HENDERSON ROAD / I-76 WESTBOUND RAMPS TRAFFIC STUDY

Montgomery County, Pennsylvania

Prepared for
Pennsylvania Department of Transportation
By
Delaware Valley Regional Planning Commission

October 2003

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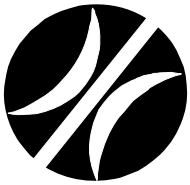
Bourse Building
111 South Independence Mall East
Philadelphia, PA 19106-2582

October 2003

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. It also includes 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.

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

On the cover: Henderson Road from South Gulph Road intersection.

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EXECUTIVE SUMMARY

This report presents a summary of the current traffic volumes, projections of 2010 and 2030 no-build traffic forecasts, opening year 2010 traffic volumes, and design year 2030 traffic volumes for the Henderson Road corridor. The Henderson Road corridor traverses Upper Merion Township, Montgomery County, in a north-south direction for approximately seven miles starting at South Gulph Road and ending at Beidler Road while providing access to other major corridors including Valley Forge Road (PA 23), DeKalb Pike (US 202), and South Gulph Road, which has access to/from the Schuylkill Expressway (I-76).

This traffic study was necessary to provide design volumes that reflect anticipated growth in the area due to possible developments and changes to the roadway configurations between the no-build and build design scenarios. Under the build conditions, a new ramp interchange linking Henderson Road directly to the Schuylkill Expressway (I-76) has been proposed directly opposite the terminus of Henderson Road at South Gulph Road. The new interchange ramps will provide limited access to the westbound traffic flow along the Schuylkill Expressway (I-76). As a result of the new interchange ramp, an existing westbound on-ramp to the Schuylkill Expressway (I-76) from South Gulph Road near Crooked Lane will be removed.

The Delaware Valley Regional Planning Commission's (DVPRC) traffic simulation model was used to predict 2010 and 2030 no-build and build traffic volumes based on the proposed roadway improvements and DVRPC board-adopted demographic and employment forecasts as updated by local development proposals within the corridor. Detailed capacity/level-of-service analyses were then performed for various links and intersections along the Henderson Road corridor to evaluate the differences between the no-build and build roadway configurations, as well as to determine additional roadway improvements required at various major intersections to accommodate future growth within the area and changes to local traffic patterns.

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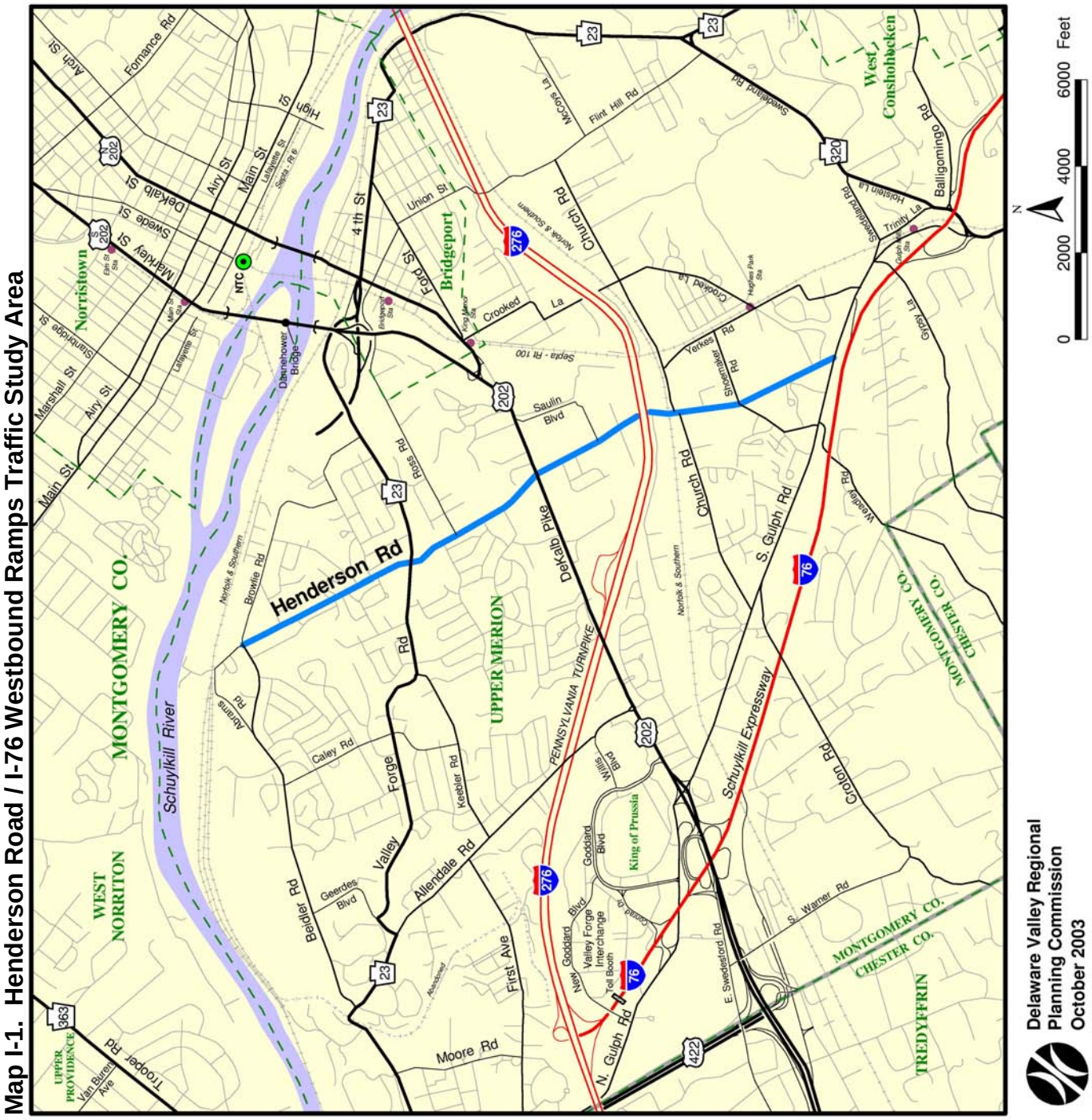
I. INTRODUCTION

This report presents a summary of the current traffic volumes and projections of 2010 and 2030 no-build traffic forecasts, opening year 2010 traffic volumes, and design year 2030 traffic volumes for Henderson Road, the proposed I-76 ramps, and impacted highway facilities in the Henderson Road corridor. The Henderson Road corridor traverses Upper Merion Township, Montgomery County in a north-south direction for approximately seven miles starting at South Gulph Road and ending at Beidler Road. **Map I-1** provides an overview of the traffic study area surrounding the Henderson Road corridor, as well as the limits of the corridor. As can be seen, Henderson Road is an important arterial that links to other major facilities within the corridor, including PA 23, DeKalb Pike (US 202), South Gulph Road, and the Schuylkill Expressway (I-76).

This traffic study was necessary to provide design volumes that reflect anticipated growth in the area due to possible developments and proposed changes to the roadway configurations. Under the build alternative, new and relocated interchange ramps linking Henderson Road directly to and from the Schuylkill Expressway (I-76) westbound are proposed directly opposite the terminus of Henderson Road at South Gulph Road. The new interchange ramps will provide limited access to and from westbound traffic on the Schuylkill Expressway (I-76). As a result of the new interchange, the existing westbound on-ramp to the Schuylkill Expressway (I-76) from South Gulph Road near Crooked Lane will be removed.

The report has been subdivided into five chapters and two appendices. Chapter II provides a description of the Henderson Road corridor, including current highway facilities, land uses, and traffic volumes. The travel forecasting procedures used in the study are briefly described in Chapter III. Highway traffic volume forecasts are presented and analyzed in Chapter IV for the no-build and build alternatives. The Congestion Management System Analysis is presented in Chapter V. Current traffic counts are included in Appendix A and current turning movement counts in Appendix B.



Map I-1. Henderson Road / I-76 Westbound Ramps Traffic Study Area

II. DESCRIPTION OF THE HENDERSON ROAD CORRIDOR

The Henderson Road corridor is located in Upper Merion Township, Montgomery County, Pennsylvania. The corridor spans a seven-mile section from South Gulph Road to Beidler Road. North of DeKalb Pike (US 202), Henderson Road's adjacent land uses are primarily residential while to the south of DeKalb Pike (US 202) the roadway serves mixed commercial areas, light industrial areas, and some residential areas. From these areas, Henderson Road provides connection to other major arterials including Valley Forge Road (PA 23), DeKalb Pike (US 202), and South Gulph Road, as well as the Schuylkill Expressway (I-76).

A. Existing Facilities and Land Use

Henderson Road traverses Upper Merion Township in a north-south direction. The seven-mile span of Henderson Road provides access to numerous residential communities, as well as office and commercial developments. Although direct access to the Pennsylvania Turnpike (I-276), the Schuylkill Expressway (I-76), and the Blue Route/Northeast Extension of the Turnpike (I-476) are not provided in the no-build alternative, indirect access is provided via other major arterials that connect with Henderson Road including Valley Forge Road (PA 23), DeKalb Pike (US 202), and South Gulph Road. Other roadways that run parallel to Henderson Road include Shoemaker Road, Crooked Lane, Yerkes Road, and Allendale Road.

Henderson Road varies from one to two lanes per direction with additional turn lanes at DeKalb Pike (US 202), Valley Forge Road (PA 23) and other busy intersections. North of the Henderson Road/DeKalb Pike (US 202) intersection, Henderson Road provides a single lane of travel in each direction with a posted speed limit of 40 miles per hour. At the DeKalb Pike (US 202) intersection, Henderson Road widens to provide two lanes of travel in each direction and the posted speed limit is decreased to 35 miles per hour. Two lanes per direction are maintained to a point south of the intersection of Henderson Road/Saulin Boulevard, where Henderson Road once again is configured with one lane of travel per direction with a posted speed limit of 35 miles per hour. Just prior to the South Gulph Road intersection, southbound Henderson Road provides two lanes of travel while the northbound direction provides a single travel lane.

Henderson Road provides access to three SEPTA Bus Routes; Routes 99, 124, and 125. Route 99 briefly proceeds along Henderson Road between Saulin Boulevard and DeKalb Pike (US 202). Route 99 connects Norristown with Pottstown via DeKalb Pike (US 202) with stops in the King of Prussia, Phoenixville, and Royersford areas. Route 124 provides frequent service along Henderson Road between North Gulph Road and DeKalb Pike (US 202). Route 124 also provides service between Philadelphia and the King of Prussia/Chesterbrook area via the Schuylkill Expressway (I-76). Route 125 connects Philadelphia with King of Prussia and Valley Forge National Historical Park area via the Schuylkill Expressway (I-76)

and Route 125 also provides access between Philadelphia and King of Prussia and Chesterbrook via the Schuylkill Expressway (I-76).

B. Existing Traffic Volumes

DVRPC and the traffic consultant collected existing traffic counts in the study area, including Automatic Traffic Recorder (ATR) counts and Manual Turning Movement counts. The ATR count locations were counted utilizing inductive loop and pneumatic tubes. The resulting annual average daily traffic volumes (AADT) have been summarized in **Figure II-1**. The detailed hourly traffic counts corresponding to the AADT information for the study area have been included in **Appendix A**.

Current traffic volumes total (northbound and southbound) on Henderson Road vary from 7,800 vehicles per day to 22,600 vehicles per day (vpd). Henderson Road to the north of DeKalb Pike (US 202) carries a significantly lower daily traffic volume (7,800 to 14,700 vpd) than the segments to the south of DeKalb Pike (US 202). The highest daily traffic on Henderson Road is between DeKalb Pike (US 202) and Church Road (22,600 vpd).

Parallel routes to Henderson Road include Crooked Lane, Allendale Road, and Swedeland Road (PA 320). From Figure II-1, it can be seen that with the exception of Crooked Lane, the parallel routes carry over 11,000 total vehicles per day in both directions. Allendale Road carries approximately 14,500 to 18,700 vpd with the daily traffic volumes increasing from north to south as Allendale Road approaches the King of Prussia Mall and DeKalb Pike (US 202). While Swedeland Road (PA 320) carries approximately 11,500 vpd, Crooked Lane carries a total of about 3,100 to 3,600 vpd north and south of Church Road, respectively.

Major routes intersecting Henderson Road include Valley Forge Road (PA 23), DeKalb Pike (US 202), and South Gulph Road, which also provide access to the Schuylkill Expressway (I-76). Valley Forge Road (PA 23) carries 9,800 to 13,700 vpd. DeKalb Pike (US 202) carries 37,500 to 41,900 vpd and South Gulph Road carries about 13,900 to 27,500 vpd with much of the traffic traveling to/from the I-76 (Schuylkill Expressway) interchange ramps.

Other facilities in the Henderson Road study area include Yerkes Road, Balligomingo Road, Gypsy Lane, Weadley Road, Croton Road, Church Road, Crooked Lane and Shoemaker Road. Of these roadways, only Croton Road, Church Road, and Balligomingo Road carry 9,800 vpd or more.

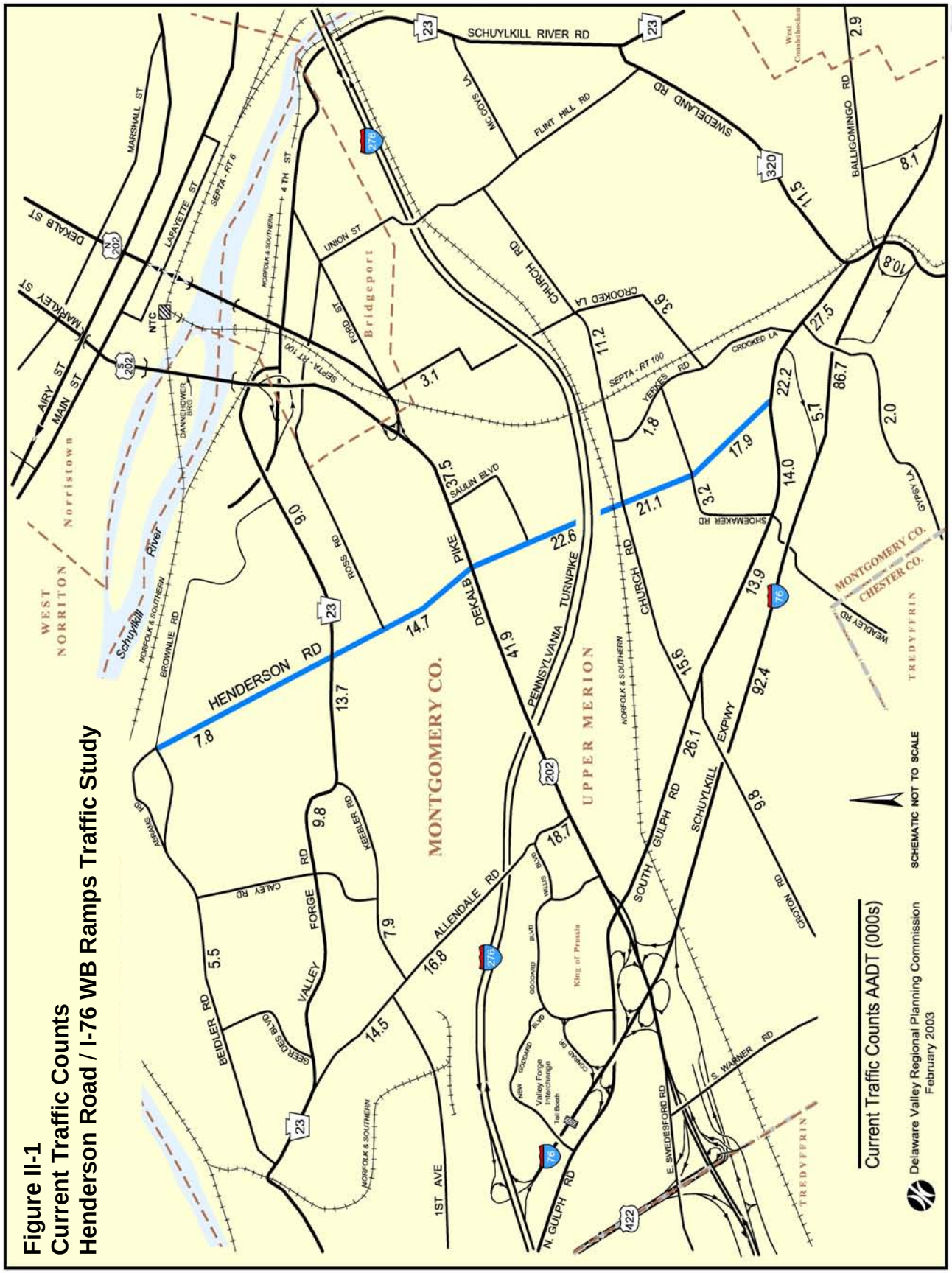


Figure II-1
Current Traffic Counts
Henderson Road / I-76 WB Ramps Traffic Study

C. Current Turning Volumes

Manual turning movement counts were collected within the study area as part of this effort at the major study area intersections. **Figure II-2** summarizes the result of the Manual Turning Movement (MTM) count data, which were collected at the following intersection locations during the weekday morning (7:00 A.M. – 9:00 A.M.) and weekday afternoon (4:00 P.M. – 6:00 P.M.) peak hours:

- Henderson Road and Valley Forge Road (PA 23)
- Henderson Road and DeKalb Pike (US 202)
- Henderson Road and Saulin Boulevard
- Henderson Road and Church Road
- Henderson Road and Shoemaker Road
- Henderson Road and South Gulph Road
- DeKalb Pike (US 202) and Saulin Boulevard
- South Gulph Road and Brooks Road
- South Gulph Road and Church Road
- South Gulph Road and Croton Road
- South Gulph Road and Shoemaker Road
- South Gulph Road and Weadley Road
- South Gulph Road and Schuylkill Expressway (I-76) Westbound On
- and Off-Ramps
- South Gulph Road and Schuylkill Expressway (I-76) Eastbound On
- and Off-Ramps
- South Gulph Road and Crooked Lane
- South Gulph Road and Gypsy Lane
- South Gulph Road and Trinity Lane
- South Gulph Road and Schuylkill Expressway (I-76) Westbound
- Off-Ramp/Eastbound Off-Ramp
- Trinity Lane and Holstein Lane (PA 320)
- Balligomingo Road and Schuylkill Expressway (I-76) Westbound
- Off-Ramp
- Trinity Lane and Swedeland Road (PA 320)
- Trinity Lane and Balligomingo Road

The detailed traffic MTM data counts at the study area intersections have been included in **Appendix B.**

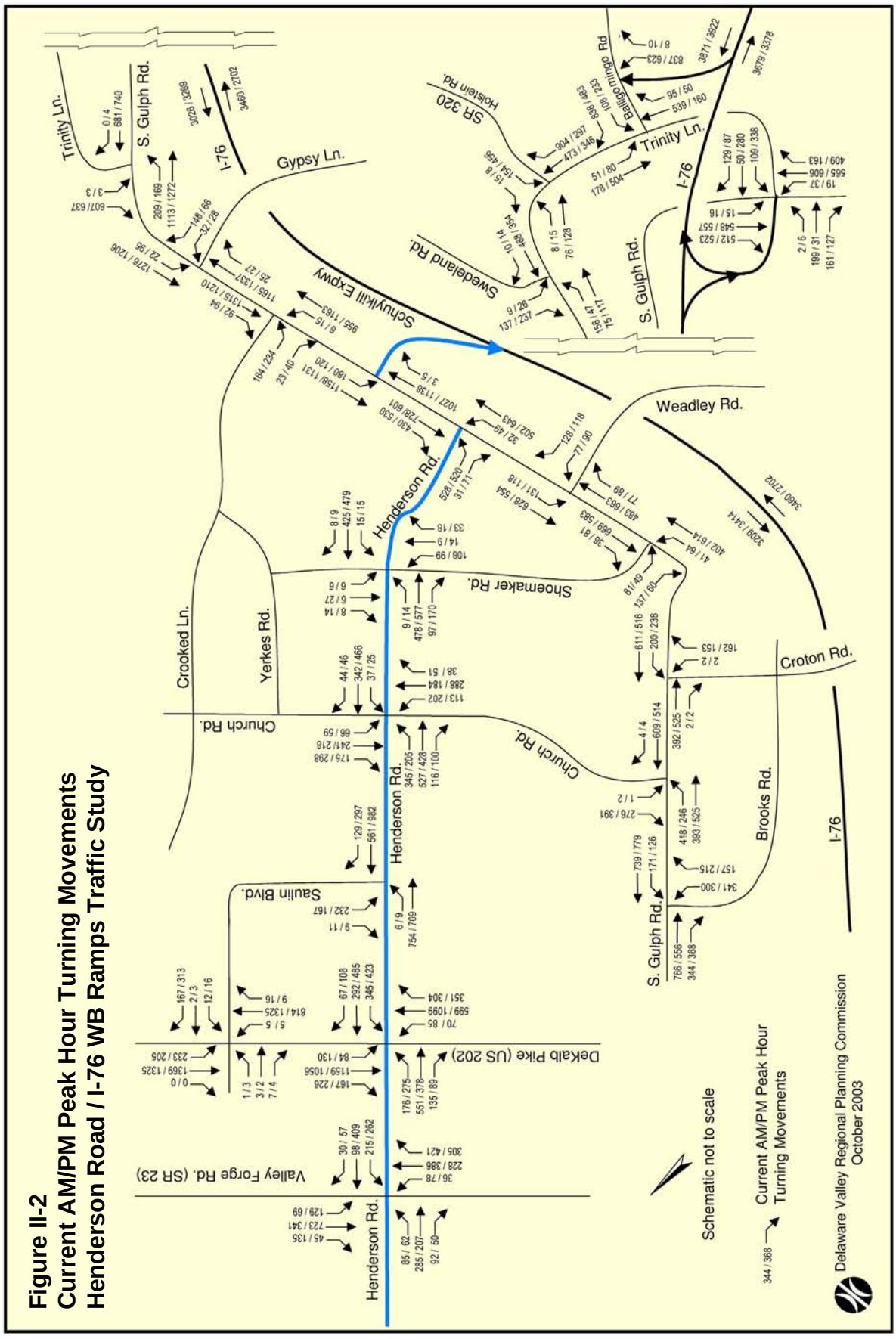


Figure II-2
Current AM/PM Peak Hour Turning Movements
Henderson Road / I-76 WB Ramps Traffic Study

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III. TRAVEL FORECASTING PROCEDURES

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 reflect an update to municipal forecasts that were last completed in June 1993.

DVRPC uses a multi-step, multi-source methodology to produce its population and employment 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-quarter's 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-quarter's 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.

2. Employment Forecasting

Employment is influenced by local, national, and global political and socio-economic 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, retail, wholesale, finance/insurance, service industries, 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.

3. Henderson Road Study Area Population and Employment Forecasts

DVRPC's long-range population and employment forecasts to year 2025 were developed prior to the release of the 2000 Census. At the time the Henderson Road traffic study was initiated, 2000 municipal-level Census population data was available. 2000 Census employment data is scheduled for release in 2003.

As part of the Henderson Road traffic study, DVRPC staff reviewed its most recent current population and employment estimates (1997), its 2025 long-range population and employment forecasts, and all revised land-use developments in the study area. Based on this review, DVRPC updated the 2025 municipal- and traffic zone population and employment forecasts for use as inputs to the traffic simulation models.

Table III-1 summarizes the population forecasts and **Table III-2** summarizes the employment forecasts used in the Henderson Road Traffic Study. In these tables the "DVRPC 2025" column refers to the local adopted numbers and the "Forecast 2025" column refers to the updated estimate used in the study.

B. Travel Forecasting Methods

DVRPC's traffic simulation models were used in conjunction with the 2025 population and employment forecasts to develop 2025 traffic volumes and patterns. Projection of travel demand for the Henderson Road build case was accomplished in two phases. First a 2025 projection of roadway traffic volumes was made based on the updated DVRPC board-adopted 2025 socioeconomic forecast and the facility improvements included in the transportation alternative under study. In a second step, 2010 link volumes were estimated by interpolating between current estimates and year 2030 forecasts were prepared by extrapolating from 2025.

1. Focused Simulation Process

The regional travel assignments do not give the detailed forecasts of AM and PM peak-hour link volumes and turns required for corridor-level design studies. In addition, local streets not included in the regional highway network are often of great interest to local planners and engineers. In order to improve the forecasting

Table III-1
Municipal Population Forecasts for the Henderson Road Traffic Study

Municipality	DVRPC 1997	Census 2000	DVRPC 2025	Forecast 2025	Difference between 1997 and 2025 Forecast	
					Diff.	% Diff.
Bridgeport	4,193	4,371	4,270	4,380	187	4.5%
Conshohocken	8,252	7,589	7,800	8,000	-252	-3.1%
Lower Providence	20,815	22,390	27,790	28,740	7,925	38.1%
Norristown	30,008	31,282	29,860	31,380	1,372	4.6%
Plymouth	16,028	16,045	15,170	16,590	562	3.5%
Upper Merion	26,289	26,863	28,300	28,510	2,221	8.4%
West Conshohocken	1,325	1,446	1,500	1,450	125	9.4%
West Norriton	14,963	14,901	14,830	16,560	1,597	10.7%
Montgomery County	**121,873**	**124,887**	**129,520**	**135,610**	**13,737**	**11.3%**
Schuylkill	6,155	6,960	8,310	11,503	5,348	86.9%
Tredyffrin	29,703	29,062	31,510	32,550	2,847	9.6%
Chester County	**35,858**	**36,022**	**39,820**	**44,053**	**8,195**	**22.9%**
TOTAL	**157,731**	**160,909**	**169,340**	**179,663**	**21,932**	**13.9%**

Table III-2
Municipal Employment Forecasts for the Henderson Road Traffic Study

Municipality	DVRPC 1997	DVRPC 2025	Forecast 2025	Difference between 1997 and 2025 Forecast	
				Diff.	% Diff.
Bridgeport	1,526	1,300	1,570	44	2.9%
Conshohocken	5,655	10,500	9,450	3,795	67.1%
Lower Providence	10,503	13,000	15,140	4,637	44.1%
Norristown	15,923	14,500	16,400	477	3.0%
Plymouth	22,399	32,000	28,810	6,411	28.6%
Upper Merion	49,737	60,250	60,250	10,513	21.1%
West Conshohocken	2,408	3,450	3,110	702	29.2%
West Norriton	6,925	7,750	9,250	2,325	33.6%
Montgomery County	**115,076**	**142,750**	**143,980**	**28,904**	**25.1%**
Schuylkill	2,893	2,800	3,200	307	10.6%
Tredyffrin	28,626	35,000	36,017	7,391	25.8%
Chester County	**31,519**	**37,800**	**39,217**	**7,698**	**24.4%**
TOTAL	**146,595**	**180,550**	**183,197**	**36,602**	**25.0%**

levels provided and to accommodate these special needs, an enhanced assignment technique focused on a detailed study area is used to produce corridor-level highway and transit forecasts. This focused simulation process allows the use of DVRPC regional simulation models and increases the accuracy and detail 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.

A focused approach was used to estimate traffic volumes based on the highway service levels provided by the Henderson Road alternative. The focused simulation process involved adding missing local streets to the network. Simulation zones inside the study area were subdivided so that traffic from existing and proposed land-use developments could be loaded directly onto the network.

2. Traffic Assignment Validation and Future Trip Table Preparation

The final step in the preparation of the focused simulation process is the validation of the simulated highway assignment outputs using current traffic counts taken on roadways serving the study area. The focused simulation model was executed with inputs reflective of 1997 conditions and the results compared with recent traffic counts collected by DVRPC. Based on this analysis, the focused model produced reasonable daily traffic volumes.

To establish the current travel demand for the area under influence of the proposed roadway access improvements, DVRPC gathered information from a traffic counting effort conducted by field personnel. Automatic Traffic Recorder equipment was set at selected locations. These traffic counts were then tabulated on a peak period and daily basis and factored to represent annual average daily traffic (AADT). These daily traffic counts form the basis for the validation of the travel simulation model. In addition, the peak hour distributions of traffic at the count locations provide guidance for the estimation of AM and PM peak hour traffic forecasts under the No-Build and Build alternatives.

For this study, the focused 2025 trip table was prepared by disaggregating the socio economic inputs to the DVRPC trip generation model and surcharging these data to reflect the additional industrial, commercial, and residential development in the area not included in the DVRPC Board-adopted 2025 forecast. Following this, the DVRPC model from trip generation through traffic assignment was executed for both of the improvement alternatives. The resulting travel matrix includes all travel patterns throughout the Delaware Valley Region. Travel to and from all parts of Bucks, Chester, Delaware, and Montgomery counties, Philadelphia, and New Jersey via the Delaware River bridges is included, as are trips to/from the remainder of Pennsylvania and the state of Delaware.

C. Synopsis of the Enhanced DVRPC Travel Simulation Process

The enhanced DVRPC travel simulation process utilizes the Evans Algorithm to iterate the model. The Evans Algorithm re-executes 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 needed for the process to converge to the approximate equilibrium state for 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. The final step of this iterative simulation process is the assignment of vehicle trips to the highway network.

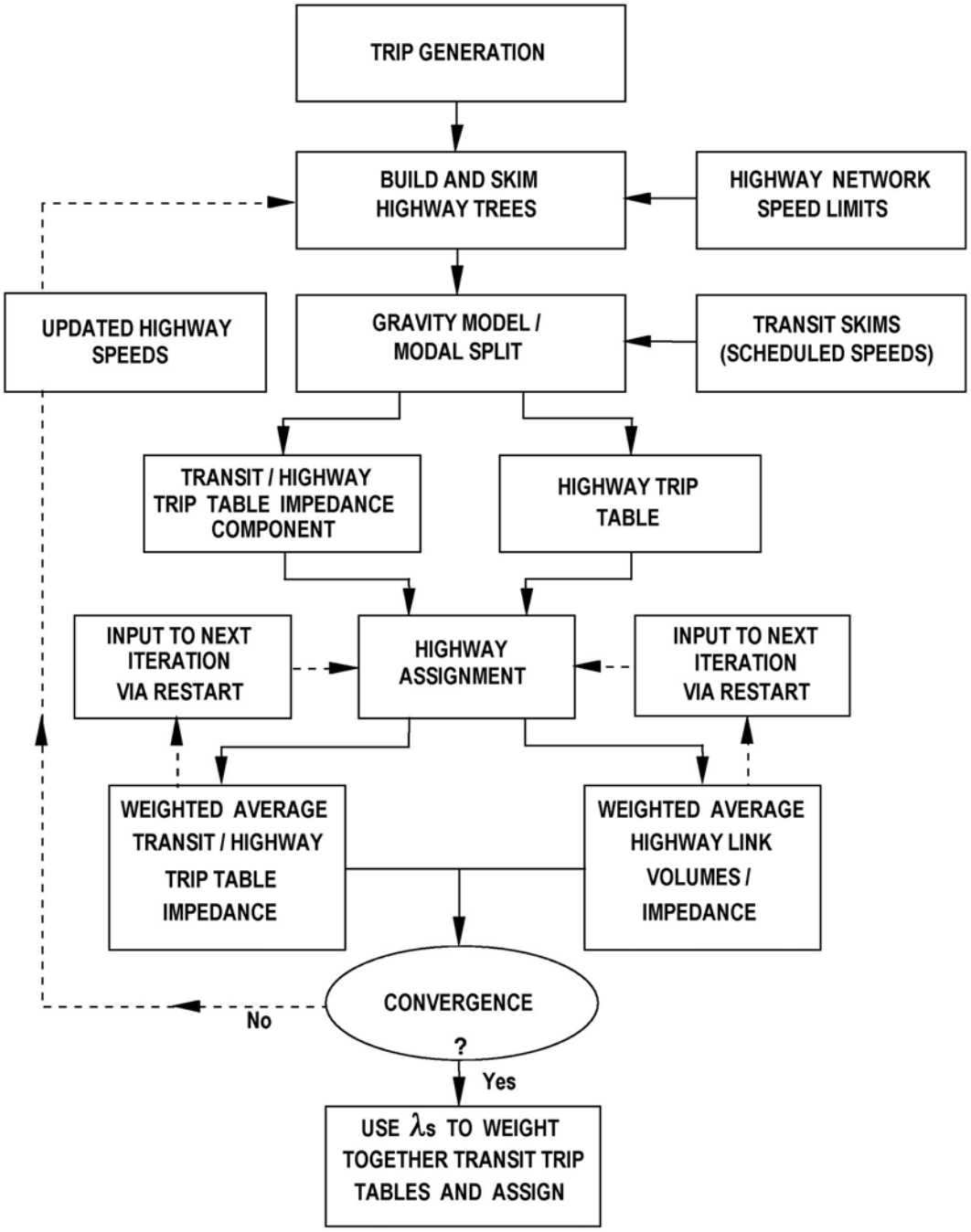
DVRPC's enhanced travel simulation model is disaggregated into separate peak period, midday, and evening time periods. This disaggregation begins in trip generation where factors are used to separate daily trips into peak and midday travel. Evening travel is then defined as the residual after peak and midday travel are removed from daily travel. The enhanced process utilizes completely separate model chains for peak, midday, and evening travel simulation runs. The peak period (combined AM and PM) is defined as 7:00 A.M. to 9:00 A.M. and 3:00 P.M. to 6:00 P.M., midday is defined as 9:00 A.M. to 3:00 P.M., and evening as 6:00 P.M. to 7:00 A.M. The separation of the models into three time periods was accomplished with few changes to the basic models or their parameters. Inputs sensitive to time of day such as highway capacities and transit service levels were disaggregated to be reflective of time-period specific conditions.

