



September 2002

Cordon Line Highway Traffic Survey for the Delaware Valley Region

PA 41 North and US 30 Cordon Stations in Chester County

Report 3



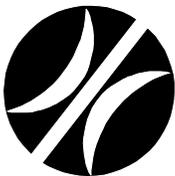
Delaware Valley Regional Planning Commission

Cordon Line Highway Traffic Survey for the Delaware Valley Region

REPORT NO.3

**PA 41 NORTH AND US 30 CORDON STATIONS IN
CHESTER COUNTY**

September 2002



**Delaware Valley Regional Planning Commission
The Bourse Building
111 South Independence Mall East
Philadelphia, PA 19106-2582**

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



Our logo is adapted from the official DVRPC seal, and is designed as a stylized image of the Delaware Valley. The outer ring symbolizes the region as a whole while the diagonal bar signifies the Delaware River. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey.

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

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
I. INTRODUCTION	3
II. DESIGN AND CONDUCT OF THE SURVEY	5
A. Survey Locations	5
1. PA 41, Gap Newport Pike	5
2. US 30, Lincoln Highway	7
B. Sample Methodology	7
1. Traffic Counts	7
2. Sample Size	9
C. Survey Conduct	9
D. Data Entry, Geocoding and Processing	10
1. Data Entry	10
2. Geocoding	12
3. Street Addresses and Businesses	13
4. Town / Place Addresses	14
III. SUMMARY SURVEY RESULT FOR PA 41, GAP NEWPORT PIKE AND US 30, LINCOLN HIGHWAY SURVEY LOCATIONS PARTS 1 AND 2	15
APPENDIX A. SURVEY RESPONSES FOR PA 41, GAP NEWPORT PIKE CORDON STATION SOUTH OF ZOOK ROAD, WEST SADSBUURY TOWNSHIP, CHESTER COUNTY, PENNSYLVANIA	A-1
APPENDIX B. SURVEY RESPONSES FOR US 30, LINCOLN HIGHWAY CORDON STATION EAST OF SWAN ROAD, WEST SADSBUURY TOWNSHIP, CHESTER COUNTY, PENNSYLVANIA	B-1

LIST OF MAPS

I-1. Regional Cordon Line Survey Stations	4
II-1. PA 41, Gap Newport Pike Survey Location	8
II-2. US 30, Lincoln Highway Survey Location	8

LIST OF FIGURES

II-1. External and Through Survey Field Form	6
II-2. Survey Entry Form as Displayed on Computer Screen	11
II-3. DVRPC Geocoding Process	12
II-4. Interface for ArcView Geocoding	13

APPENDIX A: List of Tables

A-1. Daily Vehicle Classification Traffic Counts	A-3
A-2. Survey Interviews at PA 41 North by Survey Period	A-4
A-3. Place of Vehicle Trip Origin by Municipality	A-5
A-4. Place of Vehicle Trip Destination by Municipality	A-6
A-5. Stopping before Arriving at Final Destination	A-7
A-6. Reasons for Using PA 41 North by Drivers of Passenger Vehicles	A-8
A-7. Reasons for Using PA 41 North by Truck Drivers	A-9
A-8. Major Roads taken by Drivers to Reach their Destination	A-10
A-9. Type of Vehicle Used for the Trip	A-11
A-10. Trip Purpose by Direction	A-12
A-11. Vehicle Occupancy by Traffic Direction and Time Period	A-13
A-12. Average Vehicle Occupancy by Trip Purpose	A-14
A-13. External - Internal and Internal - External Trip Length Frequency Distribution within the DVRPC Region	A-15
A-14. County where Trucks are Garaged or Parked when not in Service	A-16
A-15. Type of Commodities carried by Trucks	A-17

APPENDIX B: List of Tables

B-1 Daily Vehicle Classification Traffic Counts.	B-3
B-2. Survey Interviews at US 30 by Survey Period	B-4
B-3. Place of Vehicle Trip Origin by Municipality	B-5
B-4. Place of Vehicle Trip Destination by Municipality	B-6
B-5. Stopping before Arriving at Final Destination	B-7
B-6. Reasons for Using US 30 by Drivers of Passenger Vehicles	B-8
B-7. Reasons for Using US 30 by Truck Drivers	B-9

APPENDIX B: List of Tables (Continued)

B-8. Major Roads taken by Drivers to Reach their Destination B-10
B-9. Type of Vehicle Used for the Trip B-11
B-10. Trip Purpose by Direction B-12
B-11. Vehicle Occupancy by Traffic Direction and Time Period B-13
B-12. Average Vehicle Occupancy by Trip Purpose B-14
B-13. External - Internal and Internal - External Trip Length Frequency
Distribution within the DVRPC Region B-15
B-14. County where Trucks are Garaged or Parked when not in Service B-16
B-15. Type of Commodities carried by Trucks B-17

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EXECUTIVE SUMMARY

The External and Through Traffic Survey collected current information on traffic entering and exiting the DVRPC region. The traffic surveys at PA 41, Gap Newport Pike (here after referred to as PA 41 North) and US 30, Lincoln Highway, were two of fourteen stations surveyed around the region during the summer of 2001. Information was collected in both directions through a roadside interview, using the questionnaire shown on page 6. Questions were asked about trip origin and destination, purpose, highways used, vehicle type, occupancy, truck garage location and truck commodities. Detailed findings are available individually in Section III and in the Appendices in the back of the report. The survey was conducted with the assistance of the Lancaster County Planning Commission. Traffic was surveyed at each of the stations in both directions during the time period from 6:45 A.M. to 7:15 P.M.

The major findings for these two survey stations are as follows:

- The 24 hour counts for PA 41 north and US 30 were 13,061 AADT and 18,612 AADT, respectively. PA 41 north has an AM peak with about 6 percent and a PM peak with about 8 percent of the 24 hour total. The US 30 has an AM peak and a PM peak both with about 8 percent of the 24 hour total. The mode split for the PA 41 north is about 56 percent and 40 percent, respectively, for automobiles and trucks, but for US 30 it is about 62 percent and 35 percent, respectively, for automobiles and trucks.
- The sample sizes for PA 41 north and US 30 were close to the desired goals. PA 41 north surveyed 1,640 of 1,700 for about 96 percent of the desired sample goal, and US 30 surveyed 1,648 of 1,800 for about 92 percent of the desired sample goal.
- The PA 41 north automobile driver's reasons for traveling the facility were 69 percent saving time and 19 percent most direct, while truck drivers responded with 63 percent saving time and 21 percent most direct. On US 30, automobile driver's responses were 55 percent saves time and 34 percent most direct, while truck drivers responded 70 percent saving time and 15 percent most direct.
- The share of work trips on PA 41 north and US 30 are about 41 percent and 52 percent, respectively. Other major trip purposes on PA 41 north include 25 percent for social trips and 14 percent for shopping, and on US 30 an 18 percent share for social visits and 13 percent for shopping.
- The average total vehicle occupancy varied between survey stations, with PA 41 north and US 30 averaging 1.66 and 1.51 persons per vehicle respectively, while the average occupancy for work trips was less, with 1.22 and 1.18 persons per vehicle respectively.
- Commodities carried by the surveyed trucks at the PA 41 north station disaggregated to 28 percent building materials, 15 percent "other", and 15 percent agricultural products. Trucks crossing US 30 constituted 28 percent building materials, 20 percent "other", and 19 percent empty.

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I. INTRODUCTION

The DVRPC cordon line traffic survey was conducted to collect current information on traffic volumes and determine the origin-destination travel patterns, travel activity, and travel mode of vehicles crossing the nine-county DVRPC cordon line which forms the regional boundary. The external and through trip travel patterns are especially critical for transportation facilities located near the nine-county boundary, as this is an area where in recent years major new development has occurred. The survey, conducted in the spring and summer of 2001, updated trip characteristics and patterns that were last collected in the 1980s. The survey data will be used in the ongoing planning process, validation of travel simulation models, traffic forecasting, preliminary engineering, estimation of vehicle miles of travel (VMT), and monitoring of external and through travel. The toll authorities of the region, state transportation departments, neighboring metropolitan planning organizations, county planners, and interregional freight operators will benefit from this survey, which will provide useful data for the improvement of highway facilities in the next 20 years.

Map I-1 displays the highway facilities which were surveyed in 2001 as well as the locations of the 1988 survey. Traffic counts and a sample of interviews were collected at 14 locations crossing the boundary of the nine-county region representing a broad range of highway types, from local to interstate facilities. This information was supplemented with data from two recently conducted surveys, one on the Pennsylvania Turnpike and the other on the New Jersey Turnpike. In addition, traffic counts were taken on an additional 140 highway facilities crossing the regional boundary and bus and rail ridership was collected from carriers crossing the boundary. Survey results are presented in a series of reports. This report presents briefly the surveys conducted at PA 41 and US 30 near the Chester / Lancaster county line.

The survey consisted of roadside interviews at each location. Questions were asked about trip origin, destination, and purpose; highway use and vehicle type; and vehicle occupancy. The questionnaire also asked about the reasons for travel and how people make their travel decisions and plan their daily trips. Truck type, garaging and commodity information were also included in the survey questionnaire. Section II of the report describes the design and conduct of the survey. Included are a description of the survey questionnaire, the sample size, and the collection method. A map and description of the survey sites covered in this report are presented. A summary tabulation of traffic volumes at each site and vehicle classification information are also included.

The survey results are presented in Section III. Included is a review of the processes employed to enter the survey data, geocode origin/destination information, and tabulate the answers to survey questions. The major findings of the survey and traffic characteristics are presented; the findings for each question are offered in graphic and written form.

Detailed survey information is provided in the Appendices, including traffic and vehicle classification counts. Simple and cross tabulations of survey responses are shown in a series of 15 tables for each survey station.

II. DESIGN AND CONDUCT OF THE SURVEY

The cordon line survey was designed to gather information from a sample of drivers crossing the boundary of the DVRPC region. At each station, two types of traffic information was collected; total number of passing vehicles and driver trip-making characteristics. The recording of all traffic, by vehicle type and by the hour, was collected using DVRPC's Portable Traffic Recorder units. This information was used to establish the sample size necessary for roadside interviews to collect trip-making characteristics. As shown on the following page, the survey questionnaire consists of 13 questions; two of which need not be asked since the surveyor would be able to check the vehicle type and occupancy. The following information was collected in the interview: time of trip, origin and destination of the trip, major highways used, number of travelers (including the driver). For commercial vehicles additional questions ascertained county where the vehicle is garaged or parked when not in service and the type of commodity carried by trucks.

A. Survey Locations

The results of the survey for two locations are included in this report: PA 41, Gap Newport Pike in West Sadsbury Township; and US 30, Lincoln Highway, also in West Sadsbury Township. These facilities were chosen due to their strategic importance for travel to and from the Delaware Valley region. Both are major arterials carrying traffic into and out of the DVRPC region, both from the west.

1. PA 41, Gap Newport Pike

PA 41, Gap Newport Pike (also known as Newport Lancaster Pike) is a major arterial connecting the Wilmington area with Chester County and central Pennsylvania. It is an important freight corridor, connecting the Port of Wilmington with markets in the midwest. Land use in this area is predominantly rural, with the landscape dominated by farms and agricultural support services. In addition, due to the nature of PA 41 as a commercial corridor and the presence of recreational traffic bound for the factory outlet centers and antique stores in Lancaster County, a mixture of diners, truck stops, gasoline stations, and roadside stands are evident in the corridor. Finally, this area is at the fringe of the Philadelphia metropolitan area which has increased residential development pressure. New subdivisions are being marketed in Atglen just south of the cordon, Gap to the north of the cordon, and Parkesburg, just east of the survey site.

The survey site was approximately 1/5 mile south of the cordon (see Map II-1). At this location PA 41 is a two lane facility with 10 foot paved shoulders. This necessitated the offsetting of the survey directions to allow for traffic flow. Pennsylvania Police from the Lancaster barracks provided traffic control.

Figure II-1. External and Through Survey Field Form

 Delaware Valley Regional Planning Commission EXTERNAL AND THROUGH TRIP SURVEY		N^o 10000
		Time : : <input type="checkbox"/> AM <input type="checkbox"/> PM

1. **Where did you start this trip? (Origin)** 2. **Is this home?** Yes No

Street address or nearest intersection

Town or City	County	State	Zip Code
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3. **Where will this trip end? (Destination)** 4. **Is this home?** Yes No

Street address or nearest intersection

Town or City	County	State	Zip Code
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5. **Will you stop before arriving at your destination?** No Yes, If yes, where?

Street address or nearest intersection

Town or City	County	State	Zip Code
--------------	--------	-------	----------

7. **Why do you use this road? (check one or more)**

<input type="checkbox"/> 1] Saves Time	<input type="checkbox"/> 3] Less Congestion	<input type="checkbox"/> 5] No Traffic Lights
<input type="checkbox"/> 2] Saves Money	<input type="checkbox"/> 4] Better Road Condition	<input type="checkbox"/> 6] Other _____

8. **What is/are the major road(s) that you will take to reach the destination after this road?**

1st Highway _____ 2nd Highway _____

9. **What type of vehicle is used for the trip?**

Passenger Vehicles <input type="checkbox"/> 1] Auto <input type="checkbox"/> 2] Van, Sta. Wagon <input type="checkbox"/> 3] SUV <input type="checkbox"/> 4] Other _____	Light Trucks <input type="checkbox"/> 5] Pickup <input type="checkbox"/> 6] Panel <input type="checkbox"/> 7] Single Unit <input type="checkbox"/> 8] Other _____	Heavy Trucks (3 axles or more) <input type="checkbox"/> 9] Tractor-Trailer <input type="checkbox"/> 10] Double Trailer <input type="checkbox"/> 11] Other _____
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10. **What is the purpose of this trip? (Passenger Vehicles Only)**

<input type="checkbox"/> 1] Work	<input type="checkbox"/> 3] Eat Meal	<input type="checkbox"/> 5] Social/Recreation	<input type="checkbox"/> 7] Visitor/Tourist
<input type="checkbox"/> 2] School	<input type="checkbox"/> 4] Shopping	<input type="checkbox"/> 6] Medical	<input type="checkbox"/> 8] Other _____

11. **How many people are in the vehicle? (Passenger Vehicles Only)**

1] One 2] Two 3] Three 4] Four 5] Five 6] More than Five

12. **Where is this truck garaged or parked when not in service? (Trucks Only)**

<input type="checkbox"/> 1] Bucks County	<input type="checkbox"/> 4] Montgomery County	<input type="checkbox"/> 7] Burlington County	<input type="checkbox"/> 10] Mercer County
<input type="checkbox"/> 2] Chester County	<input type="checkbox"/> 5] Philadelphia County	<input type="checkbox"/> 8] Camden County	<input type="checkbox"/> 11] Other NJ County
<input type="checkbox"/> 3] Delaware County	<input type="checkbox"/> 6] Other PA County	<input type="checkbox"/> 9] Gloucester County	<input type="checkbox"/> 12] Other State

13. **What type of commodities are you carrying? (Trucks Only)**

<input type="checkbox"/> 1] Empty	<input type="checkbox"/> 4] Agricultural Products	<input type="checkbox"/> 7] Retail Store Merchandise
<input type="checkbox"/> 2] Manufactured Products	<input type="checkbox"/> 5] Building Materials	<input type="checkbox"/> 8] Parcels
<input type="checkbox"/> 3] Petroleum Products	<input type="checkbox"/> 6] Refrigerated Products	<input type="checkbox"/> 9] Other _____

2. US 30, Lincoln Highway

US 30 is the major east-west thoroughfare between the DVRPC region and points west. Prior to the advent of the Interstate Highway System and the Pennsylvania Turnpike, US 30 provided the major route west from points between Washington D.C. and New York. It's alignment included Pittsburgh, points in Ohio and it passes just south of Chicago. Even with the newer facilities carrying much of the interstate traffic, US 30 still provides important access to many urban areas and a scenic alternative travel route. In eastern Pennsylvania, US 30 is still a major thoroughfare between the Philadelphia and Lancaster urban areas. To the east of the cordon station, US 30 exists as a freeway facility from the intersection with US 202 near Frazer almost to PA 10. Like PA 41, US 30 provides access to the factory outlet centers and tourist destinations in Lancaster County. Scattered residences exist in the immediate vicinity of the cordon station, together with individual commercial sites. Large scale residential and commercial development development is creeping west toward the cordon, with land sale signs are a common sight along the alignment.

The survey site was on the Chester County side of the border, just east of Swan Rd. (see Map II-2). The cross section of US 30 includes 1 travel lane by direction, a center turn lane, and paved shoulders. The survey was offset, so that traffic could be surveyed in the travel lane, with the center turn lane operating as a bypass. Pennsylvania State Police from the Lancaster barracks were on site to assure the safety of the survey crew and the motoring public. Traffic flow was normal for much of the survey, although for about ½ hour of the afternoon survey a traffic accident on PA 41 led some vehicles to divert along PA 10 and into the survey. Drivers who expressed this during the survey were excused and their survey information rejected.

B. Sample Methodology

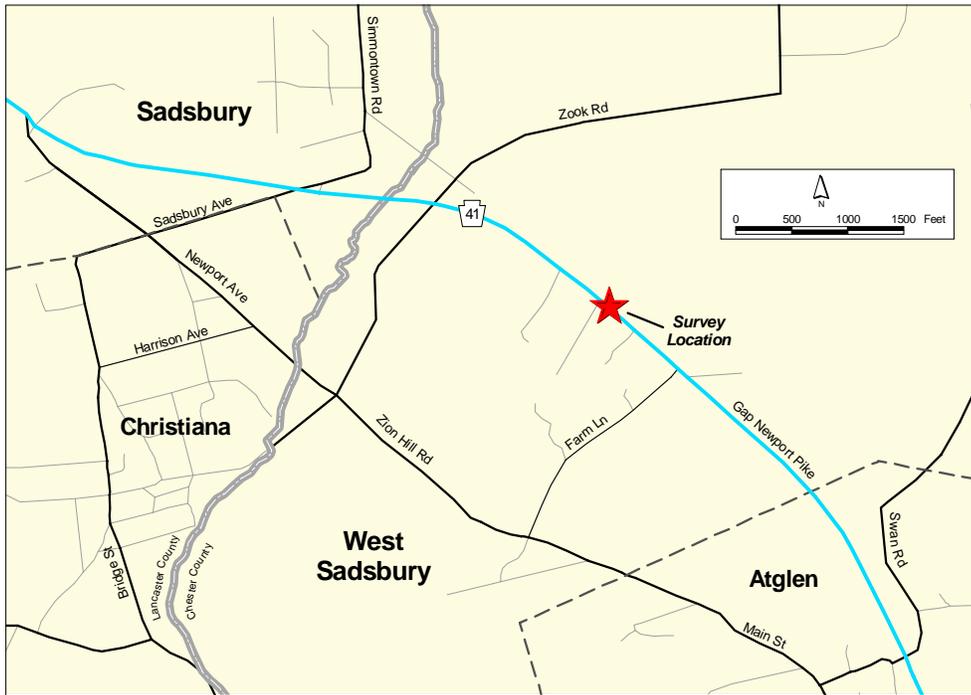
Traffic and vehicle classification counts were taken at each site. The hourly ATR counts and vehicle classification counts, by direction, are presented in the Appendices. Based on these volumes, standard statistical methods were applied and a sample size was established for each location. The sample was then disaggregated into an appropriate number of surveys for passenger and commercial vehicles for each survey period as discussed in Section III.

1. Traffic Counts

Traffic volumes at the PA 41 survey site are approximately 13,000 vehicles per day. The morning peak hour factor is 5.7 percent, occurring between 9 and 10 a.m. The afternoon peak hour factor is higher, at 7.5 percent between 4 p.m. and 5 p.m. In the morning about 60 percent of the traffic is inbound. Directionality is not as severe in the afternoon, with 56 percent of the traffic outbound from the DVRPC region. Due to the commercial importance of this facility, trucks (commercial vehicles) account for about 24 percent of the traffic mix.

Traffic volumes at the US 30 survey site are between 18,000 and 19,000 vehicles per day. Eastbound peak hour traffic is heavily peaked, at 9 percent, with the afternoon K factor in the westbound direction reflecting returning traffic (8.8%). Traffic flow on US 30 is even

Map II-1. PA 41, Gap Newport Pike Survey Location



Map II-2. US 30, Lincoln Highway Survey Location



more directional than on PA 41; in the morning approximately 2/3 of all travel is inbound to the DVRPC region. The afternoon is less heavily directional with about 58 percent of traffic outbound. Trucks (commercial vehicles) account for about 15 percent of the total traffic volume.

2. Sample Size

Based on the hourly traffic and vehicle classification counts, a sample size was determined for both passenger and commercial vehicles. This number of surveys by morning and afternoon period is presented in Section III. For PA 41, a total of 1,700 surveys were scheduled for collection. This amounted to approximately 850 in each direction, representing inbound and outbound trips. Of this total, 680 forms were to be interviews of passenger vehicles, with the remaining 170 reserved for commercial vehicles.

On US 30, the total number of interviews was set at 1,800; 900 were to be filled out for traffic in each direction. Passenger vehicles accounted for about 720 surveys, with the balance of 180 surveys consisting of trucks.

C. Survey Conduct

A manual was prepared to guide the conduct of the survey. It contained information on the distribution of surveys by survey period; partnering agency information; number of police officers needed for traffic control and staffing requirements for each site; a preliminary schedule of survey sites and shifts, as well as a listing of equipment requirements and diagram of a hypothetical site as it would be set up for survey operations.

Before the survey work could be initiated, a crew of temporary workers was hired and trained. General orientation sessions were followed with role playing by the survey crew. In this manner, the surveyor became familiar with the questions and possible problematic situations. It also allowed the surveyors to become comfortable with the survey process, so that once in the field, traffic delay would be minimal and the survey process would be safe and efficient. As the surveyors became experienced with the process, per survey time dropped to the range of 35 to 45 seconds.

While in the office prior to initiating field work, surveyors allocated the proper number of forms for passenger and commercial vehicles by time period. Four different colored forms were used to designate the traffic direction (inbound or outbound) and interview time (morning or afternoon). Forms were allocated to the following survey times:

Morning Survey

6:45 - 8:30 a.m.
8:30 - 9:30 a.m.
9:30 - 10:30 a.m. (*meal break*)
10:30 - 12:00 noon
12:00 - 1:00 p.m.

Afternoon Survey

1:00 - 2:30 p.m.
2:30 - 3:30 p.m.
3:30 - 4:30 p.m. (*meal break*)
4:30 - 6:00 p.m.
6:00 - 7:15 p.m.

Although in general the conduct was the same for each survey station, the geography of the site dictated a measure of innovation. Safety, both of the survey crew and the driving public, was the primary operating directive. For a four lane facility, the right lane and shoulder were used for the survey. This provided the left lane for traffic to bypass the survey. Two lane facilities required the survey to be offset by direction. Multiple signs were placed in advance of the site in accordance with state guidelines and distance standards. These warned motorists of the traffic survey, to be prepared to stop, and that police control was in effect. Police vehicles were prominently displayed ahead of the site, with lights flashing, as this tended to slow traffic entering the vicinity of the survey. Police and traffic cones helped direct traffic through the site, and a sign announced the end of the survey site. All survey personnel were outfitted with safety vests. Although each site was visited before the survey date and preliminary sketches of the setup were prepared, the input of the police officers on site was solicited and followed.

