction of the I-95/Pennsylvania Turnpike Interchange, forecast increases on these ramps drop almost in half, an additional 839 to 1,457 vpd above current volumes.

Traffic volumes on local streets in the area are forecast to increase an average of 26.7 percent from current volumes under the No-Build Alternative. Significant forecast flows include Bristol Pike (US 13) at 28,770 vpd (26.8 percent more than current), Hulmeville Road (PA 513) at 20,541 vpd (19.5 percent more than current), Bensalem Boulevard at 15,898 vpd (24 percent more than current), and State Road at 19,998 (28.6 percent more than current). With the introduction of the I-95/Pennsylvania Turnpike Interchange, Bristol Pike (US 13) and State Road are both forecast to have lower traffic at 26,868 (decrease of 1,902 vpd) and 19,373 (decrease of 1,168 vpd), respectively. Forecasted traffic volumes on Hulmeville Road (PA 513) and Bensalem Boulevard increase slightly for the No-Build Plus I-95/Pennsylvania Turnpike Interchange Alternative to 20,940 (increase of 399 vpd) and 16,090 vpd (increase of 1,161 vpd (15.7 percent) to 8,571 vpd and 1,810 vpd (66.7 percent) to 4,523 vpd from the current to 2030 under the No-Build Alternative. The 2030 traffic forecasts for these roadways increase to 9,626 vpd (29.9 percent over current) and 4,718 vpd (73.9 percent over current) respectively with introduction of the I-95/Pennsylvania Turnpike Interchange.



Figure 8

 16.7
 2030 No-Build Alternative AADT (000s)

 15.9
 2030 No-Bld Plus I-95/PA TPKE Interchange Alt. AADT (000s)

Delaware Valley Regional Planning Commission September 2004

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13.9 2010 No-Bid Plus I-95/PA TPKE Interchange Alt. AADT (000s)

12.6 Current Traffic Counts AADT (000s)

Table 1I-95 Street Road (PA 132) InterchangeCurrent, 2030 No-Build, and 2030 No-Build Plus Pennsylvania TurnpikeInterchange Alternatives Average Daily Traffic Volumes

Highway	Leastion		Current	No-Build			No-Build Plus I-95/Tpke			
Facility	From	То	Count	AADT	Diff.	% Diff.	AADT	Diff.	% Diff.	
I-95 Main Line										
I-95 SB I-95 NB	PA 413 Street Rd. (PA 132)	Street Rd. (PA 132) PA 413	35,917 35,007	45,009 44,445	9,092 9,438	25.3% 27.0%	51,311 50,610	15,394 15,603	42.9% 44.6%	
I-95 SB* I-95 NB*	Street Rd. (PA 132) Woodhaven Rd. (PA 63)	Woodhaven Rd. (PA 63) Street Rd. (PA 132)	44,503 42,572	53,409 51,536	8,906 8,964	20.0% 21.1%	58,342 56,715	13,839 14,143	31.1% 33.2%	
Sub-Total			157,999	194,399	36,400	23.0%	216,978	58,979	37.3%	
I-95 Ramps										
I-95 SB Off-ramp I-95 NB On-ramp	I-95 SB Street Rd (PA 132)	Street Rd. (PA 132) I-95 NB	4,904 5,419	7,295 8,302	2,391 2,883	48.8% 53.2%	7,753 8,420	2,849 3,001	58.1% 55.4%	
I-95 NB Off-ramp I-95 SB On-ramp	I-95 NB Street Rd. (PA 132)	Street Rd. (PA 132) I-95 SB	12,984 13,490	15,377 15,663	2,393 2,173	18.4% 16.1%	14,511 14,829	1,527 1,339	11.8% 9.9%	
Sub-Total			36,797	46,638	9,841	26.7%	45,514	8,717	23.7%	
Street Rd. (PA 132)										
Street Rd. (PA 132) Street Rd. (PA 132)	State Rd. Dunks Ferry Rd.	Dunks Ferry Rd. I-95	11,726 24,807	17,551 32,867	5,825 8,060	49.7% 32.5%	17,825 33,213	6,099 8,406	52.0% 33.9%	
Street Rd. (PA 132)	I-95	US 13 Ramps	34,259	43,508	9,249	27.0%	44,638	10,379	30.3%	
Street Rd. (PA 132) Street Rd. (PA 132) Street Rd. (PA 132)	US 13 Ramps Brookwood Dr. Hulmeville Rd. (PA 513)	Brookwood Dr. Hulmeville Rd. (PA 513) Knights Rd.	31,895 26,519 28,715	44,899 39,621 41,485	13,004 13,102 12,770	40.8% 49.4% 44.5%	40,856 35,856 37,921	8,961 9,337 9,206	28.1% 35.2% 32.1%	
PA 132 WB Off-ramp PA 132 EB On-ramp	Street Rd. (PA 132) Bristol Pike (US 13)	Bristol Pike (US 13) Street Rd. (PA 132)	5,364 5,282	6,872 6,743	1,508 1,461	28.1% 27.7%	6,233 6,121	869 839	16.2% 15.9%	
PA 132 WB On-ramp PA 132 EB Off-ramp	Bristol Pike (US 13) Street Rd. (PA 132)	Street Rd. (PA 132) Bristol Pike (US 13)	3,730 3,597	6,284 6,263	2,554 2,666	68.5% 74.1%	5,103 5,054	1,373 1,457	36.8% 40.5%	
Sub-Total			175,894	246,091	70,197	39.9%	232,821	56,927	32.4%	
Intersecting Roads										
State Rd.** State Rd. State Rd.	Station Ave. Street Rd. (PA 132) Dunks Ferry Rd.	Street Rd. (PA 132) Dunks Ferry Rd. Neshaminy Creek	12,623 13,170 15,553	16,701 16,867 19,998	4,077 3,697 4,445	32.3% 28.1% 28.6%	15,912 16,446 19,373	3,289 3,276 3,820	26.1% 24.9% 24.6%	
Bristol Pike (US 13) Bristol Pike (US 13) Bristol Pike (US 13)	Station Ave. PA 132 Ramps Bensalem Blvd.	PA 132 Ramps Bensalem Blvd. Neshaminy Creek	14,684 22,696 16,985	18,170 28,770 23,362	3,486 6,074 6,377	23.7% 26.8% 37.5%	18,510 26,868 21,190	3,826 4,172 4,205	26.1% 18.4% 24.8%	
Brookwood Dr.***	Street Rd. (PA 132)	Hulmeville Rd. (PA 513)	2,713	4,523	1,810	66.7%	4,718	2,005	73.9%	
Hulmeville Rd. (PA 513) Hulmeville Rd. (PA 513)** Hulmeville Rd. (PA 513)	Woodbine Ave. Street Rd. (PA 132) Brookwood Dr.	Street Rd. (PA 132) Brookwood Dr. Park Ave.	11,147 17,372 17,194	14,390 20,477 20,541	3,243 3,105 3,347	29.1% 17.9% 19.5%	14,339 21,108 20,940	3,192 3,736 3,746	28.6% 21.5% 21.8%	
Bensalem Blvd.	Bristol Pike (US 13)	Bridgewater Dr.	12,826	15,898	3,072	24.0%	16,090	3,264	25.5%	
Dunks Ferry Rd.***	Street Rd. (PA 132)	State Rd.	7,410	8,571	1,161	15.7%	9,626	2,216	29.9%	
Sub-Total			164,373	208,263	43,895	26.7%	205,121	40,748	24.8%	
Total			535,063	675,001	139,937	26.2%	700,434	165,371	30.9%	

* Flowed counts from Ramps to & from Street Road (PA 132) ** Consultant Counts

*** Estimated counts



Table 2I-95 Street Road (PA 132) InterchangeCurrent, 2010 No-Build, and 2010 No-Build Plus Pennsylvania TurnpikeInterchange Alternatives Average Daily Traffic Volumes

			Current	No-Build			No-Build Plus I-95/Tpke			
Highway Facility	Location From	То	Traffic Count	2010 AADT	Versus Curr Diff. % Diff.		2010 AADT	Versus Curr Diff. % Diff.		
I-95 Main Line										
I-95 SB I-95 NB	PA 413 Street Rd. (PA 132)	Street Rd. (PA 132) PA 413	35,917 35,007	39,593 38,948	3,676 3,941	10.2% 11.3%	42,143 41,036	6,226 6,029	17.3% 17.2%	
I-95 SB* I-95 NB*	Street Rd. (PA 132) Woodhaven Rd. (PA 63)	Woodhaven Rd. (PA 63) Street Rd. (PA 132)	44,503 42,572	48,116 46,208	3,613 3,636	8.1% 8.5%	50,129 48,039	5,626 5,467	12.6% 12.8%	
Sub-Total			157,999	172,865	14,866	9.4%	181,347	23,348	14.8%	
I-95 Ramps						- 1				
I-95 SB Off-ramp I-95 NB On-ramp	I-95 SB Street Rd. (PA 132)	Street Rd. (PA 132) I-95 NB	4,904 5,419	5,853 6,563	949 1,144	19.3% 21.1%	6,034 6,610	1,130 1,191	23.0% 22.0%	
I-95 NB Off-ramp I-95 SB On-ramp	I-95 NB Street Rd. (PA 132)	Street Rd. (PA 132) I-95 SB	12,984 13,490	13,933 14,352	949 862	7.3% 6.4%	13,590 14,021	606 531	4.7% 3.9%	
Sub-Total			36,797	40,700	3,903	26.7%	40,255	3,458	9.4%	
Street Rd. (PA 132)						- 1				
Street Rd. (PA 132) Street Rd. (PA 132)	State Rd. Dunks Ferry Rd.	Dunks Ferry Rd. I-95	11,726 24,807	14,648 28,614	2,922 3,807	24.9% 15.3%	14,805 28,801	3,079 3,994	26.3% 16.1%	
Street Rd. (PA 132)	I-95	US 13 Ramps	34,259	38,537	4,278	12.5%	39,015	4,756	13.9%	
Street Rd. (PA 132) Street Rd. (PA 132) Street Rd. (PA 132)	US 13 Ramps Brookwood Dr. Hulmeville Rd. (PA 513)	Brookwood Dr. Hulmeville Rd. (PA 513) Knights Rd.	31,895 26,519 28,715	37,662 32,325 34,389	5,767 5,806 5,674	18.1% 21.9% 19.8%	36,119 30,831 33,026	4,224 4,312 4,311	13.2% 16.3% 15.0%	
PA 132 WB Off-ramp PA 132 EB On-ramp	Street Rd. (PA 132) Bristol Pike (US 13)	Bristol Pike (US 13) Street Rd. (PA 132)	5,364 5,282	5,962 5,862	598 580	11.1% 11.0%	5,709 5,615	345 333	6.4% 6.3%	
PA 132 WB On-ramp PA 132 EB Off-ramp	Bristol Pike (US 13) Street Rd. (PA 132)	Street Rd. (PA 132) Bristol Pike (US 13)	3,730 3,597	4,743 4,654	1,013 1,057	27.2% 29.4%	4,275 4,175	545 578	14.6% 16.1%	
Sub-Total			175,894	207,396	31,502	39.9%	202,371	26,477	15.1%	
Intersecting Roads						- 1				
State Rd.** State Rd. State Rd.	Station Ave. Street Rd. (PA 132) Dunks Ferry Rd.	Street Rd. (PA 132) Dunks Ferry Rd. Neshaminy Creek	12,623 13,170 15,553	14,241 14,636 17,316	1,617 1,466 1,763	12.8% 11.1% 11.3%	13,928 14,469 17,068	1,304 1,299 1,515	10.3% 9.9% 9.7%	
Bristol Pike (US 13) Bristol Pike (US 13) Bristol Pike (US 13)	Station Ave. PA 132 Ramps Bensalem Blvd.	PA 132 Ramps Bensalem Blvd. Neshaminy Creek	14,684 22,696 16,985	16,067 25,105 19,514	1,383 2,409 2,529	9.4% 10.6% 14.9%	16,201 24,351 18,653	1,517 1,655 1,668	10.3% 7.3% 9.8%	
Brookwood Dr.***	PA 132, Street Rd.	Hulmeville Rd. (PA 513)	2,713	3,431	718	26.5%	3,508	795	29.3%	
Hulmeville Rd. (PA 513) Hulmeville Rd. (PA 513)** Hulmeville Rd. (PA 513)	Woodbine Ave. Street Rd. (PA 132) Brookwood Dr.	Street Rd. (PA 132) Brookwood Dr. Park Ave.	11,147 17,372 17,194	12,433 18,604 18,522	1,286 1,232 1,328	11.5% 7.1% 7.7%	12,413 18,854 18,680	1,266 1,482 1,486	11.4% 8.5% 8.6%	
Bensalem Blvd.	Bristol Pike (US 13)	Bridgewater Dr.	12,826	14,045	1,219	9.5%	14,121	1,295	10.1%	
Dunks Ferry Rd.***	Street Rd. (PA 132)	State Rd.	7,410	7,871	461	6.2%	8,289	879	11.9%	
Sub-Total			164,373	181,784	17,411	26.7%	180,535	16,162	9.8%	
Total			535,063	602,746	67,682	26.2%	604,508	69,445	13. 0 %	