The enhanced iterative DVRPC model is charted in **Figure III-1**. 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.

1. Trip Generation

Both internal trips (those made within the DVRPC region) and external trips (those which cross the boundary of the region) must be considered in the simulation of regional travel. Internal trip generation is based on zonal forecasts of population and employment, whereas external trips are estimated from cordon line traffic counts. The latter also include trips, which 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, midday, and evening time periods.

Figure III-1: Evans Implementation Using DVRPC's Regional Simulation Model



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2. Evans Iteration

The iterative portion of the Evans Algorithm involves updating the highway network restrained link travel speeds, rebuilding the minimum time paths through the network, and skimming the inter-zonal travel time for the minimum paths. Then the trip distribution, modal split, and highway assignment models are executed in sequence for each pass through the model chain (see Figure III-1). 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. A composite highway trip table is not required to perform the highway assignment - rather the highway link volumes from the assignment are weighted together directly. Seven iterations of the Evans process, for each time period, are performed to ensure that convergence on travel times is reached.

3. 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 for each time period. These models follow the trip purpose and vehicle type stratifications established in trip generation. Documentation of the trip distribution models is included in the commission report entitled, ***1997 Travel Simulation Model for the Delaware Valley Region***.

4. 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, which should be allocated to transit, and then assigns the residual to highway. 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. See commission report entitled, ***1990 Travel Simulation Model for the Delaware Valley Region*** for a detailed description of the model parameters.

5. Highway Assignment

The final step in the iterative simulation process is the assignment of vehicle trips to the highway network. For peak, midday, and evening travel, this assignment model produces the future traffic volumes for individual highway links that are required for planning analyses. The highway network and trip table underlying the assignment is regional in nature. This allows the diversion of highway

vehicular travel into and through the study area to various points of entry and exit in response to the characteristics of the transportation system.

For each Evans iteration, highway trips are assigned to the network by determining the best (minimum time) route through the highway network for each zonal interchange and then allocating the inter-zonal 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 restraint. 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.

Initial estimates of future year intersection turning volumes were determined by scaling current year turning volumes according to growth factors on each intersection leg. These growth factors are the ratio of future year peak-hour link volumes to current peak hour volumes. The future year peak-hour link volumes for each leg of the intersection were determined by multiplying the forecasted AADT, an output of the DVRPC traffic assignment, by AM and PM “K” factors. Existing “K” factors were calculated from traffic counts as the ratio of the highest morning and evening hourly volumes to the total AADT. Future year “K” factors were based on the existing “K” factors and the AADT growth on each intersection approach. The resulting forecasted turning volumes for the AM and PM peak hours were reviewed for reasonableness and adjusted as necessary to balance traffic flows between adjacent intersections.

6. 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.

IV. HIGHWAY TRAFFIC VOLUME FORECASTS

Projected average daily traffic volumes for selected highway links within the study area are presented and analyzed in this chapter of the report. Forecasts for two future years are presented, namely the anticipated opening year (2010) and the design year (2030), which is twenty years beyond the opening year. Traffic volumes for 2010 were developed by applying a formula to the current and 2025 volumes, while traffic volumes for 2030 were developed by extrapolating from the 2025 volumes.

A discussion of the no-build and build alternatives is included in the following sections along with details regarding analysis results. A comparison of the no-build and build conditions is also included.

A. 2010 and 2030 No-Build Alternative

Figure IV-1 compares the current traffic volumes with future 2010 and 2030 No-Build traffic forecasts. **Table IV-1** provides a comparison of the current traffic volumes to the 2030 future no-build traffic volumes. **Figure IV-2** provides a summary of the future 2030 no-build weekday morning and weekday afternoon peak hour turning movement volumes at the study area intersections.

As can be seen from Table IV-1, traffic along the Henderson Road corridor is expected to increase approximately 15% to 27% by the year 2030 due to regional growth trends in the area along with planned developments within the study area.

Traffic along I-76 (Schuylkill Expressway) is expected to increase approximately 9% to 21% by the year 2030. The most significant traffic growth occurs at the I-76 westbound on-ramp from Henderson Road, which increases from 5,700 vehicles per day to 6,900 vehicles per day (21%). The I-76 westbound off-ramp to Balligomingo Road also experiences a significant increase in traffic volume from 8,139 vehicles per day to 9,400 vehicles per day (15%).

The South Gulph Road corridor will experience an increase in traffic volumes from approximately 22% to 40% with the most significant growth occurring near the Henderson Road corridor. In particular the growth along South Gulph Road between Henderson Road and Crooked Lane increases from 22,241 vehicles per day to 31,200 vehicles per day (40%) while the traffic between Shoemaker Road and Henderson Road increases from 13,986 vehicles per day to 18,200 vehicles per day (30%).

In general, it can be seen from Table IV-1 that the existing major roadways experience an increase in traffic volumes from 10-30% while the minor roadways, which currently have lower volumes of traffic, experience higher growth rates as the major routes reach their capacity levels, which makes using the minor routes a viable option in order to avoid the congested major traffic routes in the area.

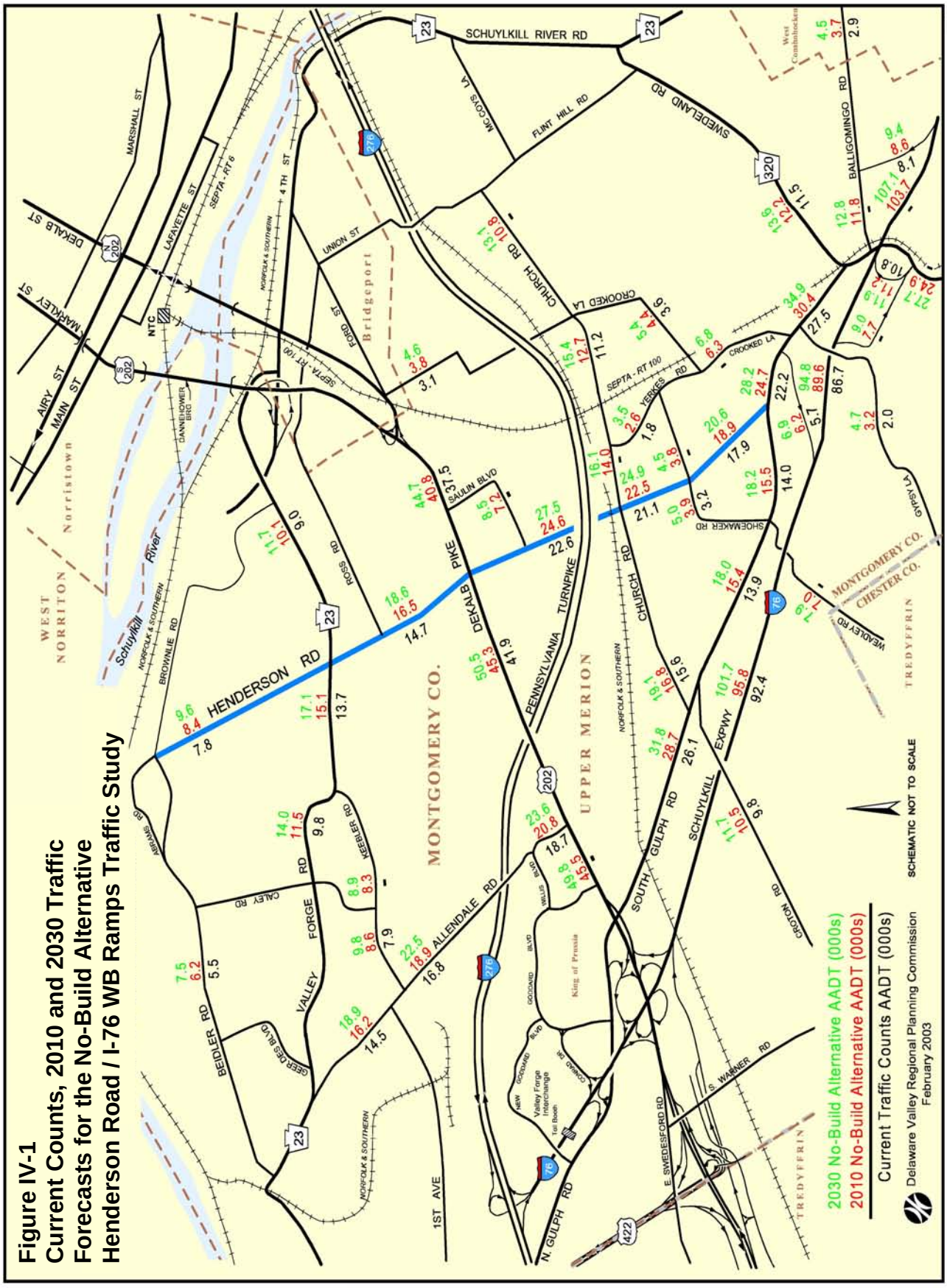

Figure IV-1
Current Counts, 2010 and 2030 Traffic Forecasts for the No-Build Alternative
Henderson Road / I-76 WB Ramps Traffic Study

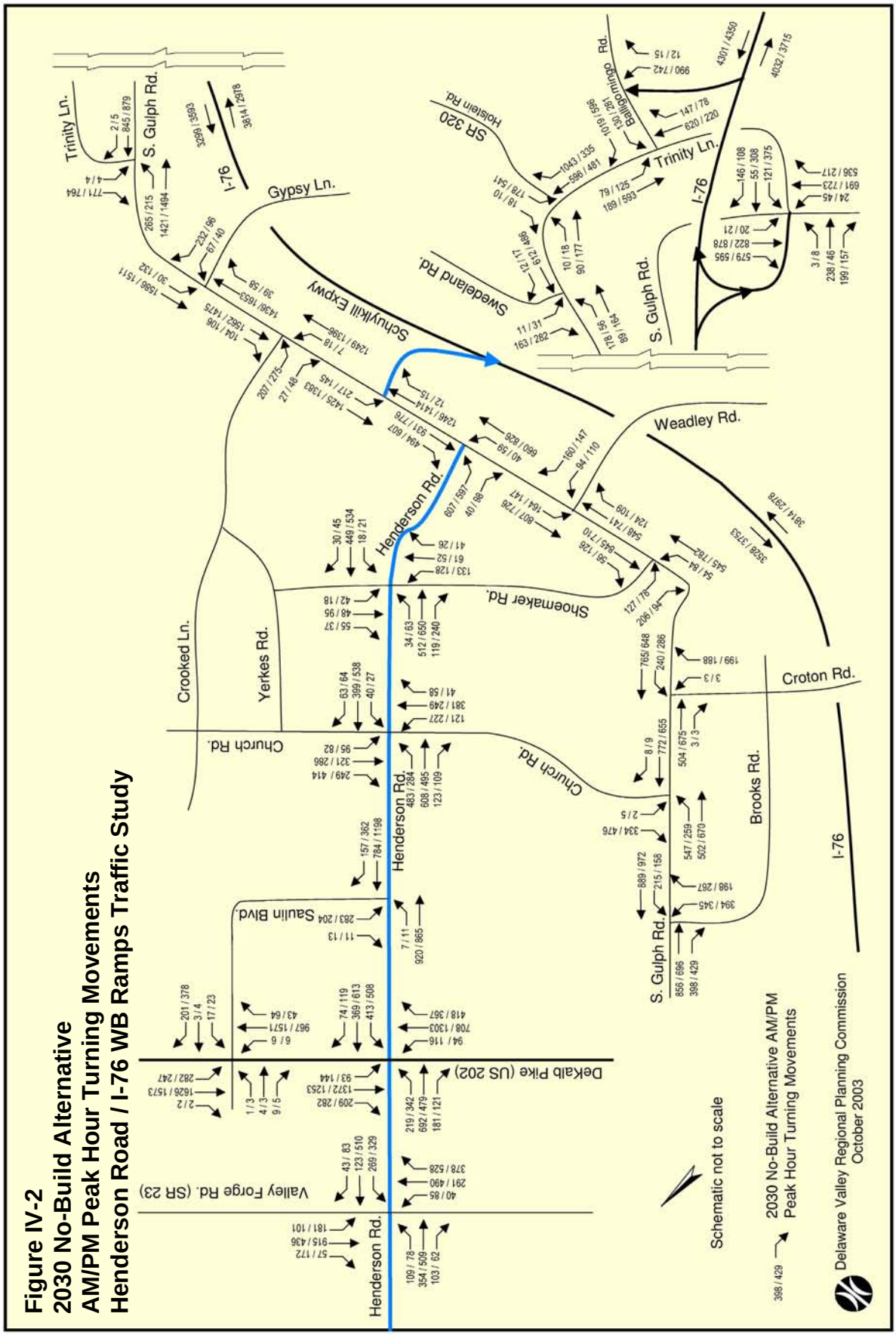

Figure IV-2
2030 No-Build Alternative
AM/PM Peak Hour Turning Movements
Henderson Road / I-76 WB Ramps Traffic Study

Table IV-1
Current, 2010 and 2030 No-Build Alternative
Average Daily Traffic Volumes

Highway Facility	Location	Current Volume	2010 No-Build Volume	2030 No-Build Volume	2030 No-Build/Current Growth	2030 No-Build/Current Percent
Henderson Road						
Henderson Road	Beidler Road to Valley Forge Road (SR 23)	7805	8400	9600	1795	23%
Henderson Road	Ross Road to DeKalb Pike (US 202)	14650	16500	18600	3950	27%
Henderson Road	DeKalb Pike (US 202) to Church Road	22597	24600	27500	4903	22%
Henderson Road	Church Road to Shoemaker Road	21131	22500	24900	3769	18%
Henderson Road	Shoemaker Road to South Gulph Road	17949	18900	20600	2651	15%
Intersecting Routes						
I-76 WB On-ramp	Henderson Road to I-76 WB	5700	6200	6900	1200	21%
I-76 EB Off-ramp	I-76 WB to South Gulph Road	n/a	7700	9000	n/a	n/a
I-76 WB Off-ramp	I-76 WB to Balligomingo Road	8139	8600	9400	1261	15%
I-76 WB Off-ramp	I-76 WB to Henderson Road	n/a	n/a	n/a	n/a	n/a
I-76 EB On-ramp	Gulph Mills Road (SR 320) to I-76 EB	10799	11200	11900	1101	10%
I-76 WB	Henderson Road On-ramp to US 202	49477	51200	54400	4923	10%
I-76 EB	Gulph Mills Road (SR 320) to US 202	42912	44600	47300	4388	10%
I-76 WB	Balligomingo Road Off-ramp to Henderson Road Off-ramp	43777	45000	47500	3723	9%
I-76 EB	Gulph Mills Road (SR 320) to US 202	42912	44600	47300	4388	10%
I-76	Gulph Mills Road (SR 320) to I-476	n/a	103700	107100	n/a	n/a
South Gulph Road	DeKalb Pike (US 202) to Church Road	26060	28700	31800	5740	22%
South Gulph Road	Croton Road to Shoemaker Road	13885	15400	18000	4115	30%
South Gulph Road	Shoemaker Road to Henderson Road	13986	15500	18200	4214	30%
South Gulph Road	Henderson Road to Crooked Lane	22241	27300	31200	8959	40%
South Gulph Road	Crooked Lane to Swedeland Road (SR 320)	27540	30400	34900	7360	27%
South Gulph Road	Trinity Lane to Upper Gulph Road	n/a	24900	27700	n/a	n/a
Shoemaker Road	Gulph Road to Henderson Road	3182	3900	5000	1818	57%
Shoemaker Road	Henderson Road to Yerkes Road	n/a	3800	4500	n/a	n/a
Church Road	Henderson Road to South Gulph Road	15577	16800	19100	3523	23%
Church Road	Henderson Road to Yerkes Road	n/a	14000	16100	n/a	n/a
Church Road	Yerkes Road to Crooked Lane	11229	12700	15400	4171	37%
Church Road	Crooked Lane to Flint Hill Road	n/a	10800	13100	n/a	n/a
DeKalb Pike (US 202)	Allendale Road to Mall Boulevard	n/a	45500	49800	n/a	n/a
DeKalb Pike (US 202)	Allendale Road to Henderson Road	41936	45300	50500	8564	20%
DeKalb Pike (US 202)	Henderson Road to Bridgeport Bypass	37532	40800	44700	7168	19%

Table IV-1
Current, 2010 and 2030 No-Build Alternative
Average Daily Traffic Volumes (Continued)

Highway Facility	Location	Current Volume	2010 No-Build Volume	2030 No-Build Volume	2030 No-Build/Current Growth	2030 No-Build/Current Percent
Keebler Road	Valley Forge Road (SR 23) to General Knox Boulevard	n/a	8300	8900	n/a	n/a
Keebler Road	General Knox Boulevard to Allendale Road	7859	8600	9800	1941	25%
Valley Forge Rd (SR 23)	Allendale Road to Keebler Road	9753	11500	14000	4247	44%
Valley Forge Rd (SR 23)	Keebler Road to Henderson Road	13726	15100	17100	3374	25%
Valley Forge Rd (SR 23)	Henderson Road to DeKalb Pike (US 202) South	9041	10100	11700	2659	29%
Beidler Road	Henderson Road to Geerdes Boulevard	5464	6200	7500	2036	37%
Saulin Boulevard	Henderson Road to US 202	n/a	7200	8500	n/a	n/a
Parallel Routes						
Crooked Lane	Ford Road to Church Road	3131	3800	4600	1469	47%
Crooked Lane	Church Road to Yerkes Road	3602	4400	5400	1798	50%
Crooked Lane	Yerkes Road to South Gulph Road	n/a	6300	6800	n/a	n/a
Yerkes Road	Holstein Road to Church Road	1799	2600	3500	1701	95%
Allendale Road	First Avenue to Valley Forge Road (SR 23)	14500	16200	18900	4400	30%
Allendale Road	First Avenue to Willis Boulevard	16753	18900	22500	5747	34%
Allendale Road	Willis Boulevard to DeKalb Pike (US 202)	18738	20800	23600	4862	26%
Balligomingo Road	Gulph Mills Off-ramp to Jones Road	2914	3700	4500	1586	54%
Balligomingo Road	I-76 WB Off-ramp to Trinity Lane (SR 320)	n/a	11800	12800	n/a	n/a
Gypsy Lane	South Gulph Road to Hughes Road	2002	3200	4700	2698	135%
Weadley Road	South Gulph Road to Hughes Road	n/a	7000	7900	n/a	n/a
Croton Road	South Gulph Road to King of Prussia Road	9847	10500	11700	1853	19%
Swedeland Road (SR 320)	South Gulph Road to Flint Hill Road	11457	12200	13600	2143	19%

B. 2010 and 2030 Build Alternative

Figure IV-3 summarizes the 2010 and 2030 no-build and build traffic forecasts. **Figure IV-4** provides a summary of the 2030 future build weekday morning (AM) and weekday afternoon (PM) peak-hour turning movement volumes at the study area intersections. **Table IV-2** provides a comparison of the current traffic volumes to the 2030 future build traffic volumes.

The annual average daily traffic (AADT) and AM and PM peak hour traffic volume forecasts under the No-build Alternative assume that the proposed Schuylkill Valley Metro, Cross Country Metro and Route 100 Extension to King of Prussia Mall are not constructed. The Build Alternative AADT projections assume that these three proposed transit lines are constructed and in revenue service. Traffic reductions on highway links in the study area from these proposed transit facilities ranges from zero to 7.5 percent of the projected Build Alternative AADT traffic volumes depending on the location of a given highway link. The highest reductions in highway volumes from the proposed transit facilities will be on highway links adjacent to and parallel to the proposed facilities. The AM and PM peak hour Build Alternative forecasts presented in Figure IV-4 do not assume construction of the Schuylkill Valley Metro, Cross County Metro, or Route 100 Extension. These Build Alternative peak hour ramp and turning movement forecasts are intended to reflect the worst case assumptions for design purposes.

Under the build alternative, the existing I-76 westbound on-ramp from South Gulph Road (to the east of Henderson Road) is proposed to be removed and replaced with a new interchange ramp system directly opposite the Henderson Road terminus along South Gulph Road. The new proposed ramp interchange will provide an on-ramp to I-76 westbound and an off-ramp from I-76 westbound. As a result, a portion of the traffic currently utilizing the I-76 westbound off-ramp at Balligomingo Road (approximately 3,300 vpd) will be transferred to the new off-ramp directly opposite Henderson Road, which will carry approximately 5,300 vpd. This diversion will alleviate 2030 traffic conditions along South Gulph Road to the east of Crooked Lane (by 2,600 vpd).

North of Henderson Road, traffic along South Gulph Road is reduced by about 1,000 vpd under the build Alternative. On Henderson Road, the proposed widening along with the I-76 ramp improvements will increase the 2030 build alternative traffic by approximately 5,100 vpd to the north of South Gulph Road. This traffic increase declines to 2,150 vpd between Saulin Boulevard and the Turnpike. North of DeKalb Pike (US 202), the traffic increase on Henderson Road under the build alternative dissipates to about 500 vpd over the no-build alternative, which is not considered significant.

Most of the other highway facilities in the Henderson Road corridor experience small traffic reductions as a result of the build alternative. DeKalb Pike (US 202) receives some traffic relief between Henderson Road and the King of Prussia Mall (up to 2,100 vpd).

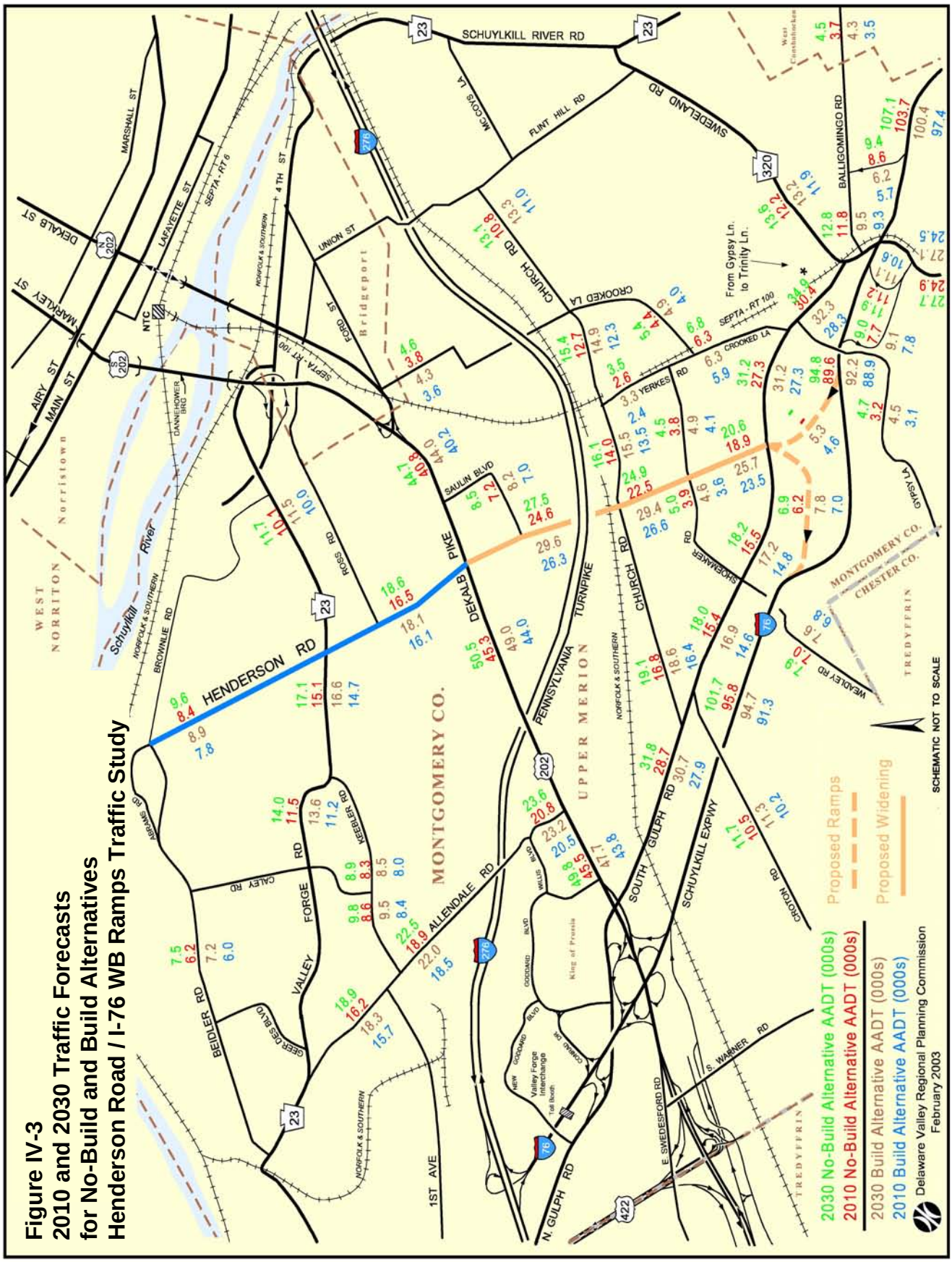

Figure IV-3
2010 and 2030 Traffic Forecasts
for No-Build and Build Alternatives
Henderson Road / I-76 WB Ramps Traffic Study

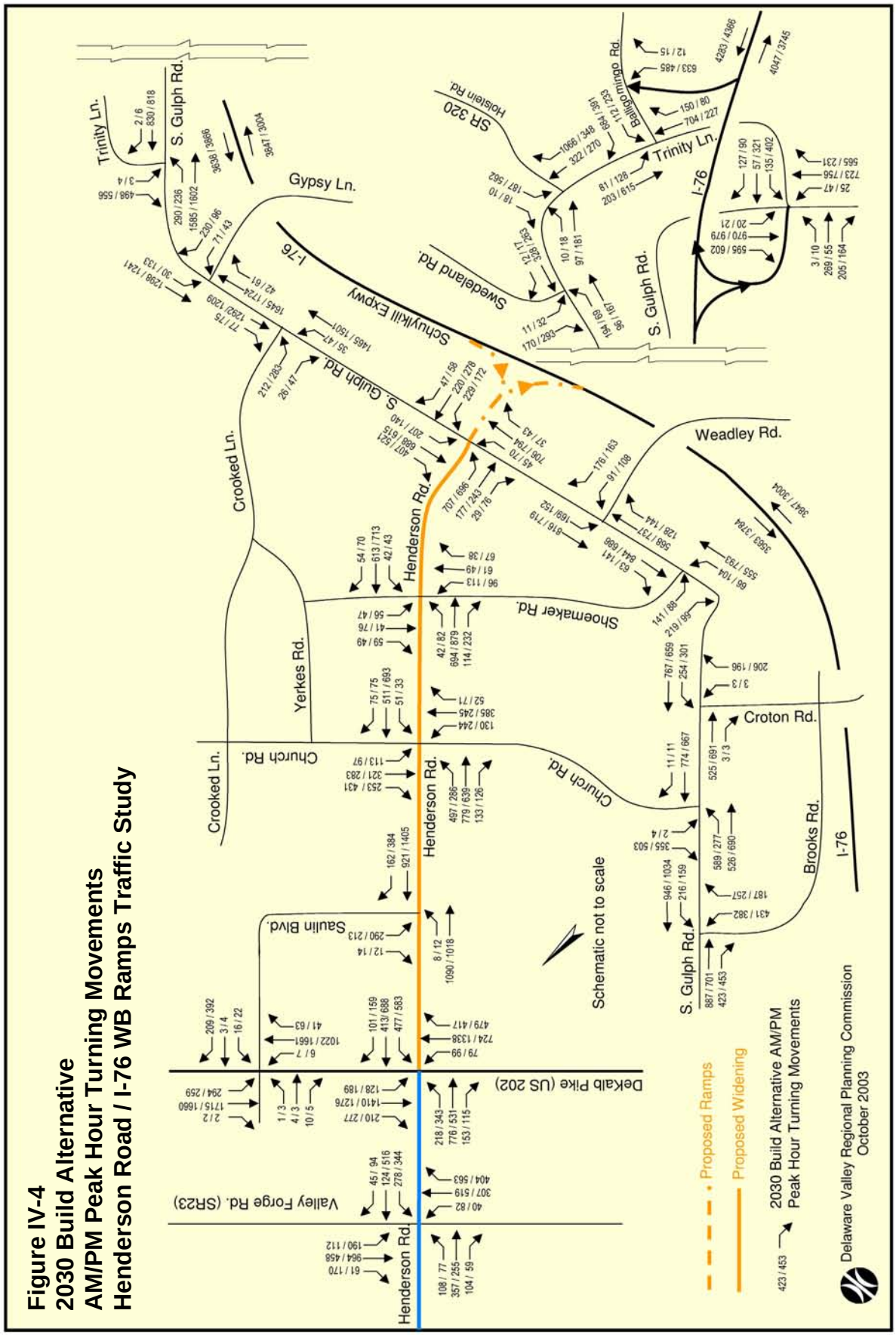

Figure IV-4
2030 Build Alternative
AM/PM Peak Hour Turning Movements
Henderson Road / I-76 WB Ramps Traffic Study

Table IV-2
Current, 2010 and 2030 Build Alternative
Average Daily Traffic Volumes