Since only a sample of the drivers were interviewed, the platooning method was used in selecting vehicles to be surveyed. A crew chief was designated for each direction and assumed the last position in the survey line. The crew chief was responsible for communicating with the other surveyors and with the police officer. The crew chief would signal the officer when the crew was ready for a platoon of vehicles. Interviews would be conducted, and the appropriate information recorded. The lead surveyor would then assure the safe re-entry of the surveyed vehicles to the traffic stream and the crew chief would signal the police officer for another platoon of vehicles.

Coordinating the survey was the responsibility of the survey chief. This person was responsible for scheduling the appropriate number of survey staff, coordinating with the police, and assuring that the survey site was properly prepared. During the survey the survey chief had the responsibility of distributing and collecting survey forms, resolving situations with the police, seeing to the physical needs of the survey crew, and speaking with motorist regarding survey questions and concerns. The survey chief would join the line of surveyors when an extra person was needed to fill the quota of surveys.

The execution of the survey at both PA 41 and US 30 was successful and the required surveys were completed on time without any incident or noticeable traffic delay.

D. Data Entry, Geocoding and Processing

1. Data Entry

Paper field responses collected from survey station interviews were converted into an electronic form suitable for spatial and statistical analysis. A Microsoft Access database

resembling the paper field survey form was used so the data entry approximated the entry of information in the field. Data entry goals included replicating the survey form to allow logical flow from paper to digital format; to standardize spelling of responses; to ensure that entries were within acceptable geographic bounds; and to avoid duplicate entries.

Several methods to this end were employed. First, extensive lists of common names for the key variables were built into the Access entry form. These include common names for places, municipalities, counties, and roads. Second, responses on the field survey form for purpose, vehicle class, vehicle type, and commodity were all made part of menu choices. Third, where possible, allowable entries were limited by either forcing a binary yes/no response or use of a validation rule to limit the range of acceptable numbers. To ease review of entries, the database remained flat with all responses recorded in one data table. An example of this screen is shown in Figure II-2 below and can be compared with the survey form shown in Figure II-1.

Figure II-2. Survey Entry Form as Displayed on Computer Screen

The screenshot shows a Microsoft Access form window titled "Internal-External Cordon Line Survey" from the Delaware Valley Regional Planning Commission. The form is organized into several sections:

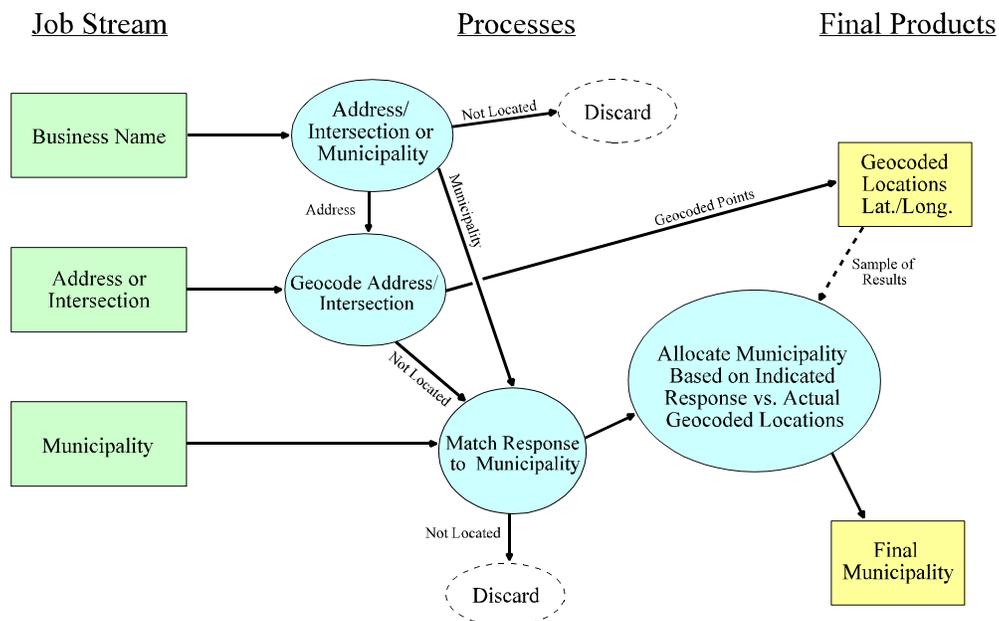
- Header:** "Internal-External Cordon Line Survey" and "Delaware Valley Regional Planning Commission". A button "Sort Records By Survey Number" is visible.
- Form Fields:**
 - Survey Number: [Text Box]
 - Time: [Text Box]
 - 1. Where Did You Start?
 - 2. Is This Home?
 - Address: [Text Box]
 - Town: [Dropdown Menu]
 - County: [Dropdown Menu]
 - State: [Dropdown Menu]
 - Zip Code: [Text Box]
 - Geocode: [Dropdown Menu]
 - 3. Where Will This Trip End?
 - 4. Is This Home?
 - Address: [Text Box]
 - Town: [Dropdown Menu]
 - County: [Dropdown Menu]
 - State: [Dropdown Menu]
 - Zip Code: [Text Box]
 - Geocode: [Dropdown Menu]
 - 5. Intermediate Stop?
 - 6. Is This Home?
 - Will You Stop?
 - Address: [Text Box]
 - Town: [Dropdown Menu]
 - County: [Dropdown Menu]
 - State: [Dropdown Menu]
 - Zip Code: [Text Box]
 - Geocode: [Dropdown Menu]
 - 7. Why Do You Use This Road?
 - 1. Saves Time
 - 2. Saves Money
 - 3. Less Congestion
 - 4. Better Road Condition
 - No Traffic Lights
 - Other: [Text Box]
 - 8. What Are The Major Roads You Will Take?
 - First Highway: [Dropdown Menu]
 - 2nd Highway: [Dropdown Menu]
 - 9. Vehicle Information
 - Vehicle Class: [Dropdown Menu]
 - Vehicle Type: [Dropdown Menu]
 - Passenger Vehicles Only
 - 10. Purpose: [Dropdown Menu]
 - 11. People: [Text Box] (value: 0)
 - Trucks Only
 - 12. Garaged: [Dropdown Menu]
 - 13. Commodity: [Dropdown Menu]
- Footer:** Record: 1 of 1, Form View, NUM button.

Finally, the survey number was used as both a unique identifier and a means to prevent duplication of data entry. The survey number also served to identify cordon station and direction. The database and entries were designed to allow further analysis and processing. One example is the geocode field that was used to specify a likely method of assigning geographic data, such as via municipality, business address, personal address, or intersection.

2. Geocoding

Geocoding refers to the assignment of geographic attributes based on entered survey data (See Figure II-3 for DVRPC Geocoding Process). Another term for this process is data conflation. The conflation process allows for spatial analysis of survey responses and separates the data into several job streams based upon likely geocoding method, and assigns unique identifiers to each address. To assign a unique identifier, full survey entries were separated into singular addresses using the survey ID number and either origin or destination. Note that stopover points were not assigned a geographic location. After separation of origin and destination, three categories were used to assign a method for data conflation: 1) where the address is a street address, intersection of named roads, or a partial combination of the two; 2) where the address is a business name with full or partial street and place information; and 3) where the address is a town, place, state, or other such designated area without a street address or road name. Those entries where the address was invalid, unreadable, or in any other way unable to be determined or placed into one of the three categories, were discarded.

Figure II-3. DVRPC Geocoding Process

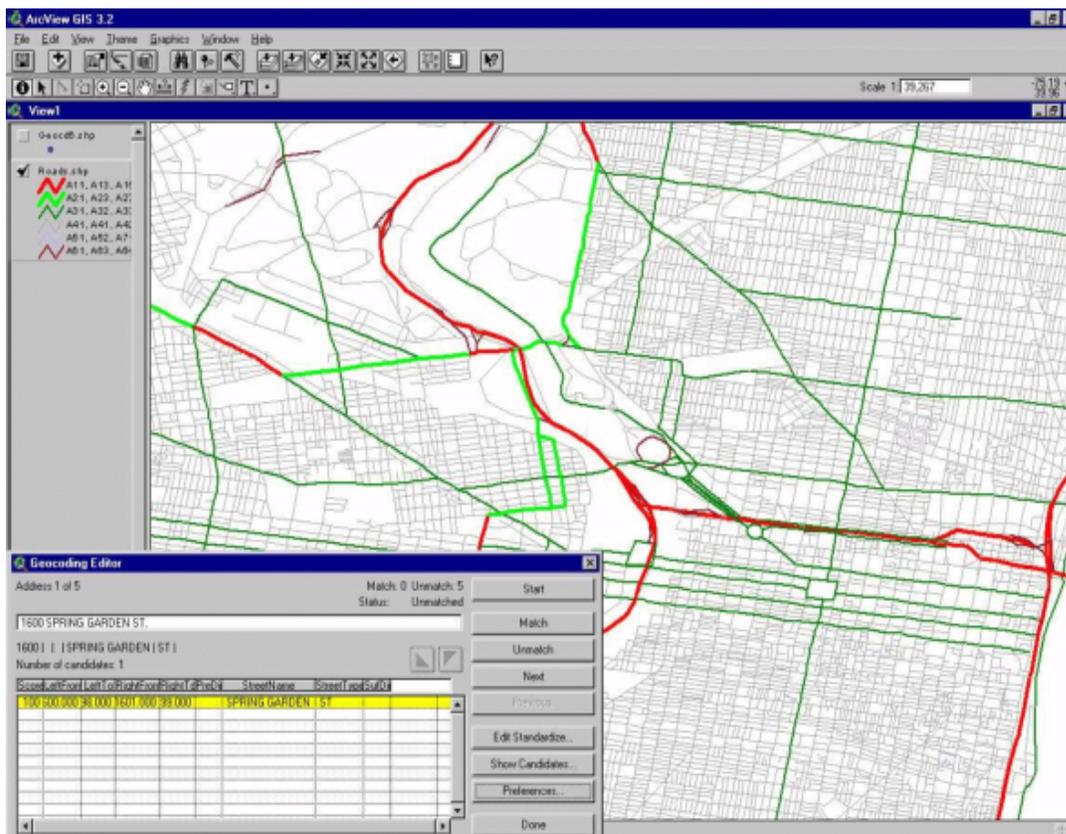


3. Street Addresses and Businesses

The first category of origins and destinations to be assigned geographic locations (latitude and longitude) was the group containing a street address, intersection, or road name. The ArcView 3.2 program was able to geocode many of the recognizable data entries. The underlying address and road name data to which it was matched was the U.S. Census TIGER files for the DVRPC region and adjacent counties. This group was first processed using the Geocoding interface in ArcView 3.2, automatically comparing entered address or intersection versus TIGER data. After the initial run, many of the addresses remained unmatched due to spelling errors in road names. To fix this, those addresses not found initially were again put through the geocoding program and checked against atlases of streets and roads in the chosen areas. This second attempt was done manually, and while very time consuming, yielded the vast majority of the remaining entries thought likely to be geocoded. Those few entries that could not be geocoded were grouped with entries where only municipality was known, or discarded.

Figure II-4 shows the ArcView Geocoding interface used to process those data items not found automatically. Entries that had a business address or name were assigned to an address using either the internet yellow pages or local phone books. After assigning the addresses to be geocoded they were “run” through the Arcview geocoding process as above. Any entries that still had not been assigned a geographic location were placed into the town/place entry file.

Figure II-4. Interface for ArcView Geocoding



4. *Town / Place Addresses*

All entries not processed using the prior two techniques were assigned geographic location via town/place name. The first part of this process was to standardize spellings and ancillary data such as county for each response. A process was developed to assign geography using surveyed town/place response, and appropriate latitude and longitude measurements. The process began with place names. Entries corresponding to places completely inside an MCD (Minor Civil Division) were assigned to either the geographic center of the place as defined by the Census Bureau, or the focal intersection for the named place. This was most effective for small villages.

The entries consisting of MCD names were allocated by comparing reported MCDs versus actual MCDs based upon the geocoding process. This process corrects for the variation between respondents conception of geographic bounds and actual political borders. Respondents indicating a specific MCD as a destination were equally likely to be traveling to the adjacent townships based upon given intersection or address. The responses were scattered across several MCDs based upon the ratio established from geocoded results, rather than assign all trips to the centroid of the MCD.

This process ensures that the geographic location for the entries assigned to municipalities near the reported MCD are representative of the actual sample. A similar procedure allocates responses when boroughs are surrounded by townships with the same name. Finally, state centroids were used to assign geographic location to states and provinces beyond 200 miles. This allows for reasonable distance calculations for longer trips.

The geocoding process yielded results allowing a full range of spatial analysis. To allow for differing geographic resolutions, survey data was grouped by accuracy. Consequently, 65.3 percent of survey responses could be assigned using address or intersection data, and 28.9 percent of responses could be assigned by municipality. Only 5.9 percent of all surveyed points were not assigned a geographic location.

III. SUMMARY SURVEY RESULTS FOR PA 41, GAP NEWPORT PIKE AND US 30, LINCOLN HIGHWAY SURVEY LOCATIONS PARTS 1 AND 2

The summary survey results for PA 41 North and US 30 are shown in this section. Part 1 of this section consists of PA 41 North survey results while Part 2 consists of US 30 survey results. Information was collected in both inbound and outbound directions on both facilities through a roadside interview, using the questionnaire shown on page 6. Questions were asked about trip origin and destination, purpose, highways used, vehicle type, occupancy, truck garage location and commodities transported. Simple and cross tabulations of survey responses for each of the two stations are summarized in Parts 1 and 2.

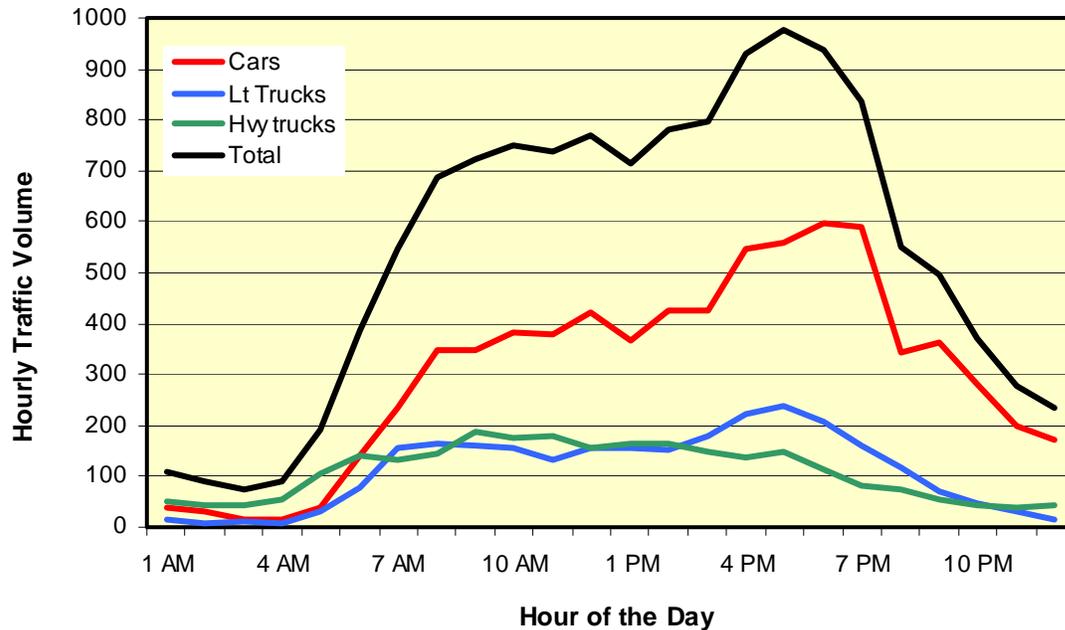
The major findings of the survey and traffic characteristics are presented with the findings for each question are offered in graphic and written form. Included with each table or figure is text summarizing the highlights of the survey responses. The text summarizes the findings and describes points of interest not shown in the graphics. Detailed survey information is provided in the Appendices.

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PART 1
PA 41 North, Survey Summary Results

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Daily Traffic Counts by Hour of the Day



- Vehicle classification traffic counts were collected during 24 hours preceding the survey. The PA 41 north traffic counts were taken near the Chester / Lancaster county boundary, where the field survey was conducted. The traffic volume, at that point, was 13,061 vehicles classified by vehicle type. The full statistical portrait of the classification counts for PA 41 north is shown in Table A-1 in the Appendix A in the back of the report.
- The AM peak hour traffic occurred later than usual, between the hours of 9:00 a.m. and 10:00 a.m. The count for that hour was 751 vehicles. This count was 5.7 percent of the 24 hour traffic volume. This may be explained by the smaller share of commuters, and a larger share of “through trips” at this station (note the prevalence of truck trips). The PM peak occurred between the hours of 4:00 p.m. and 5:00 p.m. The count for that hour was 975 vehicles, which is 7.5 percent of the 24 hour traffic volume.
- The vehicular counts were dominated by 7,268 automobiles. This is about 56 percent of the 24 hour vehicular count. Light trucks were 20 percent of the vehicles.
- Heavy trucks, those with more than two axles, make up 20 percent of the vehicular traffic. Buses and Motorcycles together, were only about 4 percent share of the vehicle counts.

Total Interviews by Survey Period

<u>Survey Period</u>	<u>Total Surveys</u>	<u>Inbound</u>		<u>Outbound</u>	
		<u>Surveys</u>	<u>% of Total</u>	<u>Surveys</u>	<u>% of Total</u>
<u>Morning Shift</u>					
6:30 a.m. - 10:30 a.m.	502	244	30%	258	31%
10:30 a.m. - 1:00 p.m.	364	169	21%	195	24%
<u>Evening Shift</u>					
1:00 p.m. - 4:30 p.m.	402	208	26%	194	24%
4:30 p.m. - 8:00 p.m.	372	192	24%	180	22%
TOTAL	1640	813	100%	827	100%

- There were 1,640 drivers surveyed at this location. This sample is about 96 percent of the desired total of 1,700. The hourly shift totals have been added together to create the table above. The disaggregated numbers are shown in greater detail in Table A-2 in the Appendix.
- There were an equal number of surveys in each direction with 813 inbound and 827 outbound vehicles surveyed at the cordon station. The 6:30 a.m. to 8:30 a.m. morning peak time had about 19 percent of the volume, while the 4:30 p.m. to 6:00 p.m. afternoon off-peak time had about 14 percent the total surveys.
- The morning inbound traffic had the lowest share of traffic with about 9 percent between 12:00 p.m. and 1:00 p.m. The evening outbound survey volumes have the lowest share of survey responses. The surveys between 4:30 p.m. and 6:00 p.m. had about 10 percent of the traffic volume. This is the smallest share of the outbound times.

Place of Trip Origin by Municipality

Inbound Trip Origins		Outbound Trip Origins	
<u>Municipality</u>	<u>% of Total</u>	<u>Municipality</u>	<u>% of Total</u>
1. Salisbury	18%	1. West Fallowfield	7%
2. East Lampeter	9%	2. Brandywine	6%
3. Manheim	7%	3. Highland	6%
4. York	5%	4. Atglen	5%
5. Lancaster	5%	5. Sadsbury	4%
6. Harrisburg	4%	6. West Sadsbury	4%
7. Paradise	4%	7. New Garden	4%
8. Christiana	3%	8. East Marlborough	3%
9. New Holland	3%	9. London Grove	3%
10. Sadsbury	3%	10. Philadelphia	3%

- There were 1,415 drivers responding to the question, “Where did you start this trip?” The numbers in the table above show only the trips originating in the top ten municipalities. The disaggregated numbers are shown in detail in Table A-3 in the Appendix.
- About 18 percent of the inbound trips originate in Salisbury and about 9 percent originate in East Lampeter with the remaining eight trip origins equaling about 42 percent. The smallest share was West Lampeter’s 1 percent, and the “other” category had about a 32 percent share of the total. A 7 percent share of the outbound trips originates in West Fallowfield. The remaining municipalities combine for about a 44 percent share with miscellaneous “other” origins adding up to about 49 percent of the responses.
- About 52 percent of the surveyed trips have home-based trip origins. Salisbury and West Fallowfield also have the largest share of inbound and outbound home-based trip origins with 16 and 10 percent, respectively.
- Truck trips constitute about 16 percent of the drivers surveyed. About 18 percent of the inbound trucks may be attributed to two origins: York (10%), and Salisbury (8%). The remaining inbound truck origins have a 35 percent share, with the “other” category having a 47 percent share. Similarly, the top outbound truck origin, Brandywine, equals only 8 percent with “other” having a dominant 56 percent share.

Place of Trip Destination by Municipality

Inbound Trip Destination		Outbound Trip Destination	
<u>Municipality</u>	<u>% of Total</u>	<u>Municipality</u>	<u>% of Total</u>
1. Atglen	8%	1. Salisbury	14%
2. Highland	7%	2. East Lampeter	10%
3. Brandywine	7%	3. Christiana	7%
4. West Fallowfield	6%	4. East Hempfield	5%
5. Philadelphia	5%	5. Manheim	5%
6. New Castle	3%	6. Sadsbury	4%
7. Salisbury	3%	7. Harrisburg	4%
8. East Marlborough	3%	8. Lancaster	4%
9. West Sadsbury	3%	9. York	4%
10. Ocean City, MD	2%	10. New Holland	3%

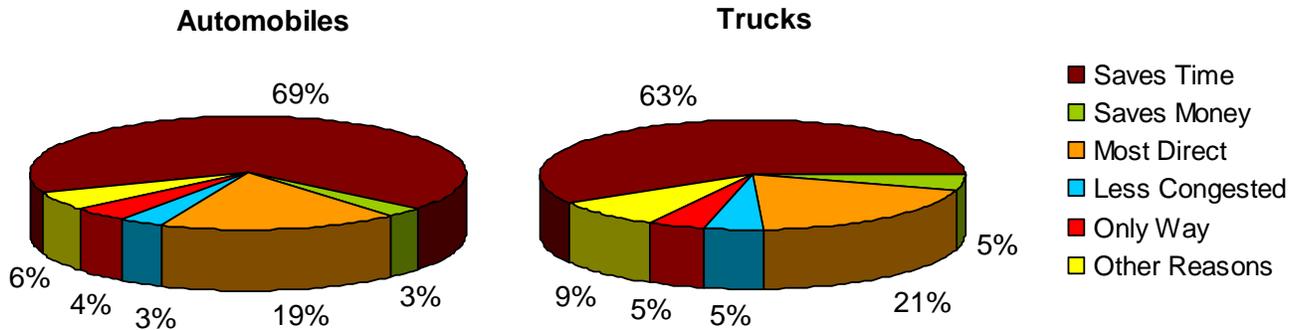
- There were 1,473 drivers responding to the question, “Where will this trip end?” The numbers in the table above show only the trip destinations aggregated for the top ten municipalities in each direction. The disaggregated numbers appear in detail in Table A-4 in the Appendix.
- The largest share of inbound trip destinations are to Atglen with an 8 percent share. Salisbury and East Lampeter combine for a 24 percent share of the outbound destinations. The “other” category dominates both inbound and outbound with about 46 and 34 percent shares respectively. The remaining inbound and outbound municipalities have smaller trip shares.
- Home-based trip destinations constitute about 50 percent of all trips. About 9 percent of home-based inbound trips have Atglen as their destination. About 24 percent of the home-based outbound trips are destined for Salisbury and East Lampeter.
- Truck trips are a 17 percent share of the surveyed vehicles, with a nearly equal number of inbound and outbound responses (126 and 130 respectively). About 10 percent of inbound truck destinations are to West Fallowfield. About 6 percent of the outbound truck destinations are destined for Salisbury. Trucks also have a large “other” destination response (56% inbound and 60% outbound), reflecting the multitude of delivery destinations made by commercial vehicles.