* Flowed counts from Ramps to & from Street Road (PA 132) ** Consultant Counts

*** Estimated counts



The four ramps to and from I-95 at Street Road (PA 132) all add between two and three thousand vpd in 2030 under the No-Build compared to current volumes. However, in percentage terms, the northbound off-ramp and southbound on-ramp grow least, 18.4 percent to 15,377 vpd and 16.1 percent to 15,663, respectively. In contrast the percentage growth to and from the north is much higher. Traffic volume on the southbound I-95 off-ramp grows by 48.8 percent to 7,295 vpd while the NB I-95 on-ramp gains 53.2 percent to 8,302 vpd. All the above numbers assume that the I-95/ Pennsylvania Turnpike Interchange is not built. Construction of this interchange, as in the No-Build Plus I-95/ Pennsylvania Turnpike Interchange Alternative, has significant effects on the I-95/ Street Road (PA 132) ramps. Street Road (PA 132) traffic to and from the north is higher, at 7,753 vpd on the northbound I-95 off-ramp and 8,420 vpd on the I-95 northbound on-ramp. However, with the I-95/Pennsylvania Turnpike Interchange, the opposite effect occurs on I-95 ramps to and from the south as 2030 traffic volumes drop from 15,377 to 14,511 vpd on the I-95 northbound off-ramp and from 15,663 to 14,829 vpd on the I-95 southbound on-ramp.

Peak hour traffic flows are forecast, *figures 10-13*, showing AM and PM Peak Hour flows for years 2010 and 2030 and for the No-Build Alternative and No-Build Plus I-95/Pennsylvania Turnpike Interchange Alternative. These 2030 peak hour forecasts provide a basis for design. With any signalized design, locations of queue formation must be identified and analyzed. The first location is the I-95 northbound off-ramp, which currently has 990 vehicles in the AM peak and 1,067 in the PM peak. For the No-Build, values for traffic flows on this ramp rise to 1,427 in the AM peak hour, and 1,392 in the PM peak hour. For the No-Build Plus I-95/Pennsylvania Turnpike Interchange, these 2030 values are 1,376 and 1,295 vehicles in the AM and PM peak hours, respectively. In both cases, conditions on this ramp, currently failing at the peak hour, will significantly worsen. However, this is less severe with the I-95/Pennsylvania Turnpike Interchange. The second key location is eastbound from the Bristol Pike (US 13) ramps to the I-95 southbound. This problem is analyzed as a weave movement, next paragraph. Conditions here also worsen under either scenario, with the No-Build having slightly more traffic in the peak hour.

Projected 2010 and 2030 weave movements in the eastbound and westbound directions for the No-Build and No-Build Plus I-95/Pennsylvania Turnpike Interchange alternatives are shown *figures 14-21*. Weave movements remain a significant issue, especially for the No-Build Alternative, with 601 eastbound vehicles forecast in 2030 from Bristol Pike (US 13) merging with 1,657 vehicles on eastbound Street Road (PA 132). The total volume turning right onto I-95 Southbound is 808 in the AM peak hour, with 321 of those vehicles from Bristol Pike (US 13). Additionally, 103 vehicles from Bristol Pike (US 13) must cross all other eastbound traffic to turn left onto I-95 northbound. Inclusion of the I-95/Pennsylvania Turnpike Interchange reduces these conflicts slightly as 1,077 vehicles are forecast on Street Road (PA 132) eastbound and 544 eastbound from Bristol Pike (US 13) in 2030.



← 338 / 516 2030 No-Build Alternative AM / PM Peak Hour Turning Movements



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← 280 / 429 2010 No-Build Alternative AM / PM Peak Hour Turning Movements

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← 308 / 477 2030 No-Build Plus I-95/PA Turnpike Interchange Alternative AM / PM Peak Hour Turning Movements





← 268 / 413 2010 No-Build Plus I-95/PA TPKE Interchange Alternative AM / PM Peak Hour Turning Movements





Figure 14 I-95 Street Road (PA 132) Interchange 2030 No-Build Alternative Eastbound AM / PM Peak Hour Weave Movements







Figure 16 I-95 Street Road (PA 132) Interchange 2010 No-Build Alternative Eastbound AM / PM Peak Hour Weave Movements



Figure 17 I-95 Street Road (PA 132) Interchange 2010 No-Build Alternative Westbound AM / PM Peak Hour Weave Movements







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* Diagramed Lines Represent Traffic Movement Patterns, Not Lane Designations

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Figure 20 I-95 Street Road (PA 132) Interchange 2010 No-Bld Plus I-95/PA TPKE Interchange Alt. Eastbound AM / PM Pk Hr Weave Movements







B. Widened Diamond Alternative

The Widened Diamond Alternative provides for widening of most links and turn bays in the existing Street Road (PA 132)/I-95/Bristol Pike (US 13) complex and introduction of a traffic signal to meter eastbound Street Road (PA 132) and eastbound traffic from Bristol Pike (US 13) to Street Road (PA 132). To establish a worst case scenario for design of the ramps within this complex, the I-95/Pennsylvania Turnpike interchange is not included in this alternative as its inclusion decreases both Street Road (PA 132) and most I-95 ramp volumes. The forecasts under the Widened Diamond Alternative show slight increases in forecast traffic volumes for ramps at I-95, Street Road (PA 132) and Bristol Pike (US 13) relative to the No-Build.

The largest absolute change in volume from the No-Build Alternative to the Widened Diamond Alternative is for Street Road (PA 132) at 1,450 vpd between I-95 and Bristol Pike (US 13). This resulted from increased travel on all the I-95 ramps and on Street Road (PA 132) east of I-95. I-95 ramps increase by around 300 vpd to and from the north and by roughly 600 vpd to and from the south. Street Road (PA 132) gains 848 vpd approaching I-95 from Dunks Ferry Road. Mainline I-95 volumes change minimally, rising roughly 250 vpd in each direction north of the I-95/Street Road (PA 132) Interchange, and 600 vpd for the corresponding links south of Street Road (PA 132).

Other forecasted gains in volume between the No-Build and Widened Diamond alternatives exceeding 500 vpd include: Street Road (PA 132) from Hulmeville Road (PA 513) to State Road (556 to 848 vpd), State Road from Dunks Ferry Road to the Neshaminy Creek (682 vpd), Bristol Pike (US 13) from Street Road (PA 132) to Bensalem Boulevard (625 vpd), and Hulmeville Road (PA 513) from Brookwood Drive to Park Avenue (546 vpd). All other changes are between zero and five hundred vpd, except State Road south of Street Road (PA 132), which declined by 144 vpd.

Daily traffic forecast for both 2010 and 2030 under the Widened Diamond, Bristol Pike Ramp, and No-Build alternatives are shown *tables 3, 4* with 2030 and 2010 forecasts *figures 22, 23*. Peak hour traffic volume forecasts and weaving movement forecast for 2010 and 2030 for the Widened Diamond Interchange are shown *figures 24-29*.

With the Widened Diamond Alternative, all forecast 2030 peak hour movements increase slightly relative to the No-Build. As an example, eastbound volumes approaching I-95 are 2,320 vehicles in the AM peak hour and 1,409 vehicles in the PM peak hour, versus 2,258 and 1,366 vehicles, respectively, for the No-Build. Westbound traffic volumes on Street Road (PA 132) approaching I-95 increase from 816 vehicles in the AM peak hour and 1,993 vehicles in the PM peak hour with the No-Build Alternative to 841 and 2,043 vehicles, respectively, in the Widened Diamond Alternative. Finally, the northbound off-ramp from I-95 to Street Road (PA 132) increases to 1,485 and 1,459 vehicles in the AM and PM peak hours from 1,427 and 1,392 vehicles under the No-Build Alternative, with similar changes on the other I-95 ramps.

Table 3I-95 Street Road (PA 132) Interchange2030 No-Build, and 2030 Widened Diamond, Bristol Pike Ramp AlternativesAverage Daily Traffic Volumes