Highway Facility	Location	Current Volume	2010 Build Volume	2030 Build Volume	2030 Build/Current Growth	2030 Build/Current Percent
Henderson Road						
Henderson Road	Beidler Road to Valley Forge Road (SR 23)	7805	7800	8900	1095	14%
Henderson Road	Ross Road to DeKalb Pike (US 202)	14650	16100	18100	3450	24%
Henderson Road	DeKalb Pike (US 202) to Church Road	22597	26300	29600	7003	31%
Henderson Road	Church Road to Shoemaker Road	21131	26600	29400	8269	39%
Henderson Road	Shoemaker Road to South Gulph Road	17949	23500	25700	7751	43%
Intersecting Routes						
I-76 WB On-ramp	Henderson Road to I-76 WB	5700	7000	7800	2100	37%
I-76 EB Off-ramp	I-76 WB to South Gulph Road	n/a	7800	9100	n/a	n/a
I-76 WB Off-ramp	I-76 WB to Balligomingo Road	8139	5700	6200	-1939	-24%
I-76 WB Off-ramp	I-76 WB to Henderson Road	n/a	4600	5300	n/a	n/a
I-76 EB On-ramp	Gulph Mills Road (SR 320) to I-76 EB	10799	10600	11100	301	3%
I-76 WB	Henderson Road On-ramp to US 202	49477	48100	49900	423	1%
I-76 EB	Gulph Mills Road (SR 320) to US 202	42912	43200	44800	1888	4%
I-76 WB	Balligomingo Road Off-ramp to Henderson Road Off-ramp	43777	45700	47400	3623	8%
I-76 EB	Gulph Mills Road (SR 320) to US 202	42912	43200	44800	1888	4%
I-76	Gulph Mills Road (SR 320) to I-476	n/a	97400	100400	n/a	n/a
South Gulph Road	DeKalb Pike (US 202) to Church Road	26060	27900	30700	4640	18%
South Gulph Road	Croton Road to Shoemaker Road	13885	14600	16900	3015	22%
South Gulph Road	Shoemaker Road to Henderson Road	13986	14800	17200	3214	23%
South Gulph Road	Henderson Road to Crooked Lane	22241	27300	31200	8959	40%
South Gulph Road	Crooked Lane to Swedeland Road (SR 320)	27540	28300	32300	4760	17%
South Gulph Road	Trinity Lane to Upper Gulph Road	n/a	24500	27100	n/a	n/a
Shoemaker Road	Gulph Road to Henderson Road	3182	3600	4600	1418	45%
Shoemaker Road	Henderson Road to Yerkes Road	n/a	4100	4900	n/a	n/a
Church Road	Henderson Road to South Gulph Road	15577	16400	18600	3023	19%
Church Road	Henderson Road to Yerkes Road	n/a	13500	15500	n/a	n/a
Church Road	Yerkes Road to Crooked Lane	11229	12300	14900	3671	33%
Church Road	Crooked Lane to Flint Hill Road	n/a	11000	13300	n/a	n/a
DeKalb Pike (US 202)	Allendale Road to Mall Boulevard	n/a	43800	47700	n/a	n/a
DeKalb Pike (US 202)	Allendale Road to Henderson Road	41936	44000	49000	7064	17%
DeKalb Pike (US 202)	Henderson Road to Bridgeport Bypass	37532	40200	44000	6468	17%

Table IV-2
Current, 2010 and 2030 Build Alternative
Average Daily Traffic Volumes (Continued)

Highway Facility	Location	Current Volume	2010 Build Volume	2030 Build Volume	2030 Build/Current Growth	2030 Build/Current Percent
Keebler Road	SR 23 to General Knox Boulevard	n/a	8000	8500	n/a	n/a
Keebler Road	General Knox Boulevard to Allendale Road	7859	8400	9500	1641	21%
Valley Forge Road (SR 23)	Allendale Road to Keebler Road	9753	11200	13600	3847	39%
Valley Forge Road (SR 23)	Keebler Road to Henderson Road	13726	14700	16600	2874	21%
Valley Forge Road (SR 23)	Henderson Road to US 202 South	9041	10000	11500	2459	27%
Beidler Road	Henderson Road to Geerdes Boulevard	5464	6000	7200	1736	32%
Saulin Boulevard	Henderson Road to DeKalb Pike (US 202)	n/a	7000	8200	n/a	n/a
Parallel Routes						
Crooked Lane	Ford Road to Church Road	3131	3600	4300	1169	37%
Crooked Lane	Church Road to Yerkes Road	3602	4000	4900	1298	36%
Crooked Lane	Yerkes Road to South Gulph Road	n/a	5900	6300	n/a	n/a
Yerkes Road	Holstein Road to Church Road	1799	2400	3300	1501	83%
Allendale Road	First Avenue to Valley Forge Road (SR 23)	14500	15700	18300	3800	26%
Allendale Road	First Avenue to Willis Boulevard	16753	18500	22000	5247	31%
Allendale Road	Willis Boulevard to DeKalb Pike (US 202)	18738	20500	23200	4462	24%
Balligomingo Road	Gulph Mills Off-ramp to Jones Road	2914	3500	4300	1386	48%
Balligomingo Road	I-76 WB Off-ramp to Trinity Lane (SR 320)	n/a	9300	9500	n/a	n/a
Gypsy Lane	South Gulph Road to Hughes Road	2002	3100	4500	2498	125%
Weadley Road	South Gulph Road to Hughes Road	n/a	6800	7600	n/a	n/a
Croton Road	South Gulph Road to King of Prussia Road	9847	10200	11300	1453	15%
Swedeland Road (SR 320)	South Gulph Road to Flint Hill Road	11457	11900	13200	1743	15%

V. CONGESTION MANAGEMENT SYSTEM ANALYSIS

A. INTRODUCTION

Proposed improvements to Henderson Road including a new westbound I-76 off-ramp, a relocated on-ramp to westbound I-76 and widening of Henderson Road to two lanes-by-direction from South Gulph Road to US 202 necessitate a Congestion Management System (CMS) analysis. The following sections describe the federal requirements that mandate a CMS analysis, the development and findings of the regional operational CMS, the requirements of a project-level CMS, and the results of the Henderson Road CMS analysis.

B. FEDERAL REQUIREMENTS

The Congestion Management System was established by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) to aid decision makers in gauging system performance and needs, and selecting cost-efficient strategies and actions to improve and protect the investment in the nation's infrastructure. The Congestion Management System is defined in the federal regulations as a "systematic process that provides information on transportation system performance and alternative strategies to alleviate congestion and enhance the mobility of persons and goods." The federal guidance states that the CMS should evaluate and include strategies to reduce single-occupant vehicle travel and improve the efficiency of the existing transportation infrastructure.

As of October 1, 1997, federal funds may not be programmed for any project that will result in a significant increase in carrying capacity of single-occupant vehicles unless the project comes from a fully operational Congestion Management System. A project needs to be considered for inclusion in the CMS if it receives federal funds, is located in an air quality nonattainment area (the entire DVRPC region is designated a severe ozone nonattainment area) and results in the equivalent of one or more general purpose lanes in carrying capacity for single-occupant vehicles. The federal guidance did not define what constitutes a significant capacity increase. However, DVRPC has adopted a policy of excluding projects that comprise either non-significant capacity increases or spot improvements from the CMS.

Non-significant capacity increases are projects that do not primarily provide through capacity but instead are a consequence of improvements such as acceleration/ deceleration lanes, center turning lanes, climbing lanes, and arterial signal systems. Spot improvements are projects that may increase capacity but are applied to a localized section of the transportation network such as isolated intersection improvements, ramp revisions at existing interchanges that do not permit additional movements between facilities, and limited at-grade circle cut-throughs. In addition, the federal guidance specifically excludes safety improvements and bottleneck elimination projects from the CMS. The ***Pennsylvania Congestion Management System Phase 2 Report***, published by DVRPC in July 1997, serves as the operational CMS for the Pennsylvania portion of the DVRPC region.

C. THE DVRPC CONGESTION MANAGEMENT SYSTEM FOR PENNSYLVANIA

DVRPC, in conjunction with its planning partners, developed the Congestion Management System for the Pennsylvania portion of the region in two phases. The first phase consisted of the cataloging of existing data and other information-gathering activities, identifying current and future congested facilities, and developing the CMS network. Phase 1 established a CMS network composed of major highways and a passenger rail network. With over 13,000 miles of roads in the Pennsylvania portion of the region, a smaller network was required to focus attention and resources on the most critical transportation facilities for moving people and goods. The highway portion of the CMS network is based upon the following facility types:

- National Highway System (NHS) routes
- Congested principal arterials not on the NHS
- Streets with significant bus activity (200+ buses per day)
- Roads connecting the NHS with major passenger intermodal facilities and major freight intermodal facilities
- Roads impacted by special event generators (i.e., the sports complex or shore traffic)

The passenger rail network includes the following facilities:

- SEPTA's Regional Rail network
- SEPTA's Broad Street Subway, Market-Frankford Subway-Elevated, Norristown High Speed, and Media/Sharon Hill Light Rail lines
- PATCO High Speed Line
- NJ Transit and Amtrak rail lines

Traffic congestion at the systems level (as opposed to location-specific "spot" congestion) for 1996 and 2005 was identified by a number of quantitative and qualitative methods including:

- Volume to capacity (V/C) ratios from DVRPC's travel demand simulation model
- Development trends by assessing 1996-2005 trip growth
- Discussions with county planning officials, PennDOT District 6-0 personnel, state police, traffic reporting services, DVRPC's Goods Movement Task Force and Regional Citizens Committee (RCC)

The second phase identified causes of congestion and reviewed strategies to relieve congestion at the corridor level. The CMS corridors were based on the corridors first established in DVRPC's ***Year 2020 Long Range Plan***. Each CMS corridor is typically organized around a major highway and parallel roads. Even though a corridor contains many other roads, and the CMS recommendations apply to the entire corridor, the primary focus is on the major highway(s). A total of eighteen corridors were evaluated. To be more reflective of the transportation network, land use, and trip-making patterns, corridors were divided into sub-corridors. In each sub-corridor, the location and severity of traffic congestion in the CMS network were evaluated along with the primary and secondary causes of congestion. Similarly, for the passenger rail network, all stations in the sub-corridor were identified along with information on service frequency, parking availability, and connecting rail and feeder buses. This information is documented on individual corridor fact sheets and maps.

Over fifty improvement strategies were identified from a number of sources including the federal CMS regulations and PennDOT's guidance on single-occupant vehicle capacity-adding (SOVCAP) projects. The strategies attempt to meet the three goals of the CMS: (1) easing traffic congestion through the reduction of single occupant vehicles; (2) optimizing the efficiency of existing transportation systems; and (3) improving access to and proficiency of the transportation network to relieve congestion and improve the mobility of goods and people. Conceptually, the strategies range from low cost alternatives to driving, to moderate improvements to the transit and highway systems, and ultimately to significant SOV capacity improvements.

For each sub-corridor, strategies were reviewed for applicability and effectiveness based upon the characteristics of the transportation network; the extent and cause of traffic congestion; and population, employment, and other characteristics inventoried in the Long Range Plan corridor analyses. A standard strategy matrix was developed that rated each strategy as either *very practical*, *practical* or *not practical* within a sub-corridor. The criteria for evaluating practicality is shown below. After DVRPC's initial analysis, members of the Pennsylvania Subcommittee of the Regional Transportation Committee (RTC) and a subcommittee of the RCC made extensive modifications based upon their knowledge of, and familiarity with, the sub-corridors.

CRITERIA FOR STRATEGY MATRIX EVALUATION

Very Practical

- Widely applicable
- Very effective
- Can be implemented by an appropriate agency with minimal difficulty

Practical

- Not widely applicable
- May not be fully effective for the sub-corridor (i.e., employer-based ridesharing in an area that is primarily residential)
- Highly desirable yet entail some implementation obstacles

Not Practical

- Not applicable or effective
- Not feasible in terms of implementation

The detailed fact sheets and strategy matrices provide a comprehensive macro-level overview of the location and causes of congestion and improvement strategies. The corridor overviews summarize the existing transportation facilities in the sub-corridors, the level of congestion and key causes, and presents a brief overview of the primary and secondary strategies to manage congestion. The *Pennsylvania Congestion Management System Phase 2 Report* is considered a systems-level analysis because it examines generalized highway links and evaluates strategies that are applicable to larger areas. In the project development process the opposite is true; the focus is on a small study area. DVRPC revises the regional CMS by conducting corridor and project-level studies using performance measures to examine congestion levels and the effectiveness of improvement strategies.

D. PROCEDURES FOR SOV CAPACITY-ADDING PROJECTS

The Pennsylvania Congestion Management System Phase 2 Report serves as the operational CMS for the Pennsylvania portion of the DVRPC region. It functions as a framework for future analysis. CMS analysis for specific locations or projects is performed when applicable using the guidelines set forth in the regional CMS. The *Pennsylvania Congestion Management System Phase 2 Report* provides an initial assessment of the appropriateness of SOV widening within a particular corridor. Further study may be necessary to determine if SOV widening is warranted for a particular facility. Typically, a facility for which a SOV enhancement is proposed will be classified as congested in the *Pennsylvania Congestion Management System Phase 2 Report*. However, there are a couple of conditions that preclude every congested facility from being identified. The CMS network is limited to the facilities described earlier. Therefore, there are many facilities that are not included in the CMS network. Because the *Pennsylvania Congestion Management System Phase 2 Report* is a systems-level analysis, localized or spot congestion may not always be documented. Also, development is continuously impacting the transportation infrastructure but not all future development is able to be accounted for in the travel demand simulation models. In many cases, DVRPC will perform an operations-level or project-specific analysis on roads for which SOV enhancement is proposed, to determine or verify if that facility is or will be congested.

Generally, a project is said to result from the CMS if SOV widening is identified in the *Pennsylvania Congestion Management System Phase 2 Report* as a very practical or practical strategy for the sub-corridor. This serves as a first screening for CMS requirements and DVRPC then makes a determination of whether a more detailed CMS study is required. All regionally significant projects that add a general purpose lane(s) of a mile in length or longer or a new interchange will require further CMS analysis and commitments.

E. HENDERSON ROAD PROJECT-LEVEL CONGESTION MANAGEMENT SYSTEM STUDY AREA

The CMS study area for the Henderson Road improvements also encompasses the Lafayette Street and PA 23 improvements. A larger CMS study area provides an expanded set of strategies to be evaluated because there is a larger population and employment base to work with. The Lafayette Street and PA 23 improvements will be evaluated separately in terms of project need and ability to reduce congestion. However, all three projects will encompass a single CMS study area and a single set of CMS strategies that will be evaluated for their adequacy to meet future travel demand. The CMS study area corresponds approximately to the study area used for the base-level travel-demand simulation modeling effort for all three projects.

F. FINDINGS OF THE PENNSYLVANIA CONGESTION MANAGEMENT SYSTEM PHASE 2 REPORT

In the *Pennsylvania Congestion Management System Phase 2 Report,* the CMS study area is covered by four different corridors (Corridors 3, 4, 22, and 25). Each corridor is further broken down into sub-corridors based on land use and travel patterns, among

other criteria. Because of the drastic change in land use and confluence of travel patterns inherent at the juncture of four major highways, the CMS study area is a break point or boundary for seven sub-corridors.

The congested facilities are identical in each (sub)corridor. However, since each corridor has a different focus, the recommended strategies differ from corridor to corridor and sub-corridor to sub-corridor even though they cover the same facilities and geographic area. Corridor 22: King of Prussia to New Jersey, focuses on the Pennsylvania Turnpike (I-276) which is the most direct route between these two locations. The focus of this corridor is reducing congestion on a limited-access expressway and on the small number of access points/interchanges. Corridor 25: King of Prussia to Doylestown, addresses travel between King of Prussia and Doylestown, with the most direct route being US 202 which is a full access arterial facility. Therefore, there are many more points of access and potential points of congestion compared to Corridor 22.

After reviewing each of the corridors, a primary and secondary sphere of influence was designated for the purpose of the CMS analysis. A primary corridor for the current study area is Corridor 3: Coatesville to Center City, which generally follows US Route 30 between Coatesville and Center City, but also encompasses the Schuylkill Expressway (I-76). Within this corridor, two overlapping sub-corridors cover the CMS study area. Corridor 25: King of Prussia to Doylestown, which focuses on US 202 was also deemed a primary corridor. There is also an overlap of two sub-corridors within Corridor 25. Corridor 4: Pottstown to King of Prussia, following US 422 and Ridge Pike/Germantown Pike and Corridor 22: King of Prussia to New Jersey, which concentrates on the Pennsylvania Turnpike (I-276), were both deemed to be secondary corridors of influence for the purposes of this CMS analysis.

Henderson Road is not included in the CMS network that was analyzed in the *Pennsylvania Congestion Management System Phase 2 Report*. It is not currently classified as a principal arterial. However, proposed improvements including direct connections to I-76 merit inclusion in the CMS network. The Schuylkill Expressway (I-76), US 202, and US 422 are all severely congested in the base of the CMS analysis (1996) and in the CMS forecast (2005).

Due to the large number of overlapping sub-corridors, a composite strategy matrix was developed for the study area based on the individual strategy matrixes from each of the seven sub-corridors that cover the study area. Priority was given to the two primary corridors. The seven sub-corridors actually had identical prioritization of the vast majority of screened strategies. In many other cases the prioritization only varied slightly, between very practical and practical, or practical and not practical. In the cases where the prioritization varied greatly (between very practical and not practical), the majority determined the composite, with emphasis being given to the two primary corridors. Every sub-corridor listed SOV roadway widening as a practical strategy. This means that the proposed projects did meet the first criteria of being part of an operational CMS. Strategies that were rated very practical in the composite strategy prioritization are shown in **Table V-5**.

The recommended strategies place a heavy emphasis on mode shift, transportation demand management, incident management, intelligent transportation systems, transit capital improvements, and improvements to traffic operations. There is a dual goal of removing vehicles/trips from the system and improving the flow on the network. The profusion of expressways in the vicinity (I-76, I-276, I-476, US 202, and US 422) naturally lends itself to incident management and ITS strategies that improve the traffic flow on freeways. The number and density of commercial and office employment destinations lend themselves to mode shift strategies such as carpooling, transit marketing and associated strategies such as ridematching and other services provided by transportation management associations. In addition, transit capital improvement projects, such as a dedicated rail line Right-of-Way (ROW), are particularly appropriate in such a dense built-up area.

G. PROJECT-LEVEL CMS ANALYSIS

Even though SOV roadway widening is identified as an appropriate strategy in each of the seven sub-corridors that cover the CMS study area, additional CMS analysis is necessary because the proposed Henderson Road improvements include a new interchange with one new ramp and a relocated ramp and a significant increase in single occupant vehicle (SOV) capacity. Additionally, Henderson Road was not part of the *Pennsylvania Congestion Management System Phase 2 Report* network. The project-level CMS analysis builds upon the results of the systems-level *Pennsylvania Congestion Management System Phase 2 Report*. The project-level CMS analysis addresses three questions: is the facility congested currently or in the future; can CMS strategies meet future travel demand; and does the proposed improvements reduce congestion?

Future no-build and build volumes are generated using the DVRPC travel-demand simulation model. The level-of-service (LOS) is then derived from the link volumes for current conditions as well as future scenarios. The first step in the project-level analysis is to determine if congestion exists on the facility, either now or in the future, based on level-of-service. Additionally, future scenario link volumes and intersection level-of-service are compared to current volumes and LOS to determine if congestion improves or worsens in the future. An adequacy test is conducted to determine if future demand can be met by means other than increasing SOV capacity, such as implementing Transportation Control Measures (TCM) or Transportation Demand Management (TDM) strategies. Finally, level-of-service results are analyzed to determine if the proposed project (build scenario) improves LOS compared to the future no-build scenario. This determines whether the proposed improvements are a legitimate congestion mitigation strategy.

If warranted, a set of CMS strategies may be selected and endorsed as project commitments to help reduce SOV travel, improve the efficiency of the existing transportation network and prolong the usefulness of capacity increases.

H. RESULTS

Two design year alternatives, a no-build and a build scenario, were analyzed using the travel demand simulation model. Results were calculated for a design year of 2030. The design year reflects a twenty-five year planning horizon based on a completion date of 2005 for the proposed improvements. The no-build scenario includes all regionally significant projects to be completed by 2025, but did not include the new ramps and improvements to Henderson Road. The projects are part of DVRPC's Year 2025 Long Range Plan and FY 2003 Transportation Improvement Program (TIP). The build scenario mirrors the no-build scenario, but assumes a new westbound I-76 off-ramp and relocated westbound on-ramp at Henderson Road and widening of Henderson Road to four lanes from South Gulph Road to US 202. Traffic volumes from the current and no-build scenarios were compared to determine the extent of congestion in the future. Level-of-service under the no-build and build scenarios were also contrasted to determine if the proposed roadway project improved or worsened future conditions. **Table V-1** shows the existing and future peak-hour volumes along Henderson Road and South Gulph Road under no-build conditions.

Table V-1. Percent Increase in Traffic Volumes Under No-Build Conditions

ROAD (LIMITS)	DIRECTION	% INCREASE NO-BUILD/CURRENT AM PEAK (PM PEAK)
Henderson Rd. (South Gulph Rd. to Shoemaker Rd.)	Northbound Southbound	20% (18%) 17% (22%)
Henderson Rd. (Shoemaker Rd. to Church Rd.)	Northbound Southbound	18% (18%) 18% (25%)
Henderson Rd. (Church Rd. to Saulin Blvd.)	Northbound Southbound	25% (22%) 23% (16%)
Henderson Rd. (Saulin Blvd. to US 202)	Northbound Southbound	22% (22%) 22% (22%)
Henderson Rd. (US 202 to PA 23)	Northbound Southbound	27% (27%) 27% (53%)
S. Gulph Rd. (Weadley Rd. to Henderson Rd.)	Westbound Eastbound	33% (36%) 22% (20%)
S. Gulph Rd. (Henderson Rd. to I-76 Ramps)	Westbound Eastbound	28% (28%) 22% (24%)

Analysis of the model runs reveals that by 2030, average annual daily traffic (AADT) on Henderson Road and surrounding vicinity will increase by 17 to 33% in the no-build scenario over current levels. Intersection level-of-service analysis, shown in **Table V-2,** reveals that level-of-service deteriorates at several intersections to a LOS of F in 2030 under no-build conditions. LOS improves in the build scenario at all intersections with the exception of Henderson Road and PA 23 where there is a decrease from LOS E to LOS F during the AM peak. The analysis shows that congestion worsens in the future no-build scenario compared to current levels and the proposed improvements (build scenario) help alleviate congestion in the future.

Table V-2. Comparison of Signalized Intersection Peak Hour Level of Service

INTERSECTION	PEAK HOUR LEVEL OF SERVICE AM (PM) 2001 BASE 2030 NO-BUILD 2030 BUILD
Henderson Road & South Gulph Road	C ©) E (F) D ©)
Henderson Road & Shoemaker Road	B (B) B (B) B (B)
Henderson Road & Church Road	F (E) D (D) * SEE NOTE D ©)
Henderson Road & Saulin Boulevard	C (B) C (B) B (B)
Henderson Road & US 202 ** SEE NOTE	F (F) F (F) F (F)
Henderson Road & PA 23	C (D) E (F) F (F) *** SEE NOTE
South Gulph Road & Shoemaker Road Offset Intersection with Weadley Road	B (B) C (B) C ©)
South Gulph Road & Weadley Road Offset Intersection with Shoemaker Road	C ©) F (F) C ©)
South Gulph Road & Crooked Lane	E (E) F (F) B (B)
South Gulph Road & Gypsy Lane	F (E) F (F) B (B)
South Gulph Road & Trinity Lane	Not Signalized Not Signalized B (B)
South Gulph Road & Trinity Lane / I-76 EB Ramps	C ©) E (E) B ©)

* Note: Assumes WB Church Rd. right turn lane built as an independent Upper Merion project.

** Note: Operation improvements, including widening, have already been completed at this location, which is just north of the proposed improvements

*** Note: Improvements at this intersection will be addressed by the PA 23 Relocation Study.

1. CMS Strategy Adequacy Test

An appropriate set of Transportation Control Measures (TCM) and Transportation Demand Management (TDM) strategies was reviewed to determine if they met the travel demand of the study area and would thereby eliminate the need for roadway widening. The analysis, performed by DVRPC staff, focused on all the strategies ranked *very practical* in the *Pennsylvania Congestion Management System Phase 2 Report*. Additional *practical* and *not very practical* strategies were evaluated to determine the maximum potential for alternatives to increasing SOV capacity.

The study area has a large set of CMS commitments and strategies in place. There are two transportation centers, over twenty transit routes including two rail lines and three shuttle services, two Transportation Management Associations, a network of multi use trails with connections to major destinations, Intelligent Transportation System components on the numerous expressways that intersect in the study area, and several area wide traffic signal closed-loop systems. However, even with all the CMS-type strategies currently in place, traffic congestion is forecast to worsen in the future. Even the addition of several SOV capacity-enhancing projects, which are currently under construction or are planned for the area, will not eliminate congestion according to future traffic modeling simulations.

Table V-3 outlines the CMS strategies being currently implemented or committed to within the project study area. The abundance of CMS-type strategies has had a discernable impact on the adequacy test. The achievable impact of the analyzed strategies has been downgraded because many of the strategies are accounted for in the benefit assessment and any additional benefit will be incremental, at best.

Table V-4 presents the results of the adequacy assessment portion of the CMS analysis, including the practicality ranking of the strategy in the *Pennsylvania Congestion Management System Phase 2 Report*. Each of the twelve selected categories of strategies was reviewed for its ability to independently meet the project needs, the opportunity to implement the strategy within the corridor, the maximum potential of a full implementation of the strategy, and the estimated potential in the study area. Generally, the maximum potential reflects the upper limit of success that each strategy has achieved in nationwide case studies. The estimated achievable reduction is based on local circumstances such as the presence of complementary and supplementary strategies within the study area and the magnitude of the proposed strategies.

The potential reduction in vehicle miles traveled was based primarily upon data reported in ***Transportation Control Measures: An Analysis of Potential Transportation Control Measures for Implementation in the Pennsylvania Portion of the DVRPC Region*** (May 1994) performed by COMSIS Corporation for DVRPC. Strategies not analyzed in that report were evaluated using case studies from ***Costs and Effectiveness of Transportation Control Measures: A Review and Analysis of the Literature*** (January 1994) prepared by Apogee Research for the National Association of Regional Councils. Data from these sources was supplemented by professional judgment and knowledge of local conditions.

Table V-3. Existing CMS Programs and Commitments Within the Study Area

STRATEGY	PREVIOUSLY INITIATED OR ALREADY COMPLETED PROJECTS AND PROGRAMS	COMMITTED AREAWIDE PROJECTS AND PROGRAMS ASSOCIATED WITH CORRIDOR
New Transit Service		A Major Investment Study/ Draft Environmental Impact Statement has been completed for the Schuylkill Valley Metro rail line between Philadelphia and Wyomissing, Berks County. The project is now in the Preliminary Engineering and Final Environmental Impact Statement phase. SEPTA is currently conducting an alternatives analysis of extending service on the Route 100 Norristown High Speed Line to King of Prussia
Demand Responsive/ Shuttle Transit Service	The Cruise Line Corporate Shuttle provides connections from transportation centers directly to a work site. This is an employer-based subscription service. The Rambler residential shuttle service operates in Upper Merion Township and West Conshohocken, Conshohocken and Bridgeport boroughs. Service is provided Monday through Saturday. Stops include the King of Prussia Transportation Center and SEPTA's Gulph Mills Station (Route 100). The Suburban Link connects King of Prussia to Collegeville via the Phoenixville area. Connections are made at SEPTA's Gulph Mills Station (Route 100) and King of Prussia Transportation Center. Three runs are made during the morning peak period and three runs are made during the afternoon peak period.	
Parking Management	GVFTMA has a "Share-a-Lot" program which seeks to maximize the availability of parking by sharing underutilized facilities.	Upper Merion Township is investigating fringe parking as part of its "Horizons" transportation and land use plan.
Transportation Management Associations (TMAs)	Greater Valley Forge TMA and the TMA of Chester County are both active within the study area. They coordinate shuttle services (with a guaranteed ride home program), promote transit, carpooling and ridesharing, telecommuting, parking management programs and flexible and staggered work schedules/hours to area employers.	
Park and Ride	Park-and-ride lots have been constructed or expanded at the following locations: Matsonford Rd. at I-76/I-476 interchange (60 spaces) Lewis Rd. at US 422 (50 spaces) Matthews Rd. at US 202/PA 29 (100 spaces) US 30 at US 202 (125 spaces) Paoli Pike at US 202 (60 spaces) PA 113 east of PA 100 (37 spaces) Intermodal connections can be made at the following lots: PA 100 at US 30 (Exton Bypass) next to the SEPTA R5 station (116 spaces) US 202 and South Gulph Rd. (120 spaces)	

STRATEGY	PREVIOUSLY INITIATED OR ALREADY COMPLETED PROJECTS AND PROGRAMS	COMMITTED AREAWIDE PROJECTS AND PROGRAMS ASSOCIATED WITH CORRIDOR
Traffic Operations Improvements		The I-76 Corridor Traffic Management Program will provide for the interconnection of signals along the I-76 corridor to be used when incidents detour traffic from I-76 to local roads. Upper Merion Township will install a township-wide closed loop traffic signal system. Norristown will institute a signal coordination and interconnection project. Provide left turn lanes on all approaches to Sandy Hill Road and Belvoir Road. Realign and provide a left turn lane at PA 23 and Balligomingo Rd. intersection. Reconstruct and add a center turn lane on Ridge Pike between the Norristown Borough line and Butler Pike. Add a left turn lane and a traffic signal and upgrade existing signal at PA 23 and Old Betzwood Bridge intersection.
Bicycle/Pedestrian Improvements	The Allendale Road Bridge over the Pennsylvania Turnpike was recently replaced and a separate bike and pedestrian lane constructed as part of the project. As part of the US 202 Section 400 project, the new Chester Valley Trail Bridge over I-76 will be completed in 2003. The Schuylkill River Trail between Valley Forge park and Oaks was opened in 2002. The Park and Ride lot on US 202 and S. Gulph Road includes bicycle facilities and access to the future Chester Valley Trail.	The Chester Valley multi-use trail will be constructed from Norristown to Downingtown. This trail will connect to the existing Schuylkill River Trail between Valley Forge National Historical Park and Center City Philadelphia and the planned Cross County Trail to the Willow Grove area. The Cross-County Trail will be a nine mile paved commuter and recreational trail that will connect the Schuylkill Trail in Conshohocken to the Willow Grove area. The Schuylkill Trail from the Perkiomen Creek in Oaks to PA 29 in Lower and Upper Providence Townships will be constructed. This will extend the Schuylkill River Trail from its current terminus in Oaks. The Old Betzwood Bridge will be replaced and space and connections provided for a bicycle/pedestrian trail. The Upper Merion Bicycle Mobility Improvement Program will provide bicycle facilities on the following roads: N. Henderson Road, W. Beidler Road, PA 23, W. Valley Forge Road, Keebler Road, S. Gulph Road, S. Henderson Road. Croton Road, and S. Warner Road. Bike racks will be installed at the King of Prussia Transportation Center, Gulph Mills (Route 100), and Paoli (R5) stations.
Intelligent Transportation System (ITS)	ITS components (including vehicle detection system, Closed Circuit Television Cameras, Variable Message Signs, Highway Advisory Radio, and EZ Pass) installed on I-76, I-476, US 202, US 422, and the Pennsylvania Turnpike.	

