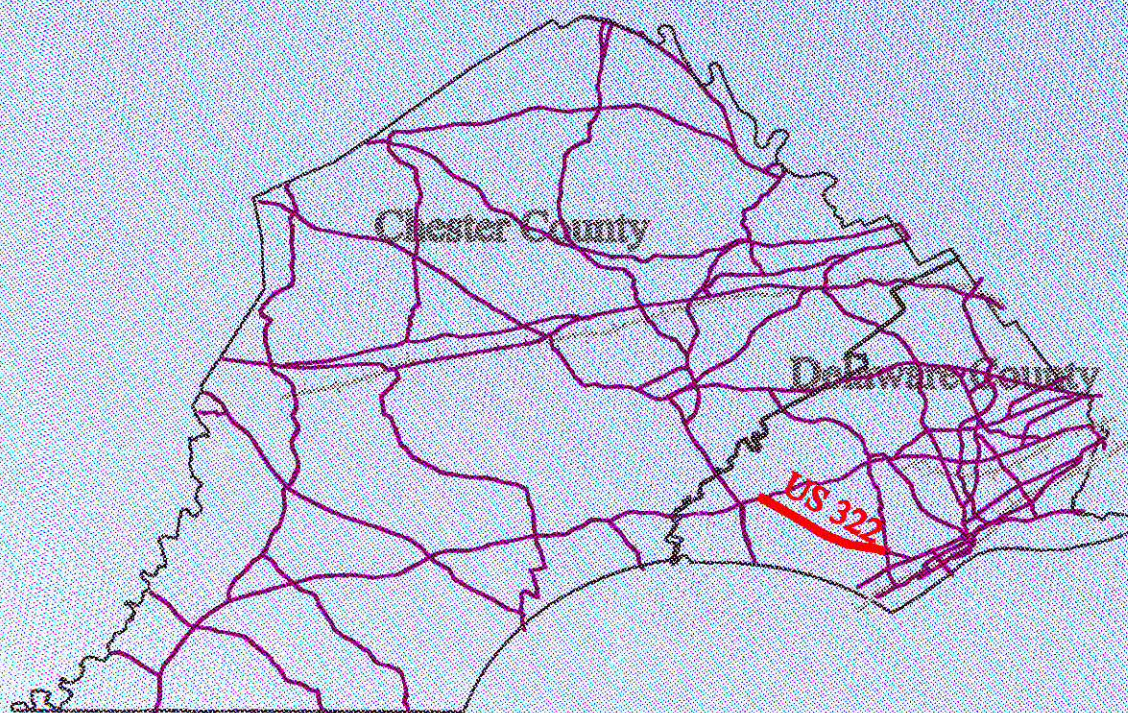


US 322, SECTION 100 CONGESTION MANAGEMENT SYSTEMS ANALYSIS



**DELAWARE VALLEY
REGIONAL PLANNING COMMISSION**

**US 322, SECTION 100
CONGESTION MANAGEMENT SYSTEMS ANALYSIS**



DELAWARE VALLEY REGIONAL PLANNING COMMISSION

JULY, 1995

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Created in 1965, the Delaware Valley Regional Planning Commission (DVRPC) is an interstate, intercounty and intercity agency which provides continuing, comprehensive and coordinated planning for the orderly growth and development of the Delaware Valley region. The region includes Bucks, Chester, Delaware, and Montgomery counties, as well as the City of Philadelphia, in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer counties in New Jersey. The Commission is an advisory agency which divides its planning and service functions between the Office of the Executive Director, the Office of Public Affairs, and four line Divisions: Transportation Planning; Regional Planning; Regional Information Services Center; and Finance and Administration. DVRPC's mission for the 1990s is to emphasize technical assistance and services, and to conduct high priority studies for member state and local governments, while determining and meeting the needs of the private sector.



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

DELAWARE VALLEY REGIONAL PLANNING COMMISSION

Publication Abstract

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Birmingham, E. Bradford, E. Goshen, W. Goshen, West Chester, Westtown, Thornbury, and Pocopson in Chester County; Thornbury, Birmingham, Concord, Bethel, Chester Heights, Middletown, Aston, Edgmont, U. Providence, U. Chichester, Chester, Marcus Hook, Parkside, Brookhaven, Media, Upland, Trainer, Lower Chichester, and Chester City in Delaware County.

Key Words:

Congestion Management System (CMS), Journey-To-Work, Telecommuting, Staggered Work Hours, Carpooling/Vanpooling, Park and Ride program, Travel Demand Management (TDM).

ABSTRACT

This report presents and evaluates the impact of the Congestion Management System (CMS) strategies on US 322 Section 100 in Chester County and Delaware County. These strategies are largely targeted to home-based work trips. After a series of meetings, the steering committee identified five strategies for DVRPC to analyze: Comprehensive employer-TDM, Carpooling/Vanpooling programs, Telecommuting, Park and Ride program, and SEPTA parking lot expansion.

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I. INTRODUCTION

US 322 is an east-west arterial that runs throughout the Delaware Valley region. It enters the region at Folsom in Gloucester County, New Jersey, and exits at Honey Brook in Chester County, Pennsylvania. Section 100 of US 322, located in Delaware County, extends from I-95 on the south to the US 1/US 322 intersection on the north. This section of US 322 is primarily a two-lane undivided arterial. There is a mix of at-grade and grade-separated intersections along the corridor, with few left-turn lanes. The section is also heavily traveled. Traffic volumes range from 20,100 vehicles per day between Spring Valley Road and US 1 to 33,300 vehicles per day between I-95 and Bethel Road.

The Pennsylvania Department of Transportation (PennDOT) is currently examining a number of improvement alternatives in an environmental assessment (EA). In September 1994, DVRPC issued US 322 Traffic Analysis Study I-95 to US 1, which forecasted design year volumes for the alternatives. They include a no-build alternative, a widening to four lanes with selected left-turn lanes, a widening to five lanes with a center left-turn lane, and a widening to four lanes with jughandles.

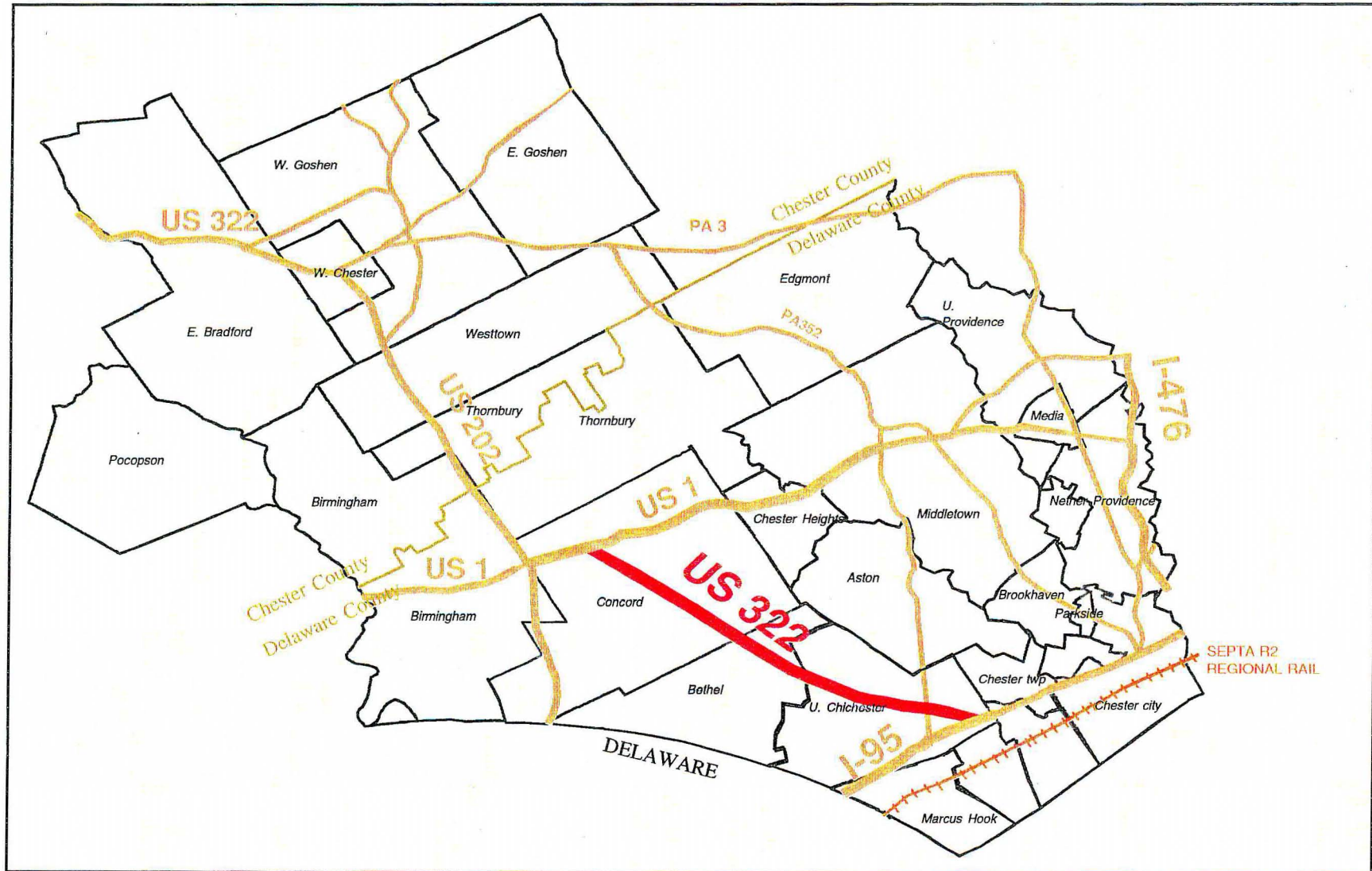
PennDOT, in cooperation with the Federal Highway Administration (FHWA), has identified the US 322, Section 100 Project as a Single Occupancy Vehicle Capacity Adding Project (SOVCAP), requiring a Congestion Management Systems analysis. Federal interim CMS regulations state that before a project's environmental study can be reviewed by FHWA, the project sponsor must clearly demonstrate that application of all reasonable CMS strategies do not sufficiently reduce the need for the capacity adding project. In a letter (SOL 430-94-05) dated January 24, 1994, PennDOT provided additional guidance on performing this determination. Eight mandatory and 28 optional Travel Demand Management (TDM) and operational strategies were listed for consideration under the CMS analysis.