			2030	Widened Diamond			Bristol Pike Ramps			
Highway	Location		No-Bld	2030	Versu	us NB	2030 Vers		us NB	
Facility	From	То	AADT	AADT	Diff.	% Diff.	AADT	Diff.	% Diff.	
I-95 Main Line										
I-95 SB I-95 NB	PA 413 Street Rd. (PA 132)	Street Rd. (PA 132) PA 413	45,009 44,445	45,267 44,655	258 210	0.6% 0.5%	45,286 44,618	277 173	0.6% 0.4%	
I-95 SB I-95 NB	Street Rd. (PA 132) Woodhaven Rd. (PA 63)	Woodhaven Rd. (PA 63) Street Rd. (PA 132)	53,409 51,536	53,824 52,095	415 559	0.8% 1.1%	54,844 51,765	1,435 229	2.7% 0.4%	
Sub-Total			194,399	195,841	1,442	0.7%	196,514	2,115	1.1%	
I-95 Ramps						- 1				
I-95 SB Off-ramp I-95 NB On-ramp	I-95 SB Street Rd. (PA 132)	Street Rd. (PA 132) I-95 NB	7,295 8,302	7,641 8,582	346 279	4.7% 3.4%	7,525 8,537	230 235	3.1% 2.8%	
I-95 NB Off-ramp I-95 SB On-ramp	I-95 NB Street Rd. (PA 132)	Street Rd. (PA 132) I-95 SB	15,377 15,663	16,021 16,198	644 535	4.2% 3.4%	15,683 17,082 7,249 9,834	306 1,419	2.0% 9.1%	
Sub-Total			46,638	48,441	1,803	3.9%	48,827	2,190	4.7%	
Street Rd. (PA 132)						- 1				
Street Rd. (PA 132) Street Rd. (PA 132)	State Rd. Dunks Ferry Rd.	Dunks Ferry Rd. I-95	17,551 32,867	18,107 33,715	556 848	3.2% 2.6%	17,951 33,664	400 798	2.3% 2.4%	
Street Rd. (PA 132)	I-95	US 13 Ramps	43,508	44,958	1,450	3.3%	36,656	-6,852	-15.7%	
Street Rd. (PA 132) Street Rd. (PA 132) Street Rd. (PA 132)	US 13 Ramps Brookwood Dr. Hulmeville Rd. (PA 513)	Brookwood Dr. Hulmeville Rd. (PA 513) Knights Rd.	44,899 39,621 41,485	45,724 40,233 41,703	825 612 218	1.8% 1.5% 0.5%	44,397 39,198 41,487	-502 -422 2	-1.1% -1.1% 0.0%	
PA 132 WB Off-ramp PA 132 EB On-ramp	Street Rd. (PA 132) Bristol Pike (US 13)	Bristol Pike, US 13 Street Rd. (PA 132)	6,872 6,743	7,182 7,046	310 303	4.5% 4.5%	7,126 2,633	254 -4,110	3.7% -60.9%	
PA 132 WB On-ramp PA 132 EB Off-ramp	Bristol Pike (US 13) Street Rd. (PA 132)	Street Rd. (PA 132) Bristol Pike (US 13)	6,284 6,263	6,335 6,314	51 51	0.8% 0.8%	6,310 8,849	26 2,586	0.4% 41.3%	
Sub-Total			246,091	251,316	5,225	2.1%	238,272	-7,819	-3.2%	
Intersecting Roads						- 1				
State Rd. State Rd. State Rd.	Station Ave. Street Rd. (PA 132) Dunks Ferry Rd.	Street Rd. (PA 132) Dunks Ferry Rd. Neshaminy Creek	16,701 16,867 19,998	16,557 17,192 20,680	-144 325 682	-0.9% 1.9% 3.4%	16,617 17,111 20,571	-84 244 573	-0.5% 1.4% 2.9%	
Bristol Pike (US 13) Bristol Pike (US 13) Bristol Pike (US 13)	Station Ave. PA 132 Ramps Bensalem Blvd.	PA 132 Ramps Bensalem Blvd. Neshaminy Creek	18,170 28,770 23,362	18,459 29,395 23,739	289 625 377	1.6% 2.2% 1.6%	18,305 29,972 23,853	136 1,202 491	0.7% 4.2% 2.1%	
Brookwood Dr.	Street Rd. (PA 132)	Hulmeville Rd. (PA 513)	4,523	4,755	232	5.1%	4,431	-92	-2.0%	
Hulmeville Rd. (PA 513) Hulmeville Rd. (PA 513) Hulmeville Rd. (PA 513)	Woodbine Ave. Street Rd. (PA 132) Brookwood Dr.	Street Rd. (PA 132) Brookwood Dr. Park Ave.	14,390 20,477 20,541	14,321 20,791 21,086	-70 313 546	-0.5% 1.5% 2.7%	14,491 20,184 20,120	101 -293 -420	0.7% -1.4% -2.0%	
Bensalem Blvd.	Bristol Pike (US 13)	Bridgewater Dr.	15,898	16,147	248	1.6%	16,662	763	4.8%	
Dunks Ferry Rd.	Street Rd. (PA 132)	State Rd.	8,571	8,864	292	3.4%	8,969	397	4.6%	
Sub-Total			208,263	211,985	3,716	1.8%	211,287	3,018	1.4%	



Table 4I-95 Street Road (PA 132) Interchange2010 No-Build, and 2010 Widened Diamond, Bristol Pike Ramp AlternativesAverage Daily Traffic Volumes

			2010	Widene	ed Diam	nond	Bristol Pike Ramps			
Highway	Location		No-Bld	2010	Versu	s NB	2010	Vers	us NB	
Facility	From	То	AADT	AADT	Diff.	% Diff.	AADT	Diff.	% Diff.	
I-95 Main Line										
I-95 SB I-95 NB	PA 413 Street Rd. (PA 132)	Street Rd. (PA 132) PA 413	39,593 38,948	39,657 39,133	64 184	0.2% 0.5%	39,665 39,100	72 152	0.2% 0.4%	
I-95 SB I-95 NB	Street Rd. (PA 132) Woodhaven Rd. (PA 63)	Woodhaven Rd. (PA 63) Street Rd. (PA 132)	48,116 46,208	48,231 46,647	115 439	0.2% 1.0%	48,587 46,381	471 173	1.0% 0.4%	
Sub-Total			172,865	173,668	803	0.5%	173,733	868	0.5%	
I-95 Ramps			_			- 1				
I-95 SB Off-ramp I-95 NB On-ramp	I-95 SB Street Rd. (PA 132)	Street Rd. (PA 132) I-95 NB	5,853 6,563	5,999 6,684	146 121	2.5% 1.8%	6,521 7,352	669 790	11.4% 12.0%	
I-95 NB Off-ramp I-95 SB On-ramp	I-95 NB Street Rd. (PA 132)	Street Rd. (PA 132) I-95 SB	13,933 14,352	14,199 14,573	266 221	1.9% 1.5%	14,633 15,444 6,554 8,891	700 1,092	5.0% 7.6%	
Sub-Total			40,700	48,441	754	1.9%	43,951	3,251	8.0%	
Street Rd. (PA 132)			_			-				
Street Rd. (PA 132) Street Rd. (PA 132)	State Rd. Dunks Ferry Rd.	Dunks Ferry Rd. I-95	14,648 28,614	14,278 28,370	-370 -244	-2.5% -0.9%	15,969 30,634	1,321 2,020	9.0% 7.1%	
Street Rd. (PA 132)	I-95	US 13 Ramps	38,537	38,539	2	0.0%	37,785	-752	-2.0%	
Street Rd. (PA 132) Street Rd. (PA 132) Street Rd. (PA 132)	US 13 Ramps Brookwood Dr. Hulmeville Rd. (PA 513)	Brookwood Dr. Hulmeville Rd. (PA 513) Knights Rd.	37,662 32,325 34,389	37,426 32,005 33,910	-236 -320 -479	-0.6% -1.0% -1.4%	40,356 35,074 37,228	2,694 2,749 2,839	7.2% 8.5% 8.3%	
PA 132 WB Off-ramp PA 132 EB On-ramp	Street Rd. (PA 132) Bristol Pike (US 13)	Bristol Pike (US 13) Street Rd. (PA 132)	5,962 5,862	6,091 5,988	129 126	2.2% 2.1%	6,428 4,571	466 -1,291	7.8% -22.0%	
PA 132 WB On-ramp PA 132 EB Off-ramp	Bristol Pike (US 13) Street Rd. (PA 132)	Street Rd. (PA 132) Bristol Pike (US 13)	4,743 4,654	4,772 4,684	29 29	0.6% 0.6%	5,370 6,332	627 1,678	13.2% 36.0%	
Sub-Total			207,396	206,063	-1,333	-0.6%	219,747	12,350	6.0%	
Intersecting Roads			_			- 1				
State Rd. State Rd. State Rd.	Station Ave. PA 132, Street Rd. Dunks Ferry Rd.	Street Rd. (PA 132) Dunks Ferry Rd. Neshaminy Creek	14,241 14,636 17,316	14,197 14,779 17,604	-44 142 288	-0.3% 1.0% 1.7%	15,191 15,626 18,618	951 990 1,302	6.7% 6.8% 7.5%	
Bristol Pike (US 13) Bristol Pike (US 13) Bristol Pike (US 13)	Station Ave. PA 132 Ramps Bensalem Blvd.	PA 132 Ramps Bensalem Blvd. Neshaminy Creek	16,067 25,105 19,514	16,194 25,375 19,687	127 271 172	0.8% 1.1% 0.9%	16,962 27,051 21,250	896 1,947 1,735	5.6% 7.8% 8.9%	
Brookwood Dr.	Street Rd. (PA 132)	Hulmeville Rd. (PA 513)	3,431	3,530	99	2.9%	3,831	400	11.7%	
Hulmeville Rd. (PA 513) Hulmeville Rd. (PA 513) Hulmeville Rd. (PA 513)	Woodbine Ave. Street Rd. (PA 132) Brookwood Dr.	Street Rd. (PA 132) Brookwood Dr. Park Ave.	12,433 18,604 18,522	12,416 18,739 18,751	-17 136 229	-0.1% 0.7% 1.2%	13,257 19,236 19,161	823 632 640	6.6% 3.4% 3.5%	
Bensalem Blvd.	Bristol Pike (US 13)	Bridgewater Dr.	14,045	14,154	109	0.8%	15,092	1,047	7.5%	
Dunks Ferry Rd.	Street Rd. (PA 132)	State Rd.	7,871	7,991	120	1.5%	8,310	439	5.6%	
Sub-Total			181,778	183,418	1,634	0.9%	193,585	11,801	6.5%	





16.6 2030 Bristol Pike Ramp Alternative AADT (000s) 16.6 2030 Widened Diamond Alternative AADT (000s)

16.7 2030 No-Build Alternative AADT (000s)

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15.2 2010 Bristol Pike Ramp Alternative AADT (000s) 14.2 2010 Widened Diamond Alternative AADT (000s)

14.2 2010 No-Build Alternative AADT (000s)















Figure 27 I-95 Street Road (PA 132) Interchange 2030 Widened Diamond Alternative Westbound AM / PM Peak Hour Weave Movements



Figure 28 I-95 Street Road (PA 132) Interchange 2010 Widened Diamond Alternative Eastbound AM / PM Peak Hour Weave Movements

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Increases in traffic volume necessarily increase weave movements therefore, all weaving movements between Bristol Pike (US 13), Street Road (PA 132), and I-95 increase slightly. However, the pivotal eastbound movement on Street Road (PA 132) between the Bristol Pike (US 13) on-ramp and I-95 southbound ramps is no longer a weave condition, as each flow is separately metered by a traffic signal.

C. Bristol Pike Ramp Alternative

The Bristol Pike Ramp Alternative includes all of the Widened Diamond improvements (primarily widening) plus the addition of a new ramp directly to southbound I-95 from Bristol Pike (US 13). This ramp begins at the intersection of the existing eastbound off-ramp from Street Road (PA 132) to Bristol Pike (US 13). Also, the ramp from Bristol Pike (US 13) to eastbound Street Road (PA 132) is relocated to the north side of Street Rd and combined with the westbound on-ramp. As in the Widned Diamond, the I-95/Pennsylvania Turnpike interchange is not included in this alternative. This alternative has significant impacts on traffic flow through the study area.

Daily traffic forecasts for both 2010 and 2030 under the Bristol Pike Ramp, Widened Diamond, and No-Build alternatives are shown in *tables 3 and 4* (pages 49 and 50). With 2030 and 2010 forecasts shown in *figures 22, 23* (pages 51 and 52). Peak hour traffic volume forecasts and weaving movement forecast for 2010 and 2030 for the Bristol Pike Ramp Alternative are shown *figures 30-35*.