STRATEGY	PREVIOUSLY INITIATED OR ALREADY COMPLETED PROJECTS AND PROGRAMS	COMMITTED AREAWIDE PROJECTS AND PROGRAMS ASSOCIATED WITH CORRIDOR
Transit Service Enhancements	In 1989, SEPTA opened the Norristown Transportation Center, which consolidated the R6 commuter rail line, the Route 100 Norristown High Speed Line and seven bus routes at one location. A park and ride lot was also provided at this location. During the past decade, the King of Prussia Transportation Center was upgraded and amenities added. The King of Prussia Transportation Center serves six bus routes in addition to the Rambler and Suburban Link shuttles and facilitates connections and travel to the King of Prussia mall. While not offering the same amenities as the Norristown and King of Prussia Transportation Centers, the Route 100 Gulph Mills station also has timed connections with three bus routes as well as the Rambler and Suburban Link shuttles. Parking facilities at the Thorndale (450 spaces), Malvern (70 spaces), and Whitford (130 spaces) stations on the SEPTA R5 rail line were recently constructed or expanded. Additional service has been added on SEPTA's R5 rail line during midday and peak periods. There has been an addition of an early morning train from Philadelphia to Thorndale on SEPTA's R5 rail line to serve reverse commuters. Provide ½ hour service during the peak period on Route 133 between King of Prussia and the Paoli rail station. Headways were decreased to ½ hour during the off-peak period on SEPTA Routes 124 and 125 to employment centers.	A 500 space parking garage will be constructed at the Norristown Transportation Center. This will help alleviate the demand for parking at the Transportation Center, which currently exceeds capacity. A new intermodal center will be constructed at Paoli. Provision of additional midday and early evening service on SEPTA Route 206 between Great Valley and Center City Philadelphia via Paoli. As part of its Automatic Vehicle Locator project, SEPTA will install four kiosks that will provide real-time arrival information for Routes 124 and 125.
Land Use Planning	All planning and zoning ordinances are the responsibility of local municipalities. Each municipality within the study area has adopted a comprehensive land use plan and zoning ordinance. Upper Merion Township has recently completed its "Horizons" transportation and land use plan. This visionary plan seeks to reduce congestion, improve quality of life and provide for orderly growth in the township.	
SOV and Mobility Enhancements	US 202 Section 400 and I-76/US 422 interchange	US 202 Section 300 US 202 Section 500 US 422/PA 363 Interchange Old Betzwood Bridge replacement US 422 Study

The categories of strategies analyzed for the adequacy test are more inclusive than in either the *Pennsylvania Congestion Management System Phase 2 Report* or the review of commitments. For instance, for the adequacy test, the "Transit Service/Operations Improvements" category includes a broad array of transit-related strategies ranging from new transit route(s) to better transit coordination. However, for purposes of the *Pennsylvania Congestion Management System Phase 2 Report* and the commitments review, each of these strategies was considered separately. This consolidation of strategies was necessary because many of the nationwide case studies applied in this assessment, are predicated upon broader, more inclusive categories of improvement types.

Table V-4. Adequacy Test of CMS Strategies to Meet Project Needs

Strategy	Strategy Independently Meets Project Purpose and Need	Strategy Opportunity Within Corridor	Applicability of Strategy within Corridor in *PA CMS Phase 2 Report*	Estimated Potential % Reduction in Daily VMT in 2030	
				Maximum Potential	Estimated Achievable
Transit Expansion and Enhancements	No	Good	Very Practical	2.6	2.6
Telecommuting, Staggered Work Hours Flexible Work Schedules	No	Moderate	Very Practical	4.0	0.75
Carpooling/Vanpooling, Areawide Ridesharing Programs	No	Good	Very Practical	2.0	0.1
Employer-Based Travel Demand Management (Preferential HOV facilities, Guaranteed Ride Home, Transit Shuttles)	No	Good	Very Practical	2.0	0.1
Transportation Management Associations	No	Excellent	Very Practical	Included with Other Strategies	Included with Other Strategies
Bicycle and Pedestrian Facilities and Programs	No	Moderate	Very Practical	0.2	0.2
Park and Ride	No	Moderate	Very Practical	0.5	0
Operational and Traffic Flow Improvements (TSM)	No	Good	Very Practical	0.1	0.1
ITS, Incident Management	No	Excellent	Very Practical	0.1	0.1
Ramp Metering	No	Limited	Practical	0.1	0.1
Land Use Planning, Activity Centers	No	Limited	Practical	5.2	1.0
High Occupancy Vehicle (HOV) Facilities	No	Very Limited	Not Practical	1.4	0.5
TOTAL				**18.2**	**5.55**

The adequacy test determined that none of the analyzed strategies is able to meet the increased travel demand forecast for the study area in the design year of 2030. Furthermore, even cumulatively, the strategies are still not able to meet the 17 to 33% increase in daily VMT forecast for 2030. Accordingly, the adequacy test concludes that CMS-type strategies are not able to meet the additional travel demand in the corridor in coming years.

2. Effect of Henderson Road Improvements

The level-of-service analysis shows that LOS significantly worsens or stays the same at all intersections in the no-build scenario when compared to current conditions. The lone exception is at Henderson Road and Church Road where a separate project will add a right turn lane that will improve conditions in the future over current conditions. Furthermore, implementing the proposed improvements (build scenario) improves or maintains the level-of-service over future no-build conditions in all but one segment. Therefore, the proposed project has congestion reducing benefits. Furthermore, traffic volumes (AADT) decrease in the future build scenario compared to the no-build scenario on I-76, US 202, PA 320, Balligomingo Road and all but one segment of South Gulph Road. These reduced volumes can be partly attributed to the proposed Henderson Road improvements.

Travel demand simulation modeling has shown that the proposed improvements to Henderson Road does reduce congestion in the future on Henderson Road and also has a positive impact on other major facilities in the area. Additionally, the proposed improvements are included in the DVRPC Long Range Plan and widening within the corridor is included as a practical strategy in the *Pennsylvania Congestion Management System Phase 2 Report*. Therefore, as a result of a project-level CMS analysis, the proposed improvements to Henderson Road are considered to be a part of an operational Congestion Management System.

3. CMS Commitments

Table V-5 shows the strategies that were ranked *very practical* for the study area in the composite strategy prioritization effort. Table V-5 also shows that the vast majority of the strategies have already been implemented within the study area or will be as part of prior CMS commitments. Only *very practical* strategies were analyzed because they have the greatest chance of succeeding in the study area.

Table V-5. Very Practical CMS Strategies and Implementation Status

VERY PRACTICAL STRATEGY	STRATEGY OR COMMITMENT INSTITUTED IN STUDY AREA (IMPLEMENTING AGENCY)
Carpool/Vanpool	Yes (TMAs) Core service provided by the TMAs
Guaranteed Ride Home Program	Yes (TMAs) Core service provided by the TMAs
Demand Responsive Shuttle Service	Yes (GVFTMA, municipalities) Cruise Line Intercorporate Shuttle Suburban Link Shuttle The Rambler Inter Municipal Shuttle
Transit Marketing	Yes (SEPTA, TMAs)
Bicycle Improvements	Yes (PennDOT, County) Chester Valley Trail Schuylkill River Trail and Extension Upper Merion Bicycle Mobility Program
Park and Ride	Yes (PennDOT) US 202 and South Gulph Road Matsonford Road at the I-76/I-476 Interchange Lewis Road at the US 422 Interchange Matthews Road at the US 202/PA 29 Interchange US 30 at the US 202 Interchange PA 100 at the Exton Bypass Interchange
Preferential HOV Parking	Yes (GVFTMA) Share-A-Lot service provided by the GVFTMA
Transportation Management Associations	Yes (GVFTMA and TMACC)
Ride Matching	Yes (DVRPC)
Telecommuting	Yes (DVRPC, TMAs)
Bicycle Improvements at SEPTA Stations	Yes (SEPTA)
Transit Enhancements/Expansion	Yes (SEPTA) see Table V-3
Intersection and Roadway Widening	Yes (PennDOT and Municipalities) see Table V-3
Traffic Surveillance and Control Systems	Yes (PennDOT)
Computerized Signal Systems	Yes (PennDOT, Municipalities) see Table V-3
Coordinate and Upgrade Traffic Signals	Yes (PennDOT, Municipalities) see Table V-3
Incident Detection and Verification	Yes (PennDOT) PennDOT Traffic Control Center
Emergency Response Time Improvements	Yes (DVRPC)
Alternative Routing Techniques	Yes (PennDOT, DVRPC, Municipalities) I-76 Corridor Traffic Management Project
Construction Management	Yes (PennDOT)
Staggered Work Hours/Flexible Work Schedules	Yes (TMAs) Strategy Promoted by the TMAs

VERY PRACTICAL STRATEGY	STRATEGY OR COMMITMENT INSTITUTED IN STUDY AREA (IMPLEMENTING AGENCY)
Compressed Work Weeks	Yes (TMAs) Strategy Promoted by the TMAs
Exclusive ROW Rail/Bus	Yes (SEPTA) Schuylkill Valley Metro Route 100 Extension to King of Prussia
Expand Parking at Rail Stations	Yes (SEPTA) Parking Expanded at Thorndale, Whitford, and Malvern stations
Intelligent Bus Stops	Yes (SEPTA) Kiosks at four locations will post the arrival time of the next bus
Advanced Mode Choice System	No
Automated Toll Collection	Yes (Pennsylvania Turnpike)
Traveler Information Services	Yes (PennDOT, private sector)

Additional enhancements to be forwarded as part of the Henderson Road improvements include a dedicated bike lane along Henderson Road, implementation of Construction Management techniques to ensure one travel lane by direction on Henderson Road during construction. Additionally, pedestrian amenities, to include striped crosswalks and pedestrian actuated crossing phase, will be provided along Henderson Road at signalized intersections not currently addressed and where appropriate. **Table V-6** includes the additional CMS enhancements associated with the Henderson Road improvements.

Table V-6. CMS Enhancements to Be Included with Project Design

ENHANCEMENT STRATEGY	DESCRIPTION
Bike Lane	Stripe a minimum five feet wide bike lane along Henderson Road from South Gulph Road to Church Road. At this point a connection will be made to the Chester Valley Trail. The design of the connection will be completed as part of the Henderson Road Final Design in consultation with the Montgomery County Planning Commission. In addition, institute Share the Road bicycle compatibility along South Gulph Road within the project area by shifting lane widths, where possible, to ensure a 14 feet wide outside lane or a minimum five feet shoulder bike lane where possible. Share the Road signs should also be placed along South Gulph Road, beginning at Henderson Road and extending to Matsonford Road. At this point, cyclists can access the Lower Merion Bike Path System. Install bike compatible storm grates along Henderson Road and South Gulph Road.
Construction Management	Maintain at least one lane of traffic in each direction along Henderson Road and South Gulph Road during duration of construction.
Pedestrian Amenities	Crosswalks and a pedestrian actuated crossing phase should be implemented at all signalized intersection along Henderson Road from South Gulph Road to US 202 where such amenities do not already exist.

APPENDIX A
24-HOUR MACHINE TRAFFIC COUNTS

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TABLE OF CONTENTS

All other roadway segments and ramp traffic counts were taken by the consultant and shown without using DVRPC format.

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Municipality : Upper Merion Twp
Comments : None
Weather : Variable
ATR #/Operator : 559/JB
Street name :Henderson Rd Cross street:btw Hawthorn Rd & Route 23 ,

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TAS for Windows
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Site Code : 000080100207
Start Date: 06/04/2001
File I.D. : DVRPC07
Page : 1

Begin	Mon.	06/04	Tues.		Wed.		Thur.		Fri.		Sat.		Sun.		Week	Avg.
Time	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 am	*	*	*	*	24	15	36	27	25	20	71	74	29	24	37	32
01:00	*	*	*	*	10	18	14	12	12	11	16	21	30	24	16	17
02:00	*	*	*	*	9	7	11	9	13	11	23	16	17	17	15	12
03:00	*	*	*	*	8	16	7	11	4	15	12	10	16	3	9	11
04:00	*	*	*	*	13	25	5	18	6	21	11	10	6	9	8	17
05:00	*	*	*	*	28	52	31	57	27	61	14	26	9	14	22	42
06:00	*	*	*	*	101	205	104	220	99	200	36	71	30	40	74	147
07:00	*	*	*	*	192	368	189	362	165	316	93	137	66	74	141	251
08:00	*	*	*	*	198	331	215	304	210	346	142	174	120	120	177	255
09:00	*	*	*	*	155	176	175	233	213	229	208	257	191	188	188	217
10:00	*	*	*	*	177	172	179	201	201	228	206	251	191	201	191	211
11:00	*	*	218	213	236	202	196	194	252	245	274	260	206	317	230	238
12:00 pm	*	*	254	232	230	271	275	234	313	267	254	240	276	243	267	248
01:00	*	*	224	214	225	214	245	213	288	251	288	220	231	227	250	223
02:00	*	*	244	231	246	238	238	242	283	272	246	230	266	236	254	242
03:00	*	*	339	255	345	261	331	219	330	259	271	212	240	204	309	235
04:00	*	*	480	225	429	251	481	242	502	271	248	265	216	199	393	242
05:00	*	*	533	277	541	285	529	261	523	295	249	224	223	207	433	258
06:00	*	*	335	298	360	290	357	271	384	309	248	221	205	188	315	263
07:00	*	*	277	205	307	204	281	247	266	267	209	172	221	184	260	213
08:00	*	*	235	190	267	205	276	180	250	204	222	175	149	149	233	184
09:00	*	*	169	144	148	82	211	128	147	114	165	137	129	111	162	119
10:00	*	*	99	59	82	70	91	100	103	81	88	90	78	76	90	79
11:00	*	*	49	28	35	20	61	37	65	50	80	63	50	41	57	40
Totals	0	0	3456	2571	4366	3978	4538	4022	4681	4343	3674	3556	3195	3096	4131	3796
	0		6027		8344		8560		9024		7230		6291		7927	
Avg. Day	.0%	.0%	83.6%	67.7%	105.6%	104.7%	109.8%	105.9%	113.3%	114.4%	88.9%	93.6%	77.3%	81.5%		
AM Peaks			11:00	11:00	11:00	07:00	08:00	07:00	11:00	08:00	11:00	11:00	11:00	11:00	11:00	08:00
Volume			218	213	236	368	215	362	252	346	274	260	206	317	230	255
PM Peaks			05:00	06:00	05:00	06:00	05:00	06:00	05:00	06:00	01:00	04:00	12:00	12:00	05:00	06:00
Volume			533	298	541	290	529	271	523	309	288	265	276	243	433	263

DVRPC – Travel Monitoring

DATE: 09/28/1998

ROAD: HENDERSON RD **FROM:** TR 202 **TO:** TR 23

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** 3029/0030/1500 **FC:** 16

PROJECT: PAM98 **COUNT DIR:** BOTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 40 **LOOP OR CLASS:**

STATION ID: 21150 **DVRPC FILE #:** 3487 **COUNTER:** 9763 **WEATHER:** F

Hour Ending	Monday 09/28/98	Tuesday 09/29/98	Wednesday 09/30/98	Thursday 10/01/98	Friday 10/02/98
1 AM		73	85		
2 AM		36	57		
3 AM		32	34		
4 AM		22	43		
5 AM		50	48		
6 AM		160	166		
7 AM		594	568		
8 AM		1,143	1,087		
9 AM	1,246	1,204	1,125		
10 AM	877	867			
11 AM	836	784			
12 PM	928	942			
1 PM	1,086	1,061			
2 PM	969	1,007			
3 PM	972	960			
4 PM	1,100	1,135			
5 PM	1,218	1,201			
6 PM	1,336	1,384			
7 PM	1,064	1,132			
8 PM	861	962			
9 PM	556	626			
10 PM	426	438			
11 PM	296	358			
12 AM	160	196			
		16,367			

SEASONAL FACTOR:	.919	AADT: **14,650**	AM PEAK %:	7.4	HOUR ENDING:	9:00 AM
AXLE CORR. FACTOR:	.974		PM PEAK %:	8.5	HOUR ENDING:	6:00 PM

DVRPC – Travel Monitoring

DATE: 03/07/2000

ROAD: HENDERSON RD **FROM:** SHOEMAKER RD **TO:** SOUTH GULPH RD

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** 3029/0010/1000 **FC:** 16

PROJECT: 202-400 **COUNT DIR:** BOTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 25 **LOOP OR CLASS:**

STATION ID: **DVRPC FILE #:** 27741 **COUNTER:** 9485 **WEATHER:** F

Hour Ending	Tuesday 03/07/00	Wednesday 03/08/00	Thursday 03/09/00	Friday 03/10/00	Saturday 03/11/00
1 AM		153	178		
2 AM		67	81		
3 AM		80	64		
4 AM		107	95		
5 AM		214	169		
6 AM		341	346		
7 AM		1,000			
8 AM		1,499			
9 AM	1,582	1,564			
10 AM	1,269	1,253			
11 AM	1,000	1,051			
12 PM	959	936			
1 PM	902	878			
2 PM	1,042	952			
3 PM	951	921			
4 PM	1,150	1,115			
5 PM	1,237	1,241			
6 PM	1,382	1,344			
7 PM	1,225	1,216			
8 PM	838	767			
9 PM	646	595			
10 PM	593	533			
11 PM	437	417			
12 AM	298	261			
		18,505			

SEASONAL FACTOR:	1.002	AADT: **17,949**	AM PEAK %:	8.5	HOUR ENDING:	9:00 AM
AXLE CORR. FACTOR:	.968		PM PEAK %:	7.3	HOUR ENDING:	6:00 PM

DVRPC – Travel Monitoring

DATE: 07/28/1999

ROAD: TR 76 WB SCHUYLKILL EXPY **FROM:** TR 202 **TO:** GULPH MILLS RD

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** 0076/3291/1000 **FC:** 11

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

STATION ID: 3938 **DVRPC FILE #:** 9477 **COUNTER:** 9451 **WEATHER:** F

Hour Ending	Wednesday 07/28/99	Thursday 07/29/99	Friday 07/30/99	Saturday 07/31/99	Sunday 08/01/99
1 AM		521			
2 AM		292			
3 AM		245			
4 AM		264			
5 AM		494			
6 AM		1,341			
7 AM		3,308			
8 AM		3,597			
9 AM		3,381			
10 AM		2,992			
11 AM		2,795			
12 PM		2,811			
1 PM		2,950			
2 PM		2,757			
3 PM		3,356			
4 PM		3,771			
5 PM		3,827			
6 PM		3,698			
7 PM		3,236			
8 PM		2,665			
9 PM		2,406			
10 PM		2,187			
11 PM		1,429			
12 AM		1,145			
		55,468			

SEASONAL FACTOR:	0.892	AADT: **49,477**	AM PEAK %:	6.5	HOUR ENDING:	8:00 AM
AXLE CORR. FACTOR:	1.000		PM PEAK %:	6.9	HOUR ENDING:	5:00 PM

DVRPC – Travel Monitoring

DATE: 07/28/1999

ROAD: TR 76 EB SCHUYLKILL EXPY **FROM:** TR 202 **TO:** GULPH MILLS RD

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** 0076/3290/1000 **FC:** 11

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

STATION ID: 3938 **DVRPC FILE #:** 9476 **COUNTER:** 9449 **WEATHER:** F

Hour Ending	Wednesday 07/28/99	Thursday 07/29/99	Friday 07/30/99	Saturday 07/31/99	Sunday 08/01/99
1 AM		530			
2 AM		414			
3 AM		301			
4 AM		300			
5 AM		455			
6 AM		1,406			
7 AM		3,079			
8 AM		3,879			
9 AM		3,350			
10 AM		2,901			
11 AM		2,607			
12 PM		2,587			
1 PM		2,102			
2 PM		3,031			
3 PM		2,347			
4 PM		2,488			
5 PM		2,305			
6 PM		3,029			
7 PM		2,880			
8 PM		2,384			
9 PM		1,720			
10 PM		1,307			
11 PM		1,539			
12 AM		1,167			
		48,108			

SEASONAL FACTOR:	0.892	AADT:	**42,912**	AM PEAK %:	8.1	HOUR ENDING:	8:00 AM
AXLE CORR. FACTOR:	1.000			PM PEAK %:	6.3	HOUR ENDING:	2:00 PM

DVRPC – Travel Monitoring

DATE: 09/14/1998

ROAD: SOUTH GULPH RD **FROM:** BROOKS RD **TO:** LONG RD

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** 3039/0050/1000 **FC:** 16

PROJECT: PAM98 **COUNT DIR:** BOTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 45 **LOOP OR CLASS:**

STATION ID: 3889 **DVRPC FILE #:** 3490 **COUNTER:** 9490 **WEATHER:** F

Hour Ending	Monday 09/14/98	Tuesday 09/15/98	Wednesday 09/16/98	Thursday 09/17/98	Friday 09/18/98
1 AM		120	123		
2 AM		47	69		
3 AM		50	49		
4 AM		61	79		
5 AM		153	151		
6 AM		379	358		
7 AM		1,150			
8 AM	2,314	2,332			
9 AM	2,370	2,425			
10 AM	1,390	1,568			
11 AM	1,148	1,222			
12 PM	1,422	1,542			
1 PM	1,764	1,872			
2 PM	1,709	1,859			
3 PM	1,472	1,714			
4 PM	1,908	2,051			
5 PM	2,328	2,304			
6 PM	2,558	2,545			
7 PM	2,045	1,929			
8 PM	1,371	1,391			
9 PM	900	955			
10 PM	632	775			
11 PM	434	432			
12 AM	212	238			
		29,114			

SEASONAL FACTOR:	.919	AADT: **26,060**	AM PEAK %:	8.3	HOUR ENDING:	9:00 AM
AXLE CORR. FACTOR:	.974		PM PEAK %:	8.7	HOUR ENDING:	6:00 PM

DVRPC – Travel Monitoring

DATE: 09/15/1997

ROAD: SOUTH GULPH RD **FROM:** LEWIS RD **TO:** HILLTOP DR

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** 3039/0030/1000 **FC:** 16

PROJECT: PASM97 **COUNT DIR:** BOTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 40 **LOOP OR CLASS:**

STATION ID: 21330 **DVRPC FILE #:** 1446 **COUNTER:** **WEATHER:** F

Hour Ending	Monday 09/15/97	Tuesday 09/16/97	Wednesday 09/17/97	Thursday 09/18/97	Friday 09/19/97
1 AM		107	72		
2 AM		45	29		
3 AM		31	18		
4 AM		24	11		
5 AM		32	24		
6 AM		82	89		
7 AM	296	406			
8 AM	1,182	1,205			
9 AM	1,358	1,389			
10 AM	894	890			
11 AM	614	604			
12 PM	702	712			
1 PM	889	854			
2 PM	791	829			
3 PM	771	786			
4 PM	1,023	1,012			
5 PM	1,285	1,321			
6 PM	1,562	1,578			
7 PM	1,167	1,157			
8 PM	758	791			
9 PM	579	590			
10 PM	423	525			
11 PM	275	352			
12 AM	169	139			
		15,461			

SEASONAL FACTOR:	.923	AADT: **13,885**	AM PEAK %:	9.	HOUR ENDING:	9:00 AM
AXLE CORR. FACTOR:	.973		PM PEAK %:	10.2	HOUR ENDING:	6:00 PM

Municipality : Upper Merion Twp
Comments : Home
Weather : Variable
ATR #/Operator : 4342/JB
Street name :Gulph Rd Cross street:Henderson Rd

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North of

Site Code : 000080100203
Start Date: 06/04/2001
File I.D. : DVRPC03
Page : 1

Begin	Mon. 06/04		Tues.		Wed.		Thur.		Fri.		Sat.		Sun.		Week	Avg.
Time	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB
12:00 am	*	*	*	*	43	31	60	55	42	50	121	105	82	77	70	64
01:00	*	*	*	*	21	13	32	16	19	19	47	24	48	31	33	21
02:00	*	*	*	*	17	16	21	13	11	13	31	20	29	14	22	15
03:00	*	*	*	*	4	3	13	1	8	7	20	10	22	8	13	6
04:00	*	*	*	*	23	16	16	18	14	24	19	25	17	9	18	18
05:00	*	*	*	*	62	68	70	58	58	55	29	31	16	19	47	46
06:00	*	*	*	*	345	341	331	317	338	288	50	46	35	33	220	205
07:00	*	*	*	*	772	657	750	426	724	408	116	93	62	51	485	327
08:00	*	*	*	*	828	728	791	422	769	460	210	169	79	89	535	374
09:00	*	*	*	*	582	442	573	278	733	341	265	209	197	141	470	282
10:00	*	*	*	*	460	271	481	264	483	267	358	222	263	168	409	238
11:00	*	*	*	*	508	289	486	308	546	314	440	260	358	216	468	277
12:00 pm	*	*	*	*	500	340	539	376	582	401	434	350	432	256	497	345
01:00	*	*	424	360	445	401	518	431	529	427	448	325	419	287	464	372
02:00	*	*	488	368	445	393	473	406	618	420	410	346	403	338	473	378
03:00	*	*	608	385	623	446	708	455	708	521	402	355	375	321	571	414
04:00	*	*	650	537	678	574	762	590	619	428	345	375	279	354	556	476
05:00	*	*	634	369	637	523	676	310	600	266	331	304	243	311	520	347
06:00	*	*	519	547	524	506	587	512	497	526	326	301	240	309	449	450
07:00	*	*	364	305	372	313	360	332	344	404	306	265	181	181	321	300
08:00	*	*	217	258	261	315	265	290	265	317	231	240	156	133	232	259
09:00	*	*	208	209	190	219	179	241	169	233	170	277	118	80	172	210
10:00	*	*	124	121	94	99	143	134	111	150	129	157	105	80	118	124
11:00	*	*	61	72	70	46	71	71	70	93	100	122	94	50	78	76
Totals	0	0	4297	3531	8504	7050	8905	6324	8857	6432	5338	4631	4253	3556	7241	5624
	0		7828		15554		15229		15289		9969		7809		12865	
Avg. Day	.0%	.0%	59.3%	62.7%	117.4%	125.3%	122.9%	112.4%	122.3%	114.3%	73.7%	82.3%	58.7%	63.2%		
AM Peaks					08:00	08:00	08:00	07:00	08:00	08:00	11:00	11:00	11:00	11:00	08:00	08:00
Volume					828	728	791	426	769	460	440	260	358	216	535	374
PM Peaks			04:00	06:00	04:00	04:00	04:00	04:00	03:00	06:00	01:00	04:00	12:00	04:00	03:00	04:00
Volume			650	547	678	574	762	590	708	526	448	375	432	354	571	476

Municipality : Upper Merion Twp
Comments : None
Weather : Variable
ATR #/Operator : 4342/JB
Street name :Gulph Rd Cross street:Henderson Rd

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Site Code : 000080100203
Start Date: 06/04/2001
File I.D. : DVRPC03
Page : 2

Begin	Mon.	06/11	Tues.		Wed.		Thur.		Fri.		Sat.		Sun.		Week	Avg.
Time	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB
12:00 am	37	27	*	*	*	*	*	*	*	*	*	*	*	*	37	27
01:00	20	11	*	*	*	*	*	*	*	*	*	*	*	*	20	11
02:00	13	9	*	*	*	*	*	*	*	*	*	*	*	*	13	9
03:00	10	6	*	*	*	*	*	*	*	*	*	*	*	*	10	6
04:00	18	20	*	*	*	*	*	*	*	*	*	*	*	*	18	20
05:00	67	73	*	*	*	*	*	*	*	*	*	*	*	*	67	73
06:00	376	311	*	*	*	*	*	*	*	*	*	*	*	*	376	311
07:00	762	442	*	*	*	*	*	*	*	*	*	*	*	*	762	442
08:00	735	403	*	*	*	*	*	*	*	*	*	*	*	*	735	403
09:00	511	247	*	*	*	*	*	*	*	*	*	*	*	*	511	247
10:00	358	266	*	*	*	*	*	*	*	*	*	*	*	*	358	266
11:00	484	278	*	*	*	*	*	*	*	*	*	*	*	*	484	278
12:00 pm	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Totals	3391	2093	0	0	0	0	0	0	0	0	0	0	0	0	3391	2093
		5484		0		0		0		0		0		0		5484
Avg. Day	100.0%	100.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%		
AM Peaks	07:00	07:00													07:00	07:00
Volume	762	442													762	442
PM Peaks																
ADTs																

DVRPC – Travel Monitoring

DATE: 07/10/2000

ROAD: SOUTH GULPH RD **FROM:** CROOKED LA **TO:** HENDERSON RD

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** 3039/0020/1000 **FC:** 16

PROJECT: PAM00 **COUNT DIR:** BOTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 40 **LOOP OR CLASS:**

STATION ID: 21329 **DVRPC FILE #:** 27616 **COUNTER:** 9949 **WEATHER:** F

Hour Ending	Monday 07/10/00	Tuesday 07/11/00	Wednesday 07/12/00	Thursday 07/13/00	Friday 07/14/00
1 AM		150	182		
2 AM		60	108		
3 AM		60	58		
4 AM		72	76		
5 AM		110	110		
6 AM		344	336		
7 AM		1,099	1,010		
8 AM		1,940	1,898		
9 AM		1,987	1,958		
10 AM		1,416	1,522		
11 AM	1,108	1,078			
12 PM	1,168	1,182			
1 PM	1,348	1,293			
2 PM	1,284	1,270			
3 PM	1,268	1,332			
4 PM	1,588	1,663			
5 PM	1,926	1,996			
6 PM	2,019	2,096			
7 PM	1,828	1,884			
8 PM	1,094	1,127			
9 PM	910	968			
10 PM	820	855			
11 PM	492	564			
12 AM	295	320			
		24,866			

SEASONAL FACTOR:	.924	AADT: **22,241**	AM PEAK %:	8.	HOUR ENDING:	9:00 AM
AXLE CORR. FACTOR:	.968		PM PEAK %:	8.4	HOUR ENDING:	6:00 PM

DVRPC – Travel Monitoring

DATE: 07/10/2000

ROAD: SOUTH GULPH RD **FROM:** TRINITY RD **TO:** CROOKED LA

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** 3039/0010/2500 **FC:** 16

PROJECT: PAM00 **COUNT DIR:** BOTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 40 **LOOP OR CLASS:**

STATION ID: 26037 **DVRPC FILE #:** 27617 **COUNTER:** 9990 **WEATHER:** F

Hour Ending	Monday 07/10/00	Tuesday 07/11/00	Wednesday 07/12/00	Thursday 07/13/00	Friday 07/14/00
1 AM		112	116		
2 AM		76	105		
3 AM		103	121		
4 AM		154	166		
5 AM		457	449		
6 AM		1,337	1,350		
7 AM		2,153	2,179		
8 AM		2,232	2,249		
9 AM		1,970	1,952		
10 AM	1,596	1,656			
11 AM	1,444	1,558			
12 PM	1,608	1,578			
1 PM	1,542	1,625			
2 PM	1,667	1,623			
3 PM	2,070	2,040			
4 PM	2,393	2,402			
5 PM	2,386	2,412			
6 PM	2,120	2,143			
7 PM	1,494	1,523			
8 PM	1,164	1,152			
9 PM	1,041	1,091			
10 PM	653	692			
11 PM	385	465			
12 AM	232	236			
		30,790			

SEASONAL FACTOR:	.924	AADT: **27,540**	AM PEAK %:	7.2	HOUR ENDING:	8:00 AM
AXLE CORR. FACTOR:	.968		PM PEAK %:	7.8	HOUR ENDING:	5:00 PM

DVRPC – Travel Monitoring

DATE: 09/15/1997

ROAD: SHOEMAKER RD **FROM:** S. GULPH RD **TO:** HENDERSON RD

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** G342/0010/ **FC:** 16

PROJECT: PASM97 **COUNT DIR:** BOTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 25 **LOOP OR CLASS:**

STATION ID: 29446 **DVRPC FILE #:** 1692 **COUNTER:** **WEATHER:** F

Hour Ending	Monday 09/15/97	Tuesday 09/16/97	Wednesday 09/17/97	Thursday 09/18/97	Friday 09/19/97
1 AM		61	24		
2 AM		21	12		
3 AM		10	10		
4 AM		4	3		
5 AM		5	6		
6 AM		13	13		
7 AM		83	85		
8 AM	242	234	213		
9 AM	269	289	287		
10 AM	189	173			
11 AM	160	148			
12 PM	213	148			
1 PM	234	241			
2 PM	191	225			
3 PM	173	195			
4 PM	214	221			
5 PM	247	232			
6 PM	330	335			
7 PM	264	268			
8 PM	224	243			
9 PM	181	137			
10 PM	133	117			
11 PM	87	91			
12 AM	59	49			
		3,543			

SEASONAL FACTOR:	.923	AADT: **3,182**	AM PEAK %:	8.2	HOUR ENDING:	9:00 AM
AXLE CORR. FACTOR:	.973		PM PEAK %:	9.5	HOUR ENDING:	6:00 PM

DVRPC – Travel Monitoring

DATE: 06/08/1999

ROAD: CHURCH RD **FROM:** RADAR DR **TO:** HENDERSON RD

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** 3028/0030/0500 **FC:** 17

PROJECT: PAM99 **COUNT DIR:** BOTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 35 **LOOP OR CLASS:**