This analysis is being undertaken to determine whether any of the 36 congestion management strategies will reduce congestion and improve travel conditions on the corridor to the extent that a road widening will not be necessary. The study area for this CMS analysis is shown in Figure 1. It is comprised of four county planning areas (CPA). These planning areas are aggregations of traffic analysis zones as defined by the DVRPC Travel Simulation model. The study area is comprised of Chester (CPA 13), North Central (CPA 17), and North Eastern (CPA 18) in Delaware County; and West Chester (CPA 23) in Chester County.

A steering committee, comprised of representatives from PennDOT District 6-0, PennDOT Bureau of Design, Delaware County Planning Commission, SEPTA, Delaware County TMA, DVRPC, Skelly & Loy, Inc., Grove Miller Engineering, Inc., Precise Communications, and Alfred Benesch & Company, is overseeing the US 322 Section 100 CMS analysis. The committee, through PennDOT, requested that DVRPC perform two analyses. The first

analysis involves journey-to-work patterns of the residents of the four county planning areas. This analysis will indicate the travel behavior of resident workers within the study area, and aid the committee in determining whether increased transit is a feasible alternative. The second analysis involves a quantitative examination of five CMS strategies.

FIGURE 1. US 322 SECTION 100 STUDY AREA MAP



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II. JOURNEY-TO-WORK ANALYSIS

This section provides an analysis of the means of transportation used by workers residing in the study area (see Figure 1) to travel to their jobs. These data are derived from the decennial census, which includes a component on work commutation based on returns from a detailed questionnaire sent to approximately 17 percent of households.

The means of transportation used by resident workers to reach their jobs for all municipalities within the study area are tabulated in Appendices A and B. The tables show the number of residents for each municipality in the study area that travel to their place of employment.

Highway modes of travel include single-occupant vehicles (drive alone) and carpools/vanpools. Public transportation is disaggregated into bus/trolley, subway/elevated, and railroad (regional or commuter rail). Other modes include trips by ferryboats, taxicabs, motorcycles, and any other means not included elsewhere. Transit calculations exclude those who work at home.

These tables indicate that resident workers in many municipalities within the study area follow similar travel patterns. Characteristics of these travel patterns include the following:

- The key destinations for resident-workers within the study area are Delaware and Chester counties. Generally, external work sites are also important destinations, followed by work sites within Center City Philadelphia. Montgomery County is an important destination for northern municipalities in the study area.
- Drive alone mode has the highest share of resident workers for almost all municipalities in the study area.
- The transit share of the resident workers who live in the study area and work in Center City Philadelphia, is relatively substantial. For example, of the 120 workers who reside in Birmingham Township (Delaware County) and commute to Center City Philadelphia, 71 (59 percent) use transit.
- A significant number of resident workers are employed outside of the nine-county Delaware Valley region. Although transit options such as SEPTA Bus Route 202 and R2 Regional Rail Line exist for these workers, the transit share percentage of workers who travel to destinations outside the DVRPC region (i.e. Delaware State) is not significant. For example, of the 381 resident workers in West Chester Borough who are employed outside the region, 5 workers (1.3 percent) commute to work via transit services.

III. CMS STRATEGIES

During a series of meetings, the US 322, Section 100 CMS steering committee screened the 36 CMS strategies provided by PennDOT's guidance, and prepared a list of 8 reasonable strategies for the corridor:

- Park and ride lots in the vicinity of US 322 and US 202, and in the vicinity of US 322 and PA 452
- Comprehensive employer-based TDM
- Comprehensive Ridesharing Program
- Telecommuting
- Staggered work hours
- Access Management
- Improved Bus Service on the SEPTA 119 Route
- Express Bus Service on US 322

After further screening, the committee identified five strategies for DVRPC to analyze:

1. Comprehensive employer-based TDM;
2. Carpooling/vanpooling programs;
3. Telecommuting;
4. Park and ride program; and
5. SEPTA parking lot expansion program.

IV. CMS EVALUATION METHODOLOGY

To evaluate these CMS strategies, two different modeling tools were employed: TDM Evaluation Model and the traffic modeling component of the Congestion Mitigation and Air Quality (CMAQ) Analysis Process for Pennsylvania. Both models were developed by the COMSIS Corporation.

1. TDM Model

COMSIS developed the TDM Model in the late 1980s, drawing upon nationwide research in TDM. A public-domain version of the TDM Model was sponsored by FHWA in 1993 to assist the states and metropolitan planning organizations (MPOs) in evaluating transportation control measures (TCMs). It was designed to be a quick interactive policy tool and to provide quantitative estimates of changes in vehicle miles traveled (VMT) for TDM strategies that were not readily handled by traditional transportation models.

The model was developed primarily to address employer-based TDM strategies: employer transportation coordinators, information programs, ridematching, vanpool formation and/or support programs, transit pass sales, preferential parking for high occupancy vehicles (HOVs), and guaranteed ride home programs. In addition, it can evaluate several types of flexible work schedules, telecommuting, and a number of financial incentives and disincentives.

Model input consists of trip tables for home-based work person trips, home-based work vehicle trips, and home-based work transit trips obtained from DVRPC's TRANPLAN trip tables. Through a series of work screens, the user must enter information on type and scope of TDM strategy, level of program (voluntary/mandatory), and type and size of employer. Assumptions used in this analysis are consistent with those employed in DVRPC's evaluation of TCMs. The model uses a "pivot point" technique to estimate the impact of TDM strategies. Model output consists of a report that describes the change in mode split, and person, vehicle, and transit trips for each scenario. A revised trip table is produced which can be fed into the traditional four-step transportation planning simulation process.

For the CMS analysis, the TDM Model evaluations were run using County Planning Area trip tables. Seventy two districts were used to define the DVRPC region.

2. CMAQ Analysis Process For Pennsylvania

The Clean Air Act Amendments of 1990 (CAAA) established strict requirements to attain national clean air standards. The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) established the CMAQ program with the primary purpose of assisting nonattainment

areas to reach attainment in the prescribed time period through projects which would reduce traffic congestion or improve air quality.

Recognizing that CMAQ is a new program, and that there is a need for consistent analysis across Pennsylvania, PennDOT commissioned COMSIS to develop a set of procedures that help MPOs identify and evaluate potential CMAQ projects. The CMAQ process ranges from project development to analysis of emission impacts. Procedures for estimating the travel and transportation impacts of various types of CMS improvements are key components of the CMAQ process.

Changes in travel behavior can be estimated with the CMAQ model through a series of customized sketch planning procedures for different categories of projects. Model outputs include changes in auto, truck and bus VMT; changes in auto, truck and bus trips; average speed and delay; and vehicle fleet characteristics. The methodology employed by COMSIS is based upon a wide review of technical literature; it is predicated upon the utilization of existing data or simplified assumptions as input to the models. There are separate modules for transit improvements, park and ride improvements, and bicycle lanes.

V. CMS STRATEGY EVALUATION

Where practical, the CMS strategy evaluations described below are based upon the same assumptions and principles used by DVRPC to evaluate TCMs and CMAQ projects.

1. Comprehensive Employer-Based TDM Strategies

In severe nonattainment areas, the CAAA calls for a 25 percent increase in the average vehicle occupancy (AVO) of all work trips. At this time, neither the Commonwealth of Pennsylvania nor the U.S. Environmental Protection Agency (EPA) plan to enforce this requirement; however, for analysis purposes only, we used the same assumptions employed in the TCM analysis of the mandatory version of the program. In this manner, we were able to ascertain the maximum benefits of a comprehensive employer-based TDM program, regardless of its status.

Within the Pennsylvania portion of the region, four AVO zones were established. While the AVO target for each zone varies, the net result will be a 25 percent increase in the regional AVO, as mandated by the CAAA. For the Philadelphia CBD (Zone 1), which has extensive transit service, an AVO target of 3.00 (5 percent increase) was established. For Zone 2 (the urban ring surrounding the Philadelphia CBD), an AVO target of 1.75 (a 14 percent improvement) was set. Zone 3 (suburban ring) was given an AVO target of 1.58 (a 31 percent increase). The outer portion of the region (Zone 4) was given an AVO target of 1.50 (a 30 percent increase).

The comprehensive employer-based TDM analysis is not applicable to all employees in the region. It applies only to employers with 100+ employees, approximately 46 percent of the employers in Zone 3. Because of the wide range of employee schedules, it was assumed that TDM is only practical for employees who arrive at work between 6 to 10 a.m., approximately 80 percent of the work force.

In the TCM analysis, different combinations of support programs and subsidies were evaluated to identify the combination that, if implemented, will achieve the AVO target goals. The elements of each combination, with their respective percent reduction in work trips, is shown in Table 1. Again, for study purposes, it is assumed that all strategies were implemented in order to determine the maximum benefits of employer-based TDM strategies.

Each support program has a level of effort by the employer associated with it. Generally, support is rated from level 1 to level 4 with the higher levels assuming a greater degree of employer support. For transit, level 4 support assumes provision of a transit information center and a policy of flexible work hours, on-site bus pass sales, a guaranteed ride home program, and a full-time transportation coordinator. Carpool level 2 support assumes in-house carpool matching services and/or carpool candidate get-togethers and a 1/4 time transportation coordinator; level 4 assumes in-house carpool matching combined with preferential parking for

carpools, flexible schedules, a guaranteed ride home program, and a full-time transportation coordinator. Vanpool support levels are comparable to those of carpool programs.