The proposed additional direct ramp to southbound I-95 from Bristol Pike (US 13) to I-95 southbound under the Bristol Pike Ramp Alternative is forecast to carry 6,600 vehicles per day (vpd). This ramp can be accessed via Street Road (PA 132) using the eastbound off-ramp directly onto the new I-95 southbound on-ramp, via the combination of Bensalem Boulevard and Bristol Pike (US 13), or via Bristol Pike (US 13). Traffic from eastbound Street Road (PA 132) causes either the existing southbound I-95 on-ramp or the proposed southbound I-95 on-ramp. For the Bristol Pike Ramp Alternative, Bensalem Boulevard, Bristol Pike (US 13), and the eastbound off-ramp from Street Road (PA 132) to Bristol Pike (US 13) are all forecast to have increased travel, while volume is decreased on Street Road (PA 132) between Hulmeville Road (PA 513) and I-95, and on Hulmeville Road (PA 513). Compared to the Widened Diamond alternative, I-95 main line volumes change by less than 50 vpd in either direction north of Street Road (PA 132), decrease by 330 vpd on northbound I-95 south of Street Road (PA 132), and increase by 1,020 vpd on southbound I-95 south of Street Road (PA 132). Forecasted 2030 traffic volumes on Street Road (PA 132) east of I-95 are similar to those for the Widened Diamond Alternative, decreasing by 56 vpd relative to the Widened Diamond Alternative to a total of 33,664 vpd. However, immediately west of I-95, volumes drop substantially relative to the Widened Diamond Alternative because of diversion to the new I-95 southbound on-ramp. Volume on Street Road (PA 132) between I-95 and Bristol Pike (US 13) ramps declines by 8,302 vpd relative to the Widened Diamond Alternative, to 36,656 vpd. Related reductions of 1,327 and 1,035 vpd are projected on the next two segments of Street Road (PA 132); from

Bristol Pike (US 13) to Brookwood Drive and then to Hulmeville Road (PA 513). West of Hulmeville Road (PA 513), forecasted volumes on Street Road (PA 132) are 216 vpd lower in the Bristol Pike Ramp Alternative than the Widened Diamond Alternative .

Traffic within the Street Road (PA 132)/Bristol Pike (US 13) interchange changes substantially as a result of the Bristol Pike Ramp Alternative. The smallest change in traffic volume relative to the Widened Diamond Alternative occurs on the westbound off-ramp from Street Road (PA 132) to Bristol Pike (US 13) which is forecast to have 7,126 vpd (56 vpd decrease) in 2030. The prior Street Road (PA 132) westbound on-ramp is used as a combined on-ramp from Bristol Pike (US 13), with forecasts of 2,633 vpd vehicles accessing eastbound Street Road (PA 132) plus 6,310 vpd heading to westbound Street Road (PA 132) for a total of 8,943 vpd under the Bristol Pike Ramp Alternative in 2030. Comparing against the Widened Diamond Alternative, this is a reduction of forecast 2030 traffic to eastbound Street Road (PA 132) of 4,413 vpd, and a decrease of 25 vehicles accessing westbound Street Road (PA 132). However, total traffic increases by 2,608 vpd as both traffic streams must use the single on-ramp. Traffic volumes on the eastbound off-ramp from Street Road (PA 132) to Bristol Pike (US 13) and the new I-95 southbound on-ramp, is forecast to increase by 2,535 vpd relative to the Widened Diamond Alternative.

Forecast traffic volumes on most local roads in the study area under the Bristol Pike Ramp Alternative are very similar to the Widened Diamond Alternative. Significant changes occur on Bensalem Boulevard and Bristol Pike (US 13) which are directly connected to the new I-95 southbound on-ramp. Traffic on Bristol Pike (US 13) in 2030 increases by 577 vpd north of Street Road (PA 132) to a total of 29,972 vpd. This increase continues as additional traffic on Bensalem Boulevard (increasing by 515 to a total of 16,662 vpd) and on Bristol Pike (US 13) north of Benslaem Boulevard (increasing 114 to a total of 23,853 vpd). However, traffic on Hulmeville Road (PA 513) in 2030 is forecast to be 20,120 vpd under the Bristol Pike Ramp Alternative, a decline of 966 vpd versus the Widened Diamond Alternative.

For the Bristol Pike Ramp Alternative, peak hour volumes follow a pattern similar to the AADTs. The largest changes are associated with the new I-95 southbound on-ramp, with a volume of 585 vehicles in the AM peak hour, and 493 vehicles in the PM peak hour. This increase is balanced by a reductions of 522 and 396 vehicles in the AM and PM peak hours, respectively, for the existing I-95 southbound on-ramp relative to the Widened Diamond Alternative. Thus, the total change in ramp volume entering southbound I-95 with the Bristol Pike Alternative is an additional 63 vehicles in the AM peak hour, and 97 vehicles in the PM peak hour versus the Widened Diamond Alternative. Through volumes on Street Road (PA 132) are slightly reduced relative to the Widened Diamond Alternative, with small differences on ramps to and from I-95 north of Street Road (PA 132). Volumes on Bensalem Boulevard increase by 43 in the AM peak hour, and 27 in the PM peak. This increase is counter-balanced by decreases in peak hour flows for Brookwood Drive (39 fewer AM , 59 fewer PM) and Hulmeville Road (PA 513) (34 fewer AM, 30 fewer PM). All other changes in forecast peak hour volumes from the Widened Diamond Alternative to the Bristol Pike Ramp Alternative are negligible at less than 10 vehicles per hour.

Weave conditions for Street Road (PA 132) westbound are similar to the Widened Diamond and will not be a substantial design constraint. Weave conflicts for eastbound Street Road (PA 132) are greatly improved, with much traffic using the new ramp, and a new signalized on-ramp from Bristol Pike (US 13) to Street Road (PA 132) eastbound. A reduction in volume on eastbound Street Road (PA 132) due to the new I-95 southbound on-ramp extends from the Bristol Pike (US 13) off-ramp to the existing I-95 southbound on-ramp.











Figure 32 I-95 Street Road (PA 132) Interchange 2030 Bristol Pike Ramp Alternative Eastbound AM / PM Peak Hour Weave Movements




Figure 33 I-95 Street Road (PA 132) Interchange 2030 Bristol Pike Ramp Alternative Westbound AM / PM Peak Hour Weave Movements







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Figure 35 I-95 Street Road (PA 132) Interchange 2010 Bristol Pike Ramp Alternative Westbound AM / PM Peak Hour Weave Movements



APPENDIX A 24-HOUR MACHINE TRAFFIC COUNTS

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Bensalem Boulevard	Bristol Pike (US 13) & Bridgewater Drive A-33

CONSULTANTS 2001 24 HOUR EXISTING TRAFFIC VOLUMES

Figure	A-1 Consultants	s 2001 24 Hour	Existing Traffi	VolumesA-	34
0					

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 ROAD: TR 95 SB DELAWARE EXPY
 FROM: TR 132
 TO: TR 413

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: 0095/0371/1000
 FC: 11

 PROJECT: INTER
 COUNT DIR: SOUTH
 TRAFFIC DIR: BOTH
 SPEED LIMIT: 55
 LOOP OR CLASS:

 STATION ID:
 DVRPC FILE #: 9247
 COUNTER: 9866
 WEATHER: F

Hour Ending	Tuesday 07/27/99	Wednesday 07/28/99	Thursday 07/29/99	Friday 07/30/99	Saturday 07/31/99
1 AM		558	565		
2 AM		432	438		
3 AM		377	397		
4 AM		388	430		
5 AM		554	584		
6 AM	1,384	1,336	1,337		
7 AM	2,541	2,454	2,458		
8 AM	2,790	2,836	2,822		
9 AM	2,558	2,536	2,532		
10 AM	2,155	2,221	1,976		
11 AM	2,266	2,152	2,268		
12 PM	2,252	2,182			
1 PM	2,201	2,210			
2 PM	2,124	2,182			
3 PM	2,340	2,362			
4 PM	2,694	2,679			
5 PM	2,932	2,840			
6 PM	3,122	3,072			
7 PM	2,608	2,662			
8 PM	1,956	2,130			
9 PM	1,644	1,683			
10 PM	1,322	1,432			
11 PM	1,156	1,236			
12 AM	801	876			
		43,390			
SEASONAL FACTOR:	.892 AADT:	35,917 AM PE	EAK %: 6	5.5 HOUR EN	DING: 8:00 AM
AXLE CORR. FACTOR:	.928	PM PE	EAK %: 7	.1 HOUR EN	DING: 6:00 PM

 ROAD:
 TR 95 NB DELAWARE EXPY
 FROM:
 TR 132
 TO:
 TR 413

 COUNTY:
 BUCKS
 MCD:
 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF:
 0095/0370/1000
 FC:
 11

 PROJECT:
 INTER
 COUNT DIR:
 NORTH
 TRAFFIC DIR:
 BOTH
 SPEED LIMIT:
 55
 LOOP OR CLASS:

 STATION ID:
 DVRPC FILE #:
 9246
 COUNTER:
 9765
 WEATHER:
 F

Hour Ending	Tuesday 07/27/99	Wednesday 07/28/99	Thursday 07/29/99	Friday S 07/30/99 (aturday)7/31/99
1 AM		594	848		
2 AM		373	488		
3 AM		386	464		
4 AM		343	362		
5 AM		544	464		
6 AM		986	950		
7 AM	2,115	2,154	2,109		
8 AM	2,851	2,832	2,753		
9 AM	2,696	2,748	2,750		
10 AM	2,104	2,122	2,132		
11 AM	1,948	1,953	1,940		
12 PM	2,074	2,000	2,036		
1 PM	1,962	1,988			
2 PM	2,054	2,131			
3 PM	2,405	2,354			
4 PM	2,516	2,665			
5 PM	2,682	2,892			
6 PM	3,022	3,206			
7 PM	2,864	2,644			
8 PM	1,987	1,898			
9 PM	1,592	1,598			
10 PM	1,494	1,456			
11 PM	1,420	1,310			
12 AM	934	1,114			
		42,291			
SEASONAL FACTOR:	.892 AADT:	35,007 AM PE	AK %: 6.7	HOUR ENDING	: 8:00 AM
AXLE CORR. FACTOR:	.928	PM PE	AK %: 7.6	6 HOUR ENDING	6:00 PM

DATE: 7/27/1999

DATE: 9/19/2000

 ROAD: TR 95 SB DELAWARE EXPY OFF RAMP
 FROM: TR 95 SB TO: TR 132 STREET RD

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: 8003/0500/0500
 FC: 14

 PROJECT: #NULL#
 COUNT DIR: SOUTH
 TRAFFIC DIR: SOUTH
 SPEED LIMIT: 25
 LOOP OR CLASS:

 STATION ID:
 DVRPC FILE #: 28793
 COUNTER: 9624
 WEATHER: F

Hour Ending	Tuesday 09/19/00	Wednesday 09/20/00	Thursday 09/21/00	F 09/	Friday Satur 22/00 09/23	day 5/00
1 AM		50	64			
2 AM		38	34			
3 AM		26	35			
4 AM		24	34			
5 AM		40	48			
6 AM		127	116			
7 AM		226	218			
8 AM		416	443			
9 AM		389	378			
10 AM	285	272	285			
11 AM	260	284	293			
12 PM	262	285	322			
1 PM	330	310	338			
2 PM	293	312	311			
3 PM	348	336	352			
4 PM	330	404	368			
5 PM	382	392	422			
6 PM	352	420	428			
7 PM	316	359	325			
8 PM	242	270	285			
9 PM	180	194				
10 PM	160	197				
11 PM	108	130				
12 AM	77	75				
		5,576				
SEASONAL FACTOR:	.919 AAI	DT: 4,904 AN	I PEAK %:	7.5	HOUR ENDING	: 8:00 AM
AXLE CORR. FACTOR:	.957	PN	I PEAK %:	7.5	HOUR ENDING	: 6:00 PM