Trip Stops by Vehicle Type

<u>Survey Period</u>	<u>Passenger Vehicle Stopping</u>	<u>Commercial Vehicle Stopping</u>	<u>Total Stopping</u>
<u>Inbound Trips</u>			
6:30 a.m. - 10:30 a.m.	2.5%	0.0%	2.1%
10:30 a.m. - 1:00 p.m.	1.5%	5.0%	2.3%
1:00 p.m. - 4:30 p.m.	4.8%	0.0%	4.3%
4:30 p.m. - 8:00 p.m.	4.0%	13.3%	5.9%
<u>Outbound</u>			
6:30 a.m. - 10:30 a.m.	4.2%	9.5%	5.1%
10:30 a.m. - 1:00 p.m.	9.2%	17.1%	10.6%
1:00 p.m. - 4:30 p.m.	12.6%	8.0%	12.0%
4:30 p.m. - 8:00 p.m.	6.5%	9.3%	7.1%
TOTAL	5.5%	8.4%	6.0%

- There were 1,639 drivers responding to the question: “Will you stop before arriving at your destination?” The numbers in the table above were aggregated from the complete data set shown in Table A-5 in the Appendix.
- Only 75 automobiles and 24 trucks responded affirmatively, meaning only about 6 percent of total drivers planned to stop before arriving at their destination. The greatest total share of positive answers occurs inbound between 4:30 p.m. and 6:00 p.m. with about 8 percent, and outbound between 2:30 p.m. and 4:30 p.m. with about 15 percent.
- In all categories outbound drivers responded that they were more likely to stop than inbound drivers. About three-quarters of all the “stop” responses (75) were from passenger vehicles with 22 heading inbound and 53 vehicles heading outbound.
- About 8 percent of trucks (the largest share) responded that they were stopping prior to their final destination. About one-quarter of all the “stop” responses (24) were from trucks with 8 heading inbound and 16 vehicles heading outbound. The greatest total share of positive answers occurs inbound between 4:30 p.m. and 6:00 p.m. with about 15 percent, and outbound between 12:00 p.m. and 1:00 p.m. with about 27 percent.

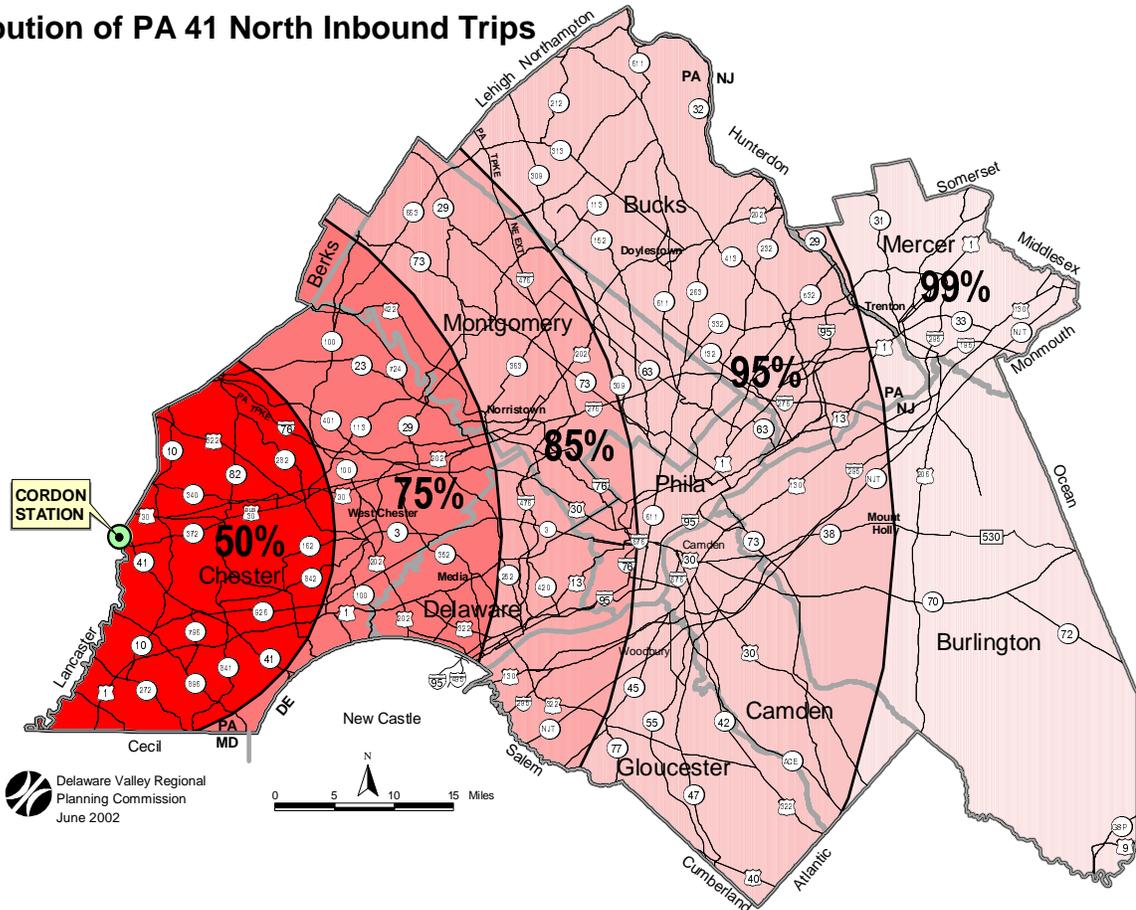
Reason for Using PA 41 North by Automobile and Truck Drivers



*Totals may exceed 100% due to multiple answers

- There were 1,326 passenger and 278 commercial vehicles responding to the question, “Why do you use this road?” The drivers were permitted to provide more than one answer, which means that totals in the Appendix tables can add to more than 100 percent. The complete data sets are in Tables A-6 and A-7 in the Appendix.
- “Saves time” was the dominant response for both vehicle types with 69 percent of the responses for automobiles and 63 percent for trucks. At the low end, a combined total of 10 percent of automobile and 15 percent of truck drivers responded with “saves money”, “only way” and “less congested”.
- The secondary response of “most direct” for automobile and truck drivers (19% and 21% respectively) acknowledges that a driver may choose a road because it is the only way to reach their destination.
- Between 1:00 p.m. and 4:30 p.m. 87 percent of automobile drivers proceeding inbound responded with “saves time”, and between 10:30 a.m. and 1:00 p.m. 76 percent of inbound trucks responded with “saves time”.

Distribution of PA 41 North Inbound Trips



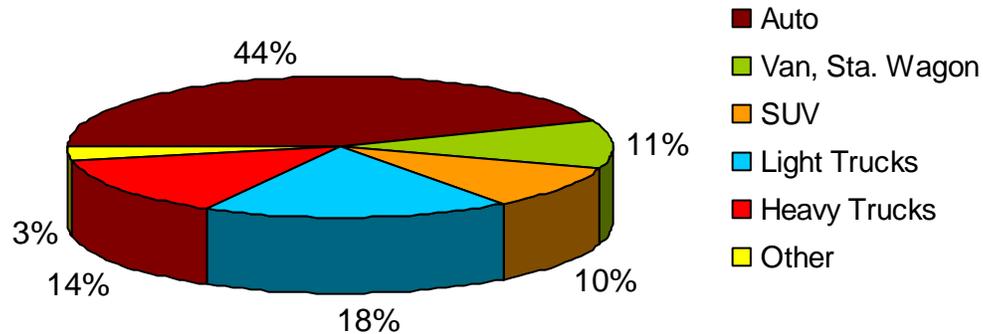
- The map shows the distribution of inbound trips within the DVRPC region, though the percentages also include values outside the region but within the isochrone lines. About 92 percent of the trips end within the region, the through trips are described below.
- About 38 percent of the surveyed vehicles were through trips with destinations outside the region.
- About 9 percent of the trips were headed to Delaware and about 16 percent were headed to Maryland. Another 3 percent were through trips headed further south.
- About 1 percent of the trips had destinations outside the region in north New Jersey and north towards New York City.
- About 8 percent of the trips were headed east towards New Jersey shore points.

Major Roads Taken by all Vehicles

Inbound Traffic		Outbound Traffic	
<u>Roads Used</u>	<u>% of Total</u>	<u>Roads Used</u>	<u>% of Total</u>
1. US 1	24%	1. US 30	51%
2. PA 10	8%	2. PA 283	11%
3. US 322	6%	3. PA 772	7%
4. I-95	6%	4. PA 741	6%
5. DE 7	6%	5. PA 896	2%
6. PA 372	5%	6. I-76	2%

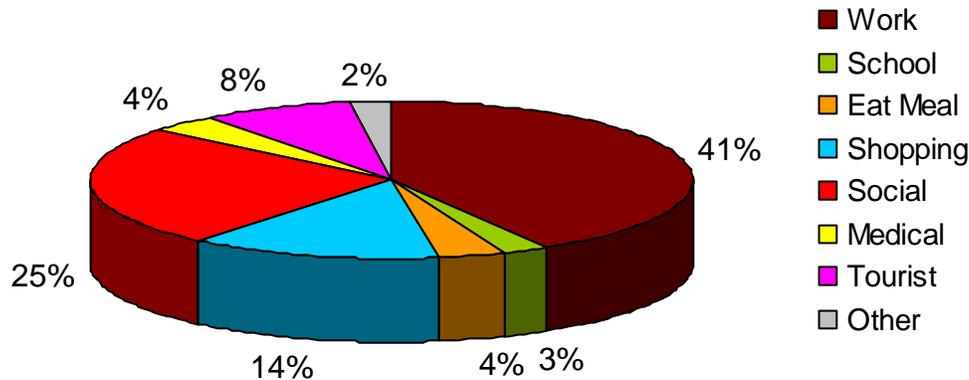
- There were 1,393 driver responses, other than “PA 41”, to the question “What is/are the major roads that you will take to reach your destination after this road?” The complete data set is in Table A-8 in the Appendix.
- About 24 percent of the total inbound drivers responded that US 1 would be the road they would use to reach their destination. Outbound traffic had a dominant response with US 30 at 51 percent and PA 283 at 11 percent for about two-thirds of the total. The “other” category had a 42 percent share inbound and 21 percent outbound. The remaining facilities have small shares of the total outbound volume.
- Inbound passenger vehicle responses were largely indistinguishable from the total responses with US 1 (25%), and “other” (41%) nearly the same. Outbound passenger vehicles were again largely indistinguishable from the total responses US 30 at 52 percent and PA 283 at 9 percent for about two-thirds of the total. Again, “other”, a catch-all for miscellaneous responses, was the dominant response inbound direction with 41 percent of the responses and outbound with 19 percent.
- Inbound truck responses varied somewhat from the passenger and total responses with US 1 (20%) and “other” (46%), while the rest of the cited roads have similar or slightly greater shares. Outbound trucks are a bit more concentrated, with US 30 at 48 percent and PA 283 at 16 percent. “Other”, a catch-all for miscellaneous responses, had about 26 percent of the responses.

Type of Vehicles Surveyed



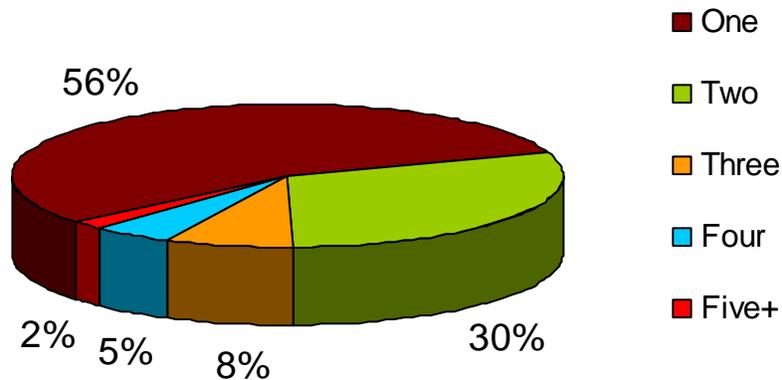
- The response to this question was obtained from observation rather than questioning the 1,640 drivers in the survey sample. The grouped categories are not aggregated the same as the 24 hour vehicle classification count, with some categories broken out and some combined in order to help with the analysis. The complete data set is in Table A-9 in the Appendix.
- The composition of the surveyed vehicles differ a from the one-way 24 hour vehicle classification counts. Surveyed passenger vehicles (autos, vans, SUVs) had a larger share than the 24 hour count (65% versus 56%). Light truck traffic (pickup, panel, and single unit) was similar for the survey and the 24 hour count (18% versus 21%).
- Automobiles make up about 44 percent of the surveyed vehicle mix, while vans with 11 percent and SUVs with about 10 percent constitute the rest of the passenger vehicles.
- Light trucks, including pick-up trucks, are about a 18 percent share, while surveyed heavy trucks had a 14 percent share of the total. This is less than the 24 hour count of 20 percent.

Trip Purpose of Passenger Vehicles



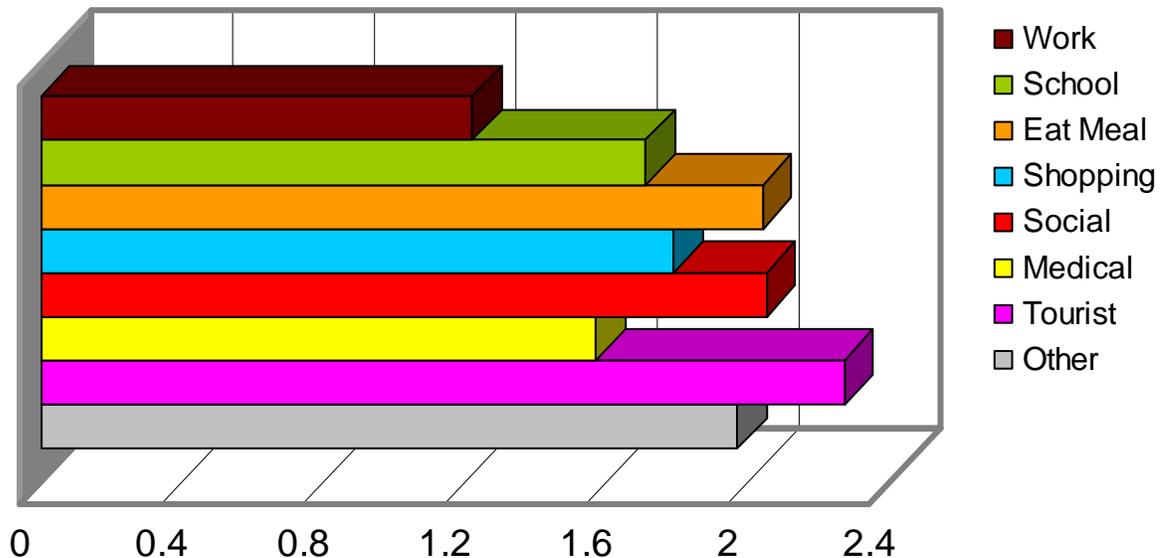
- Drivers in passenger vehicles were asked “What is the purpose of this trip?” Truck and commercial vehicle drivers were not asked this question as their purpose was evident. The complete data set is in Table A-10 in the Appendix.
- The work trip is the greatest trip purpose with about 41 percent of the total trips. Work trips dominate the morning peak hours between 6:30 a.m. and 8:30 a.m. with inbound and outbound shares (71% and 59% respectively). The PM peak between 4:30 p.m. and 6:00 p.m. have inbound and outbound shares (23% and 35%) which are not as dominant as the AM peaks.
- The social trip is the secondary reasons for making a trip, with about 25 percent of total trips. Social trips have their greatest concentration inbound between 4:30 p.m. and 8:00 p.m. (41%). Shopping provides about 14 percent of the trip purposes with the greatest concentration inbound between 1:00 p.m. and 4:30 p.m. (18%) and outbound between 10:30 a.m. and 1:00 p.m. (21%)
- The remaining five categories are split among the remaining 20 percent of trip purposes. Meal, medical and tourist together have about 16 percent total. School and “other” each offer small shares (3%, 2% respectively). None of these have notable shares in any survey period.

Vehicle Occupancy



- This question, “How many people are in the vehicle?” was obtained by observation rather than questioning the 1,297 drivers in the survey sample. This question was used for passenger vehicles only. The complete data set is in Table A-11 in the Appendix.
- Single occupant vehicles were 56 percent of total vehicles surveyed. The greatest share was distributed inbound and outbound between 6:30 a.m. and 8:30 p.m. (50% and 47% respectively).
- Two occupant vehicles are a 30 percent share of the vehicles surveyed and they have a double digit share in every survey period. The greatest inbound share of two occupant vehicles is 22 percent during the 10:30 a.m. and 12:00 p.m. period, while the greatest outbound share is 22 percent during the 2:30 p.m. to 4:30 p.m. time period.
- Three and four occupant vehicles have much smaller shares than the lesser occupied vehicles (8% and 5% respectively). Only 24 vehicles had 5+ occupants, giving it the smallest share with about 2 percent of the total.

Average Vehicle Occupancy by Trip Purpose



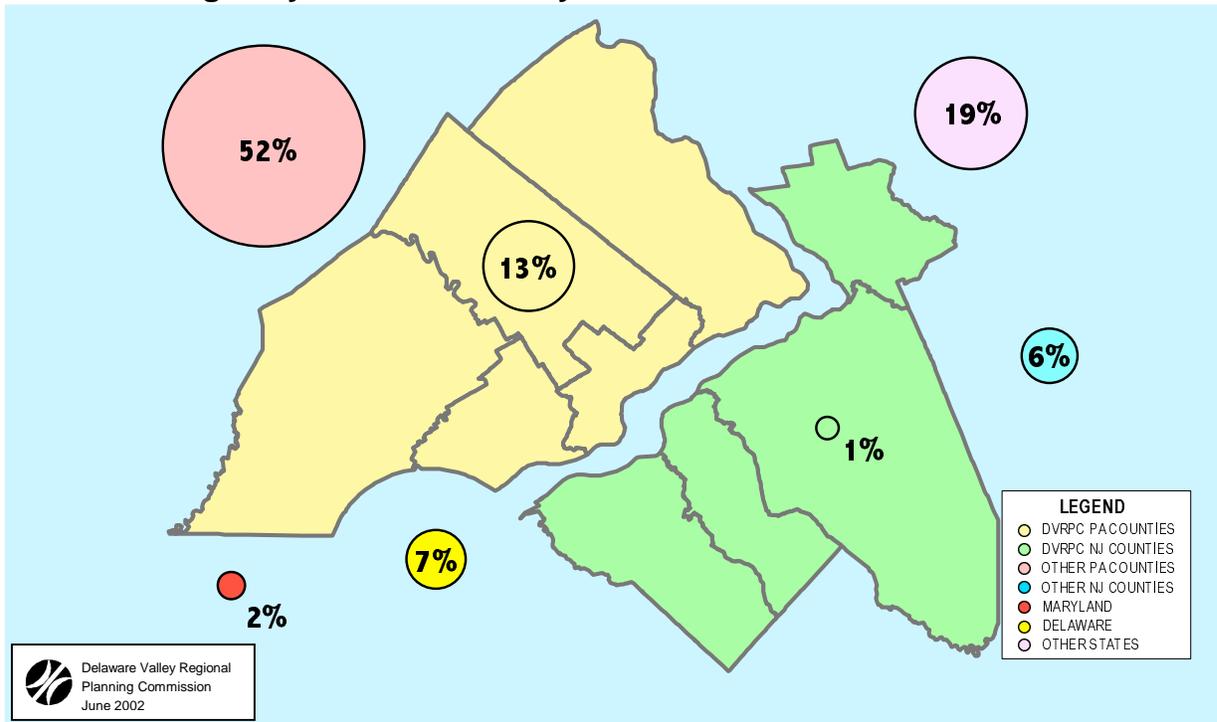
- Average vehicle occupancy by trip purpose was obtained by cross tabulating the observed vehicle occupancy with the survey question regarding trip purpose. The complete data set is in Table A-12 in the Appendix.
- Average occupancy for the van/station wagons is the greatest (1.91), exceeding the average SUV occupancy (1.65) and average auto occupancy (1.68). The SUV occupancy is less than the average occupancy of 1.66 persons per vehicle.
- Total work trips have the lowest vehicle occupancy rates for any trip purpose (1.22). The work trip occupancy rate for automobiles (1.20) and SUVs (1.21), is exceeded by van/station wagons (1.24), though all are very close.
- The trip purposes, other than work trips, with the greatest total occupancy rate are the tourist, social and eat meal categories with 2.27, 2.05 and 2.04 persons per vehicle respectively. The greatest occupancy rate overall is for the miscellaneous “other” purpose and tourist by van/station wagon (3.29 and 2.70 respectively). Closely following is the “other” purpose in the SUV mode with 2.60 persons per vehicle.
- The lowest occupancy rates, besides work trips, occur for automobiles in the “other” and school categories (1.44 and 1.58 respectively), and for SUVs in the medical category (1.50).

Vehicle Trip Length Distribution within the DVRPC Region

<u>Trip Length</u>	<u>Work Trips</u>	<u>Auto Trips</u>	<u>Truck Trips</u>
0-5 miles	30%	28%	22%
5-10 miles	20%	23%	7%
10-20 miles	28%	28%	44%
20-50 miles	19%	18%	24%
>50 miles	3%	3%	4%
Average Trip Length	14.2	14.0	18.4

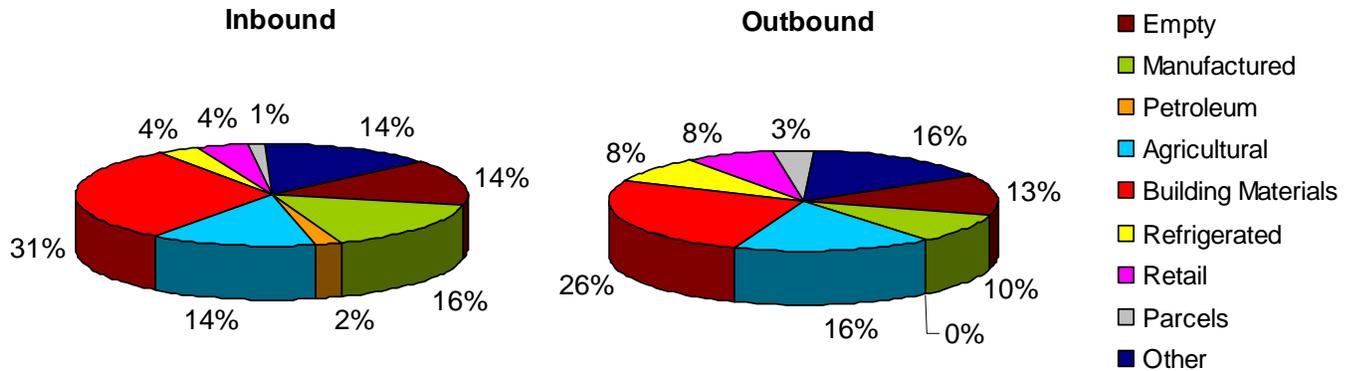
- The results for this query were obtained by using the GIS to compute distances between the cordon station and origins/destinations within the region gathered with the first two questions in the survey. This data is broken out by home-based work trips, passenger vehicle trips and truck trips. The data has been put into five general groupings by the distance traveled: 0-5 miles, 5-10 miles, 10-20 miles, 20-50 miles and above 50 miles. The complete data set is in Table A-13 in the Appendix.
- The average trip lengths vary from about 14 to 18 miles, with truck trips possessing the longest trip length (18 miles) and automobile trips the shortest (about 14 miles). The average distance for all the modes clustered at about 10-20 miles. The average values within this cluster vary slightly (28, 28, 44 miles respectively). There were 10 trips recorded beyond 60 miles.
- As would be expected, trip lengths for trucks are greater than automobile trips. The 10-50 mile trip length contains 68 percent of the commercial vehicle trips with 29 percent of the trips 10 miles and under. The other vehicle trips each have about 47 percent of their values in the 10-50 mile range for home-based work and automobile trips.
- Work and automobile trips have 30 and 28 percent shares respectively in the 0 to 5 mile range, and 20 and 23 percent shares in the 5 to 10 mile range. Work and automobile trips both have small numbers traveling 50-60 miles. There were 3 and 3 trips, respectively, in this distance category.