Table 1: Comprehensive Employer-Based TDM Program Assumptions

AVO Zone	Employer Size	Trip Reduction	Support Program			Tele-commuting	Transit Subsidy	Vanpool Subsidy	SOV Parking Charge
			Transit	Carpool	Vanpool				
1	100+	5 %	L4						
2	100+	12 %	L4	L2		Yes	\$60		
3	100+	23 %	L4	L4	L2	Yes	\$60	\$60	\$60
4	100+	23 %	L4	L4	L2	Yes	\$60	\$60	\$60

In addition to support programs, the TDM program assumes a \$60 transit subsidy will be offered to employees in Zones 2-4 and a \$60 vanpool subsidy will be offered in Zones 3-4. To further discourage SOV drivers, a \$60 parking fee is assumed for all employees in Zones 3-4.

Based on these strategies, the model produced a 7.8 percent reduction in daily home-based work vehicle trips and a 1.8 percent reduction in daily VMT in the study area. The model indicates a 10.1 percent reduction in home-based work vehicle trips for the a.m. peak hour and a 9.5 percent reduction for the p.m. peak hour. The model also shows a corresponding 6.0 percent reduction in total VMT for the a.m. peak hour and a 4.7 percent reduction in total VMT for the p.m. peak hour.

2. Carpooling/Vanpooling Programs

Like comprehensive employer-based TDM programs, ridesharing is an employer-based strategy that can be estimated by the TDM Model. Specifically, carpool and vanpool programs are examined as part of this analysis.

To determine the impact of a regional ridesharing program on the study area, we focused on employee populations not affected by comprehensive TDM programs: persons from firms with less than 100 employees and persons from firms with 100+ employees who do not arrive at work between 6 and 10 a.m. These employees were not evaluated under the comprehensive TDM program due to their arrival times at work; however, they are considered viable candidates for regional ridesharing.

A regional rideshare strategy was modeled by duplicating the assumptions used for the regional TCM evaluation of a Comprehensive Regional Ridesharing program. Since regional ridesharing is relatively new, it was assumed that employer support will be nominal. Therefore, employer support was set at level 2, which approximates a reasonable level of information and promotion. Level 2 support assumes the following incentives:

- a 1/4 time transportation coordinator;
- matching services for carpools/vanpools;
- a transit information center and information activities; and
- a policy of flexible work schedules.

In the study area, a reduction of 1.2 percent of home-based work vehicle trips and a reduction of 0.3 percent of daily VMT is projected as a result of employees in the study area utilizing a regional ridesharing program. Reductions in home based work vehicle trips would reach 0.9 percent for the a.m. peak hour and 0.9 percent for the p.m. peak hour. Reductions in total VMT would reach 0.5 percent for the a.m. peak and 0.4 percent for the p.m. peak. Results of this analysis are additive to the reductions obtained from a comprehensive employer-based TDM program.

3. Telecommuting

Telecommuting is being increasingly used by employers to reduce office overhead costs and make their employees more productive. As telecommuting technology advances and protocols for working at home or in satellite offices become established, it is likely that more and more employers will take advantage of it.

Not all industries can employ telecommuting: light and heavy manufacturing and personnel services offer little or no opportunity to telecommute. Based on national telecommuting studies and application of judgment, the TCM analysis assessed the potential of each Standard Industrial Code (SIC) group to support telecommuting. In summary, support for telecommuting varies from 10 percent for health services or legal services, to 25 percent for finance or business services, to 100 percent for engineering and management services. The potential base for telecommuting covers 15.6 percent of the regional employment base. The TCM analysis assumed 32 percent of eligible employers will participate in the telecommute program. The average number of days per week that the employee telecommutes is assumed to be 1.8 days (based upon national statistics).

To ensure that the telecommute program would be independent of telecommute measures included under comprehensive employer-based TDM programs, the analysis was performed in two steps. First, in Zone 1 (Philadelphia CBD), where no telecommute option was applied under the comprehensive employer-based TDM program, telecommuting was applied to all businesses with more than 50 employees. Second, in Zones 2 to 4 it was applied to all employees not covered by the comprehensive TDM program; that is, businesses with between 50 and 100 employees and those employees in larger firms not covered by TDM.

Telecommuting will result in a 2.2 percent reduction in daily home-based work vehicle trips, and a minor 0.5 percent reduction in daily VMT. It will result in a 1.7 percent reduction in home-based work vehicle trips during the a.m. peak hour, and a 1.6 percent reduction during the p.m. peak hour. It will also result in a 1.0 percent reduction of VMT during the a.m. peak hour, and a 0.8 percent reduction during the p.m. peak hour.

4. Park and Ride Program (Carpool/Vanpool)

In this analysis, park and ride refers to lots that provide parking to commuters who wish to carpool or vanpool to work.

Using information from DVRPC's Regional Park and Ride Assessment: Highway Related Facilities (1993), four potential park and ride lots were identified for analysis. An aerial photo showing the US 322 Section 100 corridor with two of the four proposed lots is included as Figure 2. The CMS Steering Committee is focusing on the first two lots; the third and fourth lots are located in the study area, and so were included in the analysis.

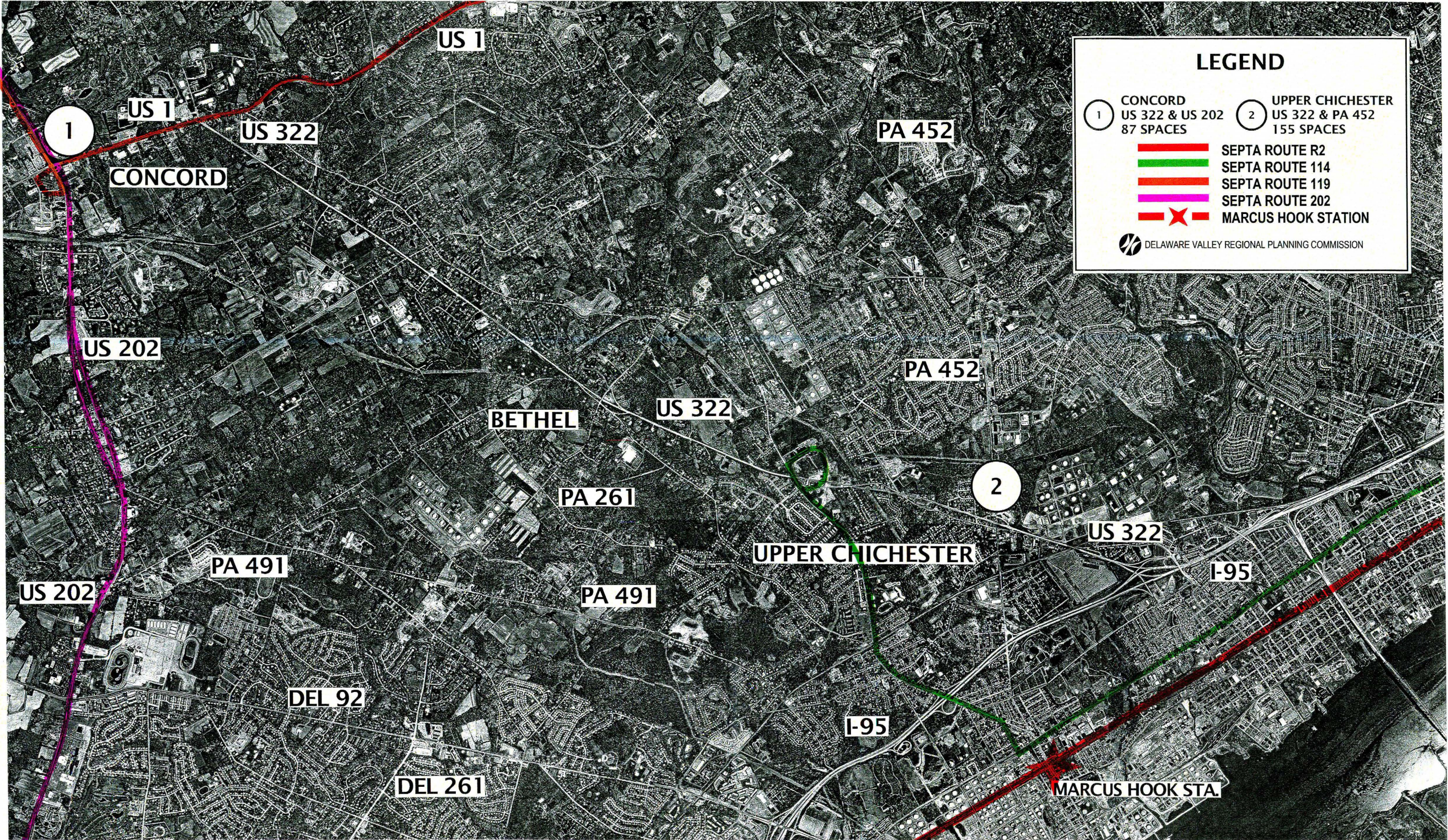
The four potential sites were evaluated for vehicle trip and VMT impacts. Each of these sites were evaluated using the CMAQ model. Each proposed lot, with its location and the proposed number of spaces, is listed below.

Table 2: Park and Ride Lot Locations

Lot	Locations	# of Spaces
Concord	US 322 & US 202	87
Upper Chichester	US 322 & PA 452	155
West Goshen	US 202 & PA 3	94
Westtown/Thornbury	US 202 & PA 926	281

In the CMAQ park and ride module, the change in VMT is calculated by estimating conditions prior to the park and ride lot and conditions after the lot is opened. Model input includes prior and future mode split of users, distance from home to lot, distance from lot to major work destinations, and type of transit service (for non-carpool/vanpool scenarios). The model assumes carpoolers must drive from their home to the park and ride lot to form carpools, and then drive or take transit from the lot to their work destination. Assumptions are based on census information or standard assumptions developed by COMSIS. The analysis differentiates whether the park and ride lot is exclusively for highway users or for transit. Projection of park and ride demand must be determined prior to using the CMAQ model; under CMAQ the user specifies the number of parking spaces and the model assumes full utilization of the lot.