STATION ID: 21123 **DVRPC FILE #:** 6874 **COUNTER:** 9326 **WEATHER:** F

Hour Ending	Tuesday 06/08/99	Wednesday 06/09/99	Thursday 06/10/99	Friday 06/11/99	Saturday 06/12/99
1 AM		94	86		
2 AM		31	47		
3 AM		21	24		
4 AM		18	20		
5 AM		34	34		
6 AM		148	127		
7 AM		629	640		
8 AM		1,376	1,310		
9 AM		1,424	1,346		
10 AM		997	1,039		
11 AM		850	896		
12 PM		858	850		
1 PM	952	942	965		
2 PM	902	889			
3 PM	1,043	984			
4 PM	1,112	1,146			
5 PM	1,224	1,261			
6 PM	1,468	1,427			
7 PM	1,206	1,220			
8 PM	864	876			
9 PM	629	734			
10 PM	648	718			
11 PM	352	401			
12 AM	224	229			
		17,307			

SEASONAL FACTOR:	.911	AADT: **15,577**	AM PEAK %:	8.2	HOUR ENDING:	9:00 AM
AXLE CORR. FACTOR:	.988		PM PEAK %:	8.2	HOUR ENDING:	6:00 PM

DVRPC – Travel Monitoring

DATE: 07/10/2000

ROAD: CHURCH RD **FROM:** CROOKED LA **TO:** HENDERSON RD

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** G313/0020/ **FC:** 17

PROJECT: PAM00 **COUNT DIR:** BOTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 40 **LOOP OR CLASS:**

STATION ID: 29430 **DVRPC FILE #:** 27686 **COUNTER:** 9991 **WEATHER:** F

Hour Ending	Monday 07/10/00	Tuesday 07/11/00	Wednesday 07/12/00	Thursday 07/13/00	Friday 07/14/00
1 AM		62	67		
2 AM		10	23		
3 AM		15	14		
4 AM		16	15		
5 AM		65	61		
6 AM		188	194		
7 AM		527	526		
8 AM		1,058	1,067		
9 AM		1,189	1,149		
10 AM		697	765		
11 AM	619	606			
12 PM	725	811			
1 PM	1,044	941			
2 PM	926	929			
3 PM	710	729			
4 PM	828	798			
5 PM	947	891			
6 PM	930	979			
7 PM	595	659			
8 PM	360	349			
9 PM	238	338			
10 PM	214	265			
11 PM	101	111			
12 AM	69	81			
		12,314			

SEASONAL FACTOR:	.922	AADT: **11,229**	AM PEAK %:	9.7	HOUR ENDING:	9:00 AM
AXLE CORR. FACTOR:	.989		PM PEAK %:	8.	HOUR ENDING:	6:00 PM

DVRPC – Travel Monitoring

DATE: 07/11/2000

ROAD: TR 202 NB DEKALB PK **FROM:** ALLENDALE RD **TO:** COLONIAL RD

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** 0202/0060/0500 **FC:** 14

PROJECT: PAM00 **COUNT DIR:** NORTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 45 **LOOP OR CLASS:**

STATION ID: 12847 **DVRPC FILE #:** 27488 **COUNTER:** 9946 **WEATHER:** F

Hour Ending	Tuesday 07/11/00	Wednesday 07/12/00	Thursday 07/13/00	Friday 07/14/00	Saturday 07/15/00
1 AM		184	202		
2 AM		100	105		
3 AM		81	72		
4 AM		81	66		
5 AM		122	98		
6 AM		216	205		
7 AM		610	622		
8 AM		1,074	941		
9 AM	1,176	1,049			
10 AM	1,058	1,060			
11 AM	1,102	1,187			
12 PM	1,343	1,372			
1 PM	1,740	1,658			
2 PM	1,568	1,556			
3 PM	1,546	1,482			
4 PM	1,643	1,614			
5 PM	1,856	1,761			
6 PM	2,086	1,972			
7 PM	1,676	1,752			
8 PM	1,396	1,391			
9 PM	1,234	1,286			
10 PM	1,084	1,090			
11 PM	553	607			
12 AM	348	340			
		23,645			

SEASONAL FACTOR:	.896	AADT: **20,275**	AM PEAK %:	5.8	HOUR ENDING:	12:00 PM
AXLE CORR. FACTOR:	.957		PM PEAK %:	8.3	HOUR ENDING:	6:00 PM

DVRPC – Travel Monitoring

DATE: 07/11/2000

ROAD: TR 202 SB DEKALB PK **FROM:** ALLENDALE RD **TO:** COLONIAL RD

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** 0202/0061/0500 **FC:** 14

PROJECT: PAM00 **COUNT DIR:** SOUTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 45 **LOOP OR CLASS:**

STATION ID: 12847 **DVRPC FILE #:** 27489 **COUNTER:** 9833 **WEATHER:** F

Hour Ending	Tuesday 07/11/00	Wednesday 07/12/00	Thursday 07/13/00	Friday 07/14/00	Saturday 07/15/00
1 AM		161	143		
2 AM		80	83		
3 AM		61	71		
4 AM		50	57		
5 AM		94	92		
6 AM		304	310		
7 AM		1,072	1,064		
8 AM		1,745	1,831		
9 AM		1,919	1,896		
10 AM		1,546	1,486		
11 AM	1,230	1,379			
12 PM	1,427	1,366			
1 PM	1,684	1,724			
2 PM	1,677	1,682			
3 PM	1,514	1,531			
4 PM	1,564	1,574			
5 PM	1,616	1,624			
6 PM	1,635	1,662			
7 PM	1,572	1,584			
8 PM	1,255	1,352			
9 PM	1,134	1,128			
10 PM	880	868			
11 PM	484	488			
12 AM	290	268			
		25,262			

SEASONAL FACTOR:	.896	AADT: **21,661**	AM PEAK %:	7.6	HOUR ENDING:	9:00 AM
AXLE CORR. FACTOR:	.957		PM PEAK %:	6.8	HOUR ENDING:	1:00 PM

DVRPC – Travel Monitoring

DATE: 03/07/2000

ROAD: TR 202 NB DEKALB PK **FROM:** HENDERSON RD **TO:** BRIDGEPORT BYP

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** 0202/0080/1500 **FC:** 14

PROJECT: 202-400 **COUNT DIR:** NORTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 45 **LOOP OR CLASS:**

STATION ID: 12848 **DVRPC FILE #:** 27737 **COUNTER:** 9489 **WEATHER:** F

Hour Ending	Tuesday 03/07/00	Wednesday 03/08/00	Thursday 03/09/00	Friday 03/10/00	Saturday 03/11/00
1 AM		158	145		
2 AM		83	90		
3 AM		81	65		
4 AM		38	41		
5 AM		81	84		
6 AM		208	201		
7 AM		577			
8 AM		1,071			
9 AM	1,020	1,083			
10 AM	1,045	1,054			
11 AM	950	959			
12 PM	1,074	1,113			
1 PM	1,246	1,237			
2 PM	1,328	1,320			
3 PM	1,240	1,244			
4 PM	1,362	1,369			
5 PM	1,538	1,544			
6 PM	1,804	1,814			
7 PM	1,334	1,362			
8 PM	1,098	1,060			
9 PM	985	949			
10 PM	738	753			
11 PM	438	431			
12 AM	252	232			
		19,821			

SEASONAL FACTOR:	.972	AADT: **18,438**	AM PEAK %:	5.6	HOUR ENDING:	12:00 PM
AXLE CORR. FACTOR:	.957		PM PEAK %:	9.2	HOUR ENDING:	6:00 PM

DVRPC – Travel Monitoring

DATE: 03/07/2000

ROAD: TR 202 SB DEKALB PK **FROM:** HENDERSON RD **TO:** BRIDGEPORT BYP

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** 0202/0081/1500 **FC:** 14

PROJECT: 202-400 **COUNT DIR:** SOUTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 45 **LOOP OR CLASS:**

STATION ID: 12848 **DVRPC FILE #:** 27738 **COUNTER:** 9489 **WEATHER:** F

Hour Ending	Tuesday 03/07/00	Wednesday 03/08/00	Thursday 03/09/00	Friday 03/10/00	Saturday 03/11/00
1 AM		98	88		
2 AM		52	70		
3 AM		42	57		
4 AM		48	41		
5 AM		96	73		
6 AM		281	253		
7 AM		963			
8 AM		1,675			
9 AM	1,493	1,557			
10 AM	1,221	1,117			
11 AM	1,143	1,092			
12 PM	1,312	1,346			
1 PM	1,396	1,454			
2 PM	1,356	1,340			
3 PM	1,163	1,202			
4 PM	1,228	1,247			
5 PM	1,474	1,425			
6 PM	1,569	1,572			
7 PM	1,276	1,351			
8 PM	937	868			
9 PM	713	716			
10 PM	492	512			
11 PM	358	290			
12 AM	167	183			
		20,527			

SEASONAL FACTOR:	.972	AADT: **19,094**	AM PEAK %:	8.2	HOUR ENDING:	8:00 AM
AXLE CORR. FACTOR:	.957		PM PEAK %:	7.7	HOUR ENDING:	6:00 PM

Tri-State Traffic Data, Inc.
(610) 444-8030

Title1 : Rt 23 East of Caley Rd-Site 05 Site: 0:
Title2 : Date: 05/21/0
Title3 :

Interval	Mon 21		Tue 22		Wed 23		Thu 24		Fri 25		Sat 26		Sun 27		Weekday Avg	
Begin	Eb	Wb	Eb	Wb	Eb	Wb	Eb	Wb	Eb	Wb	Eb	Wb	Eb	Wb	Eb	W
12:AM	*	*	22	22	20	22	19	22	*	*	*	*	*	*	20	2
01:00	*	*	13	7	15	7	8	16	*	*	*	*	*	*	12	1
02:00	*	*	5	7	7	8	7	12	*	*	*	*	*	*	6	
03:00	*	*	3	6	4	8	10	9	*	*	*	*	*	*	5	
04:00	*	*	18	10	17	13	18	11	*	*	*	*	*	*	17	
05:00	*	*	60	44	60	44	58	60	*	*	*	*	*	*	59	
06:00	*	*	241	177	247	185	250	208	*	*	*	*	*	*	246	1
07:00	*	*	508	355	486	380	516	427	*	*	*	*	*	*	503	3
08:00	*	*	465	349	489	388	514	374	*	*	*	*	*	*	489	3
09:00	*	*	326	188	300	225	286	225	*	*	*	*	*	*	304	2
10:00	*	*	234	156	242	212	252	215	*	*	*	*	*	*	242	1
11:00	*	*	282	204	299	268	*	*	*	*	*	*	*	*	290	2
12:PM	144	83	302	273	281	278	*	*	*	*	*	*	*	*	242	2
01:00	250	169	260	282	265	272	*	*	*	*	*	*	*	*	258	2
02:00	252	220	292	288	274	280	*	*	*	*	*	*	*	*	272	2
03:00	372	278	394	366	372	376	*	*	*	*	*	*	*	*	379	3
04:00	414	299	447	380	506	470	*	*	*	*	*	*	*	*	455	3
05:00	476	318	478	412	574	434	*	*	*	*	*	*	*	*	509	3
06:00	309	274	338	342	398	372	*	*	*	*	*	*	*	*	348	3
07:00	193	166	224	266	264	262	*	*	*	*	*	*	*	*	227	2
08:00	122	131	144	171	239	200	*	*	*	*	*	*	*	*	168	1
09:00	79	106	87	147	124	187	*	*	*	*	*	*	*	*	96	
10:00	40	52	61	69	96	130	*	*	*	*	*	*	*	*	65	
11:00	42	34	39	62	52	76	*	*	*	*	*	*	*	*	44	
Total	2,693	2,130	5,243	4,583	5,631	5,097	1,938	1,579	0	0	0	0	0	0	5,256	4,
Combined	4,823		9,826		10,728		3,517		0		0		0		9,791	
Split	55.8	44.2	53.4	46.6	52.5	47.5	55.1	44.9	0.0	.0	0.0	.0	0.0	.0	53.7	4
A																
Peak Hr	*	*	07:00	07:00	08:00	08:00	07:00	07:00	*	*	*	*	*	*	07:00	0
Volume	*	*	508	355	489	388	516	427	*	*	*	*	*	*	503	
P																
PeakHr	05:00	05:00	05:00	05:00	05:00	04:00	*	*	*	*	*	*	*	*	05:00	0:
Volume	476	318	478	412	574	470	*	*	*	*	*	*	*	*	509	

DVRPC – Travel Monitoring

DATE: 09/21/1998

ROAD: TR 23 VALLEY FORGE RD **FROM:** ABRAMS RUN BR **TO:** MARK LA

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** 0023/0150/0500 **FC:** 16

PROJECT: PAM98 **COUNT DIR:** BOTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 20 **LOOP OR CLASS:**

STATION ID: 25835 **DVRPC FILE #:** 3219 **COUNTER:** 9768 **WEATHER:** F

Hour Ending	Monday 09/21/98	Tuesday 09/22/98	Wednesday 09/23/98	Thursday 09/24/98	Friday 09/25/98
1 AM		53	56		
2 AM		27	34		
3 AM		18	19		
4 AM		16	24		
5 AM		39	34		
6 AM		146	135		
7 AM		634	685		
8 AM		1,506	1,554		
9 AM		1,464	1,532		
10 AM	636	747	800		
11 AM	608	585			
12 PM	758	789			
1 PM	885	908			
2 PM	824	850			
3 PM	762	838			
4 PM	971	1,030			
5 PM	1,224	1,234			
6 PM	1,418	1,617			
7 PM	916	1,000			
8 PM	654	720			
9 PM	418	504			
10 PM	326	310			
11 PM	167	196			
12 AM	119	104			
		15,335			

SEASONAL FACTOR:	.919	AADT: **13,726**	AM PEAK %:	9.8	HOUR ENDING:	8:00 AM
AXLE CORR. FACTOR:	.974		PM PEAK %:	10.5	HOUR ENDING:	6:00 PM

DVRPC – Travel Monitoring

DATE: 09/15/1997

ROAD: TR 23 VALLEY FORGE RD **FROM:** ANDERSON RD **TO:** VALLEY FORGE RD

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** 0023/0190/1000 **FC:** 16

PROJECT: PASM97 **COUNT DIR:** BOTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 35 **LOOP OR CLASS:**

STATION ID: 11658 **DVRPC FILE #:** 1188 **COUNTER:** **WEATHER:** F

Hour Ending	Monday 09/15/97	Tuesday 09/16/97	Wednesday 09/17/97	Thursday 09/18/97	Friday 09/19/97
1 AM		73	38		
2 AM		24	15		
3 AM		18	17		
4 AM		12	15		
5 AM		9	16		
6 AM		71	71		
7 AM		354	360		
8 AM		1,060	1,049		
9 AM		1,131	1,085		
10 AM		470	547		
11 AM		361	410		
12 PM	235	409	506		
1 PM	494	446			
2 PM	449	442			
3 PM	512	528			
4 PM	613	677			
5 PM	856	924			
6 PM	1,135	1,074			
7 PM	620	679			
8 PM	433	477			
9 PM	289	319			
10 PM	197	243			
11 PM	124	162			
12 AM	87	104			
		10,067			

SEASONAL FACTOR:	.923	AADT: **9,041**	AM PEAK %:	11.2	HOUR ENDING:	9:00 AM
AXLE CORR. FACTOR:	.973		PM PEAK %:	10.7	HOUR ENDING:	6:00 PM

Tri-State Traffic Data, Inc.
(610) 444-8030

Title1 : Beidler Rd West of Geerdes Blv
Title2 : Site 08
Title3 :

Site: 0
Date: 05/21/0

Interval	Mon 21		Tue 22		Wed 23		Thu 24		Fri 25		Sat 26		Sun 27		Weekday Avg	
Begin	Eb	Wb	Eb	Wb	Eb	Wb	Eb	Wb	Eb	Wb	Eb	Wb	Eb	Wb	Eb	W
12:AM	*	*	15	8	20	12	14	12	*	*	*	*	*	*	16	
01:00	*	*	5	1	9	6	5	7	*	*	*	*	*	*	6	
02:00	*	*	6	3	6	2	7	3	*	*	*	*	*	*	6	
03:00	*	*	5	4	2	3	4	3	*	*	*	*	*	*	3	
04:00	*	*	10	2	10	7	10	4	*	*	*	*	*	*	10	
05:00	*	*	46	22	39	20	50	22	*	*	*	*	*	*	45	
06:00	*	*	176	92	186	92	190	89	*	*	*	*	*	*	184	
07:00	*	*	264	224	273	220	250	207	*	*	*	*	*	*	262	2
08:00	*	*	205	216	184	196	208	226	*	*	*	*	*	*	199	2
09:00	*	*	176	137	148	126	154	136	*	*	*	*	*	*	159	1
10:00	*	*	108	102	131	104	120	109	*	*	*	*	*	*	119	1
11:00	*	*	141	116	170	106	*	*	*	*	*	*	*	*	155	
12:PM	152	154	184	154	174	159	*	*	*	*	*	*	*	*	170	
01:00	116	135	164	172	142	160	*	*	*	*	*	*	*	*	140	
02:00	146	158	138	184	129	161	*	*	*	*	*	*	*	*	137	
03:00	156	243	171	244	172	242	*	*	*	*	*	*	*	*	166	
04:00	166	360	172	374	224	416	*	*	*	*	*	*	*	*	187	
05:00	206	392	266	404	248	410	*	*	*	*	*	*	*	*	240	
06:00	165	214	166	208	194	252	*	*	*	*	*	*	*	*	175	
07:00	87	104	107	139	114	130	*	*	*	*	*	*	*	*	102	
08:00	60	62	80	76	112	121	*	*	*	*	*	*	*	*	84	
09:00	71	42	74	49	102	65	*	*	*	*	*	*	*	*	82	
10:00	36	30	44	29	46	42	*	*	*	*	*	*	*	*	42	
11:00	17	11	22	25	22	16	*	*	*	*	*	*	*	*	20	
Total	1,378	1,905	2,745	2,985	2,857	3,068	1,012	818	0	0	0	0	0	0	2,709	2,
Combined	3,283		5,730		5,925		1,830		0		0		0			5,663
Split	42.0	58.0	47.9	52.1	48.2	51.8	55.3	44.7	0.0	.0	0.0	.0	0.0	.0	47.8	
A																
Peak Hr	*	*	07:00	07:00	07:00	07:00	07:00	08:00	*	*	*	*	*	*	07:00	0
Volume	*	*	264	224	273	220	250	226	*	*	*	*	*	*	262	
P																
PeakHr	05:00	05:00	05:00	05:00	05:00	04:00	*	*	*	*	*	*	*	*	05:00	0
Volume	206	392	266	404	248	416	*	*	*	*	*	*	*	*	240	

Municipality : Upper Merion Twp
Comments : None
Weather : Variable
ATR #/Operator : 5719
Street name :Crooked Ln Cross street:Gulph Rd / Holstein

JAMAR Technologies, Inc.
TAS for Windows
Copyright 1999

Site Code : 000080100205
Start Date: 06/04/2001
File I.D. : DVRPC05
Page : 1

Begin	Mon. 06/04		Tues.		Wed.		Thur.		Fri.		Sat.		Sun.		Week	Avg.
Time	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 am	*	*	*	*	15	11	15	15	14	13	27	18	19	13	18	14
01:00	*	*	*	*	10	2	17	11	6	8	17	9	16	18	13	10
02:00	*	*	*	*	5	7	13	2	10	2	17	2	10	4	11	3
03:00	*	*	*	*	24	4	23	4	22	4	16	10	20	6	21	6
04:00	*	*	*	*	29	24	36	19	34	13	29	8	20	12	30	15
05:00	*	*	*	*	66	35	56	30	62	43	31	26	6	13	44	29
06:00	*	*	*	*	108	115	100	100	97	91	34	28	11	15	68	70
07:00	*	*	*	*	118	238	122	182	101	177	42	42	12	19	79	132
08:00	*	*	*	*	91	189	112	166	106	175	52	68	26	33	77	126
09:00	*	*	*	*	119	124	100	103	32	102	57	89	37	47	79	93
10:00	*	*	*	*	78	82	97	91	98	91	52	87	48	61	75	82
11:00	*	*	*	*	104	110	99	107	91	120	97	97	51	64	88	100
12:00 pm	*	*	94	121	91	128	107	125	97	138	84	99	72	66	91	113
01:00	*	*	96	118	114	113	104	136	102	147	57	82	59	63	89	110
02:00	*	*	103	132	103	120	107	120	92	109	63	70	60	61	88	102
03:00	*	*	95	162	94	156	107	157	78	160	61	69	48	47	80	125
04:00	*	*	96	280	95	253	76	240	83	254	71	56	56	60	80	190
05:00	*	*	95	319	108	250	90	312	93	249	50	59	49	55	81	207
06:00	*	*	75	129	83	111	87	113	86	98	44	45	60	59	72	92
07:00	*	*	64	86	77	62	64	67	55	77	38	45	49	40	58	63
08:00	*	*	57	51	76	54	76	47	59	70	47	42	37	32	59	49
09:00	*	*	59	50	49	46	57	38	46	46	38	32	37	22	48	39
10:00	*	*	37	35	26	26	34	28	43	30	33	23	33	26	34	28
11:00	*	*	21	21	23	12	32	19	28	18	34	10	31	21	28	17
Totals	0	0	892	1504	1706	2272	1731	2232	1575	2235	1091	1116	867	857	1411	1815
	0		2396		3978		3963		3810		2207		1724		3226	
Avg. Day	.0%	.0%	63.2%	82.8%	120.9%	125.1%	122.6%	122.9%	111.6%	123.1%	77.3%	61.4%	61.4%	47.2%		
AM Peaks					09:00	07:00	07:00	07:00	08:00	07:00	11:00	11:00	11:00	11:00	11:00	07:00
Volume					119	238	122	182	106	177	97	97	51	64	88	132
PM Peaks			02:00	05:00	01:00	04:00	12:00	05:00	01:00	04:00	12:00	12:00	12:00	12:00	12:00	05:00
Volume			103	319	114	253	107	312	102	254	84	99	72	66	91	207

Municipality : Upper Merion Twp
Comments : None
Weather : Variable
ATR #/Operator : 5719
Street name :Crooked Ln Cross street:Gulph Rd

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Site Code : 000080100205
Start Date: 06/04/2001
File I.D. : DVRPC05
Page : 2

Begin	Mon. 06/11		Tues.		Wed.		Thur.		Fri.		Sat.		Sun.		Week	Avg.
Time	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 am	11	10	*	*	*	*	*	*	*	*	*	*	*	*	11	10
01:00	5	3	*	*	*	*	*	*	*	*	*	*	*	*	5	3
02:00	7	6	*	*	*	*	*	*	*	*	*	*	*	*	7	6
03:00	25	4	*	*	*	*	*	*	*	*	*	*	*	*	25	4
04:00	40	12	*	*	*	*	*	*	*	*	*	*	*	*	40	12
05:00	56	33	*	*	*	*	*	*	*	*	*	*	*	*	56	33
06:00	113	89	*	*	*	*	*	*	*	*	*	*	*	*	113	89
07:00	102	187	*	*	*	*	*	*	*	*	*	*	*	*	102	187
08:00	102	158	*	*	*	*	*	*	*	*	*	*	*	*	102	158
09:00	117	103	*	*	*	*	*	*	*	*	*	*	*	*	117	103
10:00	86	77	*	*	*	*	*	*	*	*	*	*	*	*	86	77
11:00	98	109	*	*	*	*	*	*	*	*	*	*	*	*	98	109
12:00 pm	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Totals	762	791	0	0	0	0	0	0	0	0	0	0	0	0	762	791
	1553		0		0		0		0		0		0		1553	
Avg. Day	100.0%	100.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%		
AM Peaks	09:00	07:00													09:00	07:00
Volume	117	187													117	187
PM Peaks																
ADTs																

Municipality : Upper Merion Twp
Comments : None
Weather : Variable
ATR #/Operator : 555/JB
Street name :Crooked Ln Cross street:btw ~~Gulph Rd & Pine~~ Haldeman & Crawford

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TAS for Windows
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Site Code : 000080100209
Start Date: 06/04/2001
File I.D. : DVRPC09
Page : 1

Begin	Mon. 06/04		Tues.		Wed.		Thur.		Fri.		Sat.		Sun.		Week	Avg.
Time	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB
12:00 am	*	*	*	*	7	10	13	18	7	15	15	22	14	20	11	17
01:00	*	*	*	*	2	10	10	10	9	2	8	21	15	10	9	11
02:00	*	*	*	*	2	4	3	9	4	5	4	15	5	10	4	9
03:00	*	*	*	*	2	9	1	6	4	10	10	6	5	14	4	9
04:00	*	*	*	*	12	6	16	9	7	7	6	12	9	9	10	9
05:00	*	*	*	*	28	29	27	28	36	28	17	15	10	4	24	21
06:00	*	*	*	*	100	74	98	72	95	61	31	21	15	6	68	47
07:00	*	*	*	*	215	97	189	76	171	89	44	26	17	14	127	60
08:00	*	*	*	*	171	74	158	81	158	93	68	34	29	20	117	60
09:00	*	*	*	*	115	90	93	74	102	67	111	56	42	32	93	64
10:00	*	*	*	*	76	65	91	78	90	66	96	67	59	44	82	64
11:00	*	*	*	*	94	90	107	77	112	66	81	76	64	54	92	73
12:00 pm	*	*	98	94	130	98	118	85	117	79	78	86	63	64	101	84
01:00	*	*	107	76	90	84	110	79	109	86	92	75	69	51	96	75
02:00	*	*	102	72	113	78	112	93	86	68	57	63	63	52	89	71
03:00	*	*	131	74	150	77	145	74	147	73	74	59	43	47	115	67
04:00	*	*	226	102	210	77	219	92	223	85	62	71	53	51	166	80
05:00	*	*	219	98	189	115	273	79	210	97	59	55	52	47	167	82
06:00	*	*	101	71	90	84	90	88	91	81	57	53	64	60	82	73
07:00	*	*	76	59	57	83	70	58	71	50	59	43	47	49	63	57
08:00	*	*	46	60	59	63	44	70	61	49	43	42	34	28	48	52
09:00	*	*	36	53	48	40	38	56	39	49	39	37	27	36	38	45
10:00	*	*	25	36	25	24	28	26	30	33	23	29	17	30	25	30
11:00	*	*	18	10	14	18	21	27	16	27	13	28	18	28	17	23
Totals	0	0	1185	805	1999	1399	2074	1365	1995	1286	1147	1012	834	780	1648	1183
	0		1990		3398		3439		3281		2159		1614		2831	
Avg. Day	.0%	.0%	71.9%	68.0%	121.3%	118.2%	125.8%	115.3%	121.0%	108.7%	69.6%	85.5%	50.6%	65.9%		
AM Peaks					07:00	07:00	07:00	08:00	07:00	08:00	09:00	11:00	11:00	11:00	07:00	11:00
Volume					215	97	189	81	171	93	111	76	64	54	127	73
PM Peaks			04:00	04:00	04:00	05:00	05:00	02:00	04:00	05:00	01:00	12:00	01:00	12:00	05:00	12:00
Volume			226	102	210	115	273	93	223	97	92	86	69	64	167	84

Municipality : Upper Merion Twp
Comments : None
Weather : Variable
ATR #/Operator : 555/JB
Street name :Crooked Ln Cross street:btw Gulph Rd & Pine

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TAS for Windows
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Site Code : 000080100209
Start Date: 06/04/2001
File I.D. : DVRPC09
Page : 2

Begin	Mon. 06/11		Tues.		Wed.		Thur.		Fri.		Sat.		Sun.		Week	Avg.
Time	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB
12:00 am	13	7	*	*	*	*	*	*	*	*	*	*	*	*	13	7
01:00	3	5	*	*	*	*	*	*	*	*	*	*	*	*	3	5
02:00	6	3	*	*	*	*	*	*	*	*	*	*	*	*	6	3
03:00	4	13	*	*	*	*	*	*	*	*	*	*	*	*	4	13
04:00	16	12	*	*	*	*	*	*	*	*	*	*	*	*	16	12
05:00	28	26	*	*	*	*	*	*	*	*	*	*	*	*	28	26
06:00	94	87	*	*	*	*	*	*	*	*	*	*	*	*	94	87
07:00	186	92	*	*	*	*	*	*	*	*	*	*	*	*	186	92
08:00	145	85	*	*	*	*	*	*	*	*	*	*	*	*	145	85
09:00	90	75	*	*	*	*	*	*	*	*	*	*	*	*	90	75
10:00	80	68	*	*	*	*	*	*	*	*	*	*	*	*	80	68
11:00	102	83	*	*	*	*	*	*	*	*	*	*	*	*	102	83
12:00 pm	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Totals	767	556	0	0	0	0	0	0	0	0	0	0	0	0	767	556
	1323		0		0		0		0		0		0		1323	
Avg. Day	100.0%	100.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%		
AM Peaks	07:00	07:00													07:00	07:00
Volume	186	92													186	92
PM Peaks																
ADTs																

Municipality : Upper Merion Twp
Comments : None
Weather : Variable
ATR #/Operator : 543
Street name :Yerkes Rd Cross street:Church Rd / Holstein

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TAS for Windows
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Site Code : 000080100206
Start Date: 06/04/2001
File I.D. : DVRPC06
Page : 1

Begin	Mon. 06/04		Tues.		Wed.		Thur.		Fri.		Sat.		Sun.		Week	Avg.
Time	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB
12:00 am	*	*	*	*	10	4	12	2	8	2	14	5	8	4	10	3
01:00	*	*	*	*	2	0	3	2	1	2	4	3	6	5	3	2
02:00	*	*	*	*	4	2	1	3	2	3	1	2	0	4	2	3
03:00	*	*	*	*	2	14	6	13	3	12	1	9	1	6	3	11
04:00	*	*	*	*	12	15	10	21	8	23	9	9	7	6	9	15
05:00	*	*	*	*	14	27	13	26	20	34	16	16	4	4	13	21
06:00	*	*	*	*	32	36	26	36	16	32	6	16	4	6	17	25
07:00	*	*	*	*	36	59	21	64	22	58	12	31	1	4	18	43
08:00	*	*	*	*	51	50	42	57	42	50	20	38	12	18	33	43
09:00	*	*	*	*	40	58	39	56	30	60	53	60	30	26	38	52
10:00	*	*	*	*	34	35	35	40	51	57	35	40	28	29	37	40
11:00	*	*	52	44	50	43	47	50	60	55	67	60	34	39	52	48
12:00 pm	*	*	71	44	56	46	67	57	78	63	85	46	47	41	67	50
01:00	*	*	55	57	63	58	70	54	83	55	43	48	34	35	58	51
02:00	*	*	70	55	58	54	63	44	69	45	49	33	35	33	57	44
03:00	*	*	68	51	61	29	76	53	72	33	50	27	32	29	60	37
04:00	*	*	114	35	93	35	111	36	107	31	29	20	35	29	82	31
05:00	*	*	116	29	124	30	135	45	107	34	27	23	35	26	91	31
06:00	*	*	72	31	72	44	65	32	56	46	31	24	27	16	54	32
07:00	*	*	53	36	40	24	47	34	43	30	18	28	20	25	37	30
08:00	*	*	43	24	43	35	40	28	43	28	26	21	27	10	37	24
09:00	*	*	45	18	26	11	25	18	29	12	17	9	12	11	26	13
10:00	*	*	20	7	11	10	12	11	12	10	17	8	10	10	14	9
11:00	*	*	8	11	8	7	11	7	8	6	10	8	9	8	9	8
Totals	0	0	787	442	942	726	977	789	970	781	640	584	458	424	827	666
	0		1229		1668		1766		1751		1224		882		1493	
Avg. Day	.0%	.0%	95.1%	66.3%	113.9%	109.0%	118.1%	118.4%	117.2%	117.2%	77.3%	87.6%	55.3%	63.6%		
AM Peaks			11:00	11:00	08:00	07:00	11:00	07:00	11:00	09:00	11:00	09:00	11:00	11:00	11:00	09:00
Volume			52	44	51	59	47	64	60	60	67	60	34	39	52	52
PM Peaks			05:00	01:00	05:00	01:00	05:00	12:00	04:00	12:00	12:00	01:00	12:00	12:00	05:00	01:00
Volume			116	57	124	58	135	57	107	63	85	48	47	41	91	51