Trucks Garaged by State and County



- There were 285 truck drivers asked “In what county is your truck garaged or parked when not in service?” Passenger vehicles were not asked this question. The complete data set is in Table A-14 in the Appendix.
- About one-seventh of the surveyed trucks are garaged within the DVRPC region (1% in New Jersey and 13% in Pennsylvania) while a few of truck drivers house their trucks outside the DVRPC region in New Jersey or Pennsylvania (6% and 52% respectively).
- Maryland and Delaware make up 2 percent and 7 percent of the garage locations. The remaining 19 percent of the responses are singular locations distributed throughout the United States.
- About 57 percent of the inbound traffic is garaged in Pennsylvania, while 9 percent of inbound traffic is garaged in New Jersey, with the rest miscellaneous. This distribution is reversed somewhat with about 72 percent of the outbound traffic garaged in Pennsylvania, while 7 percent did likewise in New Jersey, with the rest miscellaneous.

Type of Commodities Carried by Trucks



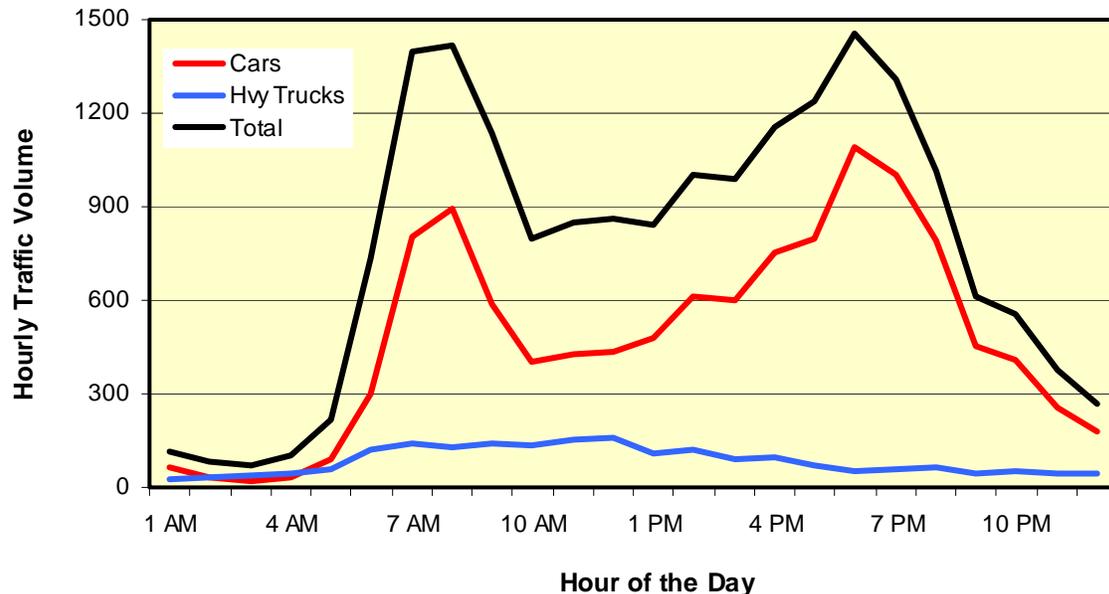
- Truck drivers were asked “What type of commodities are you carrying?” Passenger vehicles were not asked this question. The complete data set is in Table A-15 in the Appendix.
- The number of inbound and outbound trucks surveyed was nearly equal (93 versus 87 surveyed trucks). The inbound and outbound results generally mirror each other, though there are some exceptions.
- The largest total response is building materials (28% total) with 30 percent and 26 percent shares inbound and outbound respectively. Agricultural products and “other” (both 15%), “empty” (14%), and manufactured products (13%) constitute the middle values. Refrigerated and retail products (both 6%), parcels (3%), and petroleum products (1%) bring up the least common commodities carried by trucks.
- Trucks are equally likely to be traveling empty inbound and outbound (14% versus 13%). Manufactured products made up about 16 percent of the inbound traffic, but 10 percent of the outbound flow. Refrigerated products have half the inbound (4%) as the outbound flow (8%).

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PART 2
US 30 Survey Summary Results

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Daily Traffic Counts by Hour of the Day



- Vehicle classification traffic counts were collected during 24 hours preceding the survey. The US 30 north traffic counts were taken near the Chester / Lancaster county boundary, where the field survey was conducted. The traffic volume at that point was 18,612 vehicles classified by vehicle type. The statistical portrait of the classification counts for US 30 is shown in Table B-1 in the Appendix B in the back of the report.
- The AM peak hour traffic occurred between the hours of 7:00 a.m. and 8:00 a.m. The count for that hour was 1,419 vehicles. This count was 7.6 percent of the 24 hour traffic volume. The PM peak occurred between the hours of 5:00 p.m. and 6:00 p.m. The count for that hour was 1,458 vehicles. This constitutes 7.8 percent of the 24 hour traffic volume.
- The vehicular counts were dominated by 11,510 automobiles. This is about 62 percent of the 24 hour vehicular count. Light trucks were about 24 percent of the vehicles.
- Heavy trucks, those with more than two axles, make up about 11 percent of the vehicular traffic. Buses and Motorcycles together were about 3 percent share of the vehicle counts.

Total Interviews by Survey Period

<u>Survey Period</u>	<u>Total Surveys</u>	<u>Inbound Surveys</u>	<u>% of Total</u>	<u>Outbound Surveys</u>	<u>% of Total</u>
<u>Morning Shift</u>					
6:30 a.m. - 10:30 a.m.	455	235	28%	220	27%
10:30 a.m. - 1:00 p.m.	369	184	22%	185	23%
<u>Evening Shift</u>					
1:00 p.m. - 4:30 p.m.	416	207	25%	209	26%
4:30 p.m. - 8:00 p.m.	408	201	24%	207	25%
TOTAL	1648	827	100%	821	100%

- There were 1,648 drivers responding to the survey at this location. This sample is about 92 percent of the desired total of 1,800. The hourly shift totals have been added together to create the table above. The disaggregated numbers are shown in greater detail in Table B-2 in the Appendix.
- There was a similar number of surveys in each direction with 827 inbound and 821 outbound vehicles surveyed at the cordon station. The 6:30 a.m. to 8:30 a.m. morning peak time had about 14 percent of the total volume, while the 4:30 p.m. to 6:00 p.m. afternoon peak time had about 8 percent the total surveys, the lowest share of the evening shift counts.
- The inbound morning peak (6:30 a.m. to 10:30 a.m.) volume and the outbound morning peak volume are similar (28% versus 27% respectively). This pattern is followed throughout the day with the morning off-peak surveys between 10:30 a.m. and 1:00 p.m. (22% inbound versus 23% outbound) and the afternoon off-peak surveys between 1:00 p.m. and 4:30 p.m. (25% inbound and 26% outbound). The inbound and outbound responses in the evening peak are also approximately equal (24% inbound versus 25% outbound).

Place of Trip Origin by Municipality

Inbound Trip Origins		Outbound Trip Origins	
<u>Municipality</u>	<u>% of Total</u>	<u>Municipality</u>	<u>% of Total</u>
1. Salisbury	20%	1. Sadsbury	10%
2. Lancaster	17%	2. Caln	8%
3. East Lampeter	7%	3. Philadelphia	7%
4. York	6%	4. West Whiteland	5%
5. Paradise	4%	5. Coatesville	5%
6. Manheim	4%	6. West Goshen	5%
7. Sadsbury	4%	7. Downingtown	4%
8. East Hempfield	4%	8. West Sadsbury	4%
9. Strasburg	2%	9. Valley	3%
10. Christiana	2%	10. Upper Merion	2%

- There were 1,520 drivers responding to the question, “Where did you start this trip?” The numbers in the table above show only the trips originating in the top ten municipalities. The disaggregated numbers are shown in detail in Table B-3 in the Appendix.
- About 20 percent of the inbound trips originate in Salisbury and about 17 percent originate in Lancaster with the remaining trip origins equaling about 40 percent. The smallest shares (not shown above) are West Lampeter’s 2 percent and Harrisburg with about 1 percent. About 23 percent of the total origins were described as “other”. About 25 percent share of the outbound trips originates in three municipalities: Sadsbury, Caln, and Philadelphia with the rest of the municipalities combining for about a 36 percent share with about 39 percent of the responses indicating miscellaneous “other” origins.
- About 62 percent of the surveyed trips have home-based trip origins. The distribution of trip origins differ little from the total trips. Both Salisbury and Lancaster have a combined 38 percent share inbound, while Sadsbury, Caln, and Philadelphia together have about a 25 percent share of outbound home-based trip origins.
- Truck trips constitute about 16 percent of the drivers surveyed. About 20 percent of the inbound trucks may be attributed to origins in York and Paradise. The “other” category, not shown in the table and composed of miscellaneous responses, had a 43 percent inbound share. The outbound truck origins are split between Philadelphia with 17 percent and with “other” having a 53 percent share.

Place of Trip Destination by Municipality

Inbound Trip Destination		Outbound Trip Destination	
<u>Municipality</u>	<u>% of Total</u>	<u>Municipality</u>	<u>% of Total</u>
1. Philadelphia	11%	1. Salisbury	23%
2. Sadsbury	10%	2. Manheim	11%
3. Coatesville	7%	3. Paradise	6%
4. Downingtown	6%	4. Lancaster	6%
5. West Goshen	6%	5. York	4%
6. West Whiteland	5%	6. East Lampeter	4%
7. East Whiteland	3%	7. West Lampeter	3%
8. Caln	3%	8. Strasburg	3%
9. Parkesburg	3%	9. Atglen	3%
10. West Brandywine	3%	10. Christiana	3%

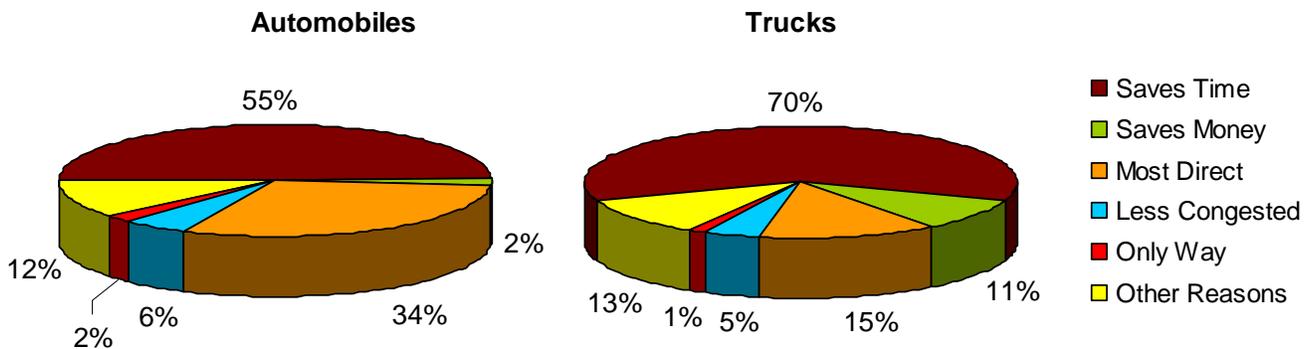
- There were 1,508 drivers responding to the question, “Where will this trip end?” The numbers in the table above show only the trip destinations aggregated for the top ten municipalities in each direction. The disaggregated numbers appear in detail in Table B-4 in the Appendix.
- The largest share of inbound trip destinations are to Philadelphia and Sadsbury with 11 percent and 10 percent shares, respectively. Salisbury and Manheim combine for a 34 percent share of the outbound destinations. The remaining inbound and outbound municipalities have smaller trip shares, though “other” destinations account for 36 and 26 percent shares, respectively.
- Home-based trip destinations constitute about 62 percent of all trips. About 29 percent of home-based inbound trips have Sadsbury, Coatesville, and Philadelphia as their destinations. About 37 percent of the home-based outbound trips are destined for Salisbury and Manheim.
- Truck trips are a 17 percent share of the surveyed vehicles with 21 percent of the inbound trucks going to Philadelphia. About 23 percent of the outbound truck destinations are destined for Manheim and Salisbury. Trucks also have a large “other” destination response (44% inbound and 47% outbound), reflecting the multitude of delivery destinations made by commercial vehicles.

Trip Stops by Vehicle Type

<u>Survey Period</u>	<u>Passenger Vehicle Stopping</u>	<u>Commercial Vehicle Stopping</u>	<u>Total Stopping</u>
<u>Inbound Trips</u>			
6:30 a.m. - 10:30 a.m.	0.5%	0.0%	0.4%
10:30 a.m. - 1:00 p.m.	2.1%	4.8%	2.7%
1:00 p.m. - 4:30 p.m.	4.8%	7.1%	5.0%
4:30 p.m. - 8:00 p.m.	3.7%	7.9%	4.4%
<u>Outbound</u>			
6:30 a.m. - 10:30 a.m.	8.8%	16.7%	10.1%
10:30 a.m. - 1:00 p.m.	5.4%	8.3%	6.1%
1:00 p.m. - 4:30 p.m.	19.9%	12.5%	18.9%
4:30 p.m. - 8:00 p.m.	7.7%	0.0%	7.7%
TOTAL	6.6%	7.7%	6.7%

- There were 1,601 drivers responding to the question: “Will you stop before arriving at your destination?” The numbers in the table above were aggregated from the complete data set shown in Table B-5 in the Appendix.
- There were 108 driver responses that they were going to stop before arriving at their destination. This consisted of 89 automobiles and 19 trucks responding affirmatively, meaning about 7 percent of responding drivers planned to stop before arriving at their destination.
- Only 25 drivers traveling inbound had “stop” responses, while 83 outbound drivers had the same response. The hours between 1:00 p.m. and 4:30 p.m. with 5 percent were the greatest inbound share. During the same hours between 1:00 p.m. and 4:30 p.m., 19 percent of outbound drivers responded that they planned on stopping.
- Trucks had a different, and smaller, pattern of replies. The hours between 8:30 a.m. and 10:30 a.m., and 2:30 p.m. and 4:30 p.m. each have 21 percent of the outbound drivers responding that they would be stopping.

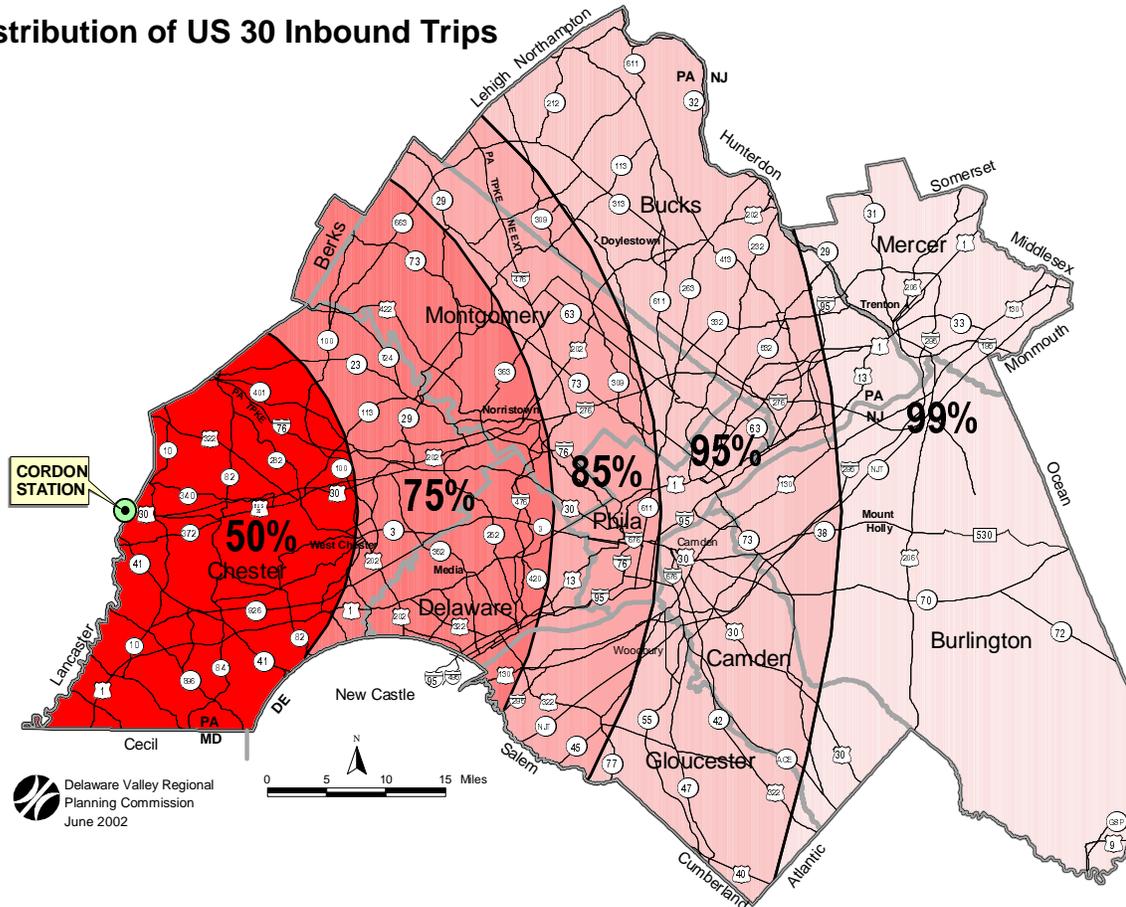
Reason for Using US 30 by Automobile and Truck Drivers



*Totals may exceed 100% due to multiple answers

- There were 1,338 passenger and 288 commercial vehicles responding to the question, “Why do you use this road?” The drivers were permitted to provide more than one answer meaning that totals in the Appendix can add to more than 100 percent. The complete data sets are in Tables B-6 and B-7 in the Appendix.
- “Saves time” was the largest response for both vehicle types with 55 percent of the responses for automobiles and 70 percent for trucks. About 4 percent of automobile drivers responded with “saves money”, “only way”, while about 1 percent of truck drivers responded with “only way”.
- There are differences between automobile and truck driver responses with “most direct” (34% versus 15% respectively), and “saves money” (2% versus 11% respectively).
- Between 6:30 a.m. and 10:30 a.m. 98 percent of automobile drivers proceeding inbound responded with “saves time”. Inbound trucks between 10:30 a.m. and 1:00 p.m. responded “saves time” 98 percent of the time. None of these shares are repeated in the outbound driver responses
- Inbound automobile drivers responded “most direct” about 75 percent of the time in the afternoon peak period between 4:30 p.m. to 8:00 p.m. These numbers are not, however, mirrored in the outbound direction for automobiles. Fifty percent of inbound truck drivers responded to the same question between 4:30 p.m. to 8:00 p.m.

Distribution of US 30 Inbound Trips



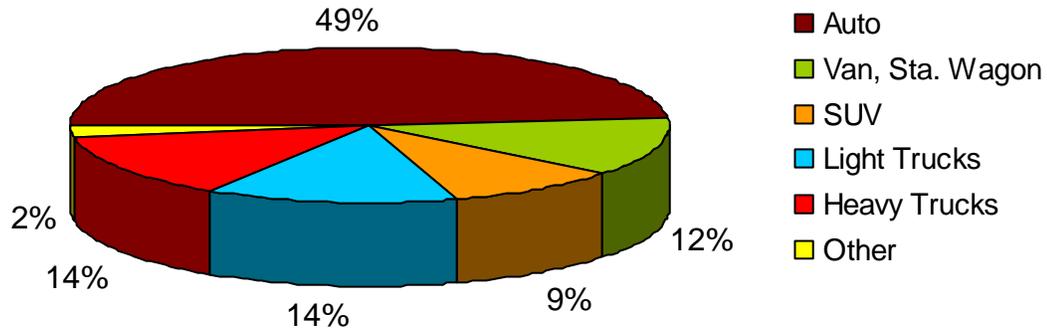
- The map shows the distribution of inbound trips within the DVRPC region, though the percentages also include values outside the region but within the isochrone lines. About 90 percent of the trips end within the region, the through trips are described below.
- Only about 7 percent of the surveyed vehicles were through trips with destinations outside the region. Of these trips about 0.5 percent of all trips were headed west out of the region into Pennsylvania towards Lancaster County..
- About 1.3 percent of the through trips went north of Pennsylvania up the PA Turnpike Northeast Extension (I-476) and beyond.
- About 2 percent of the trips had destinations outside the region in north New Jersey towards New York City and beyond to the New England states
- Only 1.3 percent of the trips were headed east towards shore points. Another 1.9 percent of the trips were headed south to Delaware and Maryland.

Major Roads Taken by all Vehicles

Inbound Traffic		Outbound Traffic	
<u>Roads Used</u>	<u>% of Total</u>	<u>Roads Used</u>	<u>% of Total</u>
1. US 202	31%	1. PA 41	16%
2. I-76 Tpke	13%	2. PA 283	12%
3. PA 100	8%	3. PA 741	7%
4. PA 10	6%	4. I-81	4%
5. US 322	4%	5. I-76	4%
6. I-95	3%	6. PA 372	3%

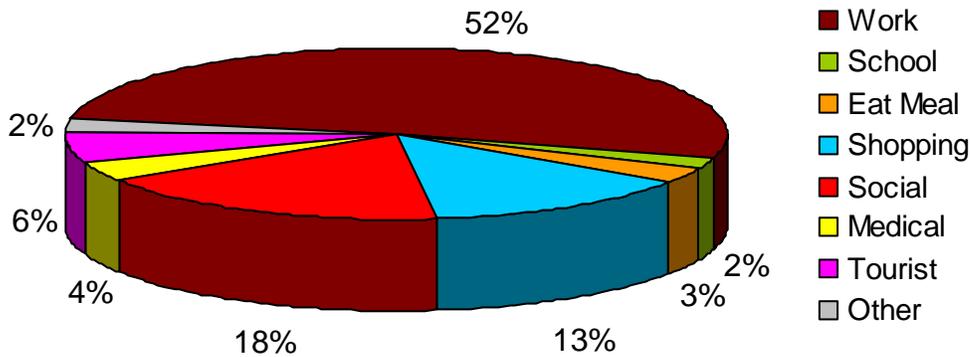
- There were 940 driver responses to the question “What is/are the major roads that you will take to reach your destination after this road?” The complete data set is in Table B-8 in the Appendix.
- About 44 percent of the total inbound drivers responded that US 202 (31%) or I-76 (13%) would be the road they would use to reach their destination. This response is not surprising given that these two facilities are major through roads within the region. The “other” category had a 32 percent share, with the remaining facilities having small shares of the total inbound volume.
- Outbound traffic had a lesser route response with PA 41 with 16 percent and PA 283 with 12 percent. The “other” category had a 51 percent share, with the remaining facilities having small shares of the total outbound volume.
- Inbound truck responses were largely indistinguishable from the passenger or total responses with US 202 (26%), I-76 (17%) and “other” (37%) combining for an 80 percent share. There are differences in the outbound direction with trucks on PA 283 (22%) and I-81 (12%) generating a combined 34 percent. Again, “other”, a catch-all for miscellaneous responses, was the largest response in the outbound direction with 50 percent of the responses. This result affirms the dispersed nature of the routes and destinations outside the region.