US 322 SECTION 100 CMS ANALYSIS



Results from the analysis show a slight increase of both home-based work vehicle trips and VMT (less than 0.1 percent in both cases for daily and a.m. and p.m. peaks). The increase in both trips and VMT is due to the increase in trips required to reach the park and ride lots. Within the study area, the benefits gained from the carpool/vanpool efforts are not sufficient to offset this increase. Regionally, however, there would be a reduction in VMT. Results of the analysis are independent of the SEPTA parking lot expansion analysis discussed below.

5. SEPTA Parking Lot Expansion Program

DVRPC was asked to evaluate the effects of the implementation of proposed SEPTA parking lot expansion projects within the study area. Currently, there are two proposed lot expansions along regional rail lines that are included in SEPTA's parking expansion program (Appendix C lists all SEPTA routes serving the US 322, Section 100 study area). The first of these lots is on the R3 Elwyn Line; the second is on the R2 Wilmington Line:

- Elwyn (250 spaces)
- Marcus Hook (100 spaces)

Two key assumptions were made: all lots will experience 100 percent utilization regardless of actual demand and all future mode departure trips will exclusively use regional rail as their means to work.

Results indicate that home-based vehicle trips and VMT will decrease by a small amount (0.1 percent) for daily and a.m. and p.m. peaks. Within the study area, the expansion of these parking lots will not have a significant effect on home-based work vehicle trips or VMT. Trips and VMT do not change significantly because future rail passengers must drive within the study area to reach the stations; the larger benefit gained because of these riders will occur outside the study area.

VI. SUMMARY

Table 3 indicates that the impact of the five CMS strategies are minor when evaluated over the entire day for all trip purposes. These strategies are largely targeted to home-based work trips (trips which occur twice a day between the home and office) and are therefore more susceptible to TDM measures. Home-based work trips constitute approximately 25 percent of total daily trips; the remaining 75 percent consist of home-based nonwork trips and nonhome-based trips, (e.g., shopping, recreation, or deliveries). Thus, while employer TDM programs reduce home-based work vehicle trips by 7.8 percent, their impact on total daily traffic is only approximately 1.8 percent. During a.m. and p.m. peak periods, when home-based work trips comprise a much higher proportion of the total traffic than they do on a daily basis, the impacts of TDM measures are commensurately greater.

In summary, the five CMS strategies will result in a 11.2 percent reduction in daily home-based work trips and a 2.6 percent reduction in total daily VMT. The strategies will reduce a.m. peak home-based work trips by 12.7 percent and total a.m. peak VMT by 7.5 percent. They will reduce p.m. peak home-based work trips by 12 percent and total p.m. peak VMT by 5.9 percent.

This analysis modeled employer-based TDM inputs as if this program were mandatory; however, it is not being enforced in the Commonwealth of Pennsylvania. The 7.8% daily reduction in vehicle trips and the 1.8% reduction in VMT derived from the model are optimistic numbers, because of the current voluntary status of the program. Actual reductions will most likely be smaller.

Table 3: Change in Travel in Study Area

Strategy	Percent Change in Home-Based Work Vehicle Trips			Percent Change in VMT		
	Daily	a.m.	p.m.	Daily	a.m.	p.m.
Employer-Based TDM Programs	-7.8%	-10.1%	-9.5%	-1.8%	-6.0%	-4.7%
Carpooling/Vanpooling Programs	-1.2%	-0.9%	-0.9%	-0.3%	-0.5%	-0.4%
Telecommuting	-2.2%	-1.7%	-1.6%	-0.5%	-1.0%	-0.8%
Park and Ride Lots (carpool/vanpool only)	< +0.1%	< +0.1%	< +0.1%	< +0.1%	< +0.1%	< +0.1%
SEPTA Parking Lot Expansion	< -0.1%	< -0.1%	< -0.1%	< -0.1%	< -0.1%	< -0.1%
Total change	-11.2%	-12.7%	-12.0%	-2.6%	-7.5%	-5.9%

Appendix A

Journey-to-Work Travel Patterns for Municipalities
in Delaware County

1990 Census Journey-to-Work Travel Patterns Workers Residing in Aston Township										
Place of Employment	Total	Means of Transportation								Transit Share (%)
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	
Delaware County	5,310	4,561	566	15	0	0	0	132	36	0.28
External	611	514	90	0	7	0	0	0	0	1.15
Chester County	436	374	62	0	0	0	0	0	0	0.00
Center City Philadelphia	403	263	53	0	0	87	0	0	0	21.59
Montgomery County	248	224	24	0	0	0	0	0	0	0.00
South Philadelphia	123	82	41	0	0	0	0	0	0	0.00
West Philadelphia	115	77	15	0	0	24	0	0	0	20.87
Lower North Philadelphia	92	78	14	0	0	0	0	0	0	0.00
Southwest Philadelphia	90	90	0	0	0	0	0	0	0	0.00
Camden County	80	80	0	0	0	0	0	0	0	0.00
Bucks County	45	38	7	0	0	0	0	0	0	0.00
Near Northeast Philadelphia	40	40	0	0	0	0	0	0	0	0.00
Olney-Oak Lane	38	25	13	0	0	0	0	0	0	0.00
Gloucester County	29	29	0	0	0	0	0	0	0	0.00
Germantown-Chestnut	22	14	8	0	0	0	0	0	0	0.00
Burlington County	18	13	5	0	0	0	0	0	0	0.00
Kensington	15	12	0	0	3	0	0	0	0	20.00
Far Northeast Philadelphia	10	6	0	0	0	4	0	0	0	40.00
Mercer County	8	0	8	0	0	0	0	0	0	0.00
Upper North Philadelphia	8	8	0	0	0	0	0	0	0	0.00

1990 Census Journey-to-Work Travel Patterns Workers Residing in Bethel Township										
Place of Employment	Total	Means of Transportation								Transit Share (%)
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	
Delaware County	942	806	65	0	0	0	0	71	0	0.00
External	446	367	72	0	0	0	0	7	0	0.00
Chester County	150	133	10	0	0	0	0	7	0	0.00
Center City Philadelphia	70	57	13	0	0	0	0	0	0	0.00
Bucks County	25	25	0	0	0	0	0	0	0	0.00
Southwest Philadelphia	19	19	0	0	0	0	0	0	0	0.00
Montgomery County	17	17	0	0	0	0	0	0	0	0.00
Camden County	15	15	0	0	0	0	0	0	0	0.00
Gloucester County	15	8	7	0	0	0	0	0	0	0.00
South Philadelphia	15	15	0	0	0	0	0	0	0	0.00
Far Northeast Philadelphia	10	10	0	0	0	0	0	0	0	0.00
Burlington County	7	7	0	0	0	0	0	0	0	0.00
Germantown-Chestnut	7	7	0	0	0	0	0	0	0	0.00
West Philadelphia	6	0	0	0	0	6	0	0	0	100.00

Source: 1990 Census CTPP - Urban Element
Prepared by Delaware Valley Regional Planning Commission
Note: "External" indicates a destination outside the nine-county DVRPC region

1990 Census Journey-to-Work Travel Patterns Workers Residing in Brookhaven Borough										
Place of Employment	Total	Means of Transportation								
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)
Delaware County	3279	2737	393	5	0	0	13	109	20	0.15
Chester County	359	347	5	0	0	7	0	0	0	1.95
External	335	233	54	0	0	8	0	21	19	2.39
Center City Philadelphia	244	116	48	14	0	66	0	0	0	32.79
Montgomery County	217	207	10	0	0	0	0	0	0	0.00
West Philadelphia	59	39	7	0	0	13	0	0	0	22.03
Camden County	50	50	0	0	0	0	0	0	0	0.00
South Philadelphia	49	26	23	0	0	0	0	0	0	0.00
Lower North Philadelphia	42	19	14	0	0	9	0	0	0	21.43
Burlington County	35	27	0	0	0	0	0	8	0	0.00
Southwest Philadelphia	35	35	0	0	0	0	0	0	0	0.00
Camden County	28	20	8	0	0	0	0	0	0	0.00
Near Northeast Philadelphia	23	9	0	0	0	14	0	0	0	60.87
Gloucester County	22	22	0	0	0	0	0	0	0	0.00
Far Northeast Philadelphia	22	22	0	0	0	0	0	0	0	0.00
Olney-Oak Lane	20	13	7	0	0	0	0	0	0	0.00
Kensington	16	16	0	0	0	0	0	0	0	0.00
Germantown-Chestnut	10	10	0	0	0	0	0	0	0	0.00
Upper North Philadelphia	9	9	0	0	0	0	0	0	0	0.00
Roxborough-Manayunk	8	0	8	0	0	0	0	0	0	0.00

1990 Census Journey-to-Work Travel Patterns Workers Residing in Chester City										
Place of Employment	Total	Means of Transportation								
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)
Delaware County	11,308	6,072	2,484	1,258	10	50	60	1,222	152	11.66
External	864	665	164	10	0	16	0	9	0	3.01
Chester County	585	460	113	0	0	0	0	0	12	0.00
Center City Philadelphia	569	233	80	108	0	138	0	0	10	43.23
Montgomery County	406	283	50	41	0	17	0	15	0	14.29
West Philadelphia	339	165	48	32	5	89	0	0	0	37.17
South Philadelphia	195	118	67	4	0	6	0	0	0	5.13
Camden County	166	139	0	8	0	10	0	0	9	10.84
Lower North Philadelphia	157	49	49	22	0	37	0	0	0	37.58
Southwest Philadelphia	92	76	7	0	0	9	0	0	0	9.78
Bucks County	83	76	7	0	0	0	0	0	0	0.00
Near Northeast Philadelphia	74	37	20	17	0	0	0	0	0	22.97
Burlington County	64	50	4	0	0	10	0	0	0	15.63
Upper North Philadelphia	55	46	0	9	0	0	0	0	0	16.36
Kensington	44	23	0	0	11	10	0	0	0	47.73
Germantown-Chestnut	41	41	0	0	0	0	0	0	0	0.00
Olney-Oak Lane	19	19	0	0	0	0	0	0	0	0.00
Far Northeast Philadelphia	18	18	0	0	0	0	0	0	0	0.00
Roxborough-Manayunk	14	14	0	0	0	0	0	0	0	0.00
Gloucester County	11	11	0	0	0	0	0	0	0	0.00