Municipality : Upper Merion Twp
Comments : None
Weather : Variable
ATR #/Operator : 543
Street name :Yerkes Rd Cross street:Church Rd

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TAS for Windows
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Site Code : 000080100206
Start Date: 06/04/2001
File I.D. : DVRPC06
Page : 2

Begin	Mon. 06/11		Tues.		Wed.		Thur.		Fri.		Sat.		Sun.		Week	Avg.
Time	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB
12:00 am	3	3	*	*	*	*	*	*	*	*	*	*	*	*	3	3
01:00	2	2	*	*	*	*	*	*	*	*	*	*	*	*	2	2
02:00	4	1	*	*	*	*	*	*	*	*	*	*	*	*	4	1
03:00	2	11	*	*	*	*	*	*	*	*	*	*	*	*	2	11
04:00	6	19	*	*	*	*	*	*	*	*	*	*	*	*	6	19
05:00	8	24	*	*	*	*	*	*	*	*	*	*	*	*	8	24
06:00	18	33	*	*	*	*	*	*	*	*	*	*	*	*	18	33
07:00	24	61	*	*	*	*	*	*	*	*	*	*	*	*	24	61
08:00	41	57	*	*	*	*	*	*	*	*	*	*	*	*	41	57
09:00	34	56	*	*	*	*	*	*	*	*	*	*	*	*	34	56
10:00	35	44	*	*	*	*	*	*	*	*	*	*	*	*	35	44
11:00	55	59	*	*	*	*	*	*	*	*	*	*	*	*	55	59
12:00 pm	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Totals	232	370	0	0	0	0	0	0	0	0	0	0	0	0	232	370
		602		0		0		0		0		0		0		602
Avg. Day	100.0%	100.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%		
AM Peaks	11:00	07:00													11:00	07:00
Volume	55	61													55	61
PM Peaks																
ADTs																

DVRPC – Travel Monitoring

DATE: 06/08/1999

ROAD: ALLENDALE RD **FROM:** TR 202 **TO:** FIRST AVE

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** G345/0010/ **FC:** 16

PROJECT: PAM99 **COUNT DIR:** BOTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 35 **LOOP OR CLASS:**

STATION ID: 29447 **DVRPC FILE #:** 6962 **COUNTER:** 9624 **WEATHER:** F

Hour Ending	Tuesday 06/08/99	Wednesday 06/09/99	Thursday 06/10/99	Friday 06/11/99	Saturday 06/12/99
1 AM		70	82		
2 AM		36	43		
3 AM		32	28		
4 AM		39	35		
5 AM		25	35		
6 AM		130	106		
7 AM		544	529		
8 AM		1,182	1,110		
9 AM		1,242	1,210		
10 AM		904	928		
11 AM		886	799		
12 PM		1,312	1,216		
1 PM	1,520	1,540			
2 PM	1,519	1,564			
3 PM	1,198	1,327			
4 PM	1,184	1,278			
5 PM	1,360	1,296			
6 PM	1,592	1,560			
7 PM	1,168	1,289			
8 PM	930	986			
9 PM	735	736			
10 PM	556	547			
11 PM	320	330			
12 AM	194	201			
		19,056			

SEASONAL FACTOR:	.912	AADT: **16,753**	AM PEAK %:	6.9	HOUR ENDING:	12:00 PM
AXLE CORR. FACTOR:	.964		PM PEAK %:	8.2	HOUR ENDING:	2:00 PM

Municipality : Upper Merion Twp
Comments : None
Weather : Variable
ATR #/Operator : 545/3593/JB
Street name :Allendale Rd - Willis/Dekalb

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Site Code : 000080100228
Start Date: 06/18/2001
File I.D. : DVRPC28W
Page : 1

Begin	Mon. 06/18		Tues.		Wed.		Thur.		Fri.		Sat.		Sun.		Week	Avg.
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 am	*	*	*	*	61	67	50	58	56	105	77	125	109	120	71	95
01:00	*	*	*	*	44	41	39	36	36	40	58	53	47	45	45	43
02:00	*	*	*	*	39	37	37	22	40	27	51	50	38	30	41	33
03:00	*	*	*	*	16	31	20	32	17	43	19	29	24	19	19	31
04:00	*	*	*	*	32	6	23	17	36	17	18	13	16	13	25	13
05:00	*	*	*	*	105	43	95	27	93	37	41	18	24	16	72	28
06:00	*	*	*	*	409	120	437	124	428	123	139	53	85	30	300	90
07:00	*	*	*	*	714	346	735	373	724	401	129	139	155	87	491	269
08:00	*	*	*	*	769	446	683	169	694	422	222	151	128	178	499	273
09:00	*	*	*	*	561	422	547	6	558	406	401	292	314	167	476	259
10:00	*	*	*	*	577	380	557	278	587	496	531	397	385	336	527	377
11:00	*	*	*	*	631	628	605	610	661	684	597	622	521	390	603	587
12:00 pm	*	*	*	*	871	865	920	844	902	940	695	617	560	568	790	767
01:00	*	*	*	*	881	808	939	824	896	905	665	635	545	580	785	750
02:00	*	*	682	703	649	718	730	713	733	851	639	613	618	548	675	691
03:00	*	*	560	783	577	753	593	819	653	904	643	718	581	673	601	775
04:00	*	*	620	853	599	843	641	928	675	967	637	685	457	623	605	816
05:00	*	*	676	835	661	893	686	940	692	906	565	711	350	562	605	808
06:00	*	*	648	764	699	807	689	740	678	753	491	689	345	533	592	714
07:00	*	*	531	653	524	635	576	650	552	660	440	510	241	266	477	562
08:00	*	*	412	556	419	545	441	609	391	552	379	478	215	210	376	492
09:00	*	*	330	471	313	495	314	512	335	502	261	491	182	180	289	442
10:00	*	*	212	294	214	283	211	263	266	338	244	257	187	116	222	258
11:00	*	*	92	179	80	196	107	148	98	237	115	201	85	140	96	184
Totals	0	0	4763	6091	10445	10408	10675	9742	10801	11316	8057	8547	6212	6430	9282	9357
	0		10854		20853		20417		22117		16604		12642		18639	
Avg. Day	.0%	.0%	51.3%	65.1%	112.5%	111.2%	115.0%	104.1%	116.3%	120.9%	86.8%	91.3%	66.9%	68.7%		
AM Peaks					08:00	11:00	07:00	11:00	07:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00
Volume					769	628	735	610	724	684	597	622	521	390	603	587
PM Peaks			02:00	04:00	01:00	05:00	01:00	05:00	12:00	04:00	12:00	03:00	02:00	03:00	12:00	04:00
Volume			682	853	881	893	939	940	902	967	695	718	618	673	790	816

Municipality : Upper Merion Twp
Comments : None
Weather : Variable
ATR #/Operator : 545/3593/JB
Street name :Allendale Rd

JAMAR Technologies, Inc.
TAS for Windows
Copyright 1999

Site Code : 000080100228
Start Date: 06/18/2001
File I.D. : DVRPC28W
Page : 2

Begin	Mon. 06/25		Tues.		Wed.		Thur.		Fri.		Sat.		Sun.		Week	Avg.
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 am	57	68	*	*	*	*	*	*	*	*	*	*	*	*	57	68
01:00	29	28	*	*	*	*	*	*	*	*	*	*	*	*	29	28
02:00	22	12	*	*	*	*	*	*	*	*	*	*	*	*	22	12
03:00	23	16	*	*	*	*	*	*	*	*	*	*	*	*	23	16
04:00	32	15	*	*	*	*	*	*	*	*	*	*	*	*	32	15
05:00	91	41	*	*	*	*	*	*	*	*	*	*	*	*	91	41
06:00	433	117	*	*	*	*	*	*	*	*	*	*	*	*	433	117
07:00	675	388	*	*	*	*	*	*	*	*	*	*	*	*	675	388
08:00	733	427	*	*	*	*	*	*	*	*	*	*	*	*	733	427
09:00	533	381	*	*	*	*	*	*	*	*	*	*	*	*	533	381
10:00	508	464	*	*	*	*	*	*	*	*	*	*	*	*	508	464
11:00	572	575	*	*	*	*	*	*	*	*	*	*	*	*	572	575
12:00 pm	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Totals	3708	2532	0	0	0	0	0	0	0	0	0	0	0	0	3708	2532
		6240		0		0		0		0		0		0		6240
Avg. Day	100.0%	100.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%		
AM Peaks	08:00	11:00													08:00	11:00
Volume	733	575													733	575
PM Peaks																

ADTs

DVRPC – Travel Monitoring

DATE: 06/11/2001

ROAD: GYPSY LANE BR **FROM:** HUGHES RD **TO:** SOUTH GULPH RD

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** 3102/0010/0000 **FC:** 19

PROJECT: PAM01 **COUNT DIR:** BOTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 25 **LOOP OR CLASS:**

STATION ID: 33270 **DVRPC FILE #:** 30626 **COUNTER:** 9943 **WEATHER:** F

Hour Ending	Monday 06/11/01	Tuesday 06/12/01	Wednesday 06/13/01	Thursday 06/14/01	Friday 06/15/01
1 AM		11	15		
2 AM		3	7		
3 AM		1	1		
4 AM		1			
5 AM		8	12		
6 AM		35	37		
7 AM		119	113		
8 AM		182	187		
9 AM		144	156		
10 AM		101	96		
11 AM		94			
12 PM	124	124			
1 PM	103	120			
2 PM	110	116			
3 PM	106	126			
4 PM	148	164			
5 PM	166	174			
6 PM	206	207			
7 PM	131	163			
8 PM	94	128			
9 PM	75	81			
10 PM	63	56			
11 PM	29	24			
12 AM	19	21			
		2,203			

SEASONAL FACTOR:	.919	AADT: **2,002**	AM PEAK %:	8.3	HOUR ENDING:	8:00 AM
AXLE CORR. FACTOR:	.989		PM PEAK %:	9.4	HOUR ENDING:	6:00 PM

DVRPC – Travel Monitoring

DATE: 07/18/2000

ROAD: CROTON RD **FROM:** CENTURY LA **TO:** BROOKS RD

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** 3024/0050/0500 **FC:** 17

PROJECT: PAM00 **COUNT DIR:** BOTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 40 **LOOP OR CLASS:**

STATION ID: 24636 **DVRPC FILE #:** 27610 **COUNTER:** 9629 **WEATHER:** F

Hour Ending	Tuesday 07/18/00	Wednesday 07/19/00	Thursday 07/20/00	Friday 07/21/00	Saturday 07/22/00
1 AM		55	40		
2 AM		21	30		
3 AM		11	16		
4 AM		9	7		
5 AM		14	21		
6 AM		58	66		
7 AM		296	338		
8 AM		842	847		
9 AM	972	986			
10 AM	642	620			
11 AM	436	435			
12 PM	507	486			
1 PM	696	628			
2 PM	566	597			
3 PM	570	529			
4 PM	690	746			
5 PM	880	948			
6 PM	1,181	1,204			
7 PM	804	836			
8 PM	551	523			
9 PM	388	384			
10 PM	310	332			
11 PM	173	153			
12 AM	83	86			
		10,799			

SEASONAL FACTOR:	.922	AADT: **9,847**	AM PEAK %:	9.1	HOUR ENDING:	9:00 AM
AXLE CORR. FACTOR:	.989		PM PEAK %:	11.1	HOUR ENDING:	6:00 PM

DVRPC – Travel Monitoring

DATE: 05/22/2001

ROAD: TR 320 SWEDELAND RD **FROM:** JONES RD **TO:** FLINT HILL RD

COUNTY: MONTGOMERY **MCD:** 228 - UPPER MERION TOWNSHIP **SR/SEG/OFF:** 0320/0050/2224 **FC:** 16

PROJECT: PAM01 **COUNT DIR:** BOTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 40 **LOOP OR CLASS:**

STATION ID: 25861 **DVRPC FILE #:** 30591 **COUNTER:** 9951 **WEATHER:** F

Hour Ending	Tuesday 05/22/01	Wednesday 05/23/01	Thursday 05/24/01	Friday 05/25/01	Saturday 05/26/01
1 AM		48	50		
2 AM		20	22		
3 AM		16	34		
4 AM		46	41		
5 AM		56	68		
6 AM		130	138		
7 AM		524	528		
8 AM		1,112	1,158		
9 AM		1,434	1,456		
10 AM		1,005	965		
11 AM	613	527			
12 PM	570	602			
1 PM	613	628			
2 PM	570	688			
3 PM	587	696			
4 PM	962	1,023			
5 PM	1,259	1,338			
6 PM	1,358	1,404			
7 PM	636	620			
8 PM	266	232			
9 PM	154	153			
10 PM	104	137			
11 PM	84	101			
12 AM	72	82			
		12,622			

SEASONAL FACTOR:	.931	AADT: **11,457**	AM PEAK %:	11.4	HOUR ENDING:	9:00 AM
AXLE CORR. FACTOR:	.975		PM PEAK %:	11.1	HOUR ENDING:	6:00 PM

APPENDIX B
INTERSECTION TURNING MOVEMENT COUNTS

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TABLE OF CONTENTS

INTERSECTION TURNING MOVEMENT COUNT LOCATION

PAGE

All intersection turning movement counts were taken by the consultant and not shown in DVRPC format.

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Tri-State Traffic Data, Inc.
(610) 444-8030

Location: Upper Merion Twp., PA
Intersection: Rt. 23 / Henderson Rd.
Date: Tuesday, May 22, 2001
Counter: ET / JT

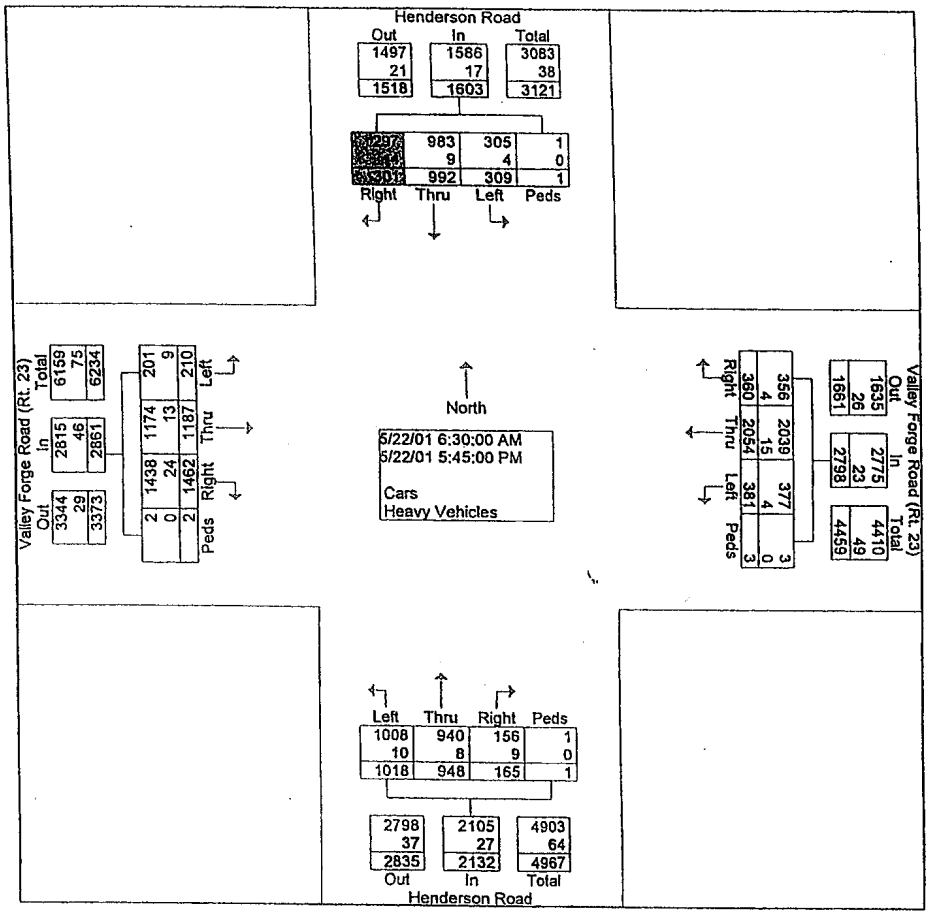
File Name : bs0522e
Site Code : 00000000
Start Date : 05/22/2001
Page No : 1

Groups Printed- Heavy Vehicles

	Henderson Road Southbound					Valley Forge Road (Rt. 23) Westbound					Henderson Road Northbound					Valley Forge Road (Rt. 23) Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	0	0	1	0	1	0	0	0	0	0	1	1	0	0	2	0	1	1	0	2	5
06:45 AM	0	0	1	0	1	0	0	1	0	1	0	3	1	0	4	1	1	0	0	2	8
Total	0	0	2	0	2	0	0	1	0	1	1	4	1	0	6	1	2	1	0	4	13
07:00 AM	1	1	0	0	2	1	3	0	0	4	1	1	2	0	4	0	0	1	0	1	11
07:15 AM	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	2	1	0	3	5
07:30 AM	1	0	1	0	2	0	2	0	0	2	1	1	1	0	3	0	0	2	0	2	9
07:45 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	1	0	1	0	2	5
Total	2	1	2	0	5	1	9	0	0	10	2	2	3	0	7	1	2	5	0	8	30
08:00 AM	1	0	0	0	1	0	0	0	0	0	3	1	0	0	4	0	1	0	0	1	6
08:15 AM	0	1	0	0	1	1	0	2	0	3	0	0	0	0	0	1	2	3	0	6	10
08:30 AM	1	2	0	0	3	1	0	0	0	1	1	0	1	0	2	3	2	0	0	5	11
08:45 AM	0	2	0	0	2	0	2	0	0	2	1	0	2	0	3	4	0	0	0	4	11
Total	2	5	0	0	7	2	2	2	0	6	5	1	3	0	9	8	5	3	0	16	38
*** BREAK ***																					
04:00 PM	0	2	0	0	2	0	0	0	0	0	1	0	2	0	3	3	0	0	0	3	8
04:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	1	0	0	3	4
04:30 PM	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	3	1	0	0	4	6
04:45 PM	0	0	0	0	0	1	1	0	0	2	0	0	1	0	1	3	1	0	0	4	7
Total	0	2	0	0	2	1	2	1	0	4	1	1	3	0	5	11	3	0	0	14	25
05:00 PM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	1	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
Total	0	1	0	0	1	0	2	0	0	2	0	0	0	0	0	3	1	0	0	4	7
Grand Total	4	9	4	0	17	4	15	4	0	23	9	8	10	0	27	24	13	9	0	46	113
Apprch %	23.5	52.9	23.5	0.0		17.4	65.2	17.4	0.0		33.3	29.6	37.0	0.0		52.2	28.3	19.6	0.0		
Total %	3.5	8.0	3.5	0.0	15.0	3.5	13.3	3.5	0.0	20.4	8.0	7.1	8.8	0.0	23.9	21.2	11.5	8.0	0.0	40.7	

Tri-State Traffic Data, Inc.
(610) 444-8030

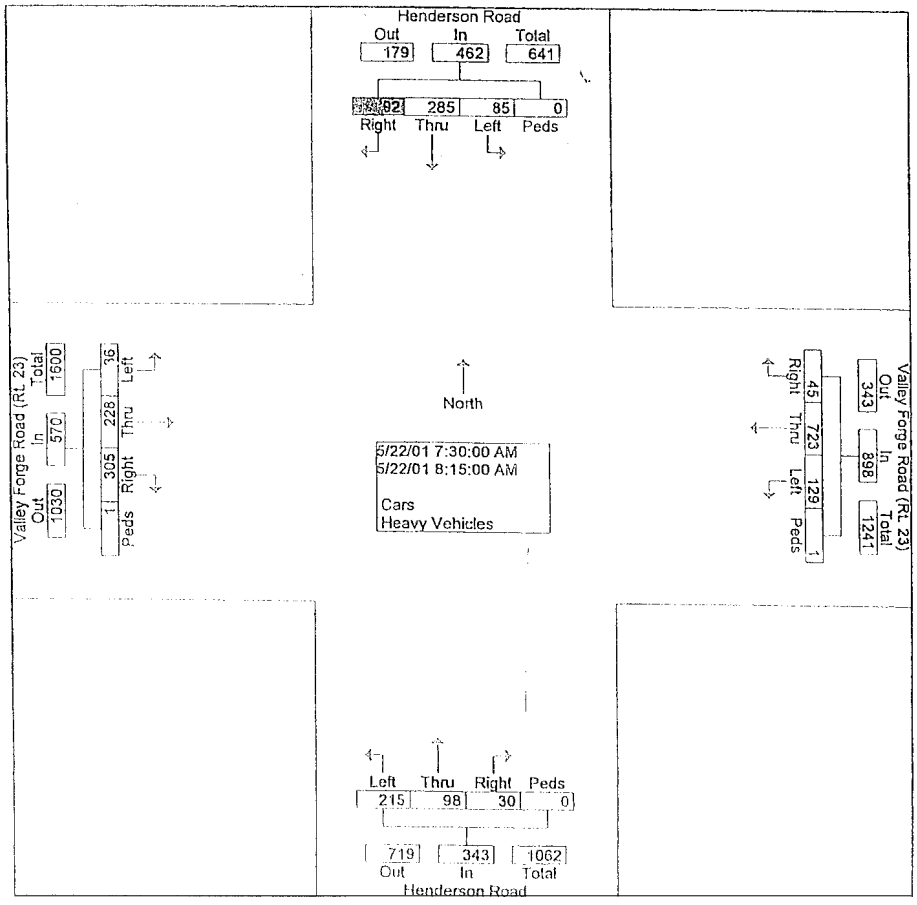
File Name : bs0522e
Site Code : 00000000
Start Date : 05/22/2001
Page No : 2



Tri-State Traffic Data, Inc.
(610) 444-8030

File Name : bs0522e
Site Code : 00000000
Start Date : 05/22/2001
Page No : 3

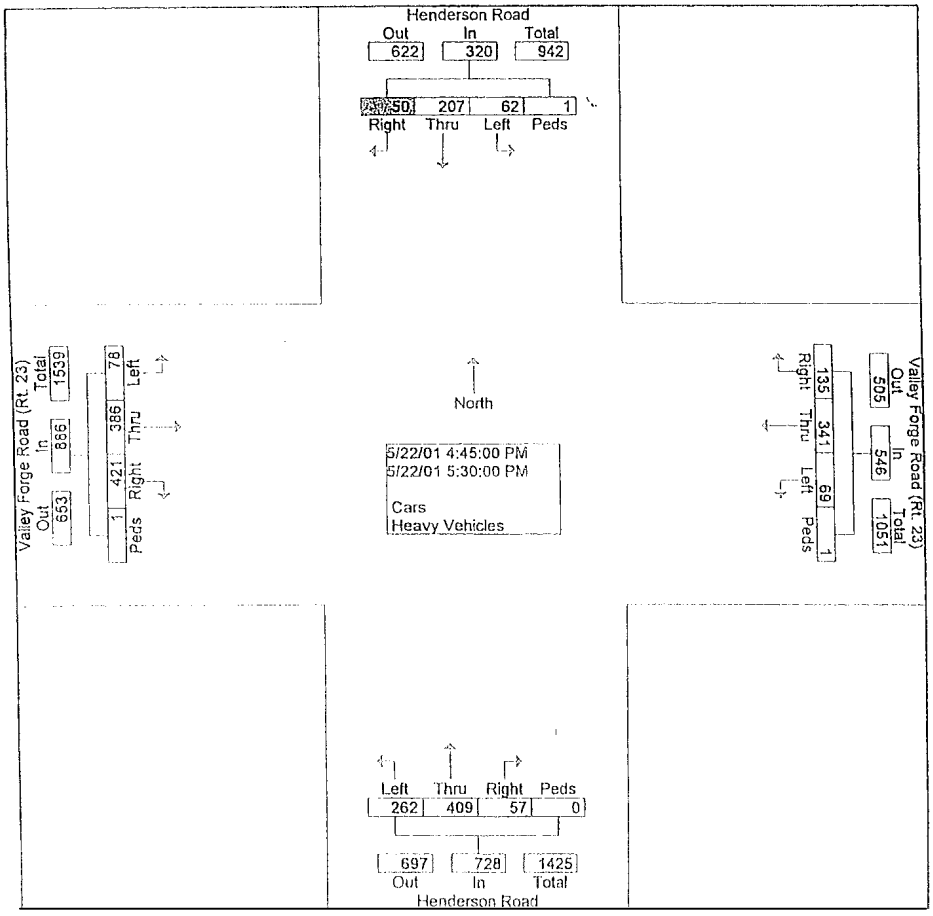
	Henderson Road Southbound					Valley Forge Road (Rt. 23) Westbound					Henderson Road Northbound					Valley Forge Road (Rt. 23) Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 11:45 AM - Peak 1 of 1																					
Intersection	07:30 AM																				
Volume	92	285	85	0	462	45	723	129	1	898	30	98	215	0	343	305	228	36	1	570	2273
Percent	19.9	61.7	18.4	0.0		5.0	80.5	14.4	0.1		8.7	28.6	62.7	0.0		53.5	40.0	6.3	0.2		
07:30 Volume	31	68	24	0	123	13	166	27	1	207	4	21	64	0	89	71	77	16	0	164	583
Peak Factor																					0.975
High Int.	07:30 AM					08:15 AM					07:30 AM					07:30 AM					
Volume	31	68	24	0	123	9	192	38	0	239	4	21	64	0	89	71	77	16	0	164	
Peak Factor					0.939					0.939					0.963					0.869	



Tri-State Traffic Data, Inc.
(610) 444-8030

File Name : bs0522e
Site Code : 00000000
Start Date : 05/22/2001
Page No : 4

	Henderson Road Southbound					Valley Forge Road (Rt. 23) Westbound					Henderson Road Northbound					Valley Forge Road (Rt. 23) Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:45 PM																				
Volume	50	207	62	1	320	135	341	69	1	546	57	409	262	0	728	421	386	78	1	886	2480
Percent	15.6	64.7	19.4	0.3		24.7	62.5	12.6	0.2		7.8	56.2	36.0	0.0		47.5	43.6	8.8	0.1		
05:15 Volume	14	60	16	0	90	50	87	18	0	155	16	100	60	0	176	78	120	20	0	218	639
Peak Factor																					0.970
High Int.	05:15 PM					05:15 PM					05:00 PM					05:00 PM					
Volume	14	60	16	0	90	50	87	18	0	155	15	115	61	0	191	133	112	21	0	266	
Peak Factor					0.889					0.881					0.953					0.833	



McMahon Associates, Inc.
Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034-2716

Municipality: Upper Merion Twp
Location: Dekalb Pk (rt202) &
Henderson Rd
Counter/Board #: JB/MM McM-2283/2161

Study Name: DVRPC43W
Site Code : 80100242
Start Date: 06/05/01
Page : 1

	Henderson Rd Southbound					Dekalb Pk (rt202) Westbound					Henderson Rd Northbound					Dekalb Pk (rt202) Eastbound							
Start Time	Left	Thru	Right	RTOR	HV	Left	Thru	Right	RTOR	HV	Left	Thru	RTOR	Right	HV	Left	Thru	Right	RTOR	HV	Intvl Total	Exclu Total	Inclu Total
06/05/01																							
07:00	34	120	18	6	7	34	293	27	19	19	33	53	2	3	19	16	137	25	34	16	915	61	854
07:15	40	130	18	8	8	26	292	45	13	18	56	111	1	8	13	22	132	27	45	10	1023	49	974
07:30	46	144	31	5	13	18	280	18	14	22	58	52	7	12	16	13	160	30	52	12	1003	63	940
07:45	50	158	33	3	10	13	315	17	10	16	67	67	9	13	14	10	147	41	59	8	1060	48	1012
Hour	170	552	100	22	38	91	1180	107	56	75	214	283	19	36	62	61	576	123	190	46	4001	221	3780
08:00	40	119	32	5	8	27	272	31	14	16	53	62	4	13	9	25	160	48	49	17	1004	50	954
08:15	44	97	27	7	8	22	313	14	8	21	63	50	11	15	9	21	147	32	48	17	974	55	919
08:30	46	108	31	4	8	27	237	22	5	15	66	42	7	24	13	30	174	29	46	25	959	61	898
08:45	42	113	27	6	21	25	262	25	17	21	57	62	8	22	10	13	124	33	28	14	930	66	864
Hour	172	437	117	22	45	101	1084	92	44	73	239	216	30	74	41	89	605	142	171	73	3867	232	3635
BREAK																							
16:00	59	92	16	3	9	40	266	28	20	14	100	115	3	20	9	16	262	15	47	16	1150	48	1102
16:15	38	92	9	6	6	25	289	31	16	11	82	120	10	27	8	21	238	21	51	10	1111	35	1076
16:30	54	104	14	9	6	31	231	45	17	11	99	118	2	24	8	22	279	30	48	10	1162	35	1127
16:45	64	78	16	6	2	29	286	44	11	9	119	115	7	21	4	27	265	20	50	10	1183	25	1158
Hour	215	366	55	24	23	125	1072	148	64	45	400	468	22	92	29	86	1044	86	196	46	4606	143	4463
17:00	89	106	15	10	2	39	245	30	24	8	92	131	6	18	3	25	267	25	42	9	1186	22	1164
17:15	68	90	12	7	4	31	294	30	25	10	113	121	6	24	3	11	288	33	56	5	1231	22	1209
17:30	49	94	12	13	2	21	245	21	27	7	98	113	7	24	6	21	256	20	45	8	1089	23	1066
17:45	50	94	30	3	0	22	296	23	28	5	82	83	9	25	7	22	216	17	39	8	1059	20	1039
Hour	256	384	69	33	8	113	1080	104	104	30	385	448	28	91	19	79	1027	95	182	30	4565	87	4478
Total	813	1739	341	101	114	430	4416	451	268	223	1238	1415	99	293	151	315	3252	446	739	195	17039	683	16356
% Apr.	26.1	55.9	10.9	3.2	3.6	7.4	76.2	7.7	4.6	3.8	38.7	44.2	3.0	9.1	4.7	6.3	65.7	9.0	14.9	3.9	-	-	-
% Int.	4.7	10.2	2.0	0.5	0.6	2.5	25.9	2.6	1.5	1.3	7.2	8.3	0.5	1.7	0.8	1.8	19.0	2.6	4.3	1.1	-	-	-

Peak Hour Analysis By Entire Intersection for the Period: 07:00 on 06/05/01 to 08:45 on 06/05/01