Type of Vehicles Surveyed



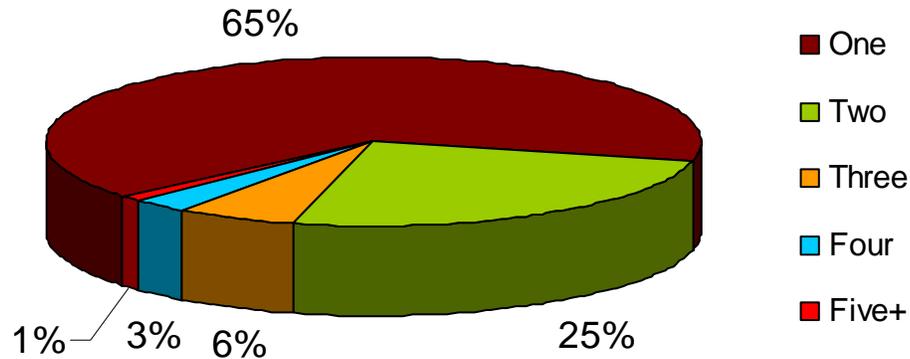
- The response to this question was obtained from observation rather than questioning the 1,648 drivers in the survey sample. The grouped categories are not aggregated the same as the 24 hour vehicle classification count, with some categories broken out and some combined in order to help with the analysis. The complete data set is in Table B-9 in the Appendix.
- The composition of the surveyed vehicles differs from the one-way 24 hour vehicle classification counts. Surveyed passenger vehicles (autos, vans, SUVs) had a greater share than the 24 hour count (72% versus 62%). Light truck traffic (pickup, panel, and single unit) had a lesser share during the survey than the 24 hour class count (14% versus 24%). The combined totals of passenger vehicles and light trucks, however, are nearly the same for both the survey as the 24 hour class count (86% and 86%, respectively)
- Automobiles make up about 49 percent of the surveyed vehicle mix, while vans, with 12 percent and SUVs, with a little over 9 percent, constitute the rest of the passenger vehicles.
- Surveyed heavy trucks had about a 14 percent share, which is greater than the 24 hour class count of about 11 percent.

Trip Purpose of Passenger Vehicles



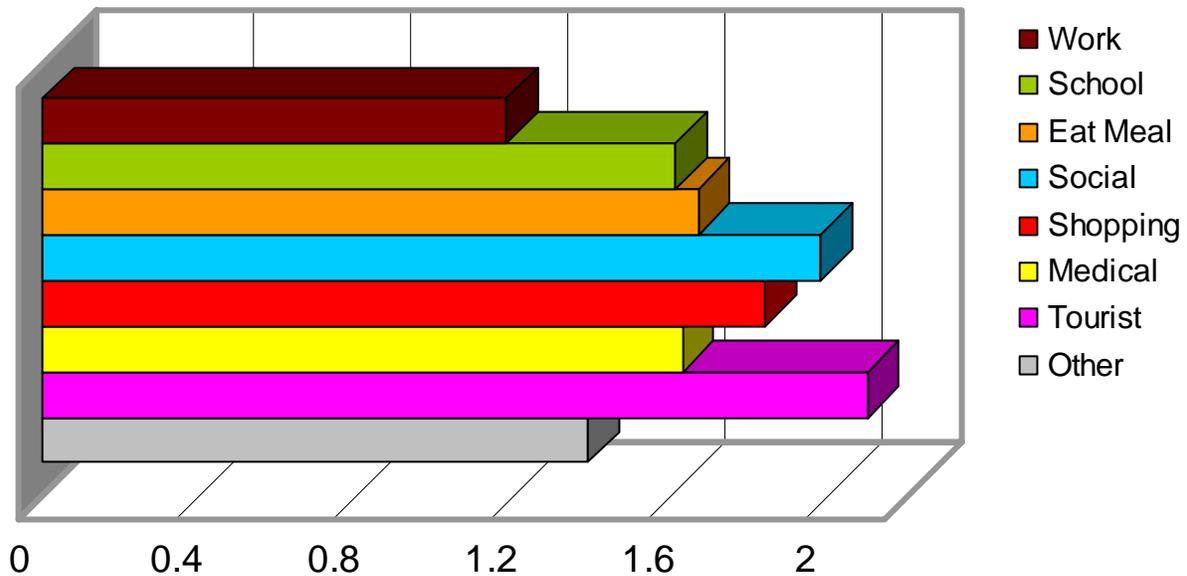
- Drivers in passenger vehicles were asked “What is the purpose of this trip?” Truck and commercial vehicle drivers were not asked this question as their purpose was evident. The complete data set is in Table B-10 in the Appendix.
- The work trip was the most common trip purpose with about 52 percent of the total trips. Work trips dominate the morning peak hours between 6:30 a.m. and 8:30 a.m. with inbound and outbound shares of 87 percent and 84 percent, respectively. The afternoon inbound and outbound peak hours between 4:30 p.m. and 6:00 p.m. have lesser shares than the AM peaks with 38 percent and 59 percent, respectively.
- The social trip is the secondary reasons for making a trip, with about 18 percent of total trips. Social trips are low during morning periods in both directions, but reach their greatest concentration both inbound and outbound between 4:30 p.m. and 8:00 p.m. (27% and 30%).
- The remaining six categories are divided among the remaining 30 percent of trip purposes. Shopping had the largest share of the remaining purposes with 13 percent. Eat meal, medical and tourist each have small shares of 3, 4, and 6 percent, respectively. “Other” and school each had similar 2 percent shares.

Vehicle Occupancy



- The answer to the question, “How many people are in the vehicle?” was obtained by observation, rather than questioning the 1,348 drivers in the survey sample. This question was used for passenger vehicles only. The complete data set is in Table B-11 in the Appendix.
- Single occupant vehicles were 65 percent of total vehicles surveyed. The greatest share occurs inbound and outbound between 6:30 a.m. and 8:30 a.m. (87% and 83%, respectively).
- Two occupant vehicles are a 25 percent share of the vehicles surveyed and they have a double digit share in every survey period. The greatest inbound share is 33 percent during the 12:00 p.m. to 1:00 p.m. period, while the greatest outbound share is 34 percent during the 6:00 p.m. to 8:00 p.m. time period.
- Three and four occupant vehicles combine for about a 9 percent share of the total (6% and 3% respectively). Only fifteen vehicles had 5+ occupants, giving it the smallest share with about 1 percent of the total.

Average Vehicle Occupancy by Trip Purpose



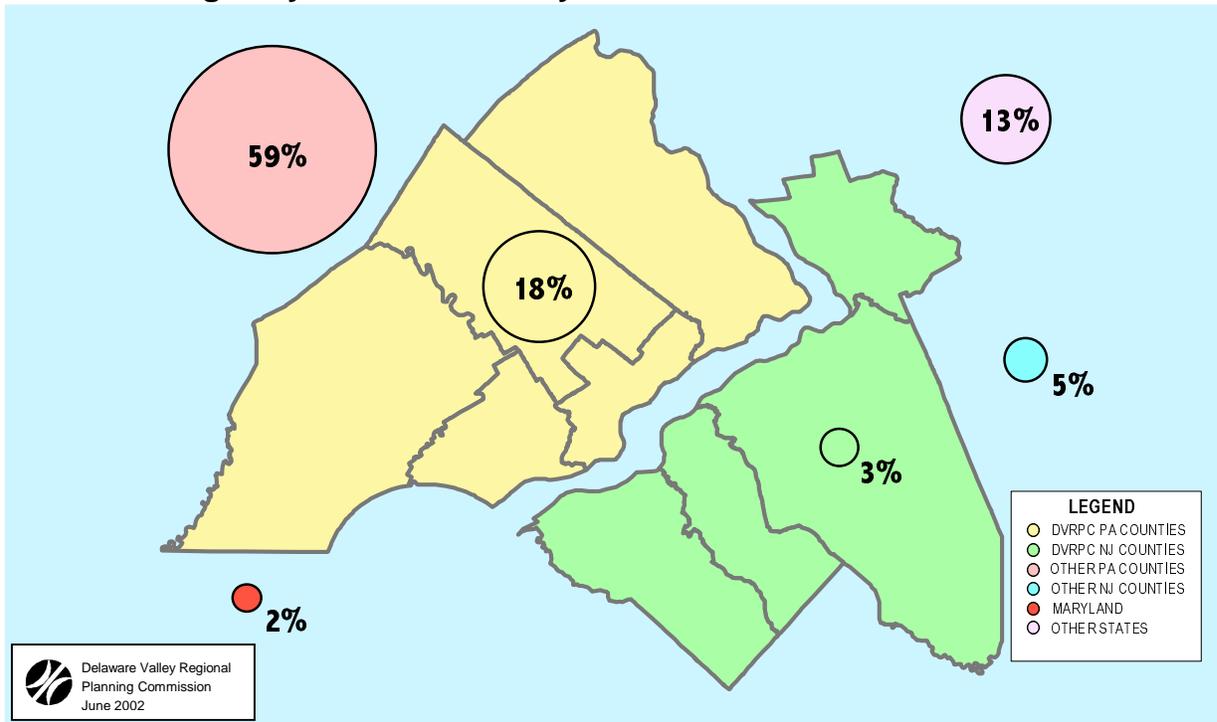
- Average vehicle occupancy by trip purpose was obtained by cross tabulating the observed vehicle occupancy with the survey question regarding trip purpose. The complete data set is in Table B-12 in the Appendix.
- The total average for all vehicles is 1.51 persons per vehicle. Average occupancy for the van/station wagons is the greatest (1.80), exceeding the average SUV occupancy (1.60) and average automobile occupancy (1.47). The mode with the greatest occupancy rate is the van/station wagon on social and tourist trips with 3.00 and 2.47 persons per van/station wagon, respectively.
- Total work trips have the lowest vehicle occupancy rates for any trip purpose (1.18). The occupancy rate in this category for individual vehicles such as automobiles (1.13), SUVs (1.27), and van/station wagons (1.27) is the lowest of any trip purpose. Individually, by vehicle type, the SUV had a high of 2.40 persons per vehicle for tourist category while the automobile had a 2.00 rate in the tourist category.
- The total trip purposes with the greatest total occupancy rate are the tourist and social trip categories with 2.10 and 1.98 persons per vehicle, respectively.

Vehicle Trip Length Distribution within the DVRPC Region

<u>Trip Length</u>	<u>Work Trips</u>	<u>Auto Trips</u>	<u>Truck Trips</u>
0-5 miles	14%	18%	11%
5-10 miles	15%	18%	13%
10-20 miles	35%	29%	17%
20-50 miles	35%	32%	47%
>50 miles	2%	3%	12%
Average Trip Length	19.1	18.8	29.1

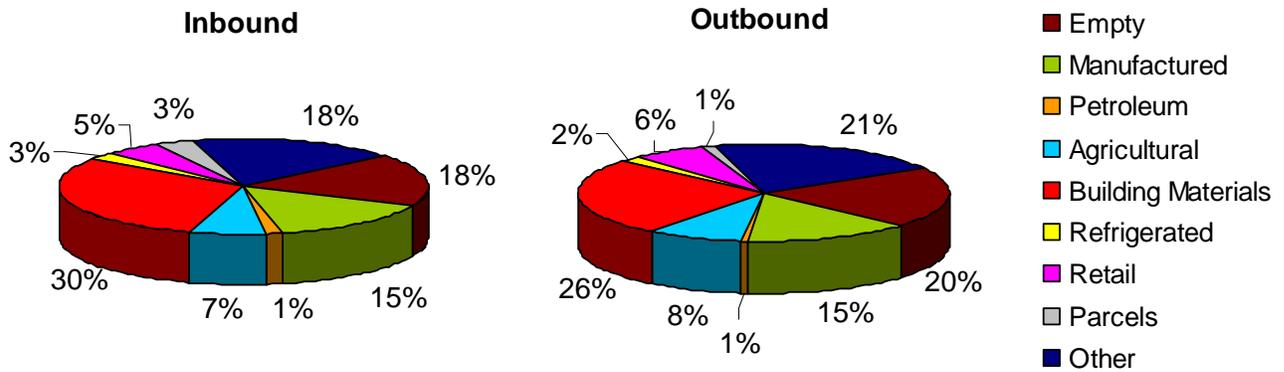
- The results for this query were obtained by using the GIS to compute distances between the cordon station and origins/destinations within the region gathered with the first two questions in the survey. This data is broken out by home-based work trips, passenger vehicle trips and truck trips. The data has been put into five general groupings by the distance traveled: 0-5 miles, 5-10 miles, 10-20 miles, 20-50 miles and above 50 miles. The complete data set is in Table B-13 in the Appendix.
- The average trip lengths vary from about 19 to 29 miles, with truck trips possessing the longest trip length (29 miles) and automobile and work trips roughly the same (about 19 miles). Auto and work trips generally mimic one another, while the truck trips show a greater clustering as the distances increase.
- As might be expected, trip lengths for trucks are greater than automobile trips. The trips with 10 miles and under have a 24 percent share, for the 10-50 mile trip distance contains 64 percent of the truck trips, and trips 50 miles and more have 12 percent of the trips.
- Work and automobile trips have similar shares in the 0 to 5 mile range and in the 5 to 10 mile range (combined 29 percent and 36 percent, respectively). The work and auto trips each have about 70 percent and 61 percent of their values in the 10-50 mile range. Work and automobile trips have 2 percent and 3 percent of the trips traveling 50-60 miles.

Trucks Garaged by State and County



- There were 268 truck drivers responded to the question “In what county is your truck garaged or parked when not in service?” Passenger vehicles were not asked this question. The complete data set is in Table B-14 in the Appendix.
- About one-fifth of the surveyed trucks are garaged within the DVRPC region (18% in Pennsylvania and 3% in New Jersey). A large portion of truck drivers house their trucks outside the DVRPC region in Pennsylvania (59%) and a small portion do likewise in New Jersey (5%).
- Maryland has only about 2 percent of the truck garage locations. The remaining 13 percent of the responses are PA singular locations distributed throughout the United States.
- About 71 percent of the inbound trucks garaged in Pennsylvania, while 11 percent of the inbound trucks did likewise in New Jersey. The remaining 18 percent garaged in other states. About 85 percent of the outbound trucks garaged in Pennsylvania, while 5 percent did likewise in New Jersey, and the remaining 10 percent elsewhere.

Type of Commodities Carried by Trucks



- Truck drivers were asked the question “What type of commodities are you carrying?” Passenger vehicles were not asked this question. The complete data set is in Table B-15 in the Appendix.
- The number of inbound and outbound trucks surveyed was nearly equal (147 versus 144 surveyed trucks). The inbound and outbound results generally mirror each other without exception.
- The largest total response is building materials (28% total) with inbound and outbound shares at 30 percent and 26 percent. “Other” (20%), empty (19%), and manufactured products (15%) constitute the middle values. Refrigerated (2%), parcels (2%), and petroleum products (1%) bring up the least common commodities carried by trucks.
- Trucks are slightly more likely to be traveling empty outbound than inbound (20% versus 18%). There were only minor disparities between inbound and outbound commodities. Only building materials with a 4 percent difference exceeded the 1 percent differences in the other commodities.

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APPENDIX A

Survey Responses for PA 41, Gap Newport Pike Cordon Station South of Zook Road, West Sadsbury Township, Chester County, Pennsylvania

**Table A-1. Daily Vehicle Classification Traffic Counts
(PA 41 North Cordon Station South of Zook Road, West Sadsbury Township)**

Hour of Day	Vehicle Type													Hourly Counts	% of Total
	1	2	3	4	5	6	7	8	9	10	11	12	13		
12 am - 1 am	1	41	13	2	1	0	1	1	49	1	0	0	0	110	0.8%
1 am - 2 am	1	32	7	8	0	1	2	1	37	1	0	0	0	90	0.7%
2 am - 3 am	1	15	8	3	3	2	1	4	36	0	0	0	0	73	0.6%
3 am - 4 am	2	16	7	9	1	1	2	4	23	25	0	0	0	90	0.7%
4 am - 5 am	3	38	19	17	11	6	12	7	79	1	0	0	0	193	1.5%
5 am - 6 am	8	141	56	15	24	8	13	6	113	2	0	0	0	386	3.0%
6 am - 7 am	9	233	104	16	51	14	7	13	96	3	0	1	0	547	4.2%
7 am - 8 am	14	346	129	20	37	11	22	20	85	3	0	0	2	689	5.3%
8 am - 9 am	10	349	118	16	43	11	20	17	137	0	0	0	1	722	5.5%
9 am -10 am	7	384	133	26	25	22	10	9	127	4	0	1	3	751	5.7%
10 am -11 am	15	379	99	31	35	16	14	16	125	1	0	1	8	740	5.7%
11 am -12 pm	9	421	121	26	37	18	9	18	109	1	0	0	2	771	5.9%
12 pm - 1 pm	9	368	122	20	33	9	17	7	126	3	0	0	2	716	5.5%
1 pm - 2 pm	15	426	120	25	33	21	8	23	108	1	0	0	3	783	6.0%
2 pm - 3 pm	24	426	149	16	32	9	21	16	101	0	0	0	1	795	6.1%
3 pm - 4 pm	13	547	182	12	39	17	7	25	87	0	0	0	0	929	7.1%
4 pm - 5 pm	12	560	203	13	37	15	4	17	113	1	0	0	0	975	7.5%
5 pm - 6 pm	6	597	173	12	33	11	11	14	79	0	0	0	0	936	7.2%
6 pm - 7 pm	0	589	137	3	25	0	9	0	72	0	0	0	0	835	6.4%
7 pm - 8 pm	1	344	112	10	7	9	3	11	53	0	0	0	0	550	4.2%
8 pm - 9 pm	1	364	69	6	0	7	1	5	42	1	0	0	0	496	3.8%
9 pm -10 pm	1	281	43	0	4	6	1	3	31	1	0	0	0	371	2.8%
10 pm -11 pm	2	199	28	6	3	6	3	0	32	0	0	0	0	279	2.1%
11 pm -12 am	2	172	15	2	0	1	0	4	37	1	0	0	0	234	1.8%
TOTAL	166	7268	2167	314	514	221	198	241	1897	50	0	3	22	13061	100%
% Of Total	1.3%	55.6%	16.6%	2.4%	3.9%	1.7%	1.5%	1.8%	14.5%	0.4%	0.0%	0.0%	0.2%	100%	

Legend	
1.	Motorcycle, Bicycle
2.	Cars Trailers
3.	Two Axle Long
4.	Buses
5.	Two Axle, Six Tire
6.	Three Axle Single
7.	Four Axle Single
8.	Less Than Five Axle Double
9.	Five Axle Double
10.	Greater Than Five Axle Double
11.	Less Than Six Axle Multi
12.	Six Axle Multi
13.	Greater Than Six Axle Multi

A-3

**Table A-2. Survey Interviews at PA 41 by Survey Period
(PA 41 North Cordon Station South of Zook Road, West Sadsbury Township)**

Survey Period	Inbound Traffic		Outbound Traffic		Total Traffic	
	No. of Surveys	% of Total	No. of Surveys	% of Total	No. of Surveys	% of Total
<u>Morning Shift</u>						
6:30 a.m. - 8:30 a.m.	158	19.4%	166	20.1%	324	19.8%
8:30 a.m. - 10:30 a.m.	86	10.6%	92	11.1%	178	10.9%
Subtotal	244	30.0%	258	31.2%	502	30.6%
10:30 a.m. - 12:00 p.m.	99	12.2%	101	12.2%	200	12.2%
12:00 p.m. - 1:00 p.m.	70	8.6%	94	11.4%	164	10.0%
Subtotal	169	20.8%	195	23.6%	364	22.2%
<u>Evening Shift</u>						
1:00 p.m. - 2:30 p.m.	126	15.5%	108	13.1%	234	14.3%
2:30 p.m. - 4:30 p.m.	82	10.1%	86	10.4%	168	10.2%
Subtotal	208	25.6%	194	23.5%	402	24.5%
4:30 p.m. - 6:00 p.m.	79	9.7%	85	10.3%	164	10.0%
6:00 p.m. - 8:00 p.m.	113	13.9%	95	11.5%	208	12.7%
Subtotal	192	23.6%	180	21.8%	372	22.7%
TOTAL	813	100%	827	100%	1640	100%

A-4

**Table A-3. Place of Vehicle Trip Origin by Municipality
(PA 41 North Cordon Station South of Zook Road, West Sadsbury Township)**

Municipality of Trip Origin	Home-Based Trips		Total Trips		Truck Trips	
	No. of Trips	% of Total	No. of Trips	% of Total	No. of Trips	% of Total
<u>Inbound Trips</u>						
1. Salisbury	55	16.3%	127	18.3%	9	8.2%
2. East Lampeter	15	4.5%	65	9.4%	5	4.5%
3. Manheim	25	7.4%	46	6.6%	5	4.5%
4. York	14	4.2%	35	5.1%	11	10.0%
5. Lancaster	17	5.0%	33	4.8%	7	6.4%
6. Harrisburg	14	4.2%	27	3.9%	6	5.5%
7. Paradise	13	3.9%	25	3.6%	5	4.5%
8. Christiana	8	2.4%	22	3.2%	0	0.0%
9. New Holland	11	3.3%	21	3.0%	3	2.7%
10. Sadsbury	14	4.2%	19	2.7%	1	0.9%
11. East Hempfield	9	2.7%	17	2.5%	3	2.7%
12. West Sadsbury	10	3.0%	13	1.9%	1	0.9%
13. Upper Leacock	7	2.1%	11	1.6%	1	0.9%
14. West Lampeter	8	2.4%	10	1.4%	1	0.9%
15. Other	117	34.7%	222	32.0%	52	47.3%
TOTAL	337	100%	693	100%	110	100%
<u>Outbound Trips</u>						
1. West Fallowfield	40	10.1%	51	7.1%	1	0.8%
2. Brandywine	20	5.0%	42	5.8%	10	8.1%
3. Highland	26	6.5%	40	5.5%	4	3.3%
4. Atglen	21	5.3%	34	4.7%	2	1.6%
5. Sadsbury	19	4.8%	30	4.2%	4	3.3%
6. West Sadsbury	6	1.5%	27	3.7%	6	4.9%
7. New Garden	13	3.3%	25	3.5%	4	3.3%
8. East Marlborough	11	2.8%	24	3.3%	5	4.1%
9. London Grove	11	2.8%	19	2.6%	1	0.8%
10. Philadelphia	4	1.0%	19	2.6%	1	0.8%
11. Avondale	2	0.5%	17	2.4%	8	6.5%
12. New Castle	7	1.8%	15	2.1%	5	4.1%
13. Lower Oxford	11	2.8%	15	2.1%	2	1.6%
14. Parkesburg	11	2.8%	14	1.9%	1	0.8%
15. Other	196	49.2%	350	48.5%	69	56.1%
TOTAL	398	100%	722	100%	123	100%