Source: 1990 Census CTPP - Urban Element
Prepared by Delaware Valley Regional Planning Commission
Note: "External" indicates a destination outside the nine-county DVRPC region

1990 Census Journey-to-Work Travel Patterns Workers Residing in Chester Heights Borough											
Place of Employment	Total	Means of Transportation									Transit Share (%)
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode		
Delaware County	815	730	82	0	0	0	0	2	1	0.00	
External	147	125	17	0	0	0	0	3	2	0.00	
Chester County	139	133	6	0	0	0	0	0	0	0.00	
Center City Philadelphia	66	41	4	0	0	21	0	0	0	31.82	
Montgomery County	55	53	2	0	0	0	0	0	0	0.00	
West Philadelphia	39	31	7	0	0	1	0	0	0	2.56	
Southwest Philadelphia	20	15	5	0	0	0	0	0	0	0.00	
Germantown-Chestnut	18	13	5	0	0	0	0	0	0	0.00	
South Philadelphia	13	11	2	0	0	0	0	0	0	0.00	
Lower North Philadelphia	12	10	0	0	0	2	0	0	0	16.67	
Olney-Oak Lane	11	11	0	0	0	0	0	0	0	0.00	
Camden County	10	10	0	0	0	0	0	0	0	0.00	
Near Northeast Philadelphia	10	8	2	0	0	0	0	0	0	0.00	
Upper North Philadelphia	7	5	0	0	2	0	0	0	0	28.57	
Burlington County	6	6	0	0	0	0	0	0	0	0.00	
Bucks County	6	6	0	0	0	0	0	0	0	0.00	
Far Northeast Philadelphia	6	6	0	0	0	0	0	0	0	0.00	
Gloucester County	5	5	0	0	0	0	0	0	0	0.00	
Kensington	2	2	0	0	0	0	0	0	0	0.00	

1990 Census Jourey-to-Work Travel Patterns Workers Residing in Chester Township											
Place of Employment	Total	Means of Transportation									
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)	
Delaware County	1,545	1,149	286	44	0	0	12	46	7	2.85	
External	181	132	38	0	0	0	4	7	0	0.00	
Chester County	168	127	40	0	0	0	0	0	0	0.00	
Center City Philadelphia	107	57	18	5	6	21	0	0	0	29.91	
Montgomery County	76	64	12	0	0	0	0	0	0	0.00	
West Philadelphia	59	37	13	0	4	5	0	0	0	15.25	
Camden County	26	19	7	0	0	0	0	0	0	0.00	
Lower North Philadelphia	25	15	5	0	0	5	0	0	0	20.00	
Bucks County	19	13	6	0	0	0	0	0	0	0.00	
South Philadelphia	19	7	12	0	0	0	0	0	0	0.00	
Gloucester County	15	15	0	0	0	0	0	0	0	0.00	
Southwest Philadelphia	13	13	0	0	0	0	0	0	0	0.00	
Burlington County	11	11	0	0	0	0	0	0	0	0.00	
Near Northeast Philadelphia	11	5	0	0	0	6	0	0	0	54.55	
Germantown-Chestnut	8	8	0	0	0	0	0	0	0	0.00	
Mercer County	7	0	7	0	0	0	0	0	0	0.00	
Olney-Oak Lane	7	7	0	0	0	0	0	0	0	0.00	
Roxborough-Manayunk	5	5	0	0	0	0	0	0	0	0.00	
Far Northeast Philadelphia	5	5	0	0	0	0	0	0	0	0.00	
Kensington	4	4	0	0	0	0	0	0	0	0.00	

Source: 1990 Census CTPP - Urban Element
Prepared by Delaware Valley Regional Planning Commission
Note: "External" indicates a destination outside the nine-county DVRPC region

1990 Census Journey-to-Work Travel Patterns Workers Residing in Concord Township											
Place of Employment	Total	Means of Transportation									
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)	
Delaware County	1,882	1,688	131	0	0	0	0	58	5	0.00	
External	517	453	57	0	0	0	0	7	0	0.00	
Chester County	318	288	25	0	0	0	0	0	6	0.00	
Center City Philadelphia	238	155	23	0	0	60	0	0	0	25.21	
Montgomery County	141	117	24	0	0	0	0	0	0	0.00	
West Philadelphia	60	54	6	0	0	0	0	0	0	0.00	
Camden County	40	35	5	0	0	0	0	0	0	0.00	
Gloucester County	37	37	0	0	0	0	0	0	0	0.00	
Southwest Philadelphia	34	34	0	0	0	0	0	0	0	0.00	
Far Northeast Philadelphia	31	31	0	0	0	0	0	0	0	0.00	
Kensington	30	24	0	0	0	6	0	0	0	20.00	
Near Northeast Philadelphia	26	21	0	0	5	0	0	0	0	19.23	
South Philadelphia	25	25	0	0	0	0	0	0	0	0.00	
Bucks County	20	20	0	0	0	0	0	0	0	0.00	
Burlington County	18	18	0	0	0	0	0	0	0	0.00	
Lower North Philadelphia	17	12	0	0	0	5	0	0	0	29.41	
Mercer County	14	0	14	0	0	0	0	0	0	0.00	
Germantown-Chestnut	14	14	0	0	0	0	0	0	0	0.00	
Olney-Oak Lane	7	0	7	0	0	0	0	0	0	0.00	

1990 Census Journey-to-Work Travel Patterns Workers Residing in Edgmont Township											
Place of Employment	Total	Means of Transportation									
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)	
Delaware County	661	594	47	0	0	0	0	12	8	0.00	
Chester County	183	170	10	0	0	2	0	0	0	1.09	
Montgomery County	87	87	0	0	0	0	0	0	0	0.00	
Center City Philadelphia	72	36	2	3	6	25	0	0	0	47.22	
External	63	41	8	0	0	0	0	2	12	0.00	
West Philadelphia	23	15	6	0	0	0	0	0	2	0.00	
Camden County	15	11	4	0	0	0	0	0	0	0.00	
Near Northeast Philadelphia	14	14	0	0	0	0	0	0	0	0.00	
Lower North Philadelphia	9	7	0	0	2	0	0	0	0	22.22	
Far Northeast Philadelphia	9	5	2	2	0	0	0	0	0	22.22	
Mercer County	8	6	2	0	0	0	0	0	0	0.00	
Kensington	8	6	2	0	0	0	0	0	0	0.00	
Olney-Oak Lane	8	5	0	0	0	3	0	0	0	37.50	
Germantown-Chestnut	7	7	0	0	0	0	0	0	0	0.00	
South Philadelphia	4	4	0	0	0	0	0	0	0	0.00	
Gloucester County	3	3	0	0	0	0	0	0	0	0.00	
Camden County	2	2	0	0	0	0	0	0	0	0.00	
Upper North Philadelphia	2	2	0	0	0	0	0	0	0	0.00	
Roxborough-Manayunk	2	2	0	0	0	0	0	0	0	0.00	

Source: 1990 Census CTPP - Urban Element
Prepared by Delaware Valley Regional Planning Commission
Note: "External" indicates a destination outside the nine-county DVRPC region

1990 Census Journey-to-Work Travel Patterns Workers Residing in Lower Chichester Township											
Place of Employment	Total	Means of Transportation									
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)	
Delaware County	1,157	866	155	20	0	5	0	106	5	2.16	
External	301	236	53	0	0	0	0	12	0	0.00	
Chester County	75	62	5	0	0	0	0	8	0	0.00	
Lower North Philadelphia	17	11	6	0	0	0	0	0	0	0.00	
Gloucester County	16	16	0	0	0	0	0	0	0	0.00	
Burlington County	15	15	0	0	0	0	0	0	0	0.00	
Center City Philadelphia	15	0	7	0	0	8	0	0	0	53.33	
West Philadelphia	14	14	0	0	0	0	0	0	0	0.00	
Kensington	13	6	0	0	0	7	0	0	0	53.85	
Southwest Philadelphia	11	11	0	0	0	0	0	0	0	0.00	
South Philadelphia	8	8	0	0	0	0	0	0	0	0.00	
Upper North Philadelphia	6	6	0	0	0	0	0	0	0	0.00	
Olney-Oak Lane	6	6	0	0	0	0	0	0	0	0.00	
Camden County	5	5	0	0	0	0	0	0	0	0.00	
Montgomery County	5	5	0	0	0	0	0	0	0	0.00	

1990 Census Journey-to-Work Travel Patterns Workers Residing in Marcus Hook Borough											
Place of Employment	Total	Means of Transportation									
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)	
Delaware County	817	448	169	38	0	0	0	162	0	4.65	
External	83	63	20	0	0	0	0	0	0	0.00	
Chester County	47	38	9	0	0	0	0	0	0	0.00	
Burlington County	11	6	0	0	0	0	0	0	5	0.00	
Bucks County	11	7	0	0	0	0	0	0	4	0.00	
Center City Philadelphia	11	0	6	0	0	5	0	0	0	45.45	
Camden County	6	0	6	0	0	0	0	0	0	0.00	
Near Northeast Philadelphia	5	0	0	0	0	0	0	0	5	0.00	

Source: 1990 Census CTPP - Urban Element
Prepared by Delaware Valley Regional Planning Commission
Note: "External" indicates a destination outside the nine-county DVRPC region