DATE: 9/19/2000

 ROAD: TR 95 NB DELAWARE EXPY ON RAMP
 FROM: TR 132 STREET RD TO: TR 95 NB

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: 8003/0750/0500
 FC: 14

 PROJECT: #NULL#
 COUNT DIR: NORTH
 TRAFFIC DIR: NORTH
 SPEED LIMIT: 25
 LOOP OR CLASS:

 STATION ID:
 DVRPC FILE #: 28795
 COUNTER: 9786
 WEATHER: F

Hour Ending	Tuesday 09/19/00	Wednesday 09/20/00	Thursday 09/21/00	09	Friday /22/00	Saturday 09/23/00	
1 AM		70	60				
2 AM		36	31				
3 AM		29	36				
4 AM		38	49				
5 AM		50	69				
6 AM		100	126				
7 AM		268	290				
8 AM		486	481				
9 AM		428	434				
10 AM	332	338	300				
11 AM	282	308	277				
12 PM	276	319	320				
1 PM	312	323	325				
2 PM	348	347	372				
3 PM	347	372	384				
4 PM	355	412	422				
5 PM	410	489	506				
6 PM	566	566	546				
7 PM	338	410	342				
8 PM	228	262	294				
9 PM	156	163					
10 PM	118	147					
11 PM	109	118					
12 AM	76	83					
		6,162					
SEASONAL FACTOR:	.919 AAI	DT: 5,419 AM	VI PEAK %:	7.9	HOUR EN	NDING:	8:00 AM
AXLE CORR. FACTOR:	.957	PI	VI PEAK %:	9.2	HOUR EN	NDING:	6:00 PM

DATE: 9/19/2000

 ROAD: TR 95 NB DELAWARE EXPY OFF RAMP
 FROM: TR 95 NB TO: TR 132 STREET RD

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: 8003/0010/0500
 FC: 14

 PROJECT: #NULL#
 COUNT DIR: NORTH
 TRAFFIC DIR: NORTH
 SPEED LIMIT: 25
 LOOP OR CLASS:

 STATION ID:
 DVRPC FILE #: 28796
 COUNTER: 9625
 WEATHER: F

Hour Ending	Tuesday 09/19/00	Wednesday 09/20/00	Thursday 09/21/00	F 09/	riday Satu 22/00 09/2	ırday 23/00
1 AM		150	273			
2 AM		94	124			
3 AM		74	105			
4 AM		84	110			
5 AM		149	160			
6 AM		426	442			
7 AM		862	856			
8 AM		1,004	1,024			
9 AM		940	980			
10 AM	738	761	746			
11 AM	646	694	649			
12 PM	686	695	704			
1 PM	772	814	756			
2 PM	720	844	842			
3 PM	782	910	842			
4 PM	846	976	1,013			
5 PM	908	983	1,039			
6 PM	951	992	930			
7 PM	935	911	928			
8 PM	591	690	595			
9 PM	398	494				
10 PM	401	506				
11 PM	324	404				
12 AM	243	306				
		14,763				
SEASONAL FACTOR:	.919 AAD	DT: 12,984 A	M PEAK %:	6.8	HOUR ENDIN	G: 8:00 AM
AXLE CORR. FACTOR:	.957	P	M PEAK %:	6.7	HOUR ENDIN	G: 6:00 PM

DATE: 9/19/2000

 ROAD: TR 95 SB DELAWARE EXPY ON RAMP
 FROM: TR 132 STREET RD TO: TR 95 SB

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: 8003/0250/0500
 FC: 14

 PROJECT: #NULL#
 COUNT DIR: SOUTH
 TRAFFIC DIR: SOUTH
 SPEED LIMIT: 25
 LOOP OR CLASS:

 STATION ID:
 DVRPC FILE #: 28794
 COUNTER: 9320
 WEATHER: F

Hour Ending	Tuesday 09/19/00	Wednesda 09/20/	ay 00	Thursday 09/21/00	09	Friday /22/00	Saturday 09/23/00	/)
1 AM		9	96	126				
2 AM		8	80	101				
3 AM		7	76	90				
4 AM		12	26	142				
5 AM		19	96	220				
6 AM		62	24	629				
7 AM		1,12	22	1,086				
8 AM		99	97	1,034				
9 AM		87	74	881				
10 AM		84	48	839				
11 AM		79	98	785				
12 PM		82	22	833				
1 PM		78	81	792				
2 PM		75	50	766				
3 PM		79	96	787				
4 PM		90	08	916				
5 PM		1,1	52	1,145				
6 PM	1,124	1,19	94					
7 PM	782	88	86					
8 PM	575	67	72					
9 PM	454	49	92					
10 PM	368	39	90					
11 PM	288	39	98					
12 AM	208	26	60					
		15,33	38					
SEASONAL FACTOR:	.919 AAD	T: 13,490	AM P	EAK %:	7.3	HOUR	ENDING:	7:00 AM
AXLE CORR. FACTOR:	.957		PM P	EAK %:	7.8	HOUR	ENDING:	6:00 PM

DATE: 5/5/1999

 ROAD:
 TR 132
 STREET RD
 FROM:
 MOORE AV
 TO:
 DUNKS
 FERRY RD

 COUNTY:
 BUCKS
 MCD:
 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF:
 2007/0010/1500
 FC:
 16

 PROJECT:
 PAB99
 COUNT DIR:
 BOTH
 TRAFFIC DIR:
 BOTH
 SPEED LIMIT:
 40
 LOOP OR CLASS:

 STATION ID:
 17395
 DVRPC FILE #:
 6395
 COUNTER:
 9629
 WEATHER:
 F

Hour	Wednesday	Thursday	/ Friday	Sat	urday Sund	dav
Ending	05/05/99	05/06/99	05/07/99	05	/08/99 05/09	/99
1 AM		154	4 162			
2 AM		13	146 I			
2 AM		10	1 1 1 2 5			
2 AM		22	206			
5 AM		21(200			
6 AM		35/	223 1 376			
7 AM		707	7 684			
8 AM	834	816	S 767			
	802	81/	1 750			
9 AM	723	607	+ 759 7 704			
11 AM	725	710	704			
12 DM	730	710) >			
12 FW	704 921	950				
	001	0.00))			
2 PM	020	040	>			
3 PW	040	910	,			
4 PM	910	902	+			
5 PM	935	896	5			
6 PM	974	950)			
7 PM	588	576	Ď			
8 PM	454	466	Ď			
9 PM	350	364	1			
10 PM	277	269	9			
11 PM	198	218	3			
12 AM	165	170)			
		13,150)			
SEASONAL FACTOR:	.925 AAD	T: 11,726	AM PEAK %:	6.2	HOUR ENDING	: 8:00 AM
AXLE CORR. FACTOR:	.964	I	PM PEAK %:	7.2	HOUR ENDING	: 6:00 PM

DATE: 4/3/2001

 ROAD: TR 132 EB STREET RD
 FROM: BRISTOL PK RAMP
 TO: DUNKS FERRY RD

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: 0132/0312/2500
 FC: 14

 PROJECT: PAB01
 COUNT DIR: EAST
 TRAFFIC DIR: BOTH
 SPEED LIMIT: 40
 LOOP OR CLASS:

 STATION ID: 32705
 DVRPC FILE #: 29804
 COUNTER: 9948
 WEATHER: F

Hour Ending	Tuesday 04/03/01	Wednesday 04/04/07	/ Thursday I 04/05/01	04	Friday 1/06/01	Saturday 04/07/01	/ I
1 AM		164	1 175				
2 AM		126	5 121				
3 AM		102	2 108				
4 AM		124	138				
5 AM		182	2 160				
6 AM		456	6 428				
7 AM		875	5 858				
8 AM		1,213	3 1,169				
9 AM		1,329	9 1,330				
10 AM	834	826	3				
11 AM	639	640)				
12 PM	686	692	2				
1 PM	867	866	6				
2 PM	934	976	6				
3 PM	862	826	6				
4 PM	826	826	6				
5 PM	758	766	6				
6 PM	652	688	3				
7 PM	530	577	7				
8 PM	387	376	6				
9 PM	282	330)				
10 PM	273	338	3				
11 PM	210	206	6				
12 AM	175	167	7				
		13,67	1				
SEASONAL FACTOR:	.955 AAD	DT: 12,338	AM PEAK %:	9.7	HOUR E	NDING:	9:00 AM
AXLE CORR. FACTOR:	.945	l	PM PEAK %:	7.1	HOUR E	NDING:	2:00 PM

DATE: 4/3/2001

 ROAD: TR 132 WB STREET RD
 FROM: BRISTOL PK RAMP
 TO: DUNKS FERRY RD

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: 0132/0313/2500
 FC: 14

 PROJECT: PAB01
 COUNT DIR: WEST
 TRAFFIC DIR: BOTH
 SPEED LIMIT: 40
 LOOP OR CLASS:

 STATION ID: 32705
 DVRPC FILE #: 29805
 COUNTER: 9833
 WEATHER: F

Hour Ending	Tuesday 04/03/01	Wednesday 04/04/01	Thursday 04/05/01	04	Friday Satu /06/01 04/	urday 07/01
1 AM		138	135			
2 AM		126	114			
3 AM		94	94			
4 AM		135	150			
5 AM		178	178			
6 AM		280	256			
7 AM		500	530			
8 AM		589	588			
9 AM		730	796			
10 AM		642	612			
11 AM	634	632				
12 PM	719	787				
1 PM	1,010	919				
2 PM	822	866				
3 PM	848	862				
4 PM	1,058	1,010				
5 PM	1,379	1,257				
6 PM	1,566	1,584				
7 PM	800	866				
8 PM	452	476				
9 PM	288	365				
10 PM	224	282				
11 PM	260	267				
12 AM	232	232	_			
		13,817				
SEASONAL FACTOR:	.955 AAD	T: 12,469 A	M PEAK %:	5.7	HOUR ENDIN	IG: 12:00 PM
AXLE CORR. FACTOR:	.945	P	M PEAK %:	11.5	HOUR ENDIN	IG: 6:00 PM

DATE: 12/13/1999

 ROAD: TR 132 EB STREET RD
 FROM: TR 13 RAMP
 TO: TR 95 RAMP

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: 0132/0312/2500
 FC: 14

 PROJECT: 6-0 74
 COUNT DIR: EAST
 TRAFFIC DIR: BOTH
 SPEED LIMIT: 45
 LOOP OR CLASS:

 STATION ID: 32705
 DVRPC FILE #: 26422
 COUNTER: 9990
 WEATHER: F

Hour Ending	Monday 12/13/99	Tuesday 12/14/99	Wednesday 12/15/99	Thur 12/1	sday Frida 16/99 12/17/9	y 9
1 AM		177	196			
2 AM		100	111			
3 AM		103	100			
4 AM		153	141			
5 AM		216	229			
6 AM		633	667			
7 AM		1,464	1,476			
8 AM		1,711	1,782			
9 AM		1,415	1,534			
10 AM	1,127	1,131	1,192			
11 AM	1,072	993	1,079			
12 PM	996	932	1,137			
1 PM	1,161	1,107				
2 PM	1,300	1,224				
3 PM	1,235	1,189				
4 PM	1,223	1,287				
5 PM	1,347	1,345				
6 PM	1,211	1,179				
7 PM	947	988				
8 PM	659	735				
9 PM	550	581				
10 PM	482	595				
11 PM	364	399				
12 AM	295	327				
		19,984				
SEASONAL FACTOR:	.942 AAD	T: 18,034 A	M PEAK %:	8.6	HOUR ENDING:	8:00 AM
AXLE CORR. FACTOR:	.958	Р	M PEAK %:	6.7	HOUR ENDING:	5:00 PM

DATE: 12/13/1999

 ROAD: TR 132 WB STREET RD
 FROM: TR 13 RAMP
 TO: TR 95 RAMP

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: 0132/0313/2500
 FC: 14

 PROJECT: 6-0 74
 COUNT DIR: WEST
 TRAFFIC DIR: BOTH
 SPEED LIMIT: 45
 LOOP OR CLASS:

 STATION ID: 32705
 DVRPC FILE #: 26423
 COUNTER: 9991
 WEATHER: F

Hour Ending	Monday 12/13/99	Tuesday 12/14/99	Wednesday 12/15/99	Thurs 12/1	day Frida 6/99 12/17/9	y 9
1 AM		191	232			
2 AM		138	159			
3 AM		78	121			
4 AM		115	127			
5 AM		128	159			
6 AM		382	400			
7 AM		810	863			
8 AM		1,018	1,138			
9 AM		1,013	1,095			
10 AM	927	885	919			
11 AM	924	815	1,013			
12 PM	1,170	1,039	1,169			
1 PM	1,224	1,113	1,233			
2 PM	1,058	998				
3 PM	1,145	1,113				
4 PM	1,232	1,286				
5 PM	1,495	1,447				
6 PM	1,509	1,507				
7 PM	1,145	1,223				
8 PM	758	769				
9 PM	566	644				
10 PM	462	484				
11 PM	378	465				
12 AM	286	318				
		17,979				
SEASONAL FACTOR:	.942 AADT:	16,225 AN	I PEAK %:	5.8	HOUR ENDING:	12:00 PM
AXLE CORR. FACTOR:	.958	PN	I PEAK %:	8.4	Hour Ending:	6:00 PM

DATE: 12/1/1999

 ROAD: TR 132 EB STREET RD
 FROM: TR 13
 TO: BROOKWOOD DR

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: 0132/0312/1500
 FC: 14

 PROJECT: TPKE
 COUNT DIR: EAST
 TRAFFIC DIR: BOTH
 SPEED LIMIT: 45
 LOOP OR CLASS:

 STATION ID: 12591
 DVRPC FILE #: 10242
 COUNTER: 9769
 WEATHER: F

Hour Ending	Wednesday 12/01/99	Thursd 12/02/	ay Fri '99 12/03	day 3/99	Sat 12	urday /04/99	Sunday 12/05/99)
1 AM		1	55	174				
2 AM		1	08	118				
3 AM			78	68				
4 AM			89	106				
5 AM		1	34	146				
6 AM		4	73	476				
7 AM		1,1	03 1,	106				
8 AM		1,3	75 1,	330				
9 AM		1,2	17					
10 AM		9	52					
11 AM		9	36					
12 PM	916	9	96					
1 PM	1,135	1,1	80					
2 PM	1,206	1,2	42					
3 PM	1,056	1,1	32					
4 PM	1,076	1,1	66					
5 PM	1,163	1,1	44					
6 PM	1,084	1,1	06					
7 PM	952	9	60					
8 PM	766	7	76					
9 PM	592	6	34					
10 PM	490	5	43					
11 PM	312	3	72					
12 AM	208	2	58					
		18,1	29					
SEASONAL FACTOR:	.942 AADT	T: 16,360	AM PEAK %	b:	7.6	HOUR EN	DING:	8:00 AM
AXLE CORR. FACTOR:	.958		PM PEAK %	b:	6.9	HOUR EN	DING:	2:00 PM

DATE: 12/1/1999

 ROAD:
 TR 132 WB STREET RD
 FROM:
 TR 13
 TO:
 BROOKWOOD DR

 COUNTY:
 BUCKS
 MCD:
 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF:
 0132/0313/1500
 FC:
 14

 PROJECT:
 TPKE
 COUNT DIR:
 WEST
 TRAFFIC DIR:
 BOTH
 SPEED LIMIT:
 45
 LOOP OR CLASS:

 STATION ID:
 12591
 DVRPC FILE #:
 10243
 COUNTER:
 9768
 WEATHER:
 F

Hour Ending	Wednesday 12/01/99	Thursday 12/02/99	Friday 12/03/99	Sat 12	turday Sund 2/04/99 12/05/2	ay 99
1 AM		156	164			
2 AM		124	116			
3 AM		86	88			
4 AM		102	98			
5 AM		123	139			
6 AM		308	326			
7 AM		622				
8 AM		825				
9 AM		908				
10 AM		861				
11 AM	874	935				
12 PM	1,038	1,072				
1 PM	1,193	1,168				
2 PM	1,076	1,048				
3 PM	1,111	1,110				
4 PM	1,116	1,154				
5 PM	1,336	1,343				
6 PM	1,593	1,517				
7 PM	1,190	1,178				
8 PM	826	826				
9 PM	614	600				
10 PM	502	486				
11 PM	416	400				
12 AM	269	263	_			
		17,215				
SEASONAL FACTOR:	.942 AADT	: 15,535 A	M PEAK %:	6.2	HOUR ENDING:	12:00 PM
AXLE CORR. FACTOR:	.958	Р	M PEAK %:	8.8	HOUR ENDING:	6:00 PM

DATE: 11/1/1999

 ROAD: TR 132 EB STREET RD
 FROM: TR 513
 TO: BROOKWOOD DR

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: 0132/0302/1500
 FC: 14

 PROJECT: TPKE
 COUNT DIR: EAST
 TRAFFIC DIR: BOTH
 SPEED LIMIT: 45
 LOOP OR CLASS:

 STATION ID: 12591
 DVRPC FILE #: 9413
 COUNTER: 9952
 WEATHER: F

Hour Ending	Monday 11/01/99	Tuesday 11/02/99	Wednesday 11/03/99	Thu 11/	rsday Frid /04/99 11/05/	lay /99
1 AM		152	171			
2 AM		94	94			
3 AM		75	78			
4 AM		76	66			
5 AM		146	136			
6 AM		388	368			
7 AM		872	930			
8 AM		1,124	1,164			
9 AM		993	1,008			
10 AM		820	856			
11 AM		824	800			
12 PM		863	874			
1 PM	950	980				
2 PM	998	954				
3 PM	966	987				
4 PM	960	992				
5 PM	1,062	1,000				
6 PM	1,081	994				
7 PM	842	820				
8 PM	678	658				
9 PM	519	484				
10 PM	472	421				
11 PM	307	332				
12 AM	232	248	-			
		15,297				
SEASONAL FACTOR:	.932 AADT	: 13,658 A	M PEAK %:	7.3	HOUR ENDING:	8:00 AM
AXLE CORR. FACTOR:	.958	F	M PEAK %:	6.5	HOUR ENDING:	5:00 PM

DATE: 11/1/1999

 ROAD: TR 132 WB STREET RD
 FROM: TR 513
 TO: BROOKWOOD DR

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: 0132/0303/1500
 FC: 14

 PROJECT: TPKE
 COUNT DIR: WEST
 TRAFFIC DIR: BOTH
 SPEED LIMIT: 45
 LOOP OR CLASS:

 STATION ID: 12591
 DVRPC FILE #: 9414
 COUNTER: 9837
 WEATHER: F

Hour Ending	Monday 11/01/99	Tuesday 11/02/99	Wednesday 11/03/99	Thu 11/	rsday Frida 04/99 11/05/9	ay 99
1 AM		144	152			
2 AM		84	92			
3 AM		72	81			
4 AM		75	76			
5 AM		94	98			
6 AM		282	277			
7 AM		552	548			
8 AM		704	748			
9 AM		880	906			
10 AM		782	784			
11 AM		858	850			
12 PM		958	954			
1 PM	1,058	1,013				
2 PM	956	916				
3 PM	968	876				
4 PM	914	889				
5 PM	1,015	1,061				
6 PM	1,346	1,162				
7 PM	960	918				
8 PM	690	684				
9 PM	450	436				
10 PM	422	420				
11 PM	278	298				
12 AM	206	246				
		14,404				
SEASONAL FACTOR:	.932 AADT	: 12,861 Al	VI PEAK %:	6.7	HOUR ENDING:	12:00 PM
AXLE CORR. FACTOR:	.958	PI	M PEAK %:	8.1	HOUR ENDING:	6:00 PM

DATE: 11/1/1999

 ROAD: TR 132 EB STREET RD
 FROM: KNIGHTS RD
 TO: TR 513

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: 0132/0292/1000
 FC: 14

 PROJECT: TPKE
 COUNT DIR: EAST
 TRAFFIC DIR: BOTH
 SPEED LIMIT: 45
 LOOP OR CLASS:

 STATION ID: 32704
 DVRPC FILE #: 9415
 COUNTER: 9957
 WEATHER: F

Hour Ending	Monday 11/01/99	Tuesday 11/02/99	Wednesday 11/03/99	Thu 11/	rsday Frida /04/99 11/05/9	y 9
1 AM		154	142			
2 AM		82	86			
3 AM		63	66			
4 AM		72	66			
5 AM		138	118			
6 AM		321	330			
7 AM		716	734			
8 AM		1,019	1,094			
9 AM		926	963			
10 AM		881	923			
11 AM		891	891			
12 PM	997	1,062				
1 PM	1,135	1,136				
2 PM	1,056	1,028				
3 PM	1,040	1,028				
4 PM	1,048	1,058				
5 PM	1,179	1,147				
6 PM	1,236	1,115				
7 PM	1,021	1,004				
8 PM	782	760				
9 PM	583	525				
10 PM	504	440				
11 PM	310	336				
12 AM	236	244				
		16,146				
SEASONAL FACTOR:	.932 AADT:	14,416 AM	M PEAK %:	6.6	HOUR ENDING:	12:00 PM
AXLE CORR. FACTOR:	.958	PI	I PEAK %:	7.1	HOUR ENDING:	5:00 PM

DATE: 11/1/1999

 ROAD: TR 132 WB STREET RD
 FROM: KNIGHTS RD
 TO: TR 513

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: 0132/0293/1000
 FC: 14

 PROJECT: TPKE
 COUNT DIR: WEST
 TRAFFIC DIR: BOTH
 SPEED LIMIT: 45
 LOOP OR CLASS:

 STATION ID: 32704
 DVRPC FILE #: 9416
 COUNTER: 9956
 WEATHER: F

Hour Ending	Monday 11/01/99	Tuesday 11/02/99	Wednesday 11/03/99	Thu 11/	rsday Frida /04/99 11/05/9	y 9
1 AM		123	126			
2 AM		82	78			
3 AM		67	70			
4 AM		86	80			
5 AM		112	118			
6 AM		301	297			
7 AM		638	632			
8 AM		782	805			
9 AM		910	906			
10 AM		853	849			
11 AM		970	910			
12 PM	1,016	1,031				
1 PM	1,140	1,072				
2 PM	1,159	1,108				
3 PM	1,096	1,116				
4 PM	1,048	1,097				
5 PM	1,082	1,112				
6 PM	1,312	1,272				
7 PM	1,024	1,012				
8 PM	745	777				
9 PM	546	526				
10 PM	418	438				
11 PM	285	306				
12 AM	204	224				
		16,015				
SEASONAL FACTOR:	.932 AADT:	14,299 AN	M PEAK %:	6.4	HOUR ENDING:	12:00 PM
AXLE CORR. FACTOR:	.958	PI	VI PEAK %:	7.9	HOUR ENDING:	6:00 PM

DATE: 12/12/2001

 ROAD: TR 132 WB OFF RAMP
 FROM: STREET RD WB
 TO: BRISTOL PK

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: //
 FC: 14

 PROJECT: 142-130-002
 COUNT DIR: WEST
 TRAFFIC DIR:
 SPEED LIMIT: 25
 LOOP OR CLASS:

 STATION ID:
 DVRPC FILE #: 31209
 COUNTER: 9789
 WEATHER: F

Hour Ending	Wednesday 12/12/01	Thursd 12/13/	ay Frid 01 12/14/	ay 9 01	Saturday 12/15/01	Sunday 12/16/01	/
1 AM			92	68			
2 AM			38	42			
3 AM			40	34			
4 AM			54	49			
5 AM			54	38			
6 AM			88	96			
7 AM		2	96 2	79			
8 AM		5	16 5	01			
9 AM		4	28 4	26			
10 AM		3	79				
11 AM		2	50				
12 PM	102	2	94				
1 PM	295	3	00				
2 PM	270	2	58				
3 PM	336	3	56				
4 PM	450	4	36				
5 PM	492	5	10				
6 PM	424	4	66				
7 PM	378	3	38				
8 PM	260	2	25				
9 PM	187	1	74				
10 PM	176	1	74				
11 PM	178	1	66				
12 AM	78	1	06				
		6,0	38				
SEASONAL FACTOR:	.94 AADT	: 5,364	AM PEAK %:	8.	5 HOUI	R ENDING:	8:00 AM
AXLE CORR. FACTOR:	.945		PM PEAK %:	8.	4 HOUI	R ENDING:	5:00 PM

DATE: 11/26/2001

 ROAD: TR 132 EB ON RAMP
 FROM: BRISTOL PK
 TO: STREET RD EB

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: //
 FC: 14

 PROJECT: 142-130-003
 COUNT DIR: EAST
 TRAFFIC DIR: EAST
 SPEED LIMIT: 25
 LOOP OR CLASS:

 STATION ID:
 DVRPC FILE #: 31208
 COUNTER: 9891
 WEATHER: F

Hour Ending	Monday 11/26/01	Tuesday 11/27/01	Wednesday 11/28/01	Thւ 11	ırsday Fric /29/01 11/30	lay /01
1 AM		59	53			
2 AM		48	56			
3 AM		22	34			
4 AM		42	36			
5 AM		47	68			
6 AM		88	104			
7 AM		302	292			
8 AM		448				
9 AM		418				
10 AM		318				
11 AM	264	287				
12 PM	306	268				
1 PM	300	296				
2 PM	287	306				
3 PM	378	386				
4 PM	482	484				
5 PM	537	540				
6 PM	528	488				
7 PM	423	408				
8 PM	204	230				
9 PM	183	190				
10 PM	162	144				
11 PM	102	92				
12 AM	74	80				
		5,991				
SEASONAL FACTOR:	.933 AADT:	5,282 AM	M PEAK %:	7.5	HOUR ENDING	: 8:00 AM
AXLE CORR. FACTOR:	.945	PI	M PEAK %:	9.	HOUR ENDING	: 5:00 PM

DATE: 11/26/2001

 ROAD: TR 132 WB ON RAMP
 FROM: BRISTOL PK
 TO: STREET RD WB

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: //
 FC: 14

 PROJECT: 142-130-001
 COUNT DIR: WEST
 TRAFFIC DIR: WEST
 SPEED LIMIT: 20
 LOOP OR CLASS:

 STATION ID:
 DVRPC FILE #: 31210
 COUNTER: 9893
 WEATHER: F

Hour Ending	Monday 11/26/01	Tuesday 11/27/01	Wednesday 11/28/01	Thւ 11	ırsday Fric /29/01 11/30	lay /01
1 AM		38	36			
2 AM		16	16			
3 AM		13	13			
4 AM		20	15			
5 AM		29	34			
6 AM		84	76			
7 AM		166	164			
8 AM		259				
9 AM		246				
10 AM		264				
11 AM		227				
12 PM	273	244				
1 PM	304	286				
2 PM	270	270				
3 PM	291	266				
4 PM	290	297				
5 PM	342	328				
6 PM	314	375				
7 PM	265	250				
8 PM	190	167				
9 PM	159	136				
10 PM	130	132				
11 PM	62	70				
12 AM	56	48	-			
		4,231				
SEASONAL FACTOR:	.933 AADT	3 ,730 A	M PEAK %:	6.2	HOUR ENDING	: 10:00 AM
AXLE CORR. FACTOR:	.945	Р	M PEAK %:	8.9	HOUR ENDING	6:00 PM

DATE: 11/26/2001

 ROAD: TR 132 EB OFF RAMP
 FROM: STREET RD EB
 TO: TR 13

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: //
 FC: 14

 PROJECT: 142-130-004
 COUNT DIR: EAST
 TRAFFIC DIR: EAST
 SPEED LIMIT: 25
 LOOP OR CLASS:

 STATION ID:
 DVRPC FILE #: 31207
 COUNTER: 9895
 WEATHER: F

Hour Ending	Monday 11/26/01	Tuesday 11/27/01	Wednesday 11/28/01	Thւ 11	ırsday Frida /29/01 11/30/0	ay)1
1 AM		37	45			
2 AM		31	32			
3 AM		24	23			
4 AM		33	40			
5 AM		44	49			
6 AM		152	154			
7 AM		352	382			
8 AM		438				
9 AM		295				
10 AM		224				
11 AM		168				
12 PM	123	153				
1 PM	148	160				
2 PM	156	182				
3 PM	196	258				
4 PM	214	282				
5 PM	199	276				
6 PM	260	311				
7 PM	182	214				
8 PM	104	134				
9 PM	68	95				
10 PM	73	108				
11 PM	60	71				
12 AM	38	44	_			
		4,086				
SEASONAL FACTOR:	.933 AADT	: 3,597 A	M PEAK %:	10.7	HOUR ENDING:	8:00 AM
AXLE CORR. FACTOR:	.945	Р	M PEAK %:	7.6	HOUR ENDING:	6:00 PM

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DATE: 11/1/1999

 ROAD: STATE RD
 FROM: TR 132
 TO: WINKS LA

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: 2002/0080/1000
 FC: 16

 PROJECT: TPKE
 COUNT DIR: BOTH
 TRAFFIC DIR: BOTH
 SPEED LIMIT: 40
 LOOP OR CLASS:

 STATION ID: 25220
 DVRPC FILE #: 9427
 COUNTER: 9870
 WEATHER: F

Hour Ending	Monday 11/01/99	Tuesday 11/02/99	Wednesday 11/03/99	Thur: 11/0	sday Frida 14/99 11/05/9	y 9
1 AM		118	125			
2 AM		78	74			
3 AM		71	54			
4 AM		94	78			
5 AM		161	144			
6 AM		389	355			
7 AM		836	863			
8 AM		1,126	1,148			
9 AM		1,116	1,046			
10 AM	718	713	698			
11 AM	682	688				
12 PM	724	738				
1 PM	828	854				
2 PM	843	849				
3 PM	923	938				
4 PM	1,061	1,076				
5 PM	1,171	1,214				
6 PM	1,354	1,331				
7 PM	639	654				
8 PM	432	412				
9 PM	300	305				
10 PM	244	248				
11 PM	161	179				
12 AM	174	178				
		14,366				
SEASONAL FACTOR:	.951 AADT	: 13,170 AM	I PEAK %:	7.8	HOUR ENDING:	8:00 AM
AXLE CORR. FACTOR:	.964	PN	I PEAK %:	9.3	HOUR ENDING:	6:00 PM

DATE: 4/3/2001

 ROAD: STATE RD
 FROM: STREET RD
 TO: HAUNTED LA

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: 2002/0080/1500
 FC: 16

 PROJECT: PAB01
 COUNT DIR: BOTH
 TRAFFIC DIR: BOTH
 SPEED LIMIT: 35
 LOOP OR CLASS:

 STATION ID: 25220
 DVRPC FILE #: 29888
 COUNTER: 99988
 WEATHER: F

Hour Ending	Tuesday 04/03/01	Wednesda 04/04/0	y Thursda 1 04/05/0	y 1 04	Friday I/06/01	Saturday 04/07/01	
1 AM		14	9 14	7			
2 AM		8	1 8	6			
3 AM		6	7 9	9			
4 AM		7	7 10	0			
5 AM		13	1 15	6			
6 AM		39	6 36	4			
7 AM		93	5 89	6			
8 AM		1,17	6 1,12	9			
9 AM		1,20	7 1,25	1			
10 AM		79	2				
11 AM		68	7				
12 PM	779	80	6				
1 PM	977	90	2				
2 PM	897	93	5				
3 PM	1,025	1,02	2				
4 PM	1,273	1,20	8				
5 PM	1,403	1,40	4				
6 PM	1,680	1,68	0				
7 PM	880	95	8				
8 PM	567	60	5				
9 PM	374	48	4				
10 PM	358	40	5				
11 PM	260	24	6				
12 AM	192	17	7				
		16,53	0				
SEASONAL FACTOR:	.965 AAD	T: 15,553	AM PEAK %:	7.3	HOUR EN	IDING:	9:00 AM
AXLE CORR. FACTOR:	.975		PM PEAK %:	10.2	HOUR EN	IDING:	6:00 PM

DATE: 5/18/1999

 ROAD: TR 13 BRISTOL PK
 FROM: WILLIAMS ST
 TO: WOODBINE AVE

 COUNTY: BUCKS
 MCD: 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF: 0013/0060/2000
 FC: 14

 PROJECT: PAB99
 COUNT DIR: BOTH
 TRAFFIC DIR: BOTH
 SPEED LIMIT: 35
 LOOP OR CLASS:

 STATION ID: 11446
 DVRPC FILE #: 6180
 COUNTER: 9163
 WEATHER: F

Hour Ending	Tuesday 05/18/99	Wednesd 05/19/	ay Thursda 99 05/20/9	ay 99 0	Friday 5/21/99	Saturday 05/22/99	/ Э
1 AM		1:	22 14	47			
2 AM		(65	70			
3 AM		4	52 క	51			
4 AM			49	71			
5 AM			62 6	67			
6 AM		24	49 23	37			
7 AM		6	66 67	79			
8 AM		1,1	11 1,10)2			
9 AM		1,0	03				
10 AM		8	61				
11 AM	862	7	77				
12 PM	931	8	77				
1 PM	996	98	85				
2 PM	1,014	9	77				
3 PM	1,123	1,1	64				
4 PM	1,174	1,1	16				
5 PM	1,226	1,2	45				
6 PM	1,269	1,2	80				
7 PM	1,057	1,2	22				
8 PM	875	8	94				
9 PM	600	7	15				
10 PM	454	5	30				
11 PM	343	3	02				
12 AM	186	2	11				
		16,5	35				
SEASONAL FACTOR:	.927 AAD	T: 14,684	AM PEAK %:	6.7	HOUR	ENDING:	8:00 AM
AXLE CORR. FACTOR:	.958		PM PEAK %:	7.7	HOUR	ENDING:	6:00 PM