**Table A-4. Place of Vehicle Trip Destination by Municipality
(PA 41 North Cordon Station South of Zook Road, West Sadsbury Township)**

Municipality of Trip Destination	Home-Based Trips		Total Trips		Truck Trips	
	No. of Trips	% of Total	No. of Trips	% of Total	No. of Trips	% of Total
<u>Inbound Trips</u>						
1. Atglen	32	9.1%	61	8.4%	7	5.6%
2. Highland	24	6.9%	50	6.9%	2	1.6%
3. Brandywine	25	7.1%	49	6.7%	0	0.0%
4. West Fallowfield	18	5.1%	44	6.0%	13	10.3%
5. Philadelphia	21	6.0%	38	5.2%	5	4.0%
6. New Castle	12	3.4%	25	3.4%	7	5.6%
7. Salisbury	13	3.7%	21	2.9%	5	4.0%
8. East Marlborough	8	2.3%	18	2.5%	5	4.0%
9. West Sadsbury	10	2.9%	18	2.5%	2	1.6%
10. District 10, Ocea	3	0.9%	16	2.2%	6	4.8%
11. Greater Newark	14	4.0%	16	2.2%	0	0.0%
12. New Garden	13	3.7%	15	2.1%	3	2.4%
13. Lewes	7	2.0%	14	1.9%	0	0.0%
14. Oxford	4	1.1%	12	1.6%	1	0.8%
15. Other	146	41.7%	331	45.5%	70	55.6%
TOTAL	350	100%	728	100%	126	100%
<u>Outbound Trips</u>						
1. Salisbury	56	14.2%	107	14.4%	8	6.2%
2. East Lampeter	40	10.2%	71	9.5%	5	3.8%
3. Christiana	39	9.9%	55	7.4%	0	0.0%
4. East Hempfield	16	4.1%	35	4.7%	5	3.8%
5. Manheim	20	5.1%	34	4.6%	6	4.6%
6. Sadsbury	21	5.3%	27	3.6%	1	0.8%
7. Harrisburg	13	3.3%	27	3.6%	6	4.6%
8. Lancaster	17	4.3%	26	3.5%	2	1.5%
9. York	11	2.8%	26	3.5%	7	5.4%
10. New Holland	12	3.0%	22	3.0%	7	5.4%
11. Paradise	12	3.0%	20	2.7%	3	2.3%
12. Strasburg	10	2.5%	16	2.1%	0	0.0%
13. Upper Leacock	8	2.0%	14	1.9%	2	1.5%
14. West Sadsbury	10	2.5%	14	1.9%	0	0.0%
15. Other	109	27.7%	251	33.7%	78	60.0%
TOTAL	394	100%	745	100%	130	100%

**Table A-5. Stopping Before Arriving at Final Destination
(PA 41 North Cordon Station South of Zook Road, West Sadsbury Township)**

Survey Period	Passenger Vehicles			Trucks			Total Vehicles		
	No. of Vehicles Surveyed	No. of Vehicles Stopping	% Stopping	No. of Vehicles Surveyed	No. of Vehicles Stopping	% Stopping	No. of Vehicles Surveyed	No. of Vehicles Stopping	% Stopping
<u>Inbound</u>									
6:30 a.m. - 8:30 a.m.	131	2	1.5%	23	0	0.0%	154	2	1.3%
8:30 a.m. - 10:30 a.m.	69	3	4.3%	14	0	0.0%	83	3	3.6%
Subtotal	200	5	2.5%	37	0	0.0%	237	5	2.1%
10:30 a.m. - 12:00 p.m.	76	1	1.3%	24	2	8.3%	100	3	3.0%
12:00 p.m. - 1:00 p.m.	56	1	1.8%	16	0	0.0%	72	1	1.4%
Subtotal	132	2	1.5%	40	2	5.0%	172	4	2.3%
1:00 p.m. - 2:30 p.m.	102	4	3.9%	8	0	0.0%	110	4	3.6%
2:30 p.m. - 4:30 p.m.	66	4	6.1%	10	0	0.0%	76	4	5.3%
Subtotal	168	8	4.8%	18	0	0.0%	186	8	4.3%
4:30 p.m. - 6:00 p.m.	71	4	5.6%	26	4	15.4%	97	8	8.2%
6:00 p.m. - 8:00 p.m.	103	3	2.9%	19	2	10.5%	122	5	4.1%
Subtotal	174	7	4.0%	45	6	13.3%	219	13	5.9%
<u>Outbound</u>									
6:30 a.m. - 8:30 a.m.	140	4	2.9%	25	2	8.0%	165	6	3.6%
8:30 a.m. - 10:30 a.m.	73	5	6.8%	17	2	11.8%	90	7	7.8%
Subtotal	213	9	4.2%	42	4	9.5%	255	13	5.1%
10:30 a.m. - 12:00 p.m.	76	10	13.2%	20	2	10.0%	96	12	12.5%
12:00 p.m. - 1:00 p.m.	77	4	5.2%	15	4	26.7%	92	8	8.7%
Subtotal	153	14	9.2%	35	6	17.1%	188	20	10.6%
1:00 p.m. - 2:30 p.m.	88	9	10.2%	11	0	0.0%	99	9	9.1%
2:30 p.m. - 4:30 p.m.	71	11	15.5%	14	2	14.3%	85	13	15.3%
Subtotal	159	20	12.6%	25	2	8.0%	184	22	12.0%
4:30 p.m. - 6:00 p.m.	74	1	1.4%	23	1	4.3%	97	2	2.1%
6:00 p.m. - 8:00 p.m.	81	9	11.1%	20	3	15.0%	101	12	11.9%
Subtotal	155	10	6.5%	43	4	9.3%	198	14	7.1%
TOTAL	1354	75	5.5%	285	24	8.4%	1639	99	6.0%

**Table A-6. Reasons for Using US 30 by Drivers of Passenger Vehicles
(PA 41 North Cordon Station South of Zook Road, West Sadsbury Township)**

Survey Period	Total Drivers	Saves Time		Saves Money		Most Direct		Less Congested		Only Way		Other Reasons	
		No. of Drivers	% of Total	No. of Drivers	% of Total	No. of Drivers	% of Total	No. of Drivers	% of Total	No. of Drivers	% of Total	No. of Drivers	% of Total
<u>Inbound</u>													
6:30 a.m. - 8:30 a.m.	127	92	72.4%	4	3.1%	15	11.8%	4	3.1%	15	11.8%	4	3.1%
8:30 a.m. - 10:30 a.m.	67	55	82.1%	1	1.5%	6	9.0%	2	3.0%	3	4.5%	2	3.0%
Subtotal	194	147	75.8%	5	2.6%	21	10.8%	6	3.1%	18	9.3%	6	3.1%
10:30 a.m. - 12:00 p.m.	74	56	75.7%	1	1.4%	16	21.6%	0	0.0%	0	0.0%	4	5.4%
12:00 p.m. - 1:00 p.m.	56	37	66.1%	1	1.8%	10	17.9%	0	0.0%	7	12.5%	3	5.4%
Subtotal	130	93	71.5%	2	1.5%	26	20.0%	0	0.0%	7	5.4%	7	5.4%
1:00 p.m. - 2:30 p.m.	97	80	82.5%	1	1.0%	10	10.3%	1	1.0%	3	3.1%	3	3.1%
2:30 p.m. - 4:30 p.m.	62	58	93.5%	3	4.8%	1	1.6%	4	6.5%	0	0.0%	1	1.6%
Subtotal	159	138	86.8%	4	2.5%	11	6.9%	5	3.1%	3	1.9%	4	2.5%
4:30 p.m. - 6:00 p.m.	70	37	52.9%	6	8.6%	9	12.9%	8	11.4%	0	0.0%	20	28.6%
6:00 p.m. - 8:00 p.m.	103	64	62.1%	10	9.7%	33	32.0%	13	12.6%	0	0.0%	3	2.9%
Subtotal	173	101	58.4%	16	9.2%	42	24.3%	21	12.1%	0	0.0%	23	13.3%
<u>Outbound</u>													
6:30 a.m. - 8:30 a.m.	138	107	77.5%	3	2.2%	13	9.4%	2	1.4%	6	4.3%	7	5.1%
8:30 a.m. - 10:30 a.m.	73	62	84.9%	2	2.7%	7	9.6%	2	2.7%	1	1.4%	1	1.4%
Subtotal	211	169	80.1%	5	2.4%	20	9.5%	4	1.9%	7	3.3%	8	3.8%
10:30 a.m. - 12:00 p.m.	76	55	72.4%	0	0.0%	19	25.0%	1	1.3%	1	1.3%	1	1.3%
12:00 p.m. - 1:00 p.m.	77	43	55.8%	1	1.3%	24	31.2%	1	1.3%	4	5.2%	4	5.2%
Subtotal	153	98	64.1%	1	0.7%	43	28.1%	2	1.3%	5	3.3%	5	3.3%
1:00 p.m. - 2:30 p.m.	86	23	26.7%	1	1.2%	40	46.5%	3	3.5%	8	9.3%	11	12.8%
2:30 p.m. - 4:30 p.m.	69	28	40.6%	1	1.4%	29	42.0%	0	0.0%	6	8.7%	6	8.7%
Subtotal	155	51	32.9%	2	1.3%	69	44.5%	3	1.9%	14	9.0%	17	11.0%
4:30 p.m. - 6:00 p.m.	72	69	95.8%	0	0.0%	0	0.0%	2	2.8%	0	0.0%	1	1.4%
6:00 p.m. - 8:00 p.m.	79	53	67.1%	2	2.5%	14	17.7%	2	2.5%	5	6.3%	5	6.3%
Subtotal	151	122	80.8%	2	1.3%	14	9.3%	4	2.6%	5	3.3%	6	4.0%
TOTAL	1326	919	69.3%	37	2.8%	246	18.6%	45	3.4%	59	4.4%	76	5.7%

**Table A-7. Reasons for Using US 30 by Truck Drivers
(PA 41 North Cordon Station South of Zook Road, West Sadsbury Township)**

Survey Period	Total Drivers	Saves Time		Saves Money		Most Direct		Less Congested		Only Way		Other Reasons	
		No. of Drivers	% of Total										
<u>Inbound</u>													
6:30 a.m. - 8:30 a.m.	27	21	77.8%	2	7.4%	3	11.1%	3	11.1%	1	3.7%	1	3.7%
8:30 a.m. - 10:30 a.m.	17	11	64.7%	0	0.0%	6	35.3%	0	0.0%	0	0.0%	0	0.0%
Subtotal	44	32	72.7%	2	4.5%	9	20.5%	3	6.8%	1	2.3%	1	2.3%
10:30 a.m. - 12:00 p.m.	23	17	73.9%	1	4.3%	4	17.4%	0	0.0%	0	0.0%	2	8.7%
12:00 p.m. - 1:00 p.m.	14	11	78.6%	0	0.0%	1	7.1%	0	0.0%	1	7.1%	1	7.1%
Subtotal	37	28	75.7%	1	2.7%	5	13.5%	0	0.0%	1	2.7%	3	8.1%
1:00 p.m. - 2:30 p.m.	23	13	56.5%	4	17.4%	1	4.3%	1	4.3%	0	0.0%	10	43.5%
2:30 p.m. - 4:30 p.m.	16	8	50.0%	3	18.8%	0	0.0%	3	18.8%	0	0.0%	8	50.0%
Subtotal	39	21	53.8%	7	17.9%	1	2.6%	4	10.3%	0	0.0%	18	46.2%
4:30 p.m. - 6:00 p.m.	2	2	100%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
6:00 p.m. - 8:00 p.m.	10	4	40.0%	0	0.0%	3	30.0%	3	30.0%	0	0.0%	0	0.0%
Subtotal	12	6	50.0%	0	0.0%	3	25.0%	3	25.0%	0	0.0%	0	0.0%
<u>Outbound</u>													
6:30 a.m. - 8:30 a.m.	26	17	65.4%	0	0.0%	8	30.8%	0	0.0%	2	7.7%	1	3.8%
8:30 a.m. - 10:30 a.m.	19	10	52.6%	0	0.0%	6	31.6%	0	0.0%	2	10.5%	1	5.3%
Subtotal	45	27	60.0%	0	0.0%	14	31.1%	0	0.0%	4	8.9%	2	4.4%
10:30 a.m. - 12:00 p.m.	24	13	54.2%	0	0.0%	10	41.7%	0	0.0%	1	4.2%	0	0.0%
12:00 p.m. - 1:00 p.m.	17	14	82.4%	1	5.9%	2	11.8%	1	5.9%	0	0.0%	0	0.0%
Subtotal	41	27	65.9%	1	2.4%	12	29.3%	1	2.4%	1	2.4%	0	0.0%
1:00 p.m. - 2:30 p.m.	20	11	55.0%	0	0.0%	7	35.0%	0	0.0%	2	10.0%	0	0.0%
2:30 p.m. - 4:30 p.m.	15	8	53.3%	2	13.3%	3	20.0%	0	0.0%	3	20.0%	0	0.0%
Subtotal	35	19	54.3%	2	5.7%	10	28.6%	0	0.0%	5	14.3%	0	0.0%
4:30 p.m. - 6:00 p.m.	11	8	72.7%	0	0.0%	3	27.3%	0	0.0%	0	0.0%	0	0.0%
6:00 p.m. - 8:00 p.m.	14	7	50.0%	1	7.1%	2	14.3%	2	14.3%	1	7.1%	2	14.3%
Subtotal	25	15	60.0%	1	4.0%	5	20.0%	2	8.0%	1	4.0%	2	8.0%
TOTAL	278	175	62.9%	14	5.0%	59	21.2%	13	4.7%	13	4.7%	26	9.4%

**Table A-8. Major Roads Taken by Drivers to Reach Their Destinations
(PA 41 North Cordon Station South of Zook Road, West Sadsbury Township)**

Roads Used	Passenger Vehicles		Trucks		All Vehicles	
	No. of Drivers	% of Total	No. of Drivers	% of Total	No. of Drivers	% of Total
<u>Inbound Traffic</u>						
1. US 1	127	25.2%	26	19.5%	153	24.1%
2. PA 10	44	8.7%	6	4.5%	50	7.9%
3. US 322	28	5.6%	11	8.3%	39	6.1%
4. I-95	29	5.8%	11	8.3%	40	6.3%
5. DE 7	29	5.8%	7	5.3%	36	5.7%
6. PA 372	23	4.6%	7	5.3%	30	4.7%
7. US 13	18	3.6%	4	3.0%	22	3.5%
8. Other	205	40.8%	61	45.9%	266	41.8%
TOTAL	503	100%	133	100%	636	100%
<u>Outbound Traffic</u>						
1. US 30	298	52.4%	90	47.9%	388	51.3%
2. PA 283	53	9.3%	30	16.0%	83	11.0%
3. PA 772	39	6.9%	12	6.4%	51	6.7%
4. PA 741	41	7.2%	1	0.5%	42	5.5%
5. PA 896	14	2.5%	1	0.5%	15	2.0%
6. I-76	5	0.9%	7	3.7%	12	1.6%
7. PA 10	9	1.6%	1	0.5%	10	1.3%
8. Other	110	19.3%	46	24.5%	156	20.6%
TOTAL	569	100%	188	100%	757	100%

**Table A-9. Type of Vehicles Used for the Trip
(PA 41 North Cordon Station South of Zook Road, West Sadsbury Township)**

Vehicle Type	Inbound Traffic					Outbound Traffic					TOTAL Traffic (% of Total)
	AM Peak (% of Total)	AM Off-Peak (% of Total)	PM Off-Peak (% of Total)	PM Peak (% of Total)	Inbound Traffic (% of Total)	AM Peak (% of Total)	AM Off-Peak (% of Total)	PM Off-Peak (% of Total)	PM Peak (% of Total)	Outbound Traffic (% of Total)	
<u>Passenger Vehicles</u>											
Auto	38.6%	42.3%	47.8%	55.7%	45.8%	38.8%	42.5%	42.9%	47.2%	42.5%	44.1%
Van, Sta. Wagon	10.6%	14.7%	9.7%	9.4%	10.9%	12.7%	10.9%	10.6%	10.6%	11.3%	11.1%
SUV	12.2%	4.3%	7.7%	9.9%	8.9%	11.9%	9.3%	9.5%	12.8%	10.9%	9.9%
Other	0.0%	0.0%	0.5%	0.0%	0.1%	0.0%	0.0%	1.6%	1.7%	0.7%	0.4%
Subtotal	61.4%	61.3%	65.7%	75.0%	65.7%	63.5%	62.7%	64.6%	72.2%	65.5%	65.6%
<u>Light Trucks</u>											
Pickup	18.7%	16.0%	15.0%	13.5%	16.0%	18.5%	14.5%	14.3%	12.8%	15.3%	15.6%
Panel	0.8%	0.6%	0.0%	1.0%	0.6%	0.4%	1.6%	1.6%	0.6%	1.0%	0.8%
Single Unit	1.2%	1.8%	1.4%	0.5%	1.2%	2.7%	1.0%	3.2%	2.2%	2.3%	1.8%
Other	0.0%	0.0%	0.5%	0.5%	0.2%	0.4%	0.5%	1.1%	0.6%	0.6%	0.4%
Subtotal	20.7%	18.4%	16.9%	15.6%	18.1%	21.9%	17.6%	20.1%	16.1%	19.2%	18.7%
<u>Heavy Trucks</u>											
Tractor-Trailer	15.9%	14.7%	13.5%	8.9%	13.4%	13.1%	17.1%	12.7%	10.6%	13.4%	13.4%
Double-Trailer	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Other	2.0%	5.5%	3.9%	0.5%	2.8%	1.5%	2.6%	2.6%	1.1%	1.9%	2.4%
Subtotal	17.9%	20.2%	17.4%	9.4%	16.2%	14.6%	19.7%	15.3%	11.7%	15.3%	15.8%
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

**Table A-10. Trip Purpose by Direction
(PA 41 North Cordon Station South of Zook Road, West Sadsbury Township)**

Survey Period	Work (% of Total)	School (% of Total)	Eat Meal (% of Total)	Shopping (% of Total)	Social Recreation (% of Total)	Medical (% of Total)	Visitor/ Tourist (% of Total)	Other (% of Total)	All Purposes
<u>Inbound</u>									
6:30 a.m. - 8:30 a.m.	71.1%	3.9%	1.6%	6.3%	11.7%	0.8%	4.7%	0.0%	71.1%
8:30 a.m. - 10:30 a.m.	55.2%	1.5%	0.0%	0.0%	32.8%	1.5%	9.0%	0.0%	55.2%
Subtotal	65.6%	3.1%	1.0%	4.1%	19.0%	1.0%	6.2%	0.0%	65.6%
10:30 a.m. - 12:00 p.m.	38.7%	5.3%	1.3%	13.3%	24.0%	2.7%	10.7%	4.0%	32.0%
12:00 p.m. - 1:00 p.m.	41.8%	3.6%	1.8%	7.3%	27.3%	3.6%	14.5%	0.0%	41.8%
Subtotal	40.0%	4.6%	1.5%	10.8%	25.4%	3.1%	12.3%	2.3%	38.8%
1:00 p.m. - 2:30 p.m.	36.7%	2.0%	4.1%	17.3%	18.4%	3.1%	15.3%	3.1%	36.7%
2:30 p.m. - 4:30 p.m.	36.4%	0.0%	4.5%	18.2%	16.7%	4.5%	19.7%	0.0%	36.4%
Subtotal	36.6%	1.2%	4.3%	17.7%	17.7%	3.7%	17.1%	1.8%	36.6%
4:30 p.m. - 6:00 p.m.	22.5%	2.8%	0.0%	14.1%	45.1%	4.2%	9.9%	1.4%	22.5%
6:00 p.m. - 8:00 p.m.	33.3%	2.9%	2.9%	11.8%	37.3%	6.9%	2.9%	2.0%	33.3%
Subtotal	28.9%	2.9%	1.7%	12.7%	40.5%	5.8%	5.8%	1.7%	28.9%
<u>Outbound</u>									
6:30 a.m. - 8:30 a.m.	59.0%	1.4%	2.2%	8.6%	20.1%	5.0%	2.2%	1.4%	59.0%
8:30 a.m. - 10:30 a.m.	38.4%	6.8%	2.7%	24.7%	8.2%	8.2%	6.8%	4.1%	38.4%
Subtotal	51.9%	3.3%	2.4%	14.2%	16.0%	6.1%	3.8%	2.4%	51.9%
10:30 a.m. - 12:00 p.m.	27.6%	0.0%	5.3%	28.9%	21.1%	5.3%	6.6%	5.3%	27.6%
12:00 p.m. - 1:00 p.m.	29.7%	1.4%	5.4%	13.5%	28.4%	6.8%	10.8%	4.1%	29.7%
Subtotal	28.7%	0.7%	5.3%	21.3%	24.7%	6.0%	8.7%	4.7%	28.7%
1:00 p.m. - 2:30 p.m.	34.5%	2.4%	4.8%	13.1%	28.6%	3.6%	13.1%	0.0%	34.5%
2:30 p.m. - 4:30 p.m.	45.1%	5.6%	1.4%	8.5%	29.6%	4.2%	2.8%	2.8%	45.1%
Subtotal	39.4%	3.9%	3.2%	11.0%	29.0%	3.9%	8.4%	1.3%	39.4%
4:30 p.m. - 6:00 p.m.	35.1%	0.0%	10.8%	20.3%	24.3%	2.7%	5.4%	1.4%	35.1%
6:00 p.m. - 8:00 p.m.	25.6%	2.6%	10.3%	17.9%	30.8%	1.3%	6.4%	5.1%	25.6%
Subtotal	30.3%	1.3%	10.5%	19.1%	27.6%	2.0%	5.9%	3.3%	30.3%
TOTAL	41.3%	2.6%	3.6%	13.6%	24.6%	4.0%	8.2%	2.1%	41.3%

**Table A-11. Vehicle Occupancy by Traffic Direction and Time Period
(PA 41 North Cordon Station South of Zook Road, West Sadsbury Township)**