1990 Census Journey-to-Work Travel Patterns Workers Residing in Media Borough										
Place of Employment	Total	Means of Transportation								
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)
Delaware County	2,016	1,338	272	67	0	0	12	309	18	3.32
Chester County	296	256	24	0	0	0	0	10	6	0.00
Montgomery County	241	223	18	0	0	0	0	0	0	0.00
Center City Philadelphia	177	60	20	8	9	80	0	0	0	54.80
External	115	76	21	0	5	6	0	7	0	9.57
Lower North Philadelphia	52	33	19	0	0	0	0	0	0	0.00
West Philadelphia	43	21	0	19	0	3	0	0	0	51.16
Camden County	34	17	10	0	0	0	0	7	0	0.00
Germantown-Chestnut	29	22	0	0	0	7	0	0	0	24.14
Far Northeast Philadelphia	29	23	0	0	0	6	0	0	0	20.69
Southwest Philadelphia	28	28	0	0	0	0	0	0	0	0.00
Gloucester County	27	18	9	0	0	0	0	0	0	0.00
Camden County	18	18	0	0	0	0	0	0	0	0.00
South Philadelphia	13	7	0	6	0	0	0	0	0	46.15
Upper North Philadelphia	12	12	0	0	0	0	0	0	0	0.00
Olney-Oak Lane	12	0	0	0	0	12	0	0	0	100.00
Burlington County	8	8	0	0	0	0	0	0	0	0.00
Kensington	4	4	0	0	0	0	0	0	0	0.00

1990 Census Journey-to-Work Travel Patterns Workers Residing in Middletown Township										
Place of Employment	Total	Means of Transportation								
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)
Delaware County	3,666	3,123	314	6	0	0	0	162	61	0.16
Chester County	416	378	37	0	0	0	0	0	0	0.00
Center City Philadelphia	371	167	46	0	20	138	0	0	0	42.59
Montgomery County	315	308	7	0	0	0	0	0	0	0.00
External	297	241	43	0	0	0	0	7	6	0.00
West Philadelphia	125	99	7	0	0	19	0	0	0	15.20
South Philadelphia	106	72	14	0	0	14	0	0	6	13.21
Lower North Philadelphia	96	52	12	0	14	12	6	0	0	27.08
Camden County	67	67	0	0	0	0	0	0	0	0.00
Bucks County	51	40	11	0	0	0	0	0	0	0.00
Southwest Philadelphia	51	45	6	0	0	0	0	0	0	0.00
Gloucester County	40	34	6	0	0	0	0	0	0	0.00
Roxborough-Manayunk	31	17	7	0	7	0	0	0	0	22.58
Burlington County	29	24	5	0	0	0	0	0	0	0.00
Germantown-Chestnut	21	7	8	0	0	6	0	0	0	28.57
Near Northeast Philadelphia	18	12	6	0	0	0	0	0	0	0.00
Far Northeast Philadelphia	17	17	0	0	0	0	0	0	0	0.00
Olney-Oak Lane	14	14	0	0	0	0	0	0	0	0.00
Kensington	13	7	0	0	0	0	0	6	0	0.00

Source: 1990 Census CTPP - Urban Element
Prepared by Delaware Valley Regional Planning Commission
Note: "External" indicates a destination outside the nine-county DVRPC region

1990 Census Journey-to-Work Travel Patterns Workers Residing in Nether Providence Township										
Place of Employment	Total	Means of Transportation								
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)
Delaware County	3,646	3,205	280	13	0	7	25	76	40	0.55
Center City Philadelphia	608	304	39	23	0	242	0	0	0	43.59
External	442	257	128	0	5	0	0	41	11	1.13
Chester County	331	285	46	0	0	0	0	0	0	0.00
West Philadelphia	279	178	15	6	14	65	0	0	0	30.47
Montgomery County	245	222	23	0	0	0	0	0	0	0.00
South Philadelphia	123	110	0	0	0	13	0	0	0	10.57
Lower North Philadelphia	106	69	20	0	0	17	0	0	0	16.04
Camden County	71	71	0	0	0	0	0	0	0	0.00
Burlington County	56	42	14	0	0	0	0	0	0	0.00
Gloucester Township	52	52	0	0	0	0	0	0	0	0.00
Germantown-Chestnut	45	28	6	0	0	11	0	0	0	24.44
Bucks County	43	43	0	0	0	0	0	0	0	0.00
Southwest Philadelphia	37	37	0	0	0	0	0	0	0	0.00
Near Northeast Philadelphia	33	14	0	0	0	19	0	0	0	57.58
Kensington	32	32	0	0	0	0	0	0	0	0.00
Olney-Oak Lane	23	14	0	9	0	0	0	0	0	39.13
Mercer County	22	22	0	0	0	0	0	0	0	0.00
Far Northeast Philadelphia	21	14	0	0	0	7	0	0	0	33.33
Upper North Philadelphia	12	12	0	0	0	0	0	0	0	0.00

1990 Census Journey-to-Work Travel Patterns Workers Residing in Parkside Borough											
Place of Employment	Total	Means of Transportation									
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)	
Delaware County	886	737	91	8	0	0	5	38	7	0.90	
External	93	77	16	0	0	0	0	0	0	0.00	
Chester County	61	55	4	0	0	0	0	0	2	0.00	
Center City Philadelphia	56	34	10	2	0	10	0	0	0	21.43	
Montgomery County	47	44	3	0	0	0	0	0	0	0.00	
West Philadelphia	20	17	3	0	0	0	0	0	0	0.00	
Gloucester County	17	12	5	0	0	0	0	0	0	0.00	
South Philadelphia	14	10	4	0	0	0	0	0	0	0.00	
Lower North Philadelphia	14	11	3	0	0	0	0	0	0	0.00	
Camden County	10	4	6	0	0	0	0	0	0	0.00	
Bucks County	8	3	2	0	0	0	0	0	3	0.00	
Southwest Philadelphia	8	2	6	0	0	0	0	0	0	0.00	
Far Northeast Philadelphia	8	8	0	0	0	0	0	0	0	0.00	
Near Northeast Philadelphia	5	2	0	0	0	3	0	0	0	60.00	
Burlington County	4	4	0	0	0	0	0	0	0	0.00	
Kensington	4	2	0	0	0	2	0	0	0	50.00	
Roxborough-Manayunk	3	3	0	0	0	0	0	0	0	0.00	
Germantown-Chestnut	2	2	0	0	0	0	0	0	0	0.00	

Source: 1990 Census CTPP - Urban Element
Prepared by Delaware Valley Regional Planning Commission
Note: "External" indicates a destination outside the nine-county DVRPC region

1990 Census Journey-to-Work Travel Patterns Workers Residing in Rose Valley Borough										
Place of Employment	Total	Means of Transportation								
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)
Delaware County	230	200	21	0	0	0	0	10	0	0.00
Center City Philadelphia	56	25	2	0	0	29	0	0	0	51.79
Chester County	29	26	4	0	0	0	0	0	0	0.00
External	27	25	2	0	0	0	0	0	0	0.00
Montgomery County	19	17	2	0	0	0	0	0	0	0.00
West Philadelphia	13	7	3	0	3	0	0	0	0	23.08
Lower North Philadelphia	11	0	8	0	0	3	0	0	0	27.27
Camden County	9	6	0	0	0	3	0	0	0	33.33
Mercer County	6	6	0	0	0	0	0	0	0	0.00
Far Northeast Philadelphia	6	6	0	0	0	0	0	0	0	0.00
South Philadelphia	5	3	2	0	0	0	0	0	0	0.00
Southwest Philadelphia	5	5	0	0	0	0	0	0	0	0.00
Kensington	4	4	0	0	0	0	0	0	0	0.00
Gloucester County	3	3	0	0	0	0	0	0	0	0.00
Near Northeast Philadelphia	3	3	0	0	0	0	0	0	0	0.00
Bucks County	2	2	0	0	0	0	0	0	0	0.00
Upper North Philadelphia	2	2	0	0	0	0	0	0	0	0.00

1990 Census Journey-to-Work Travel Patterns Workers Residing in Thornbury Township										
Place of Employment	Total	Means of Transportation								
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)
Delaware County	914	621	86	0	0	0	0	198	9	0.00
Chester County	603	559	39	0	0	0	0	3	2	0.00
External	268	195	44	0	0	0	0	24	5	0.00
Center City Philadelphia	120	54	2	22	10	32	0	0	0	53.33
Montgomery County	107	90	17	0	0	0	0	0	0	0.00
South Philadelphia	59	9	5	45	0	0	0	0	0	76.27
West Philadelphia	45	21	22	0	0	2	0	0	0	4.44
Camden County	30	30	0	0	0	0	0	0	0	0.00
Lower North Philadelphia	21	16	0	0	0	5	0	0	0	23.81
Near Northeast Philadelphia	20	7	5	0	0	8	0	0	0	40.00
Burlington County	12	12	0	0	0	0	0	0	0	0.00
Gloucester County	12	12	0	0	0	0	0	0	0	0.00
Far Northeast Philadelphia	6	0	6	0	0	0	0	0	0	0.00

Source: 1990 Census CTPP - Urban Element A-8
Prepared by Delaware Valley Regional Planning Commission
Note: "External" indicates a destination outside the nine-county DVRPC region

1990 Census Journey-to-Work Travel Patterns Workers Residing in Trainer Borough											
Place of Employment	Total	Means of Transportation									
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)	
Delaware County	697	509	135	10	0	0	2	30	11	1.43	
External	143	118	25	0	0	0	0	0	0	0.00	
Center City Philadelphia	28	7	5	6	3	3	0	2	2	42.86	
Montgomery County	26	24	2	0	0	0	0	0	0	0.00	
Chester County	25	21	4	0	0	0	0	0	0	0.00	
Southwest Philadelphia	8	8	0	0	0	0	0	0	0	0.00	
Camden County	7	7	0	0	0	0	0	0	0	0.00	
West Philadelphia	6	4	0	2	0	0	0	0	0	33.33	
Bucks County	5	5	0	0	0	0	0	0	0	0.00	
South Philadelphia	5	5	0	0	0	0	0	0	0	0.00	
Upper North Philadelphia	5	0	5	0	0	0	0	0	0	0.00	
Olney-Oak Lane	5	5	0	0	0	0	0	0	0	0.00	
Burlington County	3	3	0	0	0	0	0	0	0	0.00	
Gloucester County	3	1	2	0	0	0	0	0	0	0.00	
Mercer County	2	0	2	0	0	0	0	0	0	0.00	
Near Northeast Philadelphia	2	2	0	0	0	0	0	0	0	0.00	