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DATE: 5/24/2000

 ROAD:
 TR 13
 BRISTOL PK
 FROM:
 TR 132
 RAMPS
 TO:
 BENSALEM
 BLVD

 COUNTY:
 BUCKS
 MCD:
 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF:
 0013/0100/0500
 FC:
 14

 PROJECT:
 PAB00
 COUNT DIR:
 BOTH
 TRAFFIC DIR:
 BOTH
 SPEED LIMIT:
 40
 LOOP OR CLASS:

 STATION ID:
 11447
 DVRPC FILE #:
 26784
 COUNTER:
 9787
 WEATHER:
 F

Hour Ending	Wednesday 05/24/00	Thursday 05/25/00	y Friday 0 05/26/00	/ Sa) 05	turday Si 5/27/00 05	unday /28/00
1 AM		250) 27 ²	l		
2 AM		160	0 183	3		
3 AM		132	2 14'			
4 AM		114	4 144	1		
5 AM		183	3 23 ²			
6 AM		562	2 542	2		
7 AM		1,294	4 1,288	3		
8 AM		1,774	4 1,769)		
9 AM	1,586	1,59 ⁻	1			
10 AM	1,345	1,374	4			
11 AM	1,211	1,272	2			
12 PM	1,329	1,307	7			
1 PM	1,366	1,390	0			
2 PM	1,367	1,352	2			
3 PM	1,498	1,518	8			
4 PM	1,786	1,758	8			
5 PM	1,749	1,762	2			
6 PM	2,000	1,990	0			
7 PM	1,662	1,614	4			
8 PM	1,264	1,258	3			
9 PM	1,032	1,054	4			
10 PM	872	852	2			
11 PM	664	648	8			
12 AM	406	402	2			
		25,61	1			
SEASONAL FACTOR:	.926 AADT	22,696	AM PEAK %:	6.9	HOUR ENDI	NG: 8:00 AM
AXLE CORR. FACTOR:	.957	l	PM PEAK %:	7.8	HOUR ENDI	NG: 6:00 PM

DATE: 11/3/1998

 ROAD:
 TR 13
 BRISTOL PK
 FROM:
 BENSALEM BLVD
 TO:
 HAUNTED LA

 COUNTY:
 BUCKS
 MCD:
 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF:
 0013/0110/1000
 FC:
 14

 PROJECT:
 PAB98
 COUNT DIR:
 BOTH
 TRAFFIC DIR:
 BOTH
 SPEED LIMIT:
 45
 LOOP OR CLASS:

 STATION ID:
 11448
 DVRPC FILE #:
 4946
 COUNTER:
 9388
 WEATHER:
 F

Hour Ending	Tuesday 11/03/98	Wednesda 11/04/9	ay Thursda 98 11/05/9	y B 11	Friday I/06/98	Saturday 11/07/98	/ 3
1 AM		17	77 234	4			
2 AM		ç	96 12 ⁴	4			
3 AM		8	34 9 [.]	7			
4 AM		7	74 7	7			
5 AM		14	12 16	8			
6 AM		38	30 37	C			
7 AM		91	6 91	4			
8 AM		1,28	30 1,31 ⁻	7			
9 AM		1,23	30 1,232	2			
10 AM		98	38				
11 AM	936	92	28				
12 PM	1,030	1,04	12				
1 PM	1,112	1,16	60				
2 PM	1,233	1,26	64				
3 PM	1,176	1,20)8				
4 PM	1,268	1,34	18				
5 PM	1,426	1,36	64				
6 PM	1,435	1,44	16				
7 PM	1,082	1,16	64				
8 PM	827	87	78				
9 PM	587	68	38				
10 PM	542	54	16				
11 PM	394	41	0				
12 AM	250	31	4				
		19,12	27				
SEASONAL FACTOR:	.925 AAD	T: 16,985	AM PEAK %:	6.7	HOUR	ENDING:	8:00 AM
AXLE CORR. FACTOR:	.96		PM PEAK %:	7.6	HOUR	ENDING:	6:00 PM

DATE: 5/7/1997

 ROAD:
 TR 513 HULMEVILLE RD
 FROM:
 VIRGINIA AVE
 TO:
 STREET RD

 COUNTY:
 BUCKS
 MCD:
 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF:
 0513/0040/
 FC:
 16

 PROJECT:
 PASB97
 COUNT DIR:
 BOTH
 TRAFFIC DIR:
 BOTH
 SPEED LIMIT:
 25
 LOOP OR CLASS:

 STATION ID:
 14002
 DVRPC FILE #:
 854
 COUNTER:
 WEATHER:
 FC

Hour Ending	Wednesday 05/07/97	Thursda 05/08/9	y Friday 7 05/09/97	/ Sa / 05	turday Sur 5/10/97 05/1	nday 1/97
1 AM		7	8 109)		
2 AM		3	6 48	3		
3 AM		3	2 27	7		
4 AM		2	0 25	5		
5 AM		1	9 28	3		
6 AM		12	2 112	2		
7 AM	457	40	5			
8 AM	678	67	2			
9 AM	627	56	5			
10 AM	608	60	2			
11 AM	693	70	7			
12 PM	812	74	4			
1 PM	834	79	6			
2 PM	734	81	9			
3 PM	819	79	0			
4 PM	782	79	1			
5 PM	868	89	3			
6 PM	945	1,04	3			
7 PM	897	87	2			
8 PM	879	84	4			
9 PM	624	65	0			
10 PM	451	41	6			
11 PM	275	24	8			
12 AM	223	18	1			
		12,34	5			
SEASONAL FACTOR:	.928 AAD	T: 11,147	AM PEAK %:	6.	HOUR ENDING	G: 12:00 PM
AXLE CORR. FACTOR:	.973		PM PEAK %:	8.4	HOUR ENDING	G: 6:00 PM

DATE: 11/1/1999

 ROAD:
 TR 513 HULMEVILLE RD
 FROM:
 BROOKWOOD DR
 TO:
 PARK AVE

 COUNTY:
 BUCKS
 MCD:
 002 - BENSALEM TOWNSHIP
 SR/SEG/OFF:
 0513/0050/1000
 FC:
 16

 PROJECT:
 TPKE
 COUNT DIR:
 BOTH
 TRAFFIC DIR:
 BOTH
 SPEED LIMIT:
 40
 LOOP OR CLASS:

 STATION ID:
 14003
 DVRPC FILE #:
 9419
 COUNTER:
 9841
 WEATHER:
 F

Hour Ending	Monday 11/01/99	7 Tuesday 9 11/02/99	Wednesday 11/03/99	Thu 11/	rsday Frida /04/99 11/05/	ay 99
1 AM		127	131			
2 AM		80	76			
3 AM		66	65			
4 AM		37	50			
5 AM		86	84			
6 AM		314	291			
7 AM		774	806			
8 AM		1,015	1,034			
9 AM		936	924			
10 AM		1,033	1,040			
11 AM	1,157	7 1,142				
12 PM	1,160) 1,192				
1 PM	1,228	3 1,185				
2 PM	1,303	3 1,252				
3 PM	1,284	l 1,300				
4 PM	1,133	3 1,233				
5 PM	1,342	2 1,319				
6 PM	1,444	1,398				
7 PM	1,325	5 1,233				
8 PM	1,012	986				
9 PM	776	5 790				
10 PM	569	586				
11 PM	368	3 415				
12 AM	232	2 256	-			
		18,755				
SEASONAL FACTOR:	.951 A	ADT: 17,194 A	M PEAK %:	6.4	HOUR ENDING:	12:00 PM
AXLE CORR. FACTOR:	.964	Р	M PEAK %:	7.5	HOUR ENDING:	6:00 PM
DVRPC – Travel Monitoring

DATE: 12/20/1999

 ROAD:
 BENSALEM BLVD
 FROM:
 TR 13
 TO:
 BRIDGEWATER RD

 COUNTY:
 BUCKS
 MCD:
 005 - BRISTOL TOWNSHIP
 SR/SEG/OFF:
 2015/0010/1000
 FC:
 16

 PROJECT:
 TPKE
 COUNT DIR:
 BOTH
 TRAFFIC DIR:
 BOTH
 SPEED LIMIT:
 35
 LOOP OR CLASS:

 STATION ID:
 17978
 DVRPC FILE #:
 26407
 COUNTER:
 9841
 WEATHER:
 F

Hour Ending	Monday 12/20/99	Tuesday 12/21/99	Wednesday 12/22/99	Thu 12	rsday Frida /23/99 12/24/9	у 9
1 AM		137	118			
2 AM		82	80			
3 AM		49	50			
4 AM		66	76			
5 AM		108	117			
6 AM		336	320			
7 AM		798	762			
8 AM		954	962			
9 AM		964	974			
10 AM		746	786			
11 AM		750	719			
12 PM		734	715			
1 PM		804	757			
2 PM	660	780				
3 PM	802	861				
4 PM	960	984				
5 PM	950	1,008				
6 PM	921	956				
7 PM	732	785				
8 PM	571	564				
9 PM	476	484				
10 PM	353	388				
11 PM	266	300				
12 AM	190	221				
13,859						
SEASONAL FACTOR:	.96 AAD	T: 12,826 AM	VI PEAK %:	7.	HOUR ENDING:	9:00 AM
AXLE CORR. FACTOR:	.964	PI	VI PEAK %:	7.3	HOUR ENDING:	5:00 PM





APPENDIX B INTERSECTION TURNING MOVEMENT COUNTS

CONSULTANTS 2001 EXISTING AM/PM PEAK HOUR TURNING MOVEMENTS

Figure B-1 Consultants 2001 Existing AM/PM Peak Hour Turning Movements B-3

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Title of Report: I-95 Interchange Enhancement and Reconstruction I-95 Street Road (PA 132) Interchange, Section D01 Traffic Study

Publication No.: 04024

Date Published: September 2004

Geographic Area Covered: Delaware Expressway (I-95), Street Road (PA 132), and Bristol Pike (US 13) Interchange Complex, Bensalem Township, Bucks County

Key Words: Traffic Volumes, Peak Hour Traffic, Travel Forecast, Delaware Expressway, I-95, Street Road (PA 132), Bristol Pike (US 13), Pennsylvania Turnpike, Bensalem Township, Bucks County

ABSTRACT

This report presents traffic forecasts and analysis for the Delaware Expressway (I-95), Street Road (PA 132), and Bristol Pike (US 13) interchange complex in Bensalem Township, Bucks County, Pennsylvania. The report examines the impacts of 2010 and 2030 traffic volumes on I-95, interchange ramps for Street Road (PA 132) and Bristol Pike (US 13), and also the local roadway system for four alternatives: The "do-nothing" or No-Build Alternative, the No-Build Plus I-95/Pennsylvania Turnpike Interchange Alternative which tests impacts of the I-95/Pennsylvania Turnpike Interchange, the Widened Diamond Alternative which adds lanes to all approaches, and the Bristol Pike Ramp Alternative which adds an additional access point for I-95 southbound and widens other approaches. The report also briefly describes the methodology used to develop the traffic forecasts.

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