Survey Period	One Occupant	% of Total	Two Occupants	% of Total	Three Occupants	% of Total	Four Occupants	% of Total	Five+ Occupants	% of Total	Total Passenger Vehicles	Average Vehicle Occupancy
Inbound												
6:30 a.m. - 8:30 a.m.	92	50.0%	27	14.7%	6	3.3%	5	2.7%	0	0.0%	130	1.42
8:30 a.m. - 10:30 a.m.	35	28.9%	21	17.4%	5	4.1%	6	5.0%	1	0.8%	68	1.78
Subtotal	127	42.3%	48	16.0%	11	3.7%	11	3.7%	1	0.3%	198	1.52
10:30 a.m. - 12:00 p.m.	40	34.2%	26	22.2%	7	6.0%	1	0.9%	1	0.9%	75	1.56
12:00 p.m. - 1:00 p.m.	33	37.1%	16	18.0%	5	5.6%	1	1.1%	1	1.1%	56	1.59
Subtotal	73	36.3%	42	20.9%	12	6.0%	2	1.0%	2	1.0%	131	1.53
1:00 p.m. - 2:30 p.m.	53	31.4%	35	20.7%	6	3.6%	7	4.1%	0	0.0%	101	1.67
2:30 p.m. - 4:30 p.m.	37	35.2%	22	21.0%	5	4.8%	1	1.0%	1	1.0%	66	1.59
Subtotal	90	33.5%	57	21.2%	11	4.1%	8	3.0%	1	0.4%	167	1.61
4:30 p.m. - 6:00 p.m.	31	23.3%	27	20.3%	6	4.5%	5	3.8%	2	1.5%	71	1.87
6:00 p.m. - 8:00 p.m.	49	25.8%	32	16.8%	15	7.9%	3	1.6%	4	2.1%	103	1.84
Subtotal	80	27.3%	59	20.1%	21	7.2%	8	2.7%	6	2.0%	174	1.68
Outbound												
6:30 a.m. - 8:30 a.m.	95	46.8%	35	17.2%	4	2.0%	4	2.0%	2	1.0%	140	1.45
8:30 a.m. - 10:30 a.m.	47	43.9%	20	18.7%	5	4.7%	0	0.0%	1	0.9%	73	1.47
Subtotal	142	48.1%	55	18.6%	9	3.1%	4	1.4%	3	1.0%	213	1.38
10:30 a.m. - 12:00 p.m.	38	29.0%	27	20.6%	5	3.8%	6	4.6%	0	0.0%	76	1.72
12:00 p.m. - 1:00 p.m.	45	37.8%	23	19.3%	5	4.2%	2	1.7%	1	0.8%	76	1.57
Subtotal	83	33.9%	50	20.4%	10	4.1%	8	3.3%	1	0.4%	152	1.61
1:00 p.m. - 2:30 p.m.	50	34.5%	23	15.9%	6	4.1%	4	2.8%	3	2.1%	86	1.69
2:30 p.m. - 4:30 p.m.	32	24.6%	28	21.5%	4	3.1%	5	3.8%	2	1.5%	71	1.83
Subtotal	82	32.8%	51	20.4%	10	4.0%	9	3.6%	5	2.0%	157	1.59
4:30 p.m. - 6:00 p.m.	40	28.6%	16	11.4%	8	5.7%	6	4.3%	4	2.9%	74	1.89
6:00 p.m. - 8:00 p.m.	38	25.5%	27	18.1%	9	6.0%	5	3.4%	2	1.3%	81	1.84
Subtotal	78	30.1%	43	16.6%	17	6.6%	11	4.2%	6	2.3%	155	1.67
TOTAL	726	56.0%	389	30.0%	97	7.5%	61	4.7%	24	1.9%	1297	1.66

**Table A-12. Average Vehicle Occupancy by Trip Purpose
(PA 41 North Cordon Station South of Zook Road, West Sadsbury Township)**

Trip Purpose	Auto (Persons Per Vehicle)	Van/ Station Wagon (Persons Per Vehicle)	SUV (Persons Per Vehicle)	Total (Persons Per Vehicle)
Work	1.20	1.24	1.21	1.22
School	1.58	2.17	2.20	1.71
Eat Meal	2.19	2.00	1.82	2.04
Shopping	1.78	1.76	1.75	1.79
Social/Recreation	1.99	2.47	1.97	2.05
Medical	1.66	1.29	1.50	1.57
Visitor/Tourist	2.19	2.70	2.38	2.27
Other	1.44	3.29	2.60	1.97
All Purposes	1.68	1.91	1.65	1.66

**Table A-13. External-Internal and Internal-External Trip Length
Frequency Distribution Within The DVRPC Region
(PA 41 North Cordon Station South of Zook Road, West Sadsbury Township)**

Trip Length (Miles)	Home-Based Work Trips		Passenger Vehicle Trips		Truck Trips	
	No. of Trips	% of Total	No. of Trips	% of Total	No. of Trips	% of Total
<1	18	9.2%	65	8.3%	7	5.9%
1-2	10	5.1%	56	7.1%	9	7.6%
2-3	15	7.7%	41	5.2%	2	1.7%
3-4	11	5.6%	49	6.2%	8	6.7%
4-5	4	2.0%	11	1.4%	0	0.0%
5-6	27	13.8%	128	16.3%	7	5.9%
6-7	3	1.5%	12	1.5%	0	0.0%
7-8	3	1.5%	12	1.5%	0	0.0%
8-10	6	3.1%	25	3.2%	1	0.8%
10-12	9	4.6%	41	5.2%	9	7.6%
12-14	9	4.6%	64	8.1%	13	10.9%
14-16	21	10.7%	64	8.1%	22	18.5%
16-18	10	5.1%	39	5.0%	5	4.2%
18-20	6	3.1%	16	2.0%	3	2.5%
20-23	4	2.0%	15	1.9%	1	0.8%
23-26	11	5.6%	21	2.7%	4	3.4%
26-29	2	1.0%	4	0.5%	1	0.8%
29-32	3	1.5%	20	2.5%	1	0.8%
32-36	2	1.0%	12	1.5%	2	1.7%
36-40	4	2.0%	9	1.1%	7	5.9%
40-45	8	4.1%	34	4.3%	2	1.7%
45-50	4	2.0%	28	3.6%	10	8.4%
50-60	4	2.0%	18	2.3%	4	3.4%
60-70	1	0.5%	2	0.3%	1	0.8%
70-80	0	0.0%	0	0.0%	0	0.0%
> 80	1	0.5%	1	0.1%	0	0.0%
Average Trip Length	14.20	100%	13.95	100%	18.40	100%

**Table A-14. County Where Trucks Are Garaged or Parked When Not in Service
(PA 41 North Cordon Station South of Zook Road, West Sadsbury Township)**

County	Inbound Traffic		Outbound Traffic		Total Traffic	
	No. of Trucks	% of Total	No. of Trucks	% of Total	No. of Trucks	% of Total
Bucks	1	0.7%	0	0.0%	1	0.4%
Chester	19	13.8%	10	6.8%	29	10.2%
Delaware	2	1.4%	0	0.0%	2	0.7%
Montgomery	2	1.4%	1	0.7%	3	1.1%
Philadelphia	2	1.4%	0	0.0%	2	0.7%
Other PA	53	38.4%	95	64.6%	148	51.9%
Subtotal	79	57.2%	106	72.1%	185	64.9%
Burlington	0	0.0%	0	0.0%	0	0.0%
Camden	0	0.0%	1	0.7%	1	0.4%
Gloucester	2	1.4%	2	1.4%	4	1.4%
Mercer	0	0.0%	0	0.0%	0	0.0%
Other NJ	10	7.2%	7	4.8%	17	6.0%
Subtotal	12	8.7%	10	6.8%	22	7.7%
Delaware	14	10.1%	5	3.4%	19	6.7%
Maryland	4	2.9%	2	1.4%	6	2.1%
Other State	29	21.0%	24	16.3%	53	18.6%
Subtotal	47	34.1%	31	21.1%	78	27.4%
TOTAL	138	100%	147	100%	285	100%

Table A-15. Type of Commodities Carried by Trucks
(PA 41 North Cordon Station South of Zook Road, West Sadsbury Township)

Commodity Carried	Inbound Traffic		Outbound Traffic		Total Traffic	
	No. of Trucks	% of Total	No. of Trucks	% of Total	No. of Trucks	% of Total
Empty	20	14.4%	19	13.0%	39	13.7%
Manufactured Products	22	15.8%	14	9.6%	36	12.6%
Petroleum Products	3	2.2%	0	0.0%	3	1.1%
Agricultural Products	19	13.7%	24	16.4%	43	15.1%
Building Materials	42	30.2%	38	26.0%	80	28.1%
Refrigerated Products	5	3.6%	12	8.2%	17	6.0%
Retail Store Merchandise	6	4.3%	11	7.5%	17	6.0%
Parcels	2	1.4%	5	3.4%	7	2.5%
Other	20	14.4%	23	15.8%	43	15.1%
TOTAL	139	100%	146	100%	285	100%

APPENDIX B

Survey Responses for US 30, Lincoln Highway Cordon Station East of Swan Road, West Sadsbury Township, Chester County, Pennsylvania

**Table B-1. Daily Vehicle Classification Traffic Counts
(US 30 Cordon Station East of Swan Road, West Sadsbury Township)**

Hour of Day	Vehicle Type													Hourly Counts	% of Total
	1	2	3	4	5	6	7	8	9	10	11	12	13		
12 am - 1 am	2	65	14	7	0	3	2	3	20	0	0	0	0	116	0.6%
1 am - 2 am	1	34	8	7	4	2	5	3	22	0	0	0	0	86	0.5%
2 am - 3 am	2	16	6	5	2	1	3	3	34	0	0	0	0	72	0.4%
3 am - 4 am	0	34	13	5	3	0	4	4	37	1	0	0	0	101	0.5%
4 am - 5 am	4	89	37	7	18	1	6	10	42	0	0	0	0	214	1.1%
5 am - 6 am	14	301	224	14	61	4	13	19	81	2	0	0	0	733	3.9%
6 am - 7 am	24	807	310	23	95	5	35	20	82	0	0	0	0	1401	7.5%
7 am - 8 am	11	894	267	23	95	4	37	18	70	0	0	0	0	1419	7.6%
8 am - 9 am	10	585	308	29	65	7	38	21	72	2	0	0	0	1137	6.1%
9 am -10 am	10	403	197	21	35	9	28	24	72	1	0	0	0	800	4.3%
10 am -11 am	4	425	203	21	40	6	37	19	88	3	0	0	0	846	4.5%
11 am -12 pm	11	431	203	20	36	10	45	26	76	2	0	0	1	861	4.6%
12 pm - 1 pm	11	480	191	16	36	11	20	22	57	1	0	0	0	845	4.5%
1 pm - 2 pm	19	612	175	20	52	17	28	13	64	1	0	0	1	1002	5.4%
2 pm - 3 pm	14	597	229	23	35	7	15	10	59	1	0	0	0	990	5.3%
3 pm - 4 pm	10	754	227	26	41	8	15	18	54	0	0	0	0	1153	6.2%
4 pm - 5 pm	14	800	305	17	37	8	3	13	43	1	0	0	0	1241	6.7%
5 pm - 6 pm	17	1089	240	10	52	2	2	13	32	1	0	0	0	1458	7.8%
6 pm - 7 pm	11	1004	194	11	32	6	2	16	33	0	0	0	0	1309	7.0%
7 pm - 8 pm	12	792	107	10	31	8	3	16	34	0	0	0	0	1013	5.4%
8 pm - 9 pm	4	452	93	4	13	0	8	9	30	0	0	0	0	613	3.3%
9 pm -10 pm	4	408	80	1	11	2	4	3	42	0	0	0	0	555	3.0%
10 pm -11 pm	5	257	62	3	5	0	2	3	41	0	0	0	0	378	2.0%
11 pm -12 am	3	181	29	9	4	1	5	7	30	0	0	0	0	269	1.4%
TOTAL	217	11510	3722	332	803	122	360	313	1215	16	0	0	2	18612	100%
% Of Total	1.2%	61.8%	20.0%	1.8%	4.3%	0.7%	1.9%	1.7%	6.5%	0.1%	0.0%	0.0%	0.0%	100%	

- Legend**
1. Motorcycle, Bicycle
 2. Cars Trailers
 3. Two Axle Long
 4. Buses
 5. Two Axle, Six Tire
 6. Three Axle Single
 7. Four Axle Single
 8. Less Than Five Axle Double
 9. Five Axle Double
 10. Greater Than Five Axle Double
 11. Less Than Six Axle Multi
 12. Six Axle Multi
 13. Greater Than Six Axle Multi

B-3

**Table B-2. Survey Interviews at US 30 by Survey Period
(US 30 Cordon Station East of Swan Road, West Sadsbury Township)**

Survey Period	Inbound Traffic		Outbound Traffic		Total Traffic	
	No. of Surveys	% of Total	No. of Surveys	% of Total	No. of Surveys	% of Total
<u>Morning Shift</u>						
6:30 a.m. - 8:30 a.m.	119	14.4%	112	13.6%	231	14.0%
8:30 a.m. - 10:30 a.m.	116	14.0%	108	13.2%	224	13.6%
Subtotal	235	28.4%	220	26.8%	455	27.6%
10:30 a.m. - 12:00 p.m.	104	12.6%	85	10.4%	189	11.5%
12:00 p.m. - 1:00 p.m.	80	9.7%	100	12.2%	180	10.9%
Subtotal	184	22.2%	185	22.5%	369	22.4%
<u>Evening Shift</u>						
1:00 p.m. - 2:30 p.m.	129	15.6%	112	13.6%	241	14.6%
2:30 p.m. - 4:30 p.m.	78	9.4%	97	11.8%	175	10.6%
Subtotal	207	25.0%	209	25.5%	416	25.2%
4:30 p.m. - 6:00 p.m.	67	8.1%	71	8.6%	138	8.4%
6:00 p.m. - 8:00 p.m.	134	16.2%	136	16.6%	270	16.4%
Subtotal	201	24.3%	207	25.2%	408	24.8%
TOTAL	827	100%	821	100%	1648	100%

B-4

Table B-3. Place of Vehicle Trip Origin by Municipality
(US 30 Cordon Station East of Swan Road, West Sadsbury Township)

Municipality of Trip Origin	Home-Based Trips		Total Trips		Truck Trips	
	No. of Trips	% of Total	No. of Trips	% of Total	No. of Trips	% of Total
<u>Inbound Trips</u>						
1. Salisbury	101	21.0%	154	20.1%	9	7.0%
2. Lancaster	82	17.0%	127	16.6%	10	7.8%
3. East Lampeter	37	7.7%	55	7.2%	4	3.1%
4. York	22	4.6%	42	5.5%	13	10.2%
5. Paradise	15	3.1%	34	4.4%	12	9.4%
6. Manheim	20	4.1%	33	4.3%	6	4.7%
7. Sadsbury	22	4.6%	30	3.9%	3	2.3%
8. East Hempfield	21	4.4%	27	3.5%	3	2.3%
9. Strasburg	14	2.9%	18	2.3%	1	0.8%
10. Christiana	11	2.3%	17	2.2%	3	2.3%
11. Leacock	9	1.9%	16	2.1%	4	3.1%
12. Atglen	7	1.5%	13	1.7%	3	2.3%
13. West Lampeter	8	1.7%	12	1.6%	0	0.0%
14. Harrisburg	7	1.5%	11	1.4%	2	1.6%
15. Other	106	22.0%	177	23.1%	55	43.0%
TOTAL	482	100%	766	100%	128	100%
<u>Outbound Trips</u>						
1. Sadsbury	49	10.7%	72	9.5%	6	5.1%
2. Caln	39	8.5%	62	8.2%	6	5.1%
3. Philadelphia	25	5.5%	52	6.9%	20	16.9%
4. West Whiteland	28	6.1%	41	5.4%	2	1.7%
5. Coatesville	22	4.8%	37	4.9%	3	2.5%
6. West Goshen	25	5.5%	37	4.9%	3	2.5%
7. Downingtown	19	4.1%	30	4.0%	2	1.7%
8. West Sadsbury	18	3.9%	27	3.6%	3	2.5%
9. Valley	12	2.6%	22	2.9%	4	3.4%
10. Upper Merion	9	2.0%	18	2.4%	3	2.5%
11. West Chester	13	2.8%	16	2.1%	1	0.8%
12. East Whiteland	8	1.7%	15	2.0%	3	2.5%
13. Tredyffrin	8	1.7%	15	2.0%	0	0.0%
14. West Brandywine	10	2.2%	13	1.7%	0	0.0%
15. Other	173	37.8%	297	39.4%	62	52.5%
TOTAL	458	100%	754	100%	118	100%

**Table B-4. Place of Vehicle Trip Destination by Municipality
(US 30 Cordon Station East of Swan Road, West Sadsbury Township)**

Municipality of Trip Destination	Home-Based Trips		Total Trips		Truck Trips	
	No. of Trips	% of Total	No. of Trips	% of Total	No. of Trips	% of Total
<u>Inbound Trips</u>						
1. Philadelphia	39	8.2%	86	11.3%	28	21.2%
2. Sadsbury	58	12.1%	74	9.8%	7	5.3%
3. Coatesville	40	8.4%	51	6.7%	5	3.8%
4. Downingtown	34	7.1%	46	6.1%	8	6.1%
5. West Goshen	31	6.5%	46	6.1%	8	6.1%
6. West Whiteland	30	6.3%	40	5.3%	4	3.0%
7. East Whiteland	17	3.6%	25	3.3%	4	3.0%
8. Caln	18	3.8%	25	3.3%	2	1.5%
9. Parkesburg	11	2.3%	24	3.2%	1	0.8%
10. West Brandywine	11	2.3%	22	2.9%	1	0.8%
11. West Chester	9	1.9%	14	1.8%	1	0.8%
12. Uwchlan	9	1.9%	12	1.6%	1	0.8%
13. Valley	7	1.5%	12	1.6%	1	0.8%
14. Upper Merion	7	1.5%	12	1.6%	3	2.3%
15. Other	157	32.8%	269	35.5%	58	43.9%
TOTAL	478	100%	758	100%	132	100%
<u>Outbound Trips</u>						
1. Salisbury	119	25.9%	173	23.1%	14	10.9%
2. Manheim	48	10.5%	85	11.3%	16	12.4%
3. Paradise	29	6.3%	47	6.3%	10	7.8%
4. Lancaster	32	7.0%	43	5.7%	1	0.8%
5. York	18	3.9%	32	4.3%	9	7.0%
6. East Lampeter	20	4.4%	31	4.1%	2	1.6%
7. West Lampeter	15	3.3%	24	3.2%	3	2.3%
8. Strasburg	17	3.7%	24	3.2%	0	0.0%
9. Atglen	15	3.3%	23	3.1%	6	4.7%
10. Christiana	14	3.1%	22	2.9%	0	0.0%
11. Harrisburg	6	1.3%	17	2.3%	5	3.9%
12. East Hempfield	10	2.2%	13	1.7%	1	0.8%
13. Sadsbury	11	2.4%	13	1.7%	1	0.8%
14. West Sadsbury	7	1.5%	12	1.6%	0	0.0%
15. Other	98	21.4%	191	25.5%	61	47.3%
TOTAL	459	100%	750	100%	129	100%

**Table B-5. Stopping Before Arriving at Final Destination
(US 30 Cordon Station East of Swan Road, West Sadsbury Township)**

Survey Period	Passenger Vehicles			Trucks			Total Vehicles		
	No. of Vehicles Surveyed	No. of Vehicles Stopping	% Stopping	No. of Vehicles Surveyed	No. of Vehicles Stopping	% Stopping	No. of Vehicles Surveyed	No. of Vehicles Stopping	% Stopping
<u>Inbound</u>									
6:30 a.m. - 8:30 a.m.	98	1	1.0%	22	0	0.0%	120	1	0.8%
8:30 a.m. - 10:30 a.m.	90	0	0.0%	22	0	0.0%	112	0	0.0%
Subtotal	188	1	0.5%	44	0	0.0%	232	1	0.4%
10:30 a.m. - 12:00 p.m.	82	2	2.4%	26	2	7.7%	108	4	3.7%
12:00 p.m. - 1:00 p.m.	58	1	1.7%	16	0	0.0%	74	1	1.4%
Subtotal	140	3	2.1%	42	2	4.8%	182	5	2.7%
1:00 p.m. - 2:30 p.m.	103	5	4.9%	3	0	0.0%	106	5	4.7%
2:30 p.m. - 4:30 p.m.	62	3	4.8%	11	1	9.1%	73	4	5.5%
Subtotal	165	8	4.8%	14	1	7.1%	179	9	5.0%
4:30 p.m. - 6:00 p.m.	64	4	6.3%	14	1	7.1%	78	5	6.4%
6:00 p.m. - 8:00 p.m.	123	3	2.4%	24	2	8.3%	147	5	3.4%
Subtotal	187	7	3.7%	38	3	7.9%	225	10	4.4%
<u>Outbound</u>									
6:30 a.m. - 8:30 a.m.	98	11	11.2%	17	2	11.8%	115	13	11.3%
8:30 a.m. - 10:30 a.m.	84	5	6.0%	19	4	21.1%	103	9	8.7%
Subtotal	182	16	8.8%	36	6	16.7%	218	22	10.1%
10:30 a.m. - 12:00 p.m.	68	0	0.0%	24	3	12.5%	92	3	3.3%
12:00 p.m. - 1:00 p.m.	81	8	9.9%	24	1	4.2%	105	9	8.6%
Subtotal	149	8	5.4%	48	4	8.3%	197	12	6.1%
1:00 p.m. - 2:30 p.m.	88	19	21.6%	10	0	0.0%	98	19	19.4%
2:30 p.m. - 4:30 p.m.	73	13	17.8%	14	3	21.4%	87	16	18.4%
Subtotal	161	32	19.9%	24	3	12.5%	185	35	18.9%
4:30 p.m. - 6:00 p.m.	61	8	13.1%	0	0	0.0%	61	8	13.1%
6:00 p.m. - 8:00 p.m.	122	6	4.9%	0	0	0.0%	122	6	4.9%
Subtotal	183	14	7.7%	0	0	0	183	14	7.7%
TOTAL	1355	89	6.6%	246	19	7.7%	1601	108	6.7%

**Table B-6. Reasons for Using US 30 by Drivers of Passenger Vehicles
(US 30 Cordon Station East of Swan Road, West Sadsbury Township)**

Survey Period	Total Drivers	Saves Time		Saves Money		Most Direct		Less Congested		Only Way		Other Reasons	
		No. of Drivers	% of Total	No. of Drivers	% of Total	No. of Drivers	% of Total	No. of Drivers	% of Total	No. of Drivers	% of Total	No. of Drivers	% of Total
<u>Inbound</u>													
6:30 a.m. - 8:30 a.m.	97	94	96.9%	0	0.0%	1	1.0%	1	1.0%	0	0.0%	1	1.0%
8:30 a.m. - 10:30 a.m.	89	88	98.9%	1	1.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Subtotal	186	182	97.8%	1	0.5%	1	0.5%	1	0.5%	0	0.0%	1	0.5%
10:30 a.m. - 12:00 p.m.	80	70	87.5%	1	1.3%	4	5.0%	2	2.5%	1	1.3%	2	2.5%
12:00 p.m. - 1:00 p.m.	56	48	85.7%	0	0.0%	3	5.4%	5	8.9%	0	0.0%	0	0.0%
Subtotal	136	118	86.8%	1	0.7%	7	5.1%	7	5.1%	1	0.7%	2	1.5%
1:00 p.m. - 2:30 p.m.	103	29	28.2%	4	3.9%	50	48.5%	19	18.4%	6	5.8%	30	29.1%
2:30 p.m. - 4:30 p.m.	62	14	22.6%	2	3.2%	39	62.9%	13	21.0%	0	0.0%	20	32.3%
Subtotal	165	43	26.1%	6	3.6%	89	53.9%	32	19.4%	6	3.6%	50	30.3%
4:30 p.m. - 6:00 p.m.	64	8	12.5%	1	1.6%	45	70.3%	13	20.3%	0	0.0%	22	34.4%
6:00 p.m. - 8:00 p.m.	123	11	8.9%	1	0.8%	95	77.2%	9	7.3%	2	1.6%	18	14.6%
Subtotal	187	19	10.2%	2	1.1%	140	74.9%	22	11.8%	2	1.1%	40	21.4%
<u>Outbound</u>													
6:30 a.m. - 8:30 a.m.	97	76	78.4%	3	3.1%	11	11.3%	4	4.1%	3	3.1%	4	4.1%
8:30 a.m. - 10:30 a.m.	82	56	68.3%	1	1.2%	19	23.2%	2	2.4%	3	3.7%	5	6.1%
Subtotal	179	132	73.7%	4	2.2%	30	16.8%	6	3.4%	6	3.4%	9	5.0%
10:30 a.m. - 12:00 p.m.	65	47	72.3%	1	1.5%	8	12.3%	2	3.1%	2	3.1%	6	9.2%
12:00 p.m. - 1:00 p.m.	79	61	77.2%	0	0.0%	13	16.5%	0	0.0%	1	1.3%	5	6.3%
Subtotal	144	108	75.0%	1	0.7%	21	14.6%	2	1.4%	3	2.1%	11	7.6%
1:00 p.m. - 2:30 p.m.	86	42	48.8%	1	1.2%	44	51.2%	0	0.0%	0	0.0%	9	10.5%
2:30 p.m. - 4:30 p.m.	73	34	46.6%	11	15.1%	33	45.2%	3	4.1%	2	2.7%	13	17.8%
Subtotal	159	76	47.8%	12	7.5%	77	48.4%	3	1.9%	2	1.3%	22	13.8%
4:30 p.m. - 6:00 p.m.	61	24	39.3%	1	1.6%	27	44.3%	3	4.9%	4	6.6%	14	23.0%
6:00 p.m. - 8:00 p.m.	121	36	29.8%	1	0.8%	65	53.7%	2	1.7%	6	5.0%	15	12.4%
Subtotal	182	60	33.0%	2	1.1%	92	50.5%	5	2.7%	10	5.5%	29	15.9%
TOTAL	1338	738	55.2%	29	2.2%	457	34.2%	78	5.8%	30	2.2%	164	12.3%