1990 Census Journey-to-Work Travel Patterns Workers Residing in Upland Borough											
Place of Employment	Total	Means of Transportation									
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)	
Delaware County	982	554	304	32	0	0	9	78	5	3.26	
External	76	30	46	0	0	0	0	0	0	0.00	
Chester County	71	54	11	0	0	0	0	6	0	0.00	
Center City Philadelphia	49	27	15	0	0	7	0	0	0	14.29	
Southwest Philadelphia	42	26	11	5	0	0	0	0	0	11.90	
Montgomery County	37	24	13	0	0	0	0	0	0	0.00	
Bucks County	28	28	0	0	0	0	0	0	0	0.00	
Burlington County	23	23	0	0	0	0	0	0	0	0.00	
Lower North Philadelphia	19	19	0	0	0	0	0	0	0	0.00	
South Philadelphia	8	8	0	0	0	0	0	0	0	0.00	
West Philadelphia	8	5	3	0	0	0	0	0	0	0.00	
Near Northeast Philadelphia	6	6	0	0	0	0	0	0	0	0.00	

Source: 1990 Census CTPP - Urban Element
Prepared by Delaware Valley Regional Planning Commission
Note: "External" indicates a destination outside the nine-county DVRPC region

1990 Census Journey-to-Work Travel Patterns Workers Residing in Upper Chichester Township										
Place of Employment	Total	Means of Transportation								Transit Share (%)
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	
Delaware County	4,705	3,918	600	5	0	0	5	156	21	0.11
External	1,280	1,060	169	16	0	0	0	35	0	1.25
Chester County	361	296	65	0	0	0	0	0	0	0.00
Center City Philadelphia	321	225	43	0	0	53	0	0	0	16.51
Montgomery County	254	220	34	0	0	0	0	0	0	0.00
South Philadelphia	104	91	13	0	0	0	0	0	0	0.00
West Philadelphia	92	82	10	0	0	0	0	0	0	0.00
Southwest Philadelphia	87	48	31	0	0	0	0	0	8	0.00
Camden County	84	76	0	0	0	0	0	8	0	0.00
Germantown-Chestnut	65	30	7	0	0	28	0	0	0	43.08
Gloucester County	59	49	10	0	0	0	0	0	0	0.00
Lower North Philadelphia	48	48	0	0	0	0	0	0	0	0.00
Near Northeast Philadelphia	36	36	0	0	0	0	0	0	0	0.00
Olney-Oak Lane	35	35	0	0	0	0	0	0	0	0.00
Bucks County	34	19	15	0	0	0	0	0	0	0.00
Kensington	31	31	0	0	0	0	0	0	0	0.00
Burlington County	28	15	13	0	0	0	0	0	0	0.00
Far Northeast Philadelphia	18	18	0	0	0	0	0	0	0	0.00
Upper North Philadelphia	15	5	0	0	0	10	0	0	0	66.67
Roxborough-Manayunk	7	7	0	0	0	0	0	0	0	0.00

1990 Census Journey-to-Work Travel Patterns Workers Residing in Upper Providence Township										
Place of Employment	Total	Means of Transportation								Transit Share (%)
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	
Delaware County	2,764	2,413	245	21	0	0	0	76	9	0.76
Chester County	410	312	53	19	0	18	0	0	8	9.02
Montgomery County	364	348	16	0	0	0	0	0	0	0.00
Center City Philadelphia	311	145	17	17	26	106	0	0	0	47.91
External	283	219	39	0	8	0	0	11	6	2.83
West Philadelphia	264	209	12	5	0	32	6	0	0	14.02
Camden County	91	91	0	0	0	0	0	0	0	0.00
Lower North Philadelphia	86	60	19	0	0	0	0	7	0	0.00
Bucks County	51	35	11	0	0	0	0	0	5	0.00
Southwest Philadelphia	45	45	0	0	0	0	0	0	0	0.00
South Philadelphia	39	39	0	0	0	0	0	0	0	0.00
Near Northeast Philadelphia	38	26	6	0	0	6	0	0	0	15.79
Kensington	36	29	0	0	0	0	0	0	7	0.00
Gloucester County	32	32	0	0	0	0	0	0	0	0.00
Germantown-Chestnut	27	27	0	0	0	0	0	0	0	0.00
Olney-Oak Lane	25	19	6	0	0	0	0	0	0	0.00
Burlington County	19	19	0	0	0	0	0	0	0	0.00
Far Northeast Philadelphia	14	14	0	0	0	0	0	0	0	0.00
Upper North Philadelphia	4	4	0	0	0	0	0	0	0	0.00

Source: 1990 Census CTPP - Urban Element
Prepared by Delaware Valley Regional Planning Commission
Note: "External" indicates a destination outside the nine-county DVRPC region

Appendix B

Journey-to-Work Travel Patterns for Municipalities
in Chester County

1990 Census Journey-to-Work Travel Patterns Workers Residing in Birmingham Township											
Place of Employment	Total	Means of Transportation									
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)	
Chester County	468	434	14	0	2	0	0	15	3	0.43	
External	366	322	25	0	0	7	0	4	8	1.91	
Delaware County	264	254	6	0	0	0	0	0	4	0.00	
Montgomery County	54	50	4	0	0	0	0	0	0	0.00	
Center City Philadelphia	31	15	7	0	0	9	0	0	0	29.03	
West Philadelphia	11	11	0	0	0	0	0	0	0	0.00	
Camden County	10	10	0	0	0	0	0	0	0	0.00	
Burlington County	6	6	0	0	0	0	0	0	0	0.00	
Mercer County	4	4	0	0	0	0	0	0	0	0.00	
Olney-Oak Lane	4	2	0	0	0	2	0	0	0	50.00	
Bucks County	3	3	0	0	0	0	0	0	0	0.00	
Far Northeast Philadelphia	2	2	0	0	0	0	0	0	0	0.00	
Southwest Philadelphia	2	2	0	0	0	0	0	0	0	0.00	
South Philadelphia	2	2	0	0	0	0	0	0	0	0.00	
Lower North Philadelphia	2	2	0	0	0	0	0	0	0	0.00	
Roxborough-Manayunk	2	0	0	0	2	0	0	0	0	100.00	
Near Northeast Philadelphia	2	0	0	0	2	0	0	0	0	100.00	
Berks County	1	1	0	0	0	0	0	0	0	0.00	

1990 Census Journey-to-Work Travel Patterns Workers Residing in East Bradford Township										
Place of Employment	Total	Means of Transportation								
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)
Chester County	1,904	1,699	173	0	0	0	0	7	24	0.00
Delaware County	523	477	46	0	0	0	0	0	0	0.00
Montgomery County	264	242	22	0	0	0	0	0	0	0.00
External	203	203	0	0	0	0	0	0	0	0.00
Center City Philadelphia	82	43	9	0	0	30	0	0	0	36.59
West Philadelphia	59	32	0	0	0	17	0	10	0	28.81
Far Northeast Philadelphia	28	28	0	0	0	0	0	0	0	0.00
Burlington County	27	17	0	0	0	10	0	0	0	37.04
Camden County	27	27	0	0	0	0	0	0	0	0.00
South Philadelphia	15	7	8	0	0	0	0	0	0	0.00
Lower North Philadelphia	15	6	9	0	0	0	0	0	0	0.00
Mercer County	14	14	0	0	0	0	0	0	0	0.00
Bucks County	11	11	0	0	0	0	0	0	0	0.00
Gloucester County	9	9	0	0	0	0	0	0	0	0.00
Kensington	9	0	0	0	0	9	0	0	0	100.00
Near Northeast Philadelphia	9	9	0	0	0	0	0	0	0	0.00

Source: 1990 Census CTPP - Urban Element
Prepared by Delaware Valley Regional Planning Commission
Note: "External" indicates a destination outside the nine-county DVRPC region

1990 Census Journey-to-Work Travel Patterns Workers Residing in East Goshen Township										
Place of Employment	Total	Means of Transportation								Transit Share (%)
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	
Chester County	4,293	3,732	397	16	0	8	19	60	59	0.56
Delaware County	1,533	1,369	157	0	0	0	0	7	0	0.00
Montgomery County	849	814	26	0	9	0	0	0	0	1.06
External	465	372	43	9	9	0	7	3	22	3.87
Center City Philadelphia	355	132	26	8	31	149	0	0	9	52.96
West Philadelphia	112	73	3	0	0	36	0	0	0	32.14
South Philadelphia	67	38	10	9	10	0	0	0	0	28.36
Burlington County	64	47	17	0	0	0	0	0	0	0.00
Camden County	55	40	7	0	0	8	0	0	0	14.55
Lower North Philadelphia	51	51	0	0	0	0	0	0	0	0.00
Bucks County	45	27	13	0	0	0	0	5	0	0.00
Germantown-Chestnut	44	26	10	0	0	8	0	0	0	18.18
Near Northeast Philadelphia	26	14	12	0	0	0	0	0	0	0.00
Mercer County	25	18	7	0	0	0	0	0	0	0.00
Gloucester County	19	14	5	0	0	0	0	0	0	0.00
Southwest Philadelphia	14	14	0	0	0	0	0	0	0	0.00
Upper North Philadelphia	9	9	0	0	0	0	0	0	0	0.00
Kensington	9	9	0	0	0	0	0	0	0	0.00
Far Northeast Philadelphia	8	8	0	0	0	0	0	0	0	0.00
Roxborough-Manayunk	6	6	0	0	0	0	0	0	0	0.00