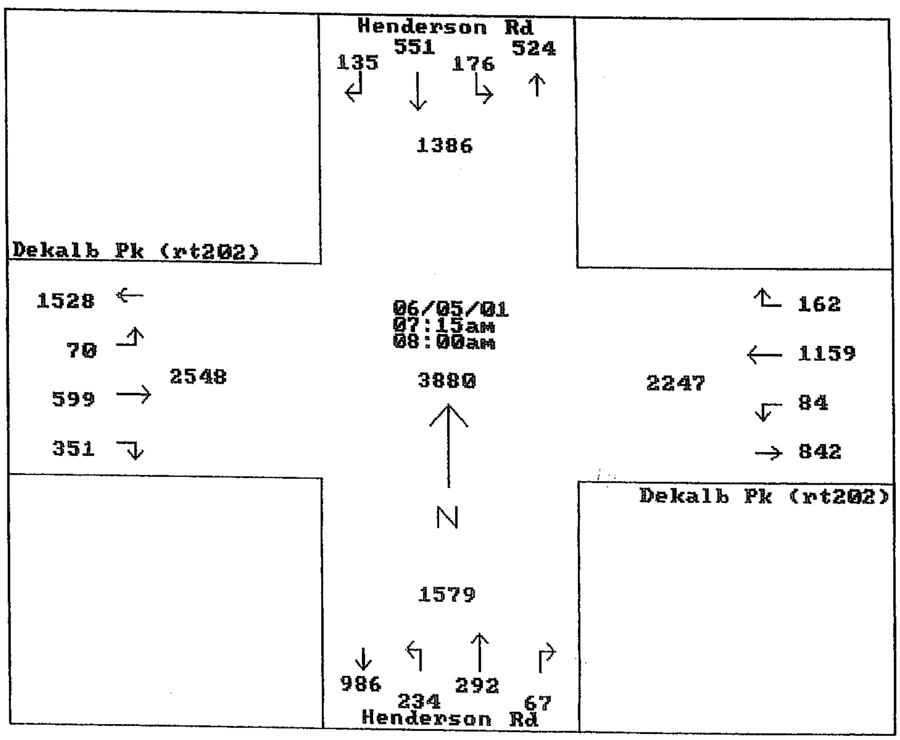
Time	07:15					07:15					07:15					07:15							
Vol.	176	551	114	21	x	84	1159	111	51	x	234	292	21	46	x	70	599	146	205	x			
Pct.	20.4	63.9	13.2	2.4	x	5.9	82.4	7.9	3.6	x	39.4	49.2	3.5	7.7	x	6.8	58.7	14.3	20.0	x			
Total	862					1405					593					1020							
High	07:45					07:15					07:15					08:00							
Vol.	50	158	33	3	x	26	292	45	13	x	56	111	1	8	x	25	160	48	49	x			
Total	244					376					176					282							
PHF	0.883					0.934					0.842					0.904							

Municipality: Upper Merion Twp
Location: Dekalb Pk (rt202) &
Henderson Rd
Counter/Board #: JB/MM McM-2283/2161

McMahon Associates, Inc.
Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034-2716

Study Name: DVRPC43W
Site Code : 80100242
Start Date: 06/05/01

Start Time	Henderson Rd Southbound					Dekalb Pk (rt202) Westbound					Henderson Rd Northbound					Dekalb Pk (rt202) Eastbound					Intvl
	Left	Thru	Right	RTOR	HV	Left	Thru	Right	RTOR	HV	Left	Thru	RTOR	Right	HV	Left	Thru	Right	RTOR	HV	Total

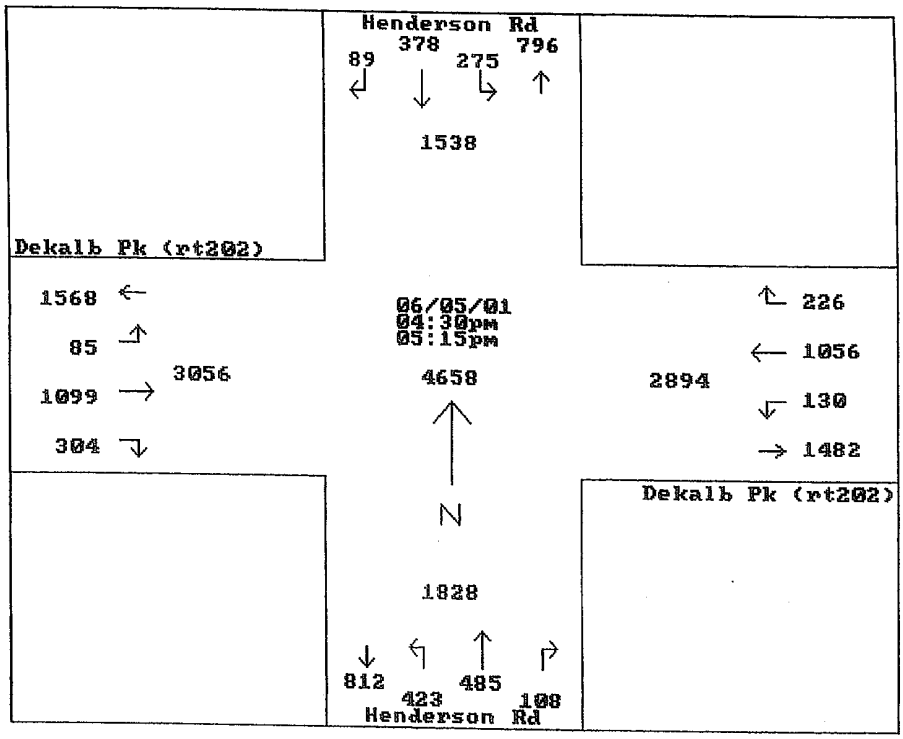


Municipality: Upper Merion Twp
Location: Dekalb Pk (rt202) &
Henderson Rd
Counter/Board #: JB/MM McM-2283/2161

McMahon Associates, Inc.
Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034-2716

Study Name: DVRPC43W
Site Code : 80100242
Start Date: 06/05/01
Page : 3

Start Time	Henderson Rd Southbound					Dekalb Pk (rt202) Westbound					Henderson Rd Northbound					Dekalb Pk (rt202) Eastbound					Intvl Total
	Left	Thru	Right	RTOR	HV	Left	Thru	Right	RTOR	HV	Left	Thru	RTOR	Right	HV	Left	Thru	Right	RTOR	HV	



McMahon Associates, Inc.
Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034 2716

Municipality: Upper Merion Twp
Location: Henderson Rd & Church Rd

Counter/Board #: LB/2215

Study Name: DVRPC 2W
Site Code : 80100 42
Start Date: 06/05 01
Page : 1

	Church Rd Southbound					Henderson Rd Westbound					Church Rd Northbound					Henderson Rd Eastbound					Intvl	Exclu	Inclu
Start Time	Left	Thru	Right	RTOR	HV	Left	Thru	Right	RTOR	HV	Left	Thru	Right	RTOR	HV	Left	Thru	Right	RTOR	HV	Total	Total	Total
06/05/01																							
07:00	21	59	8	0	5	54	104	22	1	14	9	43	25	2	15	8	106	8	1	14	519	48	471
07:15	31	55	9	0	4	65	140	36	0	19	12	52	40	1	16	5	108	10	0	5	608	44	564
07:30	30	82	9	1	7	76	126	30	0	16	16	57	52	0	17	6	79	10	0	3	617	43	574
07:45	28	64	5	0	4	89	109	27	0	21	21	63	39	0	18	7	74	13	0	2	584	45	539
Hour	110	260	31	1	20	284	479	115	1	70	58	215	156	3	66	26	367	41	1	24	2328	180	2148
08:00	33	73	14	0	9	68	159	32	0	20	18	68	49	0	14	18	100	10	2	6	693	49	644
08:15	22	69	9	0	6	112	133	27	0	18	11	53	35	0	12	6	89	8	1	8	619	44	575
08:30	16	65	11	1	5	71	108	24	2	18	13	47	25	0	11	12	85	15	0	10	539	44	495
08:45	25	52	8	0	8	57	110	36	0	34	19	46	41	0	10	7	81	13	0	4	551	56	495
Hour	96	259	42	1	28	308	510	119	2	90	61	214	150	0	47	43	355	46	3	28	2402	193	2209
[BREAK																							
16:00	39	49	6	0	5	50	127	14	1	13	7	62	77	0	7	4	109	13	2	6	591	31	560
16:15	33	37	8	0	6	40	131	18	0	12	7	55	74	0	8	4	133	13	1	5	585	31	554
16:30	42	37	9	0	1	49	134	20	0	9	7	42	89	0	6	6	114	4	1	10	580	26	554
16:45	51	40	11	1	3	34	83	27	0	6	15	44	83	0	7	2	93	8	0	4	512	20	492
Hour	165	163	34	1	15	173	475	79	1	40	36	203	323	0	28	16	449	38	4	25	2268	108	2160
17:00	46	42	18	0	5	58	119	26	0	8	6	46	74	0	3	3	120	7	0	7	588	23	565
17:15	63	54	13	0	3	51	85	16	0	6	21	57	81	0	4	10	91	10	1	0	566	13	553
17:30	47	37	12	0	4	42	118	27	0	3	15	57	64	0	6	7	124	9	0	5	577	18	559
17:45	46	51	8	0	1	54	106	30	1	7	17	58	79	0	4	5	131	19	0	3	620	15	605
Hour	202	184	51	0	13	205	428	99	1	24	59	218	298	0	17	25	466	45	1	15	2351	69	2282
Total	573	866	158	3	76	970	1892	412	5	224	214	850	927	3	158	110	1637	170	9	92	9349	550	8799
% Apr.	34.1	51.6	9.4	0.1	4.5	27.6	54.0	11.7	0.1	6.3	9.9	39.4	43.0	0.1	7.3	5.4	81.1	8.4	0.4	4.5	-	-	-
% Int.	6.1	9.2	1.6	-	0.8	10.3	20.2	4.4	-	2.3	2.2	9.0	9.9	-	1.6	1.1	17.5	1.8	-	0.9	-	-	-

Peak Hour Analysis By Entire Intersection for the Period: 07:00 on 06/05/01 to 08:45 on 06/05/01

Time	07:30					07:30					07:30					07:30							
Vol.	113	288	37	1	x	345	527	116	0	x	66	241	175	0	x	37	342	41	3	x			
Pct.	25.7	65.6	8.4	0.2	x	34.9	53.3	11.7	0.0	x	13.6	50.0	36.3	0.0	x	8.7	80.8	9.6	0.7	x			
Total	439					988					482					423							
High	07:30					08:15					08:00					08:00							
Vol.	30	82	9	1	x	112	133	27	0	x	18	68	49	0	x	18	100	10	2	x			
Total	122					272					135					130							
PHF	0.899					0.908					0.892					0.813							

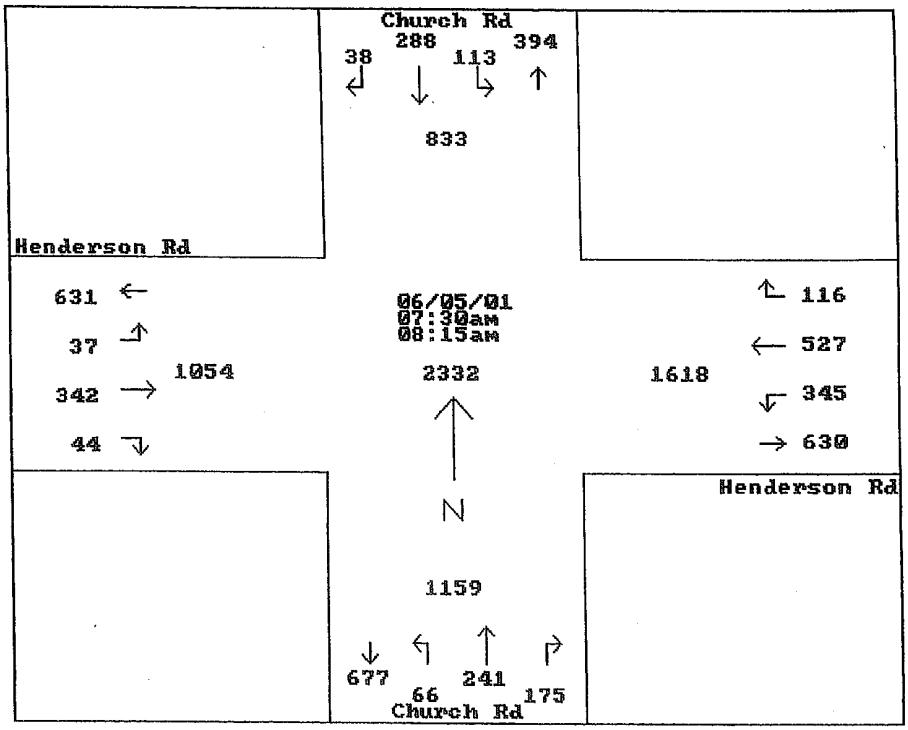
McMahon Associates, Inc.
Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034-2716

Municipality: Upper Merion Twp
Location: Henderson Rd & Church Rd

Counter/Board #: LB/2215

Study Name: DVRPC42W
Site Code : 80100242
Start Date: 06/05/01
Page : 2

Start	Church Rd Southbound					Henderson Rd Westbound					Church Rd Northbound					Henderson Rd Eastbound					Intvl
Time	Left	Thru	Right	RTOR	HV	Left	Thru	Right	RTOR	HV	Left	Thru	Right	RTOR	HV	Left	Thru	Right	RTOR	HV	Total



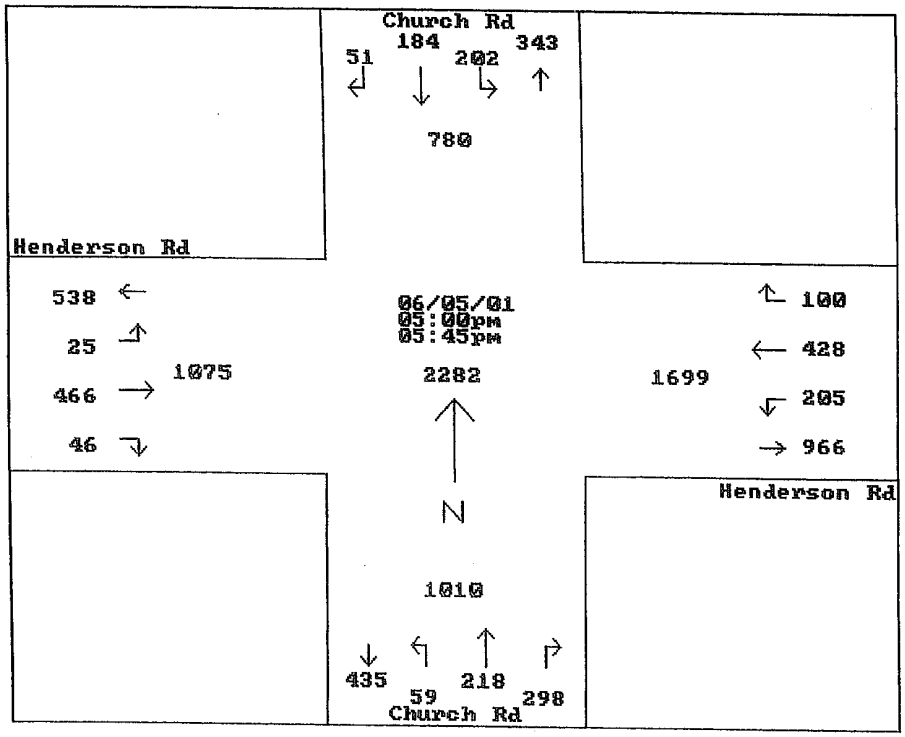
Municipality: Upper Merion Twp
Location: Henderson Rd & Church Rd

Counter/Board #: LB/2215

McMahon Associates, Inc.
Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034-2716

Study Name: DVRPC42W
Site Code : 80100242
Start Date: 06/05/01
Page : 3

Start Time	Church Rd Southbound				Henderson Rd Westbound				Church Rd Northbound				Henderson Rd Eastbound				Intvl Total
	Left	Thru	Right	RTOR HV	Left	Thru	Right	RTOR HV	Left	Thru	Right	RTOR HV	Left	Thru	Right	RTOR HV	



McMahon Associates, Inc.
Transportation Engineers & Planners
425 Commerce Dr, Suite 200
Ft. Washington, PA 19034

Municipality: Upper Merion Twp
Location: S. Gulph Rd & Henderson Rd

Counter/Board #: WW/McM-2161

Study Name: DVRPC39W
Site Code : 80100239
Start Date: 06/06/01
Page : 1

	Henderson Rd Southbound				S. Gulph Rd Westbound				S. Gulph Rd Eastbound						
Start Time	Left	Right	RTOR	HV	Thru	Right	RTOR	HV	Left	Thru	HV	Intrvl. Total	Exclude Total	Include Total
06/06/01														
07:00	87	0	1	7	173	122	9	10	10	103	5	527	22	505
07:15	154	2	4	14	208	101	30	11	6	118	6	654	31	623
07:30	176	3	5	13	212	64	17	11	9	144	6	660	30	630
07:45	149	6	3	13	205	96	11	11	9	107	3	613	27	586
Hour	566	11	13	47	798	383	67	43	34	472	20	2454	110	2344
08:00	149	6	2	9	203	90	21	6	8	133	10	637	25	612
08:15	112	4	2	7	231	94	6	15	17	97	7	592	29	563
08:30	148	5	2	5	196	78	34	10	11	97	6	592	21	571
08:45	102	6	0	8	186	102	16	10	21	86	10	547	28	519
Hour	511	21	6	29	816	364	77	41	57	413	33	2368	103	2265
[BREAK]														
16:00	143	16	1	9	153	92	14	21	10	142	4	605	34	571
16:15	148	15	4	5	158	89	22	9	9	117	7	583	21	562
16:30	181	3	4	2	171	80	19	3	6	160	2	631	7	624
16:45	176	4	7	2	142	117	20	4	13	154	0	639	6	633
Hour	648	38	16	18	624	378	75	37	38	573	13	2458	68	2390
17:00	167	14	6	1	140	102	18	9	21	169	2	649	12	637
17:15	171	15	3	0	143	113	17	4	11	123	1	601	5	596
17:30	126	17	3	1	161	114	16	8	8	193	3	650	12	638
17:45	156	11	2	3	157	126	24	7	9	158	2	655	12	643
Hour	620	57	14	5	601	455	75	28	49	643	8	2555	41	2514
Total	2345	127	49	99	2839	1580	294	149	178	2101	74	9835	322	9513
% Apr.	89.5	4.8	1.8	3.7	58.3	32.4	6.0	3.0	7.5	89.2	3.1	-	-	-
% Int.	23.8	1.2	0.4	1.0	28.8	16.0	2.9	1.5	1.8	21.3	0.7	-	-	-

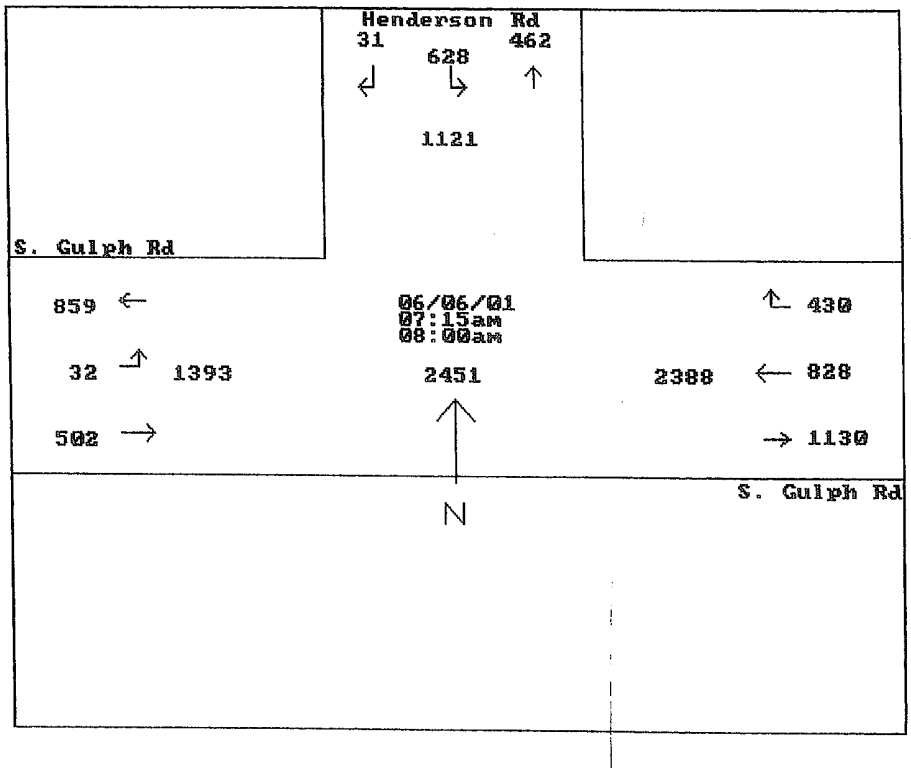
McMahon Associates, Inc.
Transportation Engineers & Planners
425 Commerce Dr, Suite 200
Ft. Washington, PA 19034

Municipality: Upper Merion Twp
Location: S. Gulph Rd & Henderson Rd

Counter/Board #: WW/McM-2161

Study Name: DVRPC39W
Site Code : 80100239
Start Date: 06/06/01
Page : 2

Start	Henderson Rd Southbound				S. Gulph Rd Westbound				S. Gulph Rd Eastbound			Intrvl.	Exclude	Include
Time	Left	Right	RTOR	HV	Thru	Right	RTOR	HV	Left	Thru	HV	Total	Total	Total
Peak Hour Analysis By Entire Intersection for the Period: 07:00 on 06/06/01 to 08:45 on 06/06/01														
Time	07:15				07:15				07:15					
Vol.	628	17	14	x	828	351	79	x	32	502	x			
Pct.	95.2	2.5	2.1	x	65.8	27.9	6.2	x	5.9	94.0	x			
Total	659				1258				534					
High	07:30				07:15				07:30					
Vol.	176	3	5	x	208	101	30	x	9	144	x			
Total	184				339				153					
PHF	0.895				0.927				0.872					



McMahon Associates, Inc.

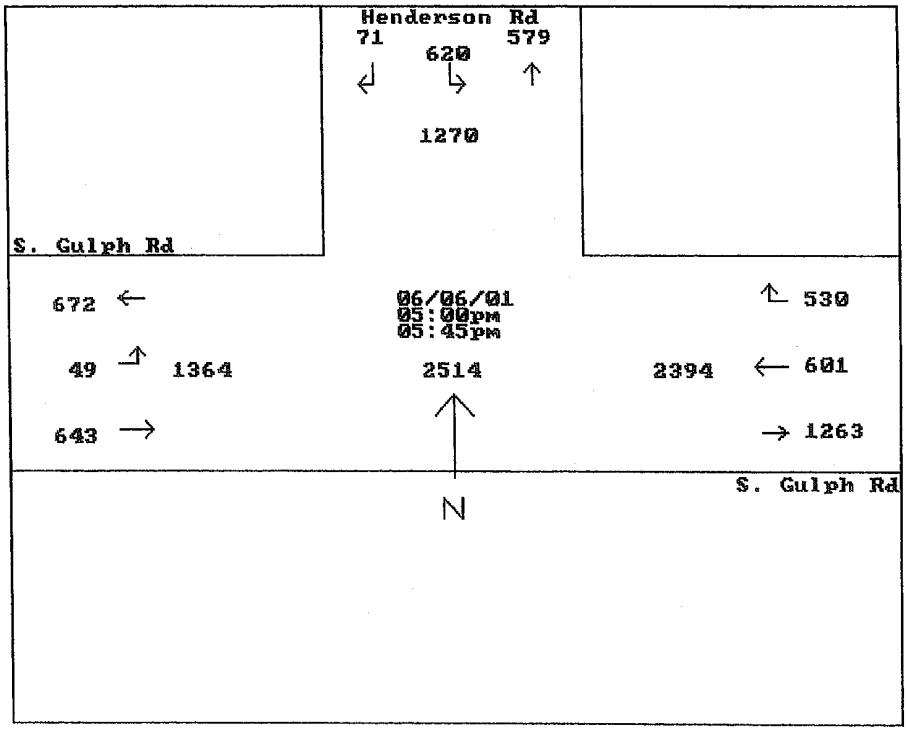
Municipality: Upper Merion Twp
Location: S. Gulph Rd & Henderson Rd

Transportation Engineers & Planners
425 Commerce Dr, Suite 200
Ft. Washington, PA 19034

Study Name: DVRPC39W
Site Code : 80100239
Start Date: 06/06/01

Counter/Board #: WW/McM-2161

Start	Henderson Rd Southbound				S. Gulph Rd Westbound				S. Gulph Rd Eastbound				Intrvl.	Exclude	Include
Time	Left	Right	RTOR	HV	Thru	Right	RTOR	HV	Left	Thru	HV		Total	Total	Total
Peak Hour Analysis By Entire Intersection for the Period: 16:00 on 06/06/01 to 17:45 on 06/06/01															
Time	17:00				17:00				17:00						
Vol.	620	57	14	x	601	455	75	x	49	643	x				
Pct.	89.7	8.2	2.0	x	53.1	40.2	6.6	x	7.0	92.9	x				
Total	691				1131				692						
High	17:15				17:45				17:30						
Vol.	171	15	3	x	157	126	24	x	8	193	x				
Total	189				307				201						
PHF	0.914				0.921				0.860						



McMahon Associates, Inc.
Transportation Engineers & Planners
425 Commerce Dr, Suite 200
Ft. Washington, PA 19034

Municipality: Upper Merion Twp
Location: Brooks Rd & South Gulph Rd

Counter/Board #: LB/2215

Study Name: DVRPC39W
Site Code : 80100290
Start Date: 06/06/01
Page : 1

	Cemetary Access Southbound					South Gulph Rd Westbound					Brook Rd Northbound					South Gulph Rd Eastbound					Intvl	Exclu	Inclu
Start Time	Left	Thru	Right	RTOR	HV	Left	Thru	Right	RTOR	HV	Left	Thru	RTOR	Right	HV	Left	Thru	Right	RTOR	HV	Total	Total	Total
06/06/01																							
07:00	0	0	0	0	0	17	189	0	0	21	56	0	8	8	2	0	132	51	0	7	491	30	461
07:15	0	0	0	0	0	27	159	0	0	18	81	0	10	9	1	0	125	40	0	8	478	27	451
07:30	0	0	0	0	0	40	224	0	0	14	88	1	9	15	2	0	184	77	0	10	664	26	638
07:45	0	0	0	1	0	39	237	0	0	16	87	0	16	21	1	1	181	55	0	3	658	20	638
Hour	0	0	0	1	0	123	809	0	0	69	312	1	43	53	6	1	622	223	0	28	2291	103	2188
08:00	0	2	0	0	1	23	217	0	0	12	77	0	15	20	2	0	157	56	0	10	592	25	567
08:15	0	0	0	0	0	25	253	0	0	16	69	0	11	22	1	0	158	65	0	10	630	27	603
08:30	1	0	0	0	0	35	195	0	0	11	54	0	15	9	3	0	142	58	0	8	531	22	509
08:45	0	0	0	0	0	24	183	0	0	12	85	1	19	18	4	0	162	61	0	14	583	30	553
Hour	1	2	0	0	1	107	848	0	0	51	285	1	60	69	10	0	619	240	0	42	2336	104	2232
{BREAK}																							
16:00	0	0	1	2	0	18	217	0	0	14	87	0	8	28	4	0	130	72	0	6	587	24	563
16:15	2	1	1	0	0	21	182	0	0	5	86	1	13	15	2	2	120	53	0	10	514	17	497
16:30	1	0	1	1	0	28	137	0	0	3	58	0	11	16	3	0	139	55	0	6	459	12	447
16:45	0	0	0	0	0	23	153	0	0	1	70	0	10	34	1	1	151	63	0	2	509	4	505
Hour	3	1	3	3	0	90	689	0	0	23	301	1	42	93	10	3	540	243	0	24	2069	57	2012
17:00	2	2	0	0	0	10	93	0	0	1	67	0	14	30	0	0	121	66	0	7	413	8	405
17:15	0	0	1	0	0	17	181	0	0	6	101	0	28	49	1	0	127	85	0	3	599	10	589
17:30	0	0	0	0	0	20	190	0	0	3	89	0	23	31	0	0	168	72	0	3	599	6	593
17:45	0	0	1	0	0	32	235	0	0	4	99	0	25	34	0	1	164	62	0	2	659	6	653
Hour	2	2	2	0	0	79	699	0	0	14	356	0	90	144	1	1	580	285	0	15	2270	30	2240
Total	6	5	5	4	1	399	3045	0	0	157	1254	3	235	359	27	5	2361	991	0	109	8966	294	8672
% Apr.	28.5	23.8	23.8	19.0	4.7	11.0	84.5	-	-	4.3	66.7	0.1	12.5	19.1	1.4	0.1	68.1	28.5	-	3.1	-	-	-
% Int.	-	-	-	-	-	4.4	33.9	-	-	1.7	13.9	-	2.6	4.0	0.3	-	26.3	11.0	-	1.2	-	-	-

Peak Hour Analysis By Entire Intersection for the Period: 07:00 on 06/06/01 to 08:45 on 06/06/01

Time	07:30					07:30					07:30					07:30							
Vol.	0	2	0	1	x	127	931	0	0	x	321	1	51	78	x	1	680	253	0	x			
Pct.	0.0	66.6	0.0	33.3	x	12.0	87.9	0.0	0.0	x	71.1	0.2	11.3	17.2	x	0.1	72.8	27.0	0.0	x			
Total	3					1058					451					934							
High	08:00					08:15					07:45					07:30							
Vol.	0	2	0	0	x	25	253	0	0	x	87	0	16	21	x	0	184	77	0	x			
Total	2					278					124					261							
PHF	0.375					0.951					0.909					0.894							

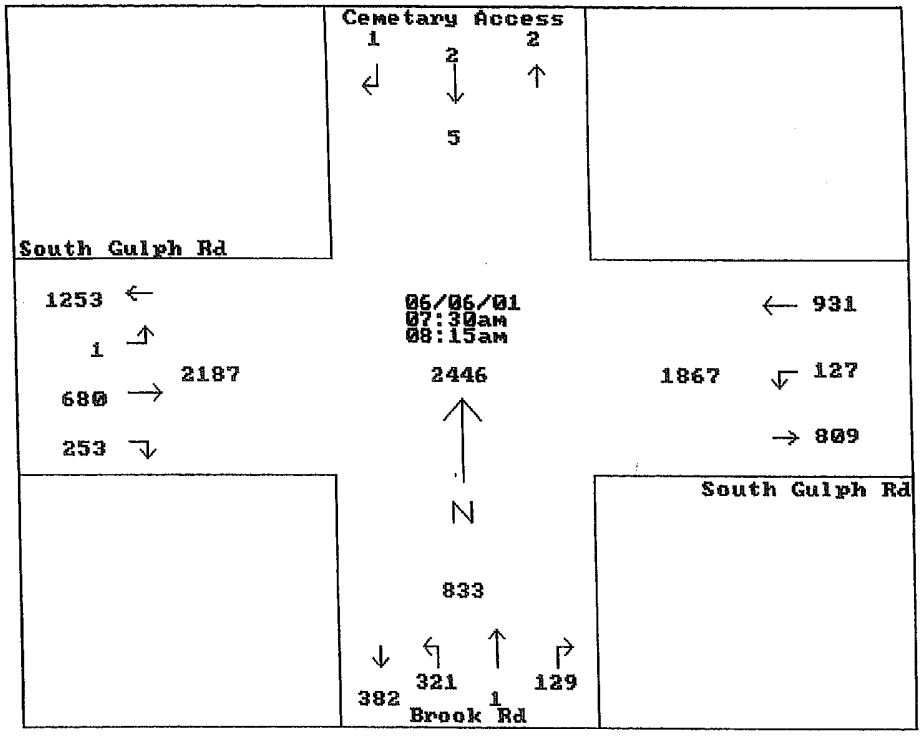
McMahon Associates, Inc.
Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034-2716

Municipality: Upper Merion Twp
Location: Brooks Rd & South Gulph Rd

Counter/Board #: LB/2215

Study Name: DVRPC90W
Site Code : 80100290
Start Date: 06/06/01
Page : 2

Start Time	Cemetary Access Southbound					South Gulph Rd Westbound					Brook Rd Northbound					South Gulph Rd Eastbound					Intvl Total
	Left	Thru	Right	RTOR	HV	Left	Thru	Right	RTOR	HV	Left	Thru	RTOR	Right	HV	Left	Thru	Right	RTOR	HV	