**Table B-7. Reasons for Using US 30 by Truck Drivers
(US 30 Cordon Station East of Swan Road, West Sadsbury Township)**

Survey Period	Total Drivers	Saves Time		Saves Money		Most Direct		Less Congested		Only Way		Other Reasons	
		No. of Drivers	% of Total	No. of Drivers	% of Total	No. of Drivers	% of Total						
<u>Inbound</u>													
6:30 a.m. - 8:30 a.m.	19	18	94.7%	0	0.0%	0	0.0%	0	0.0%	1	5.3%	0	0.0%
8:30 a.m. - 10:30 a.m.	26	24	92.3%	0	0.0%	0	0.0%	1	3.8%	0	0.0%	1	3.8%
Subtotal	45	42	93.3%	0	0.0%	0	0.0%	1	2.2%	1	2.2%	1	2.2%
10:30 a.m. - 12:00 p.m.	22	22	100%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
12:00 p.m. - 1:00 p.m.	22	21	95.5%	3	13.6%	0	0.0%	1	4.5%	0	0.0%	1	4.5%
Subtotal	44	43	97.7%	3	6.8%	0	0.0%	1	2.3%	0	0.0%	1	2.3%
1:00 p.m. - 2:30 p.m.	26	19	73.1%	2	7.7%	1	3.8%	5	19.2%	0	0.0%	9	34.6%
2:30 p.m. - 4:30 p.m.	16	6	37.5%	2	12.5%	7	43.8%	4	25.0%	0	0.0%	8	50.0%
Subtotal	42	25	59.5%	4	9.5%	8	19.0%	9	21.4%	0	0.0%	17	40.5%
4:30 p.m. - 6:00 p.m.	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
6:00 p.m. - 8:00 p.m.	11	2	18.2%	1	9.1%	7	63.6%	0	0.0%	0	0.0%	2	18.2%
Subtotal	14	2	14.3%	1	7.1%	7	50.0%	0	0.0%	0	0.0%	2	14.3%
<u>Outbound</u>													
6:30 a.m. - 8:30 a.m.	14	6	42.9%	4	28.6%	3	21.4%	0	0.0%	1	7.1%	1	7.1%
8:30 a.m. - 10:30 a.m.	24	17	70.8%	3	12.5%	4	16.7%	0	0.0%	0	0.0%	0	0.0%
Subtotal	38	23	60.5%	7	18.4%	7	18.4%	0	0.0%	1	2.6%	1	2.6%
10:30 a.m. - 12:00 p.m.	16	8	50.0%	0	0.0%	6	37.5%	0	0.0%	1	6.3%	1	6.3%
12:00 p.m. - 1:00 p.m.	18	8	44.4%	4	22.2%	6	33.3%	2	11.1%	0	0.0%	3	16.7%
Subtotal	34	16	47.1%	4	11.8%	12	35.3%	2	5.9%	1	2.9%	4	11.8%
1:00 p.m. - 2:30 p.m.	24	12	50.0%	1	4.2%	10	41.7%	1	4.2%	1	4.2%	2	8.3%
2:30 p.m. - 4:30 p.m.	24	18	75.0%	7	29.2%	0	0.0%	0	0.0%	0	0.0%	6	25.0%
Subtotal	48	30	62.5%	8	16.7%	10	20.8%	1	2.1%	1	2.1%	8	16.7%
4:30 p.m. - 6:00 p.m.	9	8	88.9%	2	22.2%	0	0.0%	0	0.0%	0	0.0%	1	11.1%
6:00 p.m. - 8:00 p.m.	14	13	92.9%	2	14.3%	0	0.0%	0	0.0%	0	0.0%	1	7.1%
Subtotal	23	21	91.3%	4	17.4%	0	0.0%	0	0.0%	0	0.0%	2	8.7%
TOTAL	288	202	70.1%	31	10.8%	44	15.3%	14	4.9%	4	1.4%	36	12.5%

**Table B-8. Major Roads Taken by Drivers to Reach Their Destinations
(US 30 Cordon Station East of Swan Road, West Sadsbury Township)**

Roads Used	Passenger Vehicles		Trucks		All Vehicles	
	No. of Drivers	% of Total	No. of Drivers	% of Total	No. of Drivers	% of Total
<u>Inbound Traffic</u>						
1. US 202	133	32.4%	31	25.6%	164	30.9%
2. I-76 T'pike	47	11.5%	20	16.5%	67	12.6%
3. PA 100	35	8.5%	8	6.6%	43	8.1%
4. PA 10	25	6.1%	7	5.8%	32	6.0%
5. US 322	20	4.9%	0	0.0%	20	3.8%
6. I-95	10	2.4%	8	6.6%	18	3.4%
7. PA 340	16	3.9%	2	1.7%	18	3.4%
8. Other	124	30.2%	45	37.2%	169	31.8%
TOTAL	410	100%	121	100%	531	100%
<u>Outbound Traffic</u>						
1. PA 41	56	18.9%	9	8.0%	65	15.9%
2. PA 283	25	8.4%	25	22.3%	50	12.2%
3. PA 741	29	9.8%	0	0.0%	29	7.1%
4. I-81	3	1.0%	13	11.6%	16	3.9%
5. I-76	10	3.4%	5	4.5%	15	3.7%
6. PA 372	10	3.4%	2	1.8%	12	2.9%
7. PA 896	10	3.4%	2	1.8%	12	2.9%
8. Other	154	51.9%	56	50.0%	210	51.3%
TOTAL	297	100%	112	100%	409	100%

**Table B-9. Type of Vehicles Used for the Trip
(US 30 Cordon Station East of Swan Road, West Sadsbury Township)**

Vehicle Type	Inbound Traffic					Outbound Traffic					TOTAL Traffic (% of Total)
	AM Peak (% of Total)	AM Off-Peak (% of Total)	PM Off-Peak (% of Total)	PM Peak (% of Total)	Inbound Traffic (% of Total)	AM Peak (% of Total)	AM Off-Peak (% of Total)	PM Off-Peak (% of Total)	PM Peak (% of Total)	Outbound Traffic (% of Total)	
<u>Passenger Vehicles</u>											
Auto	50.9%	39.8%	49.3%	61.7%	50.7%	48.0%	41.1%	46.2%	56.0%	48.0%	49.4%
Van, Sta. Wagon	10.3%	17.1%	11.1%	12.9%	12.7%	14.8%	17.8%	10.2%	6.3%	12.2%	12.4%
SUV	8.6%	6.1%	6.8%	10.0%	7.9%	10.9%	8.1%	10.7%	15.5%	11.4%	9.6%
Other	0.0%	0.6%	0.5%	1.0%	0.5%	0.0%	0.5%	1.0%	1.9%	0.9%	0.7%
Subtotal	69.8%	63.5%	67.6%	85.6%	71.7%	73.8%	67.6%	68.0%	79.7%	72.5%	72.1%
<u>Light Trucks</u>											
Pickup	11.2%	12.7%	11.6%	7.0%	10.6%	10.9%	10.8%	11.7%	9.7%	10.8%	10.7%
Panel	0.9%	0.6%	0.5%	0.0%	0.5%	0.0%	1.6%	1.5%	0.5%	0.9%	0.7%
Single Unit	1.7%	3.3%	1.9%	0.0%	1.7%	3.9%	4.9%	4.1%	0.5%	3.3%	2.5%
Other	0.9%	0.0%	0.0%	0.5%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Subtotal	14.7%	16.6%	14.0%	7.5%	13.2%	14.8%	17.3%	17.3%	10.6%	14.9%	14.0%
<u>Heavy Trucks</u>											
Tractor-Trailer	14.2%	18.8%	15.5%	6.0%	13.5%	9.2%	13.5%	12.7%	7.7%	10.6%	12.1%
Double-Trailer	0.4%	0.6%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Other	0.9%	0.6%	2.9%	1.0%	1.3%	2.2%	1.6%	2.0%	1.9%	2.0%	1.6%
Subtotal	15.5%	19.9%	18.4%	7.0%	15.1%	11.4%	15.1%	14.7%	9.7%	12.6%	13.8%
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

**Table B-10. Trip Purpose by Direction
(US 30 Cordon Station East of Swan Road, West Sadsbury Township)**

Survey Period	Work (% of Total)	School (% of Total)	Eat Meal (% of Total)	Shopping (% of Total)	Social Recreation (% of Total)	Medical (% of Total)	Visitor/ Tourist (% of Total)	Other (% of Total)	All Purposes
<u>Inbound</u>									
6:30 a.m. - 8:30 a.m.	87.4%	5.3%	1.1%	1.1%	2.1%	2.1%	0.0%	1.1%	100%
8:30 a.m. - 10:30 a.m.	73.0%	2.2%	1.1%	2.2%	10.1%	7.9%	3.4%	0.0%	100%
Subtotal	80.4%	3.8%	1.1%	1.6%	6.0%	4.9%	1.6%	0.5%	100%
10:30 a.m. - 12:00 p.m.	50.6%	2.5%	3.8%	17.7%	8.9%	6.3%	10.1%	0.0%	100%
12:00 p.m. - 1:00 p.m.	35.7%	1.8%	12.5%	14.3%	21.4%	1.8%	7.1%	5.4%	100%
Subtotal	44.4%	2.2%	7.4%	16.3%	14.1%	4.4%	8.9%	2.2%	100%
1:00 p.m. - 2:30 p.m.	44.6%	1.0%	1.0%	20.8%	16.8%	4.0%	9.9%	2.0%	100%
2:30 p.m. - 4:30 p.m.	39.3%	1.6%	6.6%	24.6%	18.0%	3.3%	3.3%	3.3%	100%
Subtotal	42.6%	1.2%	3.1%	22.2%	17.3%	3.7%	7.4%	2.5%	100%
4:30 p.m. - 6:00 p.m.	37.5%	1.6%	7.8%	20.3%	26.6%	0.0%	3.1%	3.1%	100%
6:00 p.m. - 8:00 p.m.	35.8%	0.0%	3.3%	19.2%	27.5%	2.5%	7.5%	4.2%	100%
Subtotal	36.4%	0.5%	4.9%	19.6%	27.2%	1.6%	6.0%	3.8%	100%
<u>Outbound</u>									
6:30 a.m. - 8:30 a.m.	83.7%	2.0%	1.0%	3.1%	3.1%	1.0%	2.0%	4.1%	100%
8:30 a.m. - 10:30 a.m.	54.2%	6.0%	1.2%	8.4%	13.3%	6.0%	6.0%	4.8%	100%
Subtotal	70.2%	3.9%	1.1%	5.5%	7.7%	3.3%	3.9%	4.4%	100%
10:30 a.m. - 12:00 p.m.	44.1%	1.5%	5.9%	19.1%	13.2%	1.5%	10.3%	4.4%	100%
12:00 p.m. - 1:00 p.m.	51.3%	0.0%	7.7%	11.5%	14.1%	7.7%	5.1%	2.6%	100%
Subtotal	47.9%	0.7%	6.8%	15.1%	13.7%	4.8%	7.5%	3.4%	100%
1:00 p.m. - 2:30 p.m.	38.4%	1.2%	0.0%	12.8%	31.4%	8.1%	7.0%	1.2%	100%
2:30 p.m. - 4:30 p.m.	42.3%	5.6%	0.0%	21.1%	19.7%	4.2%	5.6%	1.4%	100%
Subtotal	40.1%	3.2%	0.0%	16.6%	26.1%	6.4%	6.4%	1.3%	100%
4:30 p.m. - 6:00 p.m.	59.0%	0.0%	1.6%	16.4%	16.4%	3.3%	3.3%	0.0%	100%
6:00 p.m. - 8:00 p.m.	39.7%	1.7%	3.3%	8.3%	36.4%	1.7%	7.4%	1.7%	100%
Subtotal	46.2%	1.1%	2.7%	11.0%	29.7%	2.2%	6.0%	1.1%	100%
TOTAL	51.7%	2.1%	3.2%	13.1%	17.8%	3.8%	5.8%	2.4%	100%

**Table B-11. Vehicle Occupancy by Traffic Direction and Time Period
(US 30 Cordon Station East of Swan Road, West Sadsbury Township)**

Survey Period	One Occupant	% of Total	Two Occupants	% of Total	Three Occupants	% of Total	Four Occupants	% of Total	Five+ Occupants	% of Total	Total Passenger Vehicles	Average Vehicle Occupancy
Inbound												
6:30 a.m. - 8:30 a.m.	84	86.6%	12	12.4%	1	1.0%	0	0.0%	0	0.0%	97	1.14
8:30 a.m. - 10:30 a.m.	73	82.0%	12	13.5%	4	4.5%	0	0.0%	0	0.0%	89	1.22
Subtotal	157	84.4%	24	12.9%	5	2.7%	0	0.0%	0	0.0%	186	1.18
10:30 a.m. - 12:00 p.m.	58	72.5%	16	20.0%	5	6.3%	1	1.3%	0	0.0%	80	1.36
12:00 p.m. - 1:00 p.m.	29	50.9%	19	33.3%	4	7.0%	4	7.0%	1	1.8%	57	1.75
Subtotal	87	63.5%	35	25.5%	9	6.6%	5	3.6%	1	0.7%	137	1.49
1:00 p.m. - 2:30 p.m.	62	60.2%	30	29.1%	5	4.9%	4	3.9%	2	1.9%	103	1.58
2:30 p.m. - 4:30 p.m.	39	62.9%	14	22.6%	5	8.1%	4	6.5%	0	0.0%	62	1.58
Subtotal	101	61.2%	44	26.7%	10	6.1%	8	4.8%	2	1.2%	165	1.52
4:30 p.m. - 6:00 p.m.	32	50.0%	17	26.6%	8	12.5%	4	6.3%	3	4.7%	64	1.94
6:00 p.m. - 8:00 p.m.	65	52.8%	39	31.7%	12	9.8%	6	4.9%	1	0.8%	123	1.70
Subtotal	97	51.9%	56	29.9%	20	10.7%	10	5.3%	4	2.1%	187	1.65
Outbound												
6:30 a.m. - 8:30 a.m.	81	82.7%	16	16.3%	0	0.0%	1	1.0%	0	0.0%	98	1.19
8:30 a.m. - 10:30 a.m.	55	66.3%	21	25.3%	4	4.8%	2	2.4%	1	1.2%	83	1.47
Subtotal	136	75.1%	37	20.4%	4	2.2%	3	1.7%	1	0.6%	181	1.29
10:30 a.m. - 12:00 p.m.	42	61.8%	20	29.4%	4	5.9%	2	2.9%	0	0.0%	68	1.50
12:00 p.m. - 1:00 p.m.	51	63.0%	23	28.4%	6	7.4%	1	1.2%	0	0.0%	81	1.47
Subtotal	93	62.4%	43	28.9%	10	6.7%	3	2.0%	0	0.0%	149	1.48
1:00 p.m. - 2:30 p.m.	54	62.1%	24	27.6%	5	5.7%	3	3.4%	1	1.1%	87	1.54
2:30 p.m. - 4:30 p.m.	42	57.5%	23	31.5%	6	8.2%	1	1.4%	1	1.4%	73	1.58
Subtotal	96	60.0%	47	29.4%	11	6.9%	4	2.5%	2	1.3%	160	1.49
4:30 p.m. - 6:00 p.m.	42	68.9%	12	19.7%	6	9.8%	1	1.6%	0	0.0%	61	1.44
6:00 p.m. - 8:00 p.m.	63	51.6%	41	33.6%	9	7.4%	4	3.3%	5	4.1%	122	1.75
Subtotal	105	57.4%	53	29.0%	15	8.2%	5	2.7%	5	2.7%	183	1.51
TOTAL	872	64.7%	339	25.1%	84	6.2%	38	2.8%	15	1.1%	1348	1.51

**Table B-12. Average Vehicle Occupancy by Trip Purpose
(US 30 Cordon Station East of Swan Road, West Sadsbury Township)**

Trip Purpose	Auto (Persons Per Vehicle)	Van/ Station Wagon (Persons Per Vehicle)	SUV (Persons Per Vehicle)	Total (Persons Per Vehicle)
Work	1.13	1.27	1.27	1.18
School	1.52	2.00	1.75	1.61
Eat Meal	1.67	1.70	2.00	1.67
Shopping	1.84	2.15	1.81	1.84
Social/Recreation	1.85	3.00	1.91	1.98
Medical	1.61	1.70	2.00	1.63
Visitor/Tourist	2.00	2.47	2.40	2.10
Other	1.36	1.67	1.63	1.39
All Purposes	1.47	1.80	1.60	1.51

**Table B-13. External-Internal and Internal-External Trip Length
Frequency Distribution Within The DVRPC Region
(US 30 Cordon Station East of Swan Road, West Sadsbury Township)**

Trip Length (Miles)	Home-Based Work Trips		Passenger Vehicle Trips		Truck Trips	
	No. of Trips	% of Total	No. of Trips	% of Total	No. of Trips	% of Total
<1	2	0.5%	14	1.2%	1	0.5%
1-2	21	4.9%	59	5.1%	2	0.9%
2-3	15	3.5%	49	4.2%	8	3.7%
3-4	15	3.5%	65	5.6%	5	2.3%
4-5	5	1.2%	25	2.2%	8	3.7%
5-6	7	1.6%	23	2.0%	5	2.3%
6-7	7	1.6%	21	1.8%	2	0.9%
7-8	30	6.9%	96	8.3%	11	5.1%
8-10	20	4.6%	68	5.9%	9	4.2%
10-12	22	5.1%	51	4.4%	2	0.9%
12-14	14	3.2%	36	3.1%	4	1.9%
14-16	28	6.5%	68	5.9%	11	5.1%
16-18	11	2.5%	27	2.3%	6	2.8%
18-20	77	17.8%	151	13.0%	14	6.5%
20-23	24	5.6%	49	4.2%	5	2.3%
23-26	33	7.6%	66	5.7%	10	4.7%
26-29	14	3.2%	30	2.6%	2	0.9%
29-32	27	6.3%	58	5.0%	6	2.8%
32-36	10	2.3%	22	1.9%	14	6.5%
36-40	13	3.0%	39	3.4%	14	6.5%
40-45	13	3.0%	51	4.4%	19	8.8%
45-50	15	3.5%	53	4.6%	32	14.9%
50-60	6	1.4%	25	2.2%	19	8.8%
60-70	3	0.7%	9	0.8%	6	2.8%
70-80	0	0.0%	3	0.3%	0	0.0%
> 80	0	0.0%	0	0.0%	0	0.0%
Average Trip Length	19.07	100%	18.82	100%	29.11	100%

**Table B-14. County Where Trucks Are Garaged or Parked When Not in Service
(US 30 Cordon Station East of Swan Road, West Sadsbury Township)**

County	Inbound Traffic		Outbound Traffic		Total Traffic	
	No. of Trucks	% of Total	No. of Trucks	% of Total	No. of Trucks	% of Total
Bucks	1	0.7%	0	0.0%	1	0.4%
Chester	15	10.5%	14	11.2%	29	10.8%
Delaware	2	1.4%	1	0.8%	3	1.1%
Montgomery	5	3.5%	0	0.0%	5	1.9%
Philadelphia	8	5.6%	3	2.4%	11	4.1%
Other PA	70	49.0%	88	70.4%	158	59.0%
Subtotal	101	70.6%	106	84.8%	207	77.2%
	1					
Burlington	3	2.1%	1	0.8%	4	1.5%
Camden	0	0.0%	0	0.0%	0	0.0%
Gloucester	0	0.0%	1	0.8%	1	0.4%
Mercer	2	1.4%	1	0.8%	3	1.1%
Other NJ	11	7.7%	3	2.4%	14	5.2%
Subtotal	16	11.2%	6	4.8%	22	8.2%
Maryland	2	1.4%	2	1.6%	4	1.5%
Other States	24	16.8%	11	8.8%	35	13.1%
Subtotal	26	18.2%	13	10.4%	39	14.6%
TOTAL	143	100%	125	100%	268	100%

Table B-15. Type of Commodities Carried by Trucks
(US 30 Cordon Station East of Swan Road, West Sadsbury Township)

Commodity Carried	Inbound Traffic		Outbound Traffic		Total Traffic	
	No. of Trucks	% of Total	No. of Trucks	% of Total	No. of Trucks	% of Total
Empty	26	17.7%	29	20.1%	55	18.9%
Manufactured Products	22	15.0%	21	14.6%	43	14.8%
Petroleum Products	2	1.4%	1	0.7%	3	1.0%
Agricultural Products	10	6.8%	12	8.3%	22	7.6%
Building Materials	44	29.9%	37	25.7%	81	27.8%
Refrigerated Products	4	2.7%	3	2.1%	7	2.4%
Retail Store Merchandise	7	4.8%	9	6.3%	16	5.5%
Parcels	5	3.4%	2	1.4%	7	2.4%
Other	27	18.4%	30	20.8%	57	19.6%
TOTAL	147	100%	144	100%	291	100%

Cordon Line Highway Survey for the Delaware Valley Region - Report No. 3 PA 41 North and US 30 Cordon Stations in Chester County

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Geographic Area Covered: Delaware Valley metropolitan region comprised of five counties in Pennsylvania (Bucks, Chester, Delaware, Montgomery, and Philadelphia); and four counties in New Jersey (Burlington, Camden, Gloucester and Mercer) and includes some counties adjoining the region: (Lancaster, Berks, and Lehigh in PA; Hunterdon, Middlesex, Ocean, Cumberland and Salem in NJ; and New Castle County in Delaware).

Key Words: Traffic count, geocoding, cordon line, survey station, travel trends, vehicle trips, person trips, AM and PM peak hour, origin and destination, average vehicular occupancy, commodities.

ABSTRACT

A cordon line survey of traffic entering and leaving the Delaware Valley region was conducted during the summer of 2001. This is a summary report describing the characteristics of traffic crossing the regional cordon line at 2 locations in Pennsylvania: PA 41 and US 30. This includes information regarding the data collection, data summaries, and complete data tables in the Appendices.

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