1990 Census Journey-to-Work Travel Patterns Workers Residing in Pocopson Township											
Place of Employment	Total	Means of Transportation									
		Drive Alone	Carpool/Vanpool	Bus/Trolley	Subway/Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)	
Chester County	645	539	61	0	0	0	2	30	13	0.00	
External	269	225	25	2	0	0	0	7	10	0.74	
Delaware County	192	184	8	0	0	0	0	0	0	0.00	
Montgomery County	43	41	2	0	0	0	0	0	0	0.00	
Lower North Philadelphia	12	12	0	0	0	0	0	0	0	0.00	
South Philadelphia	11	9	0	0	0	2	0	0	0	18.18	
Center City Philadelphia	10	10	0	0	0	0	0	0	0	0.00	
Near Northeast Philadelphia	9	9	0	0	0	0	0	0	0	0.00	
Camden County	7	1	6	0	0	0	0	0	0	0.00	
Burlington County	6	6	0	0	0	0	0	0	0	0.00	
Germantown-Chestnut	6	6	0	0	0	0	0	0	0	0.00	
Bucks County	4	4	0	0	0	0	0	0	0	0.00	
Mercer County	3	3	0	0	0	0	0	0	0	0.00	
West Philadelphia	3	3	0	0	0	0	0	0	0	0.00	
Far Northeast Philadelphia	3	3	0	0	0	0	0	0	0	0.00	
Gloucester County	2	2	0	0	0	0	0	0	0	0.00	
Southwest Philadelphia	2	2	0	0	0	0	0	0	0	0.00	
Kensington	2	2	0	0	0	0	0	0	0	0.00	

Source: 1990 Census CTPP - Urban Element
Prepared by Delaware Valley Regional Planning Commission
Note: "External" indicates a destination outside the nine-county DVRPC region

1990 Census Journey-to-Work Travel Patterns Workers Residing in Thornbury Township										
Place of Employment	Total	Means of Transportation								
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)
Chester County	228	208	15	0	0	0	0	3	2	0.00
Delaware County	133	126	7	0	0	0	0	0	0	0.00
External	69	55	5	0	0	0	0	4	5	0.00
Montgomery County	42	25	17	0	0	0	0	0	0	0.00
Center City Philadelphia	18	5	2	0	0	11	0	0	0	61.11
South Philadelphia	14	9	5	0	0	0	0	0	0	0.00
Camden County	9	9	0	0	0	0	0	0	0	0.00
Gloucester County	6	6	0	0	0	0	0	0	0	0.00
Roxborough-Manayunk	5	5	0	0	0	0	0	0	0	0.00
Bucks County	5	5	0	0	0	0	0	0	0	0.00
Kensington	5	5	0	0	0	0	0	0	0	0.00
Burlington County	5	5	0	0	0	0	0	0	0	0.00
Lower North Philadelphia	2	2	0	0	0	0	0	0	0	0.00
Olney-Oak Lane	2	2	0	0	0	0	0	0	0	0.00
Southwest Philadelphia	2	2	0	0	0	0	0	0	0	0.00
Upper North Philadelphia	2	2	0	0	0	0	0	0	0	0.00
West Philadelphia	2	0	0	0	0	2	0	0	0	100.00

1990 Census Journey-to-Work Travel Patterns Workers Residing in West Chester Borough										
Place of Employment	Total	Means of Transportation								
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)
Chester County	7,908	4,504	1,135	116	5	11	84	1,942	114	1.67
Delaware County	557	467	67	0	0	6	0	17	0	1.08
Montgomery County	415	358	24	17	0	0	0	8	8	4.10
External	381	350	13	5	0	0	0	13	0	1.31
Center City Philadelphia	162	99	9	18	9	18	0	9	0	27.78
Camden County	53	39	8	0	0	0	0	6	0	0.00
Lower North Philadelphia	41	16	12	0	0	5	0	0	8	12.20
South Philadelphia	36	22	7	0	0	7	0	0	0	19.44
West Philadelphia	31	16	9	0	6	0	0	0	0	19.35
Bucks County	24	18	6	0	0	0	0	0	0	0.00
Far Northeast Philadelphia	24	0	9	7	0	0	0	8	0	29.17
Near Northeast Philadelphia	22	8	14	0	0	0	0	0	0	0.00
Burlington County	20	13	0	0	0	0	0	7	0	0.00
Roxborough-Manayunk	18	8	0	0	0	0	0	10	0	0.00
Upper North Philadelphia	11	11	0	0	0	0	0	0	0	0.00
Olney-Oak Lane	11	11	0	0	0	0	0	0	0	0.00
Southwest Philadelphia	8	8	0	0	0	0	0	0	0	0.00
Kensington	6	6	0	0	0	0	0	0	0	0.00

Source: 1990 Census CTPP - Urban Element
Prepared by Delaware Valley Regional Planning Commission
Note: "External" indicates a destination outside the nine-county DVRPC region

1990 Census Journey-to-Work Travel Patterns Workers Residing in West Goshen Township											
Place of Employment	Total	Means of Transportation									
		Drive Alone	Carpool/ Vanpool	Bus/ Trolley	Subway/ Elevated	Regional Rail	Bike	Walk	Other Mode	Transit Share (%)	
Chester County	6,004	5,208	516	28	0	0	8	230	15	0.47	
Delaware County	1,454	1,326	128	0	0	0	0	0	0	0.00	
Montgomery County	874	852	17	0	0	0	0	0	5	0.00	
External	554	472	55	0	0	6	0	21	0	1.08	
Center City Philadelphia	304	128	26	7	0	143	0	0	0	49.34	
West Philadelphia	121	75	8	20	0	18	0	0	0	31.40	
South Philadelphia	92	62	21	0	0	9	0	0	0	9.78	
Bucks County	68	61	7	0	0	0	0	0	0	0.00	
Far Northeast Philadelphia	55	37	6	0	0	12	0	0	0	21.82	
Burlington County	47	38	0	0	0	0	0	0	9	0.00	
Camden County	47	47	0	0	0	0	0	0	0	0.00	
Lower North Philadelphia	44	30	0	0	7	7	0	0	0	31.82	
Kensington	25	17	8	0	0	0	0	0	0	0.00	
Germantown-Chestnut	23	18	0	0	0	5	0	0	0	21.74	
Southwest Philadelphia	20	20	0	0	0	0	0	0	0	0.00	
Mercer County	17	17	0	0	0	0	0	0	0	0.00	
Upper North Philadelphia	17	17	0	0	0	0	0	0	0	0.00	
Roxborough-Manayunk	10	10	0	0	0	0	0	0	0	0.00	

1990 Census Journey-to-Work Travel Patterns Workers Residing in Westtown Township											
Place of Employment	Total	Means of Transportation								Transit Share (%)	
		Drive Alone	Carpool/Vanpool	Bus/Trolley	Subway/Elevated	Regional Rail	Bike	Walk	Other Mode		
Chester County	2,452	2,188	165	5	0	0	0	85	10	0.20	
Delaware County	968	907	58	0	0	0	0	3	0	0.00	
External	437	355	44	0	0	5	0	12	21	1.14	
Montgomery County	428	414	14	0	0	0	0	0	0	0.00	
Center City Philadelphia	183	103	17	30	7	26	0	0	0	34.43	
South Philadelphia	53	42	11	0	0	0	0	0	0	0.00	
West Philadelphia	46	39	7	0	0	0	0	0	0	0.00	
Burlington County	39	39	0	0	0	0	0	0	0	0.00	
Camden County	34	19	10	5	0	0	0	0	0	14.71	
Bucks County	32	25	7	0	0	0	0	0	0	0.00	
Lower North Philadelphia	27	22	0	0	0	5	0	0	0	18.52	
Gloucester County	25	25	0	0	0	0	0	0	0	0.00	
Southwest Philadelphia	21	21	0	0	0	0	0	0	0	0.00	
Kensington	17	17	0	0	0	0	0	0	0	0.00	
Mercer County	15	15	0	0	0	0	0	0	0	0.00	
Far Northeast Philadelphia	15	15	0	0	0	0	0	0	0	0.00	
Near Northeast Philadelphia	14	14	0	0	0	0	0	0	0	0.00	
Roxborough-Manayunk	9	9	0	0	0	0	0	0	0	0.00	
Olney-Oak Lane	5	5	0	0	0	0	0	0	0	0.00	
Upper North Philadelphia	4	4	0	0	0	0	0	0	0	0.00	

Source: 1990 Census CTPP - Urban Element
Prepared by Delaware Valley Regional Planning Commission
Note: "External" indicates a destination outside the nine-county DVRPC region

Appendix C

SEPTA Routes Serving the US Route 322 Study Area

Section 1 - Routes within the scope of US Route 322 Corridor

Route	Origin	Desination	Townships/Boroughs Served
114	Boothwyn	Darby	Upper Chichester
119	Feltonville	West Chester	Concord
202	West Chester	Wilmington	Concord

Section 2 - Routes within the US Route 322 Study Area

Route	Origin	Desination	Townships/Boroughs Served
R-2	Marcus Hook	CC Philadelphia	Chester City, Trainer, Marcus Hook
R-3	Elwyn	CC Philadelphia	Nether Providence, Media, Middletown
92	West Chester	King of Prussia	West Goshen, West Chester
104	69th Street	West Chester	Edgmont, Westtown, East Goshen, West Goshen, West Chester
110	69th Street	Penn State Univ.	Media, Middletown
113	69th Street	Marcus Hook	Chester City, Trainer, Marcus Hook
114	Darby Terminal	Boothwyn	Chester City, Chester Township, Lower Chichester, Upper Chichester
116	Chester	Granite Run Mall	Chester City, Parkside, Brookhaven, Aston, Middletown
117	Feltonville	West Chester	Chester City, Chester Township, Upland, Parkside, Brookhaven, Middletown, Edgmont, Thornbury (Delco) Thornbury (Chesco), Westtown, West Goshen, West Chester
118	Chester	King of Prussia	Chester City, Nether Providence, Media, Upper Providence
119	Feltonville	West Chester	Chester City, Chester Township, Upland, Parkside, Brookhaven, Middletown, Chester Heights, Concord, Birmingham (Delco) and (Chesco), Thornbury (Chesco) West Goshen, West Chester
120	69th Street	Cheyney Univ.	Edgmont, Westtown, Thornbury (Delco), Thornbury (Chesco)
202	West Chester	Wilmington	Concord, Birmingham (Delco) and (Chesco), Thornbury (Chesco), Westtown, West Goshen, West Chester