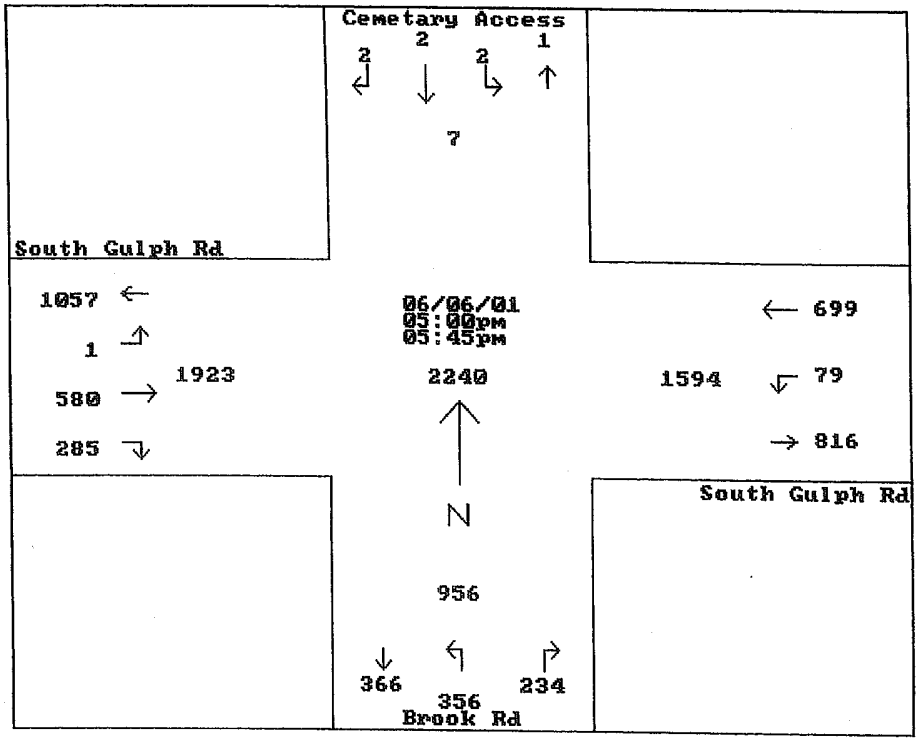
McMahon Associates, Inc.
Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034-2716

Municipality: Upper Merion Twp
Location: Brooks Rd & South Gulph Rd

Counter/Board #: LB/2215

Study Name: DVRPC90W
Site Code : 80100290
Start Date: 06/06/01
Page : 3

Start Time	Cemetary Access Southbound					South Gulph Rd Westbound					Brook Rd Northbound					South Gulph Rd Eastbound					Intvl Total
	Left	Thru	Right	RTOR	HV	Left	Thru	Right	RTOR	HV	Left	Thru	RTOR	Right	HV	Left	Thru	Right	RTOR	HV	



McMahon Associates, Inc.
Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034-2716

Municipality: Upper Merion Twp
Location: Croton Rd and S Gulph Rd

Counter/Board #: LB/McM-1403

Study Name: DVRPC40A
Site Code : 80100240
Start Date: 06/14/01

Start	S Gulph Rd Westbound		Croton Northe	S Gulph Rd Eastbound		Intrvl.	Exclude	Include
Time	BLeft	Thru	Thru	Thru	Right	Total	Total	Total
06/14/01								
07:00	25	142	8	71	1	247	0	247
07:15	36	157	25	90	1	309	0	309
07:30	46	213	22	104	0	385	0	385
07:45	66	169	27	85	2	349	0	349
Hour	173	681	82	350	4	1290	0	1290
08:00	54	192	37	107	0	390	0	390
08:15	55	207	43	101	0	406	0	406
08:30	43	193	47	93	1	377	0	377
08:45	42	166	29	91	1	329	0	329
Hour	194	758	156	392	2	1502	0	1502
Total	367	1439	238	742	6	2792	0	2792
% Apr.	20.3	79.6	100.0	99.1	0.8	-	-	-
% Int.	13.1	51.5	8.5	26.5	0.2	-	-	-

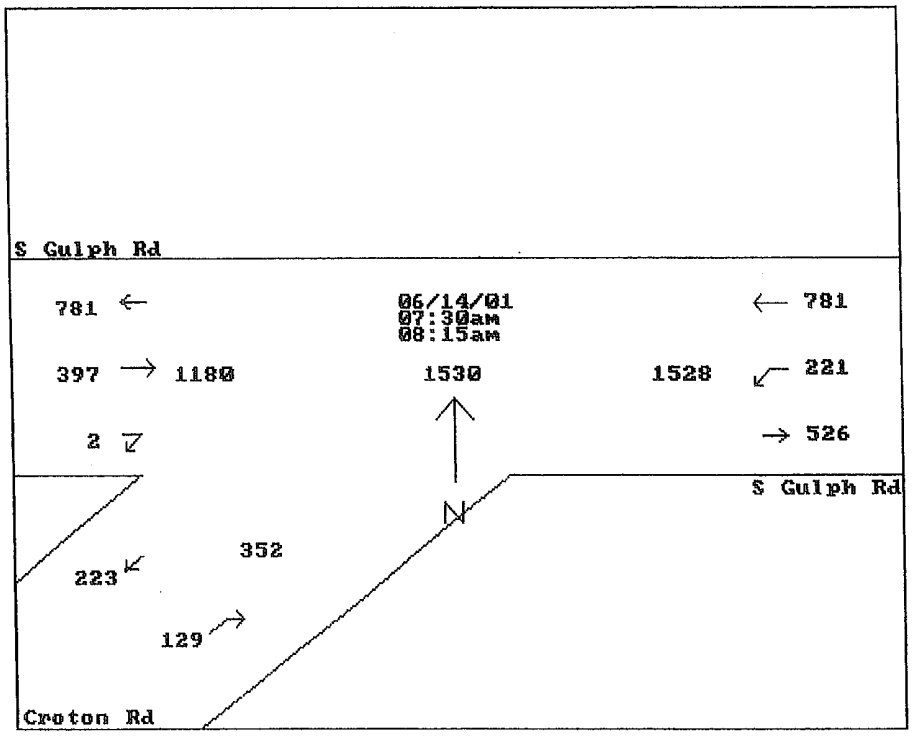
McMahon Associates, Inc.

Municipality: Upper Merion Twp
Location: Croton Rd and S Gulph Rd
Counter/Board #: LB/McM-1403

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034-2716

Study Name: DVRPC40A
Site Code : 80100240
Start Date: 06/14/01
Page : 2

Start Time	S Gulph Rd Westbound BLeft	Thru	Croton Northe Thru	S Gulph Rd Eastbound Thru	Right	Intrvl. Total	Exclude Total	Include Total
Peak Hour Analysis By Entire Intersection for the Period: 07:00 on 06/14/01 to 08:45 on 06/14/01								
Time	07:30		07:30	07:30				
Vol.	221	781	129	397	2			
Pct.	22.0	77.9	100.0	99.4	0.5			
Total	1002		129	399				
High	08:15		08:15	08:00				
Vol.	55	207	43	107	0			
Total	262		43	107				
PHF	0.956		0.750	0.932				



McMahon Associates, Inc.
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425 Commerce Dr, Suite 200
Ft. Washington, PA 19034

Municipality: Upper Merion Twp
Location: South Gulph Rd & Croton Rd

Counter/Board #: SAK/Mcm-2213

Study Name: DVRPC40P
Site Code : 80100240
Start Date: 06/06/01
Page : 1

	South Gulph Rd Westbound			Croton Rd Northeastbound			South Gulph Rd Eastbound					
Start Time	Left	Thru	HV	Left	Right	HV	Thru	Right	HV	Intrvl. Total	Exclude Total	Include Total
06/06/01												
16:00	27	163	6	0	26	2	113	0	3	340	11	329
16:15	26	152	2	1	33	1	108	1	1	325	4	321
16:30	37	119	1	1	29	0	126	0	1	314	2	312
16:45	49	131	1	0	35	0	127	2	1	346	2	344
Hour	139	565	10	2	123	3	474	3	6	1325	19	1306
17:00	51	78	0	0	47	0	102	1	0	279	0	279
17:15	65	110	1	0	53	0	94	0	2	325	3	322
17:30	81	144	1	0	42	0	129	1	2	400	3	397
17:45	50	147	1	0	55	0	134	0	1	388	2	386
Hour	247	479	3	0	197	0	459	2	5	1392	8	1384
Total	386	1044	13	2	320	3	933	5	11	2717	27	2690
% Apr.	26.7	72.3	0.9	0.6	98.4	0.9	98.3	0.5	1.1	-	-	-
% Int.	14.2	38.4	0.4	-	11.7	0.1	34.3	0.1	0.4	-	-	-

McMahon Associates, Inc.

Municipality: Upper Merion Twp
Location: South Gulph Rd & Croton Rd

Transportation Engineers & Planners
425 Commerce Dr, Suite 200
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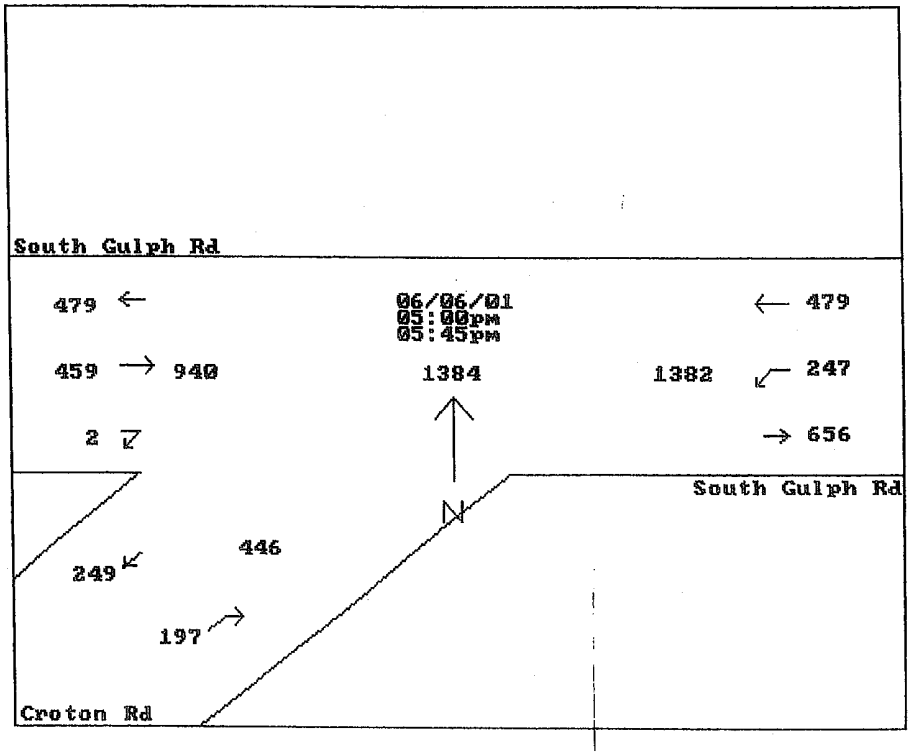
Study Name: DVRPC40P
Site Code : 80100240
Start Date: 06/06/01

Counter/Board #: SAK/Mcm-2213

Start Time	South Gulph Rd Westbound Left	Thru	HV	Croton Rd Northeastbound Left	Right	HV	South Gulph Rd Eastbound Thru	Right	HV	Intrvl. Total	Exclude Total	Include Total
Peak Hour Analysis By Entire Intersection for the Period: 16:00 on 06/06/01 to 17:45 on 06/06/01												
Time	17:00			17:00			17:00					
Vol.	247	479	x	0	197	x	459	2	x			
Pct.	34.0	65.9	x	0.0	100.0	x	99.5	0.4	x			
Total	726			197			461					
High	17:30			17:45			17:45					
Vol.	81	144	x	0	55	x	134	0	x			
Total	225			55			134					
PHF	0.806			0.895			0.860					



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Municipality: Upper Merion Twp
Location: South Gulph Rd & Shoemaker Rd

Counter/Board #: JB/McM-2283

Study Name: DVRPC91W
Site Code : 80100291
Start Date: 06/06/01
Page : 1

	Shoemaker Rd			South Gulph Rd			South Gulph Rd					
	Southbound			Westbound			Eastbound					
Start										Intrvl.	Exclude	Include
Time	Left	Right	HV	Thru	Right	HV	Left	Thru	HV	Total	Total	Total
06/06/01												
07:00	11	19	0	155	9	5	8	106	3	316	8	308
07:15	16	28	2	192	14	5	18	101	4	380	11	369
07:30	26	26	1	194	7	6	12	112	2	386	9	377
07:45	17	41	1	193	6	2	15	111	3	389	6	383
Hour	70	114	4	734	36	18	53	430	12	1471	34	1437
08:00	23	31	0	169	8	2	5	89	6	333	8	325
08:15	15	39	2	213	15	11	9	90	5	399	18	381
08:30	21	23	1	172	15	8	18	92	6	356	15	341
08:45	12	14	0	158	8	4	9	80	7	292	11	281
Hour	71	107	3	712	46	25	41	351	24	1380	52	1328
[BREAK]												
16:00	11	13	0	160	14	11	9	135	6	359	17	342
16:15	9	13	0	163	14	2	14	128	3	346	5	341
16:30	14	17	0	159	14	2	12	143	2	363	4	359
16:45	9	10	1	143	20	2	14	163	1	363	4	359
Hour	43	53	1	625	62	17	49	569	12	1431	30	1401
17:00	13	18	0	145	18	3	18	167	3	385	6	379
17:15	13	15	1	136	29	2	20	141	3	360	6	354
17:30	8	19	0	145	23	1	24	134	4	358	5	353
17:45	10	19	0	141	21	2	17	148	1	359	3	356
Hour	44	71	1	567	91	8	79	590	11	1462	20	1442
Total	228	345	9	2638	235	68	222	1940	59	5744	136	5608
% Apr.	39.1	59.2	1.5	89.6	7.9	2.3	9.9	87.3	2.6	-	-	-
% Int.	3.9	6.0	0.1	45.9	4.0	1.1	3.8	33.7	1.0	-	-	-

McMahon Associates, Inc.

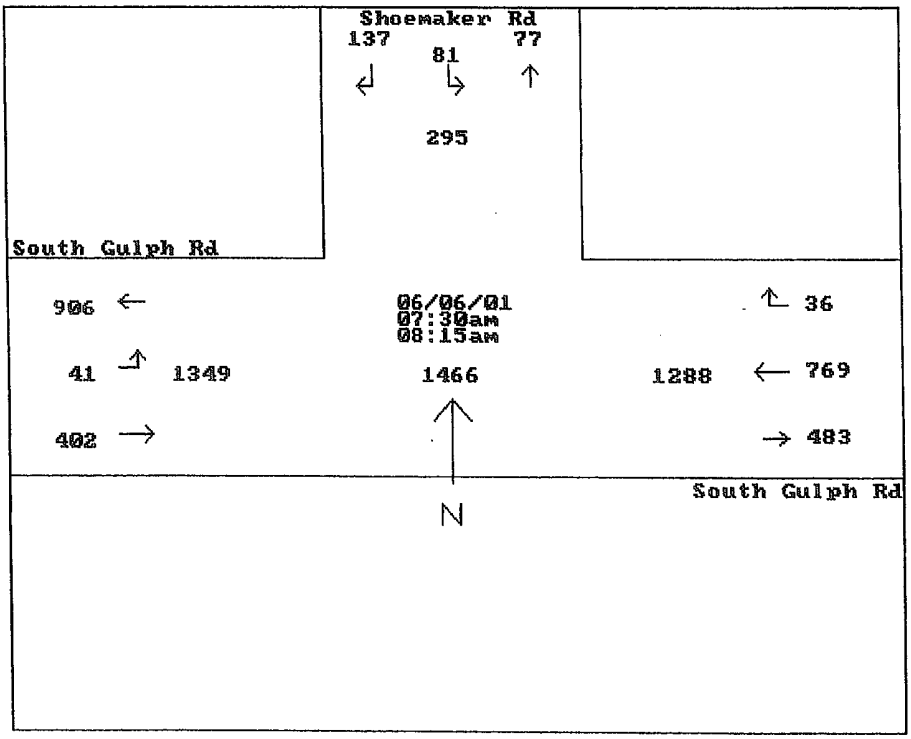
Municipality: Upper Merion Twp
Location: South Gulph Rd & Shoemaker Rd

Transportation Engineers & Planners
425 Commerce Dr, Suite 200
Ft. Washington, PA 19034

Study Name: DVRPC91W
Site Code : 80100291
Start Date: 06/06/01

Counter/Board #: JB/McM-2283

	Shoemaker Rd Southbound			South Gulph Rd Westbound			South Gulph Rd Eastbound					
Start Time	Left	Right	HV	Thru	Right	HV	Left	Thru	HV	Intrvl. Total	Exclude Total	Include Total
Peak Hour Analysis By Entire Intersection for the Period: 07:00 on 06/06/01 to 08:45 on 06/06/01												
Time	07:30			07:30			07:30					
Vol.	81	137	x	769	36	x	41	402	x			
Pct.	37.1	62.8	x	95.5	4.4	x	9.2	90.7	x			
Total	218			805			443					
High	07:45			08:15			07:45					
Vol.	17	41	x	213	15	x	15	111	x			
Total	58			228			126					
PHF	0.939			0.882			0.878					



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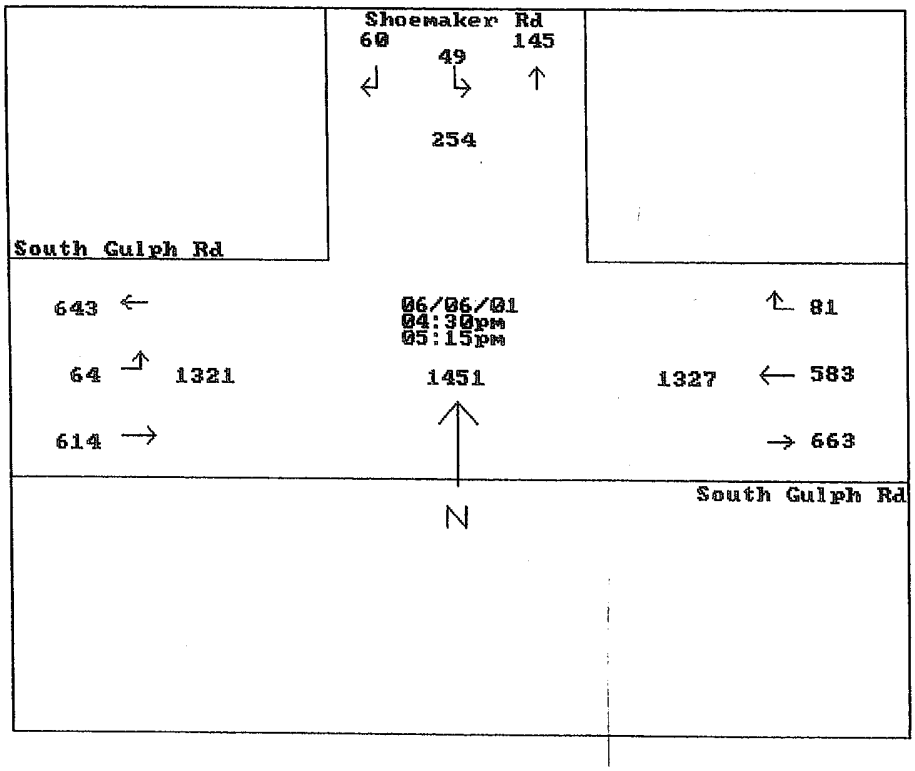
425 Commerce Dr, Suite 200
Ft. Washington, PA 19034

Municipality: Upper Merion Twp
Location: South Gulph Rd & Shoemaker Rd

Counter/Board #: JB/McM-2283

Study Name: DVRPC91W
Site Code : 80100291
Start Date: 06/06/01

	Shoemaker Rd Southbound			South Gulph Rd Westbound			South Gulph Rd Eastbound					
Start Time	Left	Right	HV	Thru	Right	HV	Left	Thru	HV	Intrvl. Total	Exclude Total	Include Total
Peak Hour Analysis By Entire Intersection for the Period: 16:00 on 06/06/01 to 17:45 on 06/06/01												
Time	16:30			16:30			16:30					
Vol.	49	60	x	583	81	x	64	614	x			
Pct.	44.9	55.0	x	87.8	12.1	x	9.4	90.5	x			
Total	109			664			678					
High	16:30			16:30			17:00					
Vol.	14	17	x	159	14	x	18	167	x			
Total	31			173			185					
PHF	0.879			0.959			0.916					



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425 Commerce Drive, Suite 200
Fort Washington, PA 19034-2716

Municipality: Plymouth Twp
Location: S. Gulph Rd & I-76 Eastbound Ramps
Counter/Board #: WW/CM/2161/2285

Study Name: DVRPC38W
Site Code : 80100238
Start Date: 06/26/01
Page : 1

Vehicle group 1

Start	S. Gulph Rd Southbound				Trinity Rd Westbound				S. Gulph Rd Northbound				I-76 Ramps Eastbound				Intvl	Exclu	Inclu
Time	Left	Thru	Right	HV	Left	Thru	Right	HV	Left	Thru	Right	HV	Left	Thru	Right	HV	Total	Total	Total
06/26/01																			
07:00	1	66	112	7	20	10	5	7	18	123	38	3	2	47	53	2	514	19	495
07:15	4	92	118	10	24	12	9	9	20	167	49	2	1	51	61	5	634	26	608
07:30	2	121	116	15	30	22	12	16	21	177	62	4	3	35	83	2	721	37	684
07:45	3	103	145	7	41	14	9	6	20	157	92	2	4	67	68	4	742	19	723
Hour	10	382	491	39	115	58	35	38	79	624	241	11	10	200	265	13	2611	101	2510
08:00	3	120	138	13	21	11	26	11	18	145	96	3	0	45	69	1	720	28	692
08:15	3	113	120	21	30	20	21	7	19	138	84	6	3	49	71	1	706	35	671
08:30	4	118	104	9	32	15	8	8	19	149	64	2	1	48	95	1	677	20	657
08:45	4	95	102	10	23	19	14	12	16	149	56	5	3	51	68	13	640	40	600
Hour	14	446	464	53	106	65	69	38	72	581	300	16	7	193	303	16	2743	123	2620
[BREAK]																			
16:00	2	115	133	6	38	67	15	6	15	107	15	7	3	7	34	1	571	20	551
16:15	9	106	109	5	42	68	12	9	15	104	18	4	10	5	35	2	553	20	533
16:30	10	110	114	3	64	54	6	2	21	126	21	10	0	12	65	1	619	16	603
16:45	8	160	104	3	78	77	10	4	5	173	34	4	0	11	51	0	722	11	711
Hour	29	491	460	17	222	266	43	21	56	510	88	25	13	35	185	4	2465	67	2398
17:00	10	137	136	0	70	53	5	5	23	170	37	4	4	12	50	2	718	11	707
17:15	5	154	117	4	68	58	12	6	10	179	43	1	0	13	68	1	739	12	727
17:30	7	123	98	3	76	54	1	5	14	120	22	4	5	14	74	1	621	13	608
17:45	1	111	94	4	76	35	8	4	8	159	21	5	8	5	60	0	599	13	586
Hour	23	525	445	11	290	200	26	20	55	628	123	14	17	44	252	4	2677	49	2628
Total	76	1844	1860	120	733	589	173	117	262	2343	752	66	47	472	1005	37	10496	340	10156
% Apr.	1.9	47.2	47.6	3.0	45.4	36.5	10.7	7.2	7.6	68.4	21.9	1.9	3.0	30.2	64.3	2.3	-	-	-
% Int.	0.7	17.5	17.7	1.1	6.9	5.6	1.6	1.1	2.4	22.3	7.1	0.6	0.4	4.4	9.5	0.3	-	-	-

McMahon Associates, Inc.
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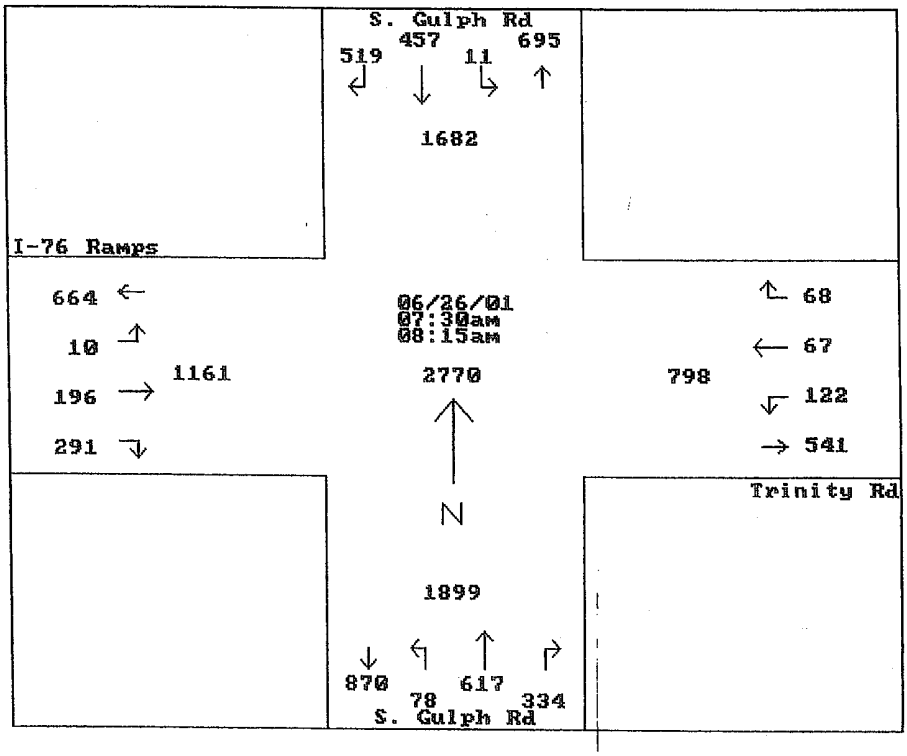
425 Commerce Drive, Suite 200
Fort Washington, PA 19034-2716

Municipality: Plymouth Twp
Location: S. Gulph Rd & I-76 Eastbound Ramps
Counter/Board #: WW/CM/2161/2285

Study Name: DVRPC38W
Site Code : 80100238
Start Date: 06/26/01

Vehicle group 1

Start Time	S. Gulph Rd Southbound Left	Thru	Right	HV	Trinity Rd Westbound Left	Thru	Right	HV	S. Gulph Rd Northbound Left	Thru	Right	HV	I-76 Ramps Eastbound Left	Thru	Right	HV	Intvl Total	Exclu Total	Inclu Total
Peak Hour Analysis By Entire Intersection for the Period: 07:00 on 06/26/01 to 08:45 on 06/26/01																			
Time	07:30				07:30				07:30				07:30						
Vol.	11	457	519	x	122	67	68	x	78	617	334	x	10	196	291	x			
Pct.	1.1	46.3	52.5	x	47.4	26.0	26.4	x	7.5	59.9	32.4	x	2.0	39.4	58.5	x			
Total	987				257				1029				497						
High	08:00				08:15				07:45				07:45						
Vol.	3	120	138	x	30	20	21	x	20	157	92	x	4	67	68	x			
Total	261				71				269				139						
PHF	0.945				0.904				0.956				0.893						



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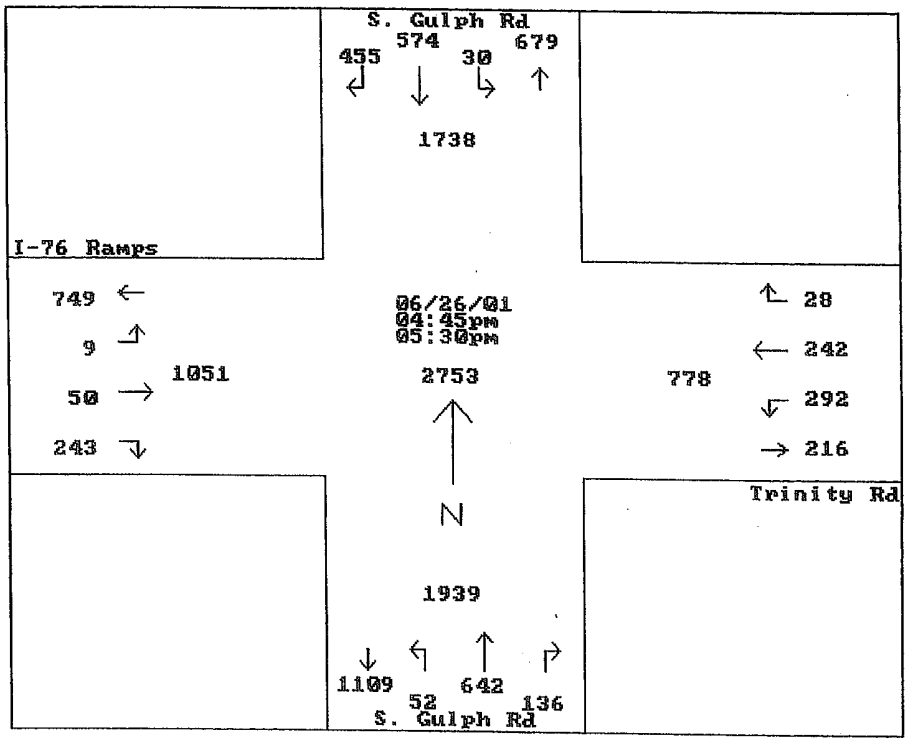
425 Commerce Drive, Suite 200
Fort Washington, PA 19034-2716

Municipality: Plymouth Twp
Location: S. Gulph Rd & I-76 Eastbound Ramps
Counter/Board #: WW/CM/2161/2285

Study Name: DVRPC38W
Site Code : 80100238
Start Date: 06/26/01

Vehicle group 1

Start	S. Gulph Rd Southbound				Trinity Rd Westbound				S. Gulph Rd Northbound				I-76 Ramps Eastbound				Intvl	Exclu	Inclu
Time	Left	Thru	Right	HV	Left	Thru	Right	HV	Left	Thru	Right	HV	Left	Thru	Right	HV	Total	Total	Total
Peak Hour Analysis By Entire Intersection for the Period: 16:00 on 06/26/01 to 17:45 on 06/26/01																			
Time	16:45				16:45				16:45				16:45						
Vol.	30	574	455	x	292	242	28	x	52	642	136	x	9	50	243	x			
Pct.	2.8	54.2	42.9	x	51.9	43.0	4.9	x	6.2	77.3	16.3	x	2.9	16.5	80.4	x			
Total	1059				562				830				302						
High	17:00				16:45				17:15				17:30						
Vol.	10	137	136	x	78	77	10	x	10	179	43	x	5	14	74	x			
Total	283				165				232				93						
PHF	0.935				0.851				0.894				0.811						



Henderson Road / I-76 Westbound Ramps Traffic Study – Montgomery County, Pennsylvania

Publication No. : 03006

Date Published: October 2003

Geographic Area Covered: Lower Providence Township, Plymouth Township, Upper Merion Township, West Norriton Township, Bridgeport Borough, Conshohocken Borough, Norristown Borough, West Conshohocken Borough, and King of Prussia in Montgomery County, and the municipalities of Schuylkill and Tredyffrin in Chester County.

Key Words: Highway Network, Traffic Simulation, Traffic Demand Forecasting Analysis, Traffic Volumes, Peak Hour Turning Movements, Design Factors, Henderson Road, I-76 (Schuylkill Expressway).

ABSTRACT

This report presents 2010 and 2030 forecasts for the No-Build and Build Alternatives for the Henderson Road corridor and surrounding traffic study area. It was prepared at the request of the Pennsylvania Department of Transportation, which is conducting traffic alternatives analyses in support of providing new interchange ramps between Henderson Road and I-76 (Schuylkill Expressway). DVRPC's travel simulation model was utilized to estimate future traffic volumes for the No-Build and Build Alternatives. The Build Alternative assumes new ramp interchanges between Henderson Road and I-76 (Schuylkill Expressway) that are designed to improve traffic flows and enhance safety